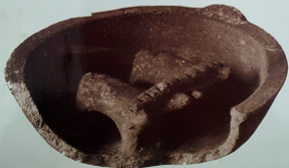


ARCHAEOLOGY AT AKSUM, ETHIOPIA, 1993-7

by David W. Phillipson

Volume II



Archaeology at Aksum, Ethiopia, 1993-7

Volume II

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ARCHAEOLOGY AT AKSUM, ETHIOPIA, 1993-7

by

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Chapter 10

THE D SITE AT KIDANE MEHRET

SUMMARY: Excavation at D site revealed two distinct components.

A Pre-Aksumite domestic settlement c. 800-400 BC lacked the monumental architecture known for this period at Yeha. After a long hiatus Late Aksumite low-to-middle-rank occupation, peripheral to the main urban area, was largely engaged in the production and processing of food.

THE SITE AND ITS SEQUENCE

(D.W.P. and Jacke Phillips)

A prime aim of the Project here described was the investigation of one or more sites of domestic occupation where an understanding might be obtained of everyday living conditions and local economy practised by the non-élite echelons of ancient Aksumite society. After consideration of several areas where stratified remains of such occupation could have survived with

minimal disturbance, a site was selected on the northern edge of Aksum, beside the road to the Tombs of Kaleb and Gabra Maskal, where indications of domestic occupation were visible on the surface of cultivated fields (Fig. 236). Traces of ancient activity in this area had been noted previously by Michels (1990, 1994). The site slopes down to the south, from about 44 m to 28 m above Maryam Tsion Cathedral, and is located 1.1 km to its north-northeast (Figs 6, 7, above). To the west, backed by the slopes of Beta Giyorgis, is a



Fig. 236 View over D site from the south. The stone building right of centre houses the stone inscription discovered in 1981. D site is located in the cultivated fields immediately north of this building (cf. Fig. 237). The roofs visible on the horizon protect the Tombs of Kaleb and Gabra Maskal.

Archaeology at Aksum

wide valley through which passes a track leading from Aksum to Adi Tsehafi. At the foot of the slope on the southern edge of the site, in the area called Geza 'Agmai, the inscription of King Ezana discovered in May 1981 (Bernand 1982; Bernand *et al.* 1991: 185*bis*) is preserved *in situ*. The archaeological site itself is named Kidane Mehret (Covenant of Mercy) after the dedication of a church which overlooks it from the east. For convenience it was designated during excavation by the initial D (for Domestic Site), and the convention is followed here. The area including the site is now covered by a series of cultivation terraces. Evidence of ancient occupation visible before excavation began included abundant surface pottery as well as the inscription noted above. A gully which has eroded on the east side of the road revealed the presence of deep stratified deposits with traces of stone walls. Scatters of Aksumite pottery and associated lithics suggest that broadly contemporary cultivation occurred over much of the valley to the west of the site, although no traces of buildings were observed there.

The underlying solid geology is granitic overlain by varied clays which were exposed in several excavation trenches and in the roadside gully. To the north the subsoil is a stiff grey clay, while the site itself rests on solid black clay containing massive rounded boulders; this deposit extends beyond the site to the south and rests on red and yellow clays. Although the area is currently cultivated, ploughing has only penetrated to an average depth of 0.15 m, with the result that the underlying archaeological deposits are largely undisturbed.

Excavations

Excavation began in 1994, when twelve trial trenches were opened under Jenny Jones's supervision (Fig. 237). Positioned to investigate the extent of ancient occupation, they indicated that, contrary to expectation, the immediate vicinity of the Ezana inscription preserved little other trace of ancient activity. Upslope, however, they revealed stone walls with signs of repeated repair and alteration, associated with deposits up to 2.0 m deep containing artefacts which appeared to date back to at least the sixth century AD.

During the following two seasons more extensive excavations were undertaken, supervised in 1995 by Andrew Reynolds with the principal assistance of Yohannes Gebre Hiwot, and in 1996 by Klara Spandl (Fig. 238). Deposits were sampled, under Sheila Boardman's direction, primarily for archaeobotanical study. The research was designed to establish the chronological and spatial patterning of the domestic settlements, to reveal ground plans of domestic buildings and associated structures and (if possible) to establish their function, to reconstruct the economic

bases of the settlements, to provide dated artefact assemblages from stratified contexts, to place the excavated evidence within a settlement hierarchy and to relate it to other aspects of Aksumite society.

At the conclusion of each research season, the excavations were backfilled and the site returned to cultivation.

Extent of settlement

The southern limit of the archaeological remains in the roadside gully was examined through excavation of trench D15 (Figs 237, 239). Two distinct layers of redeposited domestic rubbish were noted but, to the south, no structural features were visible in the roadside section or in the surrounding plough-land: it therefore seems that D site was separated from the main built area of Aksum by a belt of open country.

The excavations revealed evidence for two distinct periods of ancient activity. The first, and more extensive, belongs to the Pre-Aksumite period now dated between the eighth and the fifth centuries BC. After a long hiatus, a more restricted area (or possibly areas) to the north was re-occupied in the Late Aksumite period beginning, perhaps, around the end of the fifth century AD. The site seems to have been abandoned in the early seventh century and at some later date to have been terraced for agricultural use which has continued to the present. Fig. 237 shows the approximate extent thus indicated for the two occupations, which were initially distinguished by the typology of the associated pottery. Trenches D1, D2, D4, D8, D10-15 and D23 yielded material that was Pre-Aksumite in character, that from D3, D7 and D16 was predominantly Late Aksumite, while trenches D9, D19 and D22 showed the stratigraphic relationship between the two.³⁵ No evidence was found for occupation during the fourth-century period of the Ezana inscription, although in the uphill trenches occasional sherds attributed to this time suggest activity nearby. The chronology of the site is evaluated in greater detail below (pp. 372-9, 485-6).

Most of the midden and hillwash deposits encountered lie directly downhill from trenches which yielded evidence for primary occupation. The exceptions (D9, D10 and D11) probably indicate Pre-Aksumite settlement in unexcavated areas directly upslope; if this is assumed to have been the case, occupation along the contour of D16 must have extended both eastward and westward of that trench.

A monumental flight of roughly constructed stone steps exposed by cultivation and erosion of a terrace edge east of the lowermost hillwash trenches suggests further but possibly separate occupation of

³⁵ D6 and D17 were subsequently incorporated within D19. D18 was not excavated. D5, D20 and D21 were effectively sterile.

D Site at Kidane Mehret

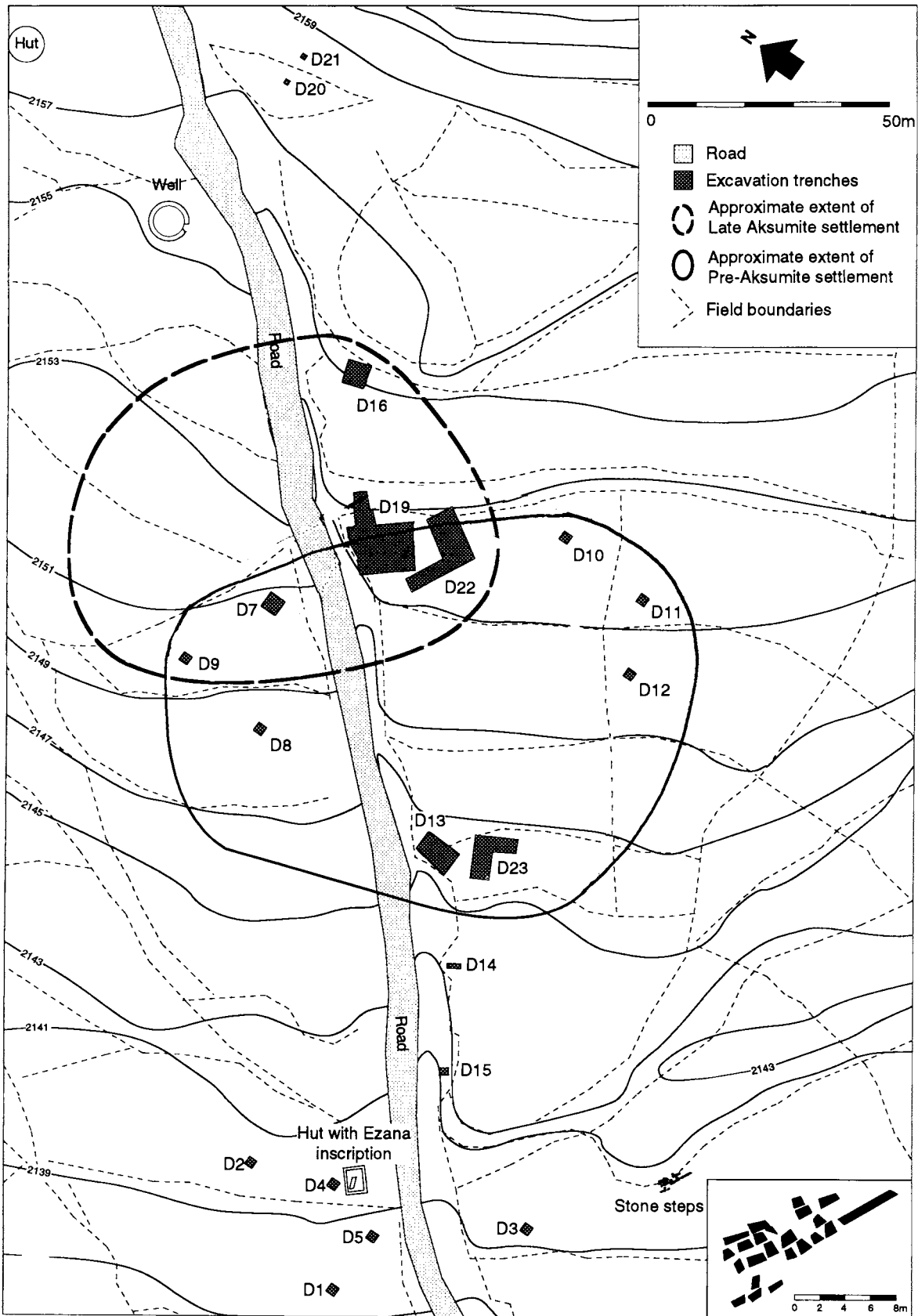


Fig. 237 Plan of D site, showing the location of the excavations and approximate areas of ancient settlement. Inset: plan of stone steps.



a



b



c

Fig. 238 Excavation of Late Aksumite structures in progress in trench D19.

D Site at Kidane Mehret

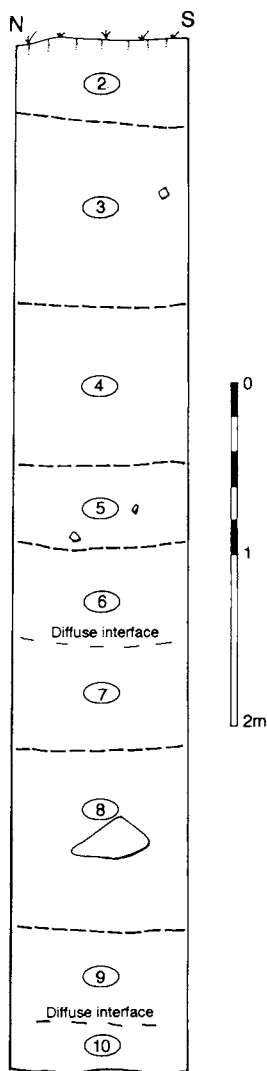


Fig. 239 North-south section of trench D15.

unknown age. Surface scatters of microlithic artefacts were denser in this area than in other parts of the site. The steps were planned and photographed (Fig. 240), but not otherwise investigated.

Post-occupation levels were progressively deeper on the lower terraces, being overlain by thicker deposits of hillwash and erosion debris. The upper trenches (D8, D16, D19 and D22) revealed deposits of such material between 0.1 and 0.2 m thick, whilst the lower ones (D13 and D23) have between 0.3 and 0.4 m. Some 0.3 m of topsoil overlies the midden layers (2,3) in D14 (Fig. 242) but, farther downhill, D15 (Fig. 239) has 1.5 m of overlay in four layers above midden layers (6,7), some of which may have been deliberately dumped to prepare for cultivation.

Fourteen major phases of occupation were distinguished at D site, and in several cases these were

subdivided.³⁶ The sequence divides into two principal periods: Pre-Aksumite represented by phases 1 to 3 and, after a long hiatus, a Late Aksumite occupation in which phases 4 to 13 are recognised. Phase 14 represents later material, generally mixed or disturbed by cultivation. In the following sections an outline account of the sequence is presented, followed (pp. 280-301) by a more detailed consideration of the structures and stratigraphy.

Pre-Aksumite occupation, phases 1 to 3

Some 20 m upslope from the southern edge of the settlement area, traces of stone walling were visible in the roadside section. Excavation of trenches D13 and D23 here covered an area of 99 sq. m and revealed walls and a cobbled surface probably representing an unroofed yard (Fig. 242) of phases 1C and 2A.

A much larger area of some 230 sq. m was investigated in trenches D19 and D22 some 100 m further north (Fig. 237, above), reaching a maximum depth of 2.5 m. The Pre-Aksumite deposits were concentrated in the southern part of the excavations and appear broadly contemporary with those investigated in D13 and D23, with abundant artefacts and some stone walling. The oldest phase, 1A, was represented by traces of a wall running from north-northwest to south-southeast. A later wall, aligned north-northeast to south-southwest, represents phase-2A occupation. Three walls of somewhat later Pre-Aksumite date (phase 3A) were exposed in the northern part of the excavated area, enclosing a room aligned from northwest to southeast and having a floor of trampled natural clay. These walls were roughly built of large undressed rounded stones, some of which were in their original position, one having been moved and set in a pit prior to incorporation within the wall. Two further walls in the southern part of the excavation were of similar construction and orientation, suggesting that they may have formed the northeast and southwest walls of a related room or building. The floor associated with these walls, not fully excavated, was sealed by a dumped layer incorporating at its base a substantial number of complete and partially complete pots, including large storage vessels. After demolition, the buildings of this period were sealed by further layers of dumping and levelling; a number of pits were subsequently dug into these deposits.

In addition to the substantial traces of Pre-Aksumite occupation in D13 and D23 and in the lower

³⁶ The phasing presented in this work applies to the whole of D site and replaces that offered in a preliminary report of the D19 excavations (D.W. Phillipson, Reynolds *et al.* 1996: 120-5). Phases 1A-3A were formerly grouped as D19 phase 1, phases 4-7B as phase 2, while phases 8-14 were previously designated 3-9. Phase 3B is not represented in D19.



Fig. 240 The stone steps exposed in the southern part of D site. Scales: 0.5 m.

levels of D19 and D22, single walls were encountered in D8 and D12. There were also substantial midden (D9-11, D14 and D15) and hillwash (D1, D2 and D4) deposits. This indicates widespread occupation of the hillside, possibly extending to an unexcavated northeast area above D10 and D11. At least two occupation levels can be distinguished stratigraphically. The general alignment of the walls suggests that the majority of this material relates to a single building-phase 2A, and the uniformity of the associated pottery strengthens this conclusion. Unfortunately, virtually all building remains had been robbed, demolished or truncated, so there is little that can be said about spatial patterning and use.

Four radiocarbon age-determinations have been obtained from Pre-Aksumite contexts at D site, three of them giving results in very close agreement with one another. Full details are provided in Appendix VI. Two samples are from wheat seeds in phase 2: 2430 bp ± 50 (OxA-8282) and 2485 bp ± 40 (OxA-8229). Phase 3 charcoal yielded a date of 2480 bp ± 45 (OxA-8334). A further determination from the same phase-3 context was based on cotton seeds which proved to be intrusive from the overlying Late Aksumite deposits, giving an age of 1240 bp ± 35 (OxA-8228). The implications of these dates, especially for the agricultural history of the Aksum region, are discussed on pp. 365 and 372-4, below.

Fig. 241 East-west section of trench D14.

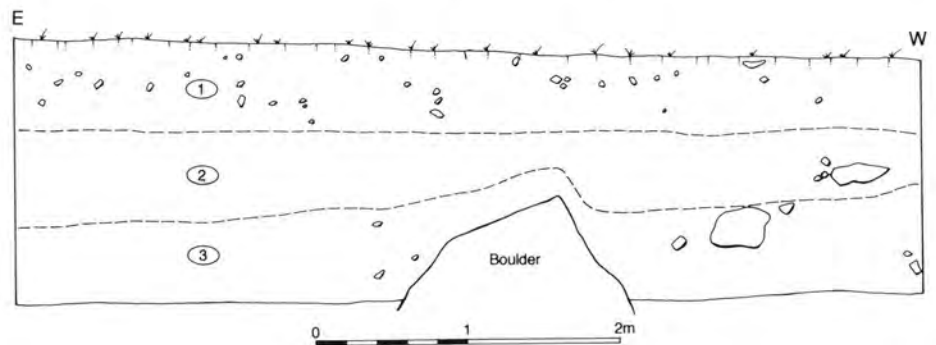




Fig. 242 *The Pre-Aksumite courtyard surface exposed in trench D13. Scale: 0.5 m.*

Following the Pre-Aksumite occupation, which probably fell between the eighth and the fifth centuries BC, a long hiatus intervened, during which there is no evidence for human activity at D site.

Late Aksumite occupation, phases 4 to 13

The Late Aksumite occupation may have begun early in the sixth century AD. Phases 4 to 6 were marked by the erection of substantial boundary or retaining walls in preparation for a building of which traces were preserved only in the northeastern part of the excavated area. Naturally rounded stones continued in use, especially for the boundary walls, although they were now laid in rough courses to provide facing for a rubble infill.

Shortly afterwards, in phase 7A, there was erected an elaborate structure whose exposed features, at the north end of trench D19, include neatly built rebated walls with massive corner blocks of finely dressed syenite and string courses of blue-grey slate, six steps of a monumental sandstone staircase and a small paved forecourt with a stone drainage channel at its south end (Fig. 243). Its architecture contrasts markedly with that of all other buildings at D site, but shows very close affinities with that of high-status structures such as Ta'akha Maryam, Enda Sem'on and Dungur (D.W. Phillipson 1997: 93-122; Munro-Hay 1989: 121-42; Anfray 1972a), or the superstructure to the Tombs of Kaleb and Gabra Maskal (D.W. Phillipson 1997: 73-88). Although only a very restricted part of it was excavated, it is clear that this élite structure must have

been smaller than others known at Aksum; its size was restricted by its hillside location and there was no trace of it in trench D16, 27 m to the north. Much of the élite structure had been removed during construction of the road which runs directly through it and by erosion of the adjacent gully. Its closest parallels are at Dungur (Anfray 1972a) and Matara Edifice B (Anfray and Annequin 1965).³⁷ The limited investigation that was conducted provided no indication that the structure was fully completed before being abandoned. Investigation of this apparently short-lived building was limited to establishing its stratigraphic position in the sequence. Following its demise, layers of natural hill-wash became deposited, upon which limited Aksumite occupation was represented by small pits, scattered pottery and animal bone.

The next phase, 8, was marked by the erection of several walls and, later, a large rectangular masonry building, comprising at least three rooms on an alignment from northwest to southeast (Figs 244a-c). These walls were composed of roughly hewn stone laid in random courses, bonded together with a weak mud mortar and often incorporating a rubble core. Floors were of earth or paved with stone flags including some which may have been robbed from the élite structure (Figs 246a, b). Against the southwestern wall of the building an extensive yard surface was laid

³⁷ The closest parallel of the D-site staircase is at the entrance to the Dungur complex, as opposed to its central building. Other élite structures at Aksum are located on fairly level ground and lack the precise type of staircase represented at D site.

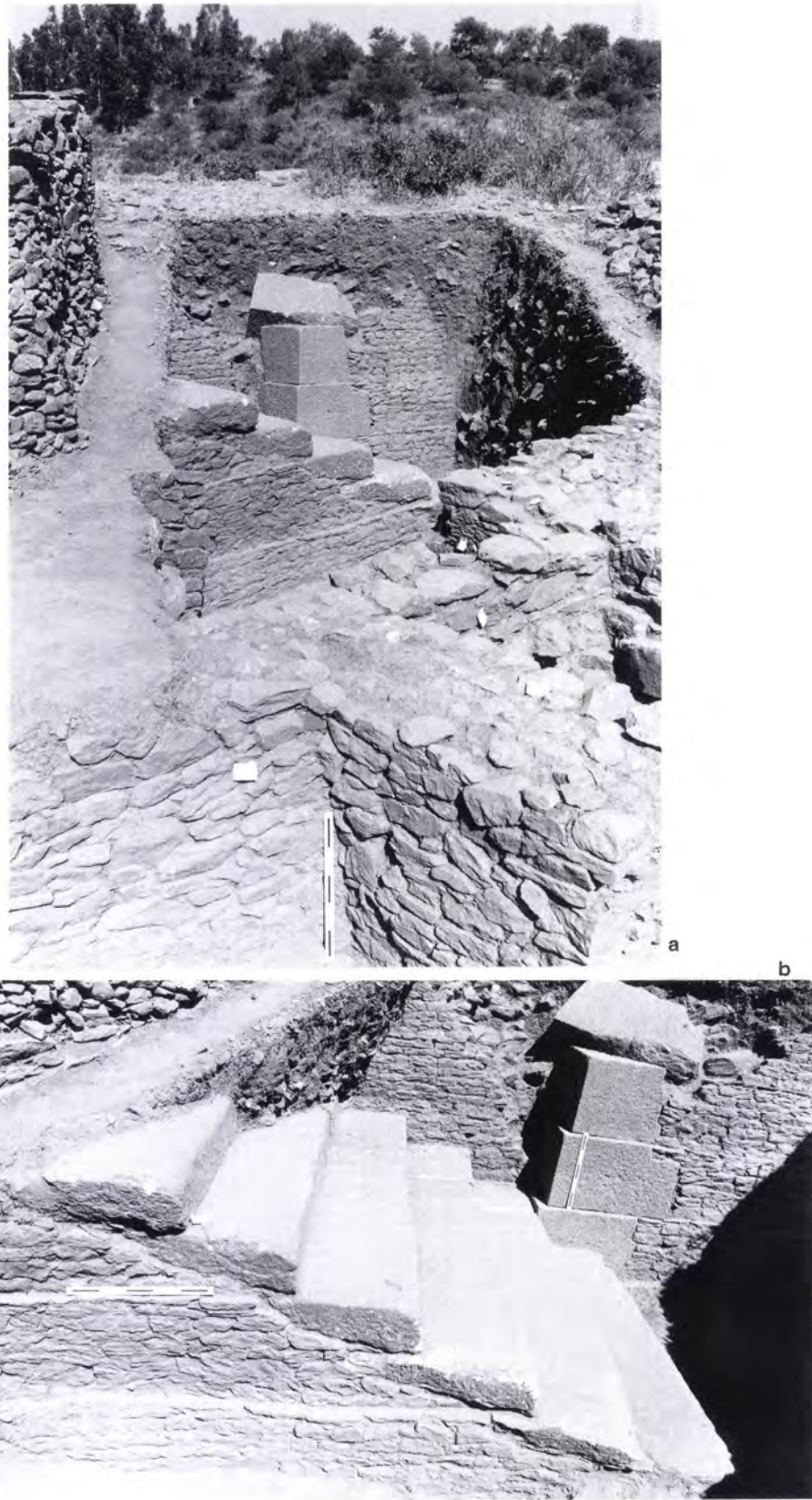


Fig. 243 The élite structure partially exposed in trench D19. Scales: 0.5 m.

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which comprised angular stone chips characteristic of construction debris. This deposit yielded little-worn coins of sixth-century date.³⁸

During the life of this building, various alterations and subdivisions were made. To the south, an unusual building with rounded corners was erected in phase 9. Its walls were composed of an off-white sandstone not used elsewhere at D site, roughly hewn and laid in random courses (Fig. 244d). Outside the structure, deposits abutting its walls were found to contain several coins of the sixth century. A new yard surface was laid across the entire area between the main complex and the round-cornered building. The numerous artefacts in this deposit included a group of coins largely consistent with those described above, although the latest was an unworn example of Gersem dated not earlier than AD 600. Phase-10 developments comprised additions and alterations to the main complex, apparently accompanied by a reduction in prosperity. The round-cornered building was demolished in phase 11 and much of the resultant debris was incorporated into a new yard surface that sealed its remains (Fig. 244e). The make-up of this surface contained a wide range of artefacts including a series of coins, one of the fifth century and the rest spanning the greater part of the sixth century. It seems likely that some of these artefacts may have been derived from redeposited middens which originated during the more affluent phases of occupation. The number of rooms that were in use continued to decline in phase 12, when the western part of the complex appears to have been levelled. After continued decay in phase 13 the area reverted to cultivation.

Near the northern edge of the settlement, a complex sequence was revealed over 25 sq. m in trench D16 (Fig. 245). The first substantial building, equated with phases 8 and 9, was of roughly hewn sandstone masonry built on a terrace cut into the hillside. Four subrectangular rooms were revealed, apparently set around a yard. The thickness of the walls varied, as did the depth of their foundations. In general, little attempt had been made to achieve right-angle corners or straight walls. The associated floors were composed of hard, well laid grit which included a sixth-century coin. The only internal feature of this phase was a stone bench. Subsequently, extensive structural alterations were carried out and new floors laid. It seems that one wall had developed a serious lean and was demolished to alleviate structural failure. Later, this building was almost completely demolished and replaced. The alignment of the new structure mirrored

³⁸ Aksumite coins are here dated according to the system presented by Munro-Hay and Juel-Jensen (1995), although it should be noted that the radiocarbon analyses from D site suggest that the final issues should be dated rather later (p. 484 and Appendix VI).

that of the earlier buildings, one wall of which continued in use.

The Late Aksumite structures of D7, D16, D19 and D22 retained the alignment of the phase-7A élite structure, despite the fact that the latter had gone out of use and been deliberately covered. Later additions and alterations to these Late Aksumite structures did not alter the alignment. The only walls not so governed are the apparent boundary walls in D22, which follow the general hillside slope (and, incidentally, the latest of the Pre-Aksumite structures); they first supported the earliest Late Aksumite buildings and were subsequently remodelled to form the south courtyard of the élite structure. Traces of a further wall, also on a different alignment, may date from a very late period after the Late Aksumite buildings had been forgotten.

Clearly, the majority of the Late Aksumite occupation lay at the north end of the excavated area, extending beyond it to the north and northeast where the ground is more level. (The difficulties encountered in building on sloping ground are exemplified in the southern part of D22 which seems to have been repeatedly raised and levelled, its retaining or boundary wall being rebuilt at least once.) This terrace, or possibly that directly downhill, may represent the southern limit of Late Aksumite occupation. Thus the Late Aksumite settlement had a quite restricted area effectively limited to that surrounding the élite structure, and should be considered an organic unit with occasional additions and alterations rather than multiple separate structures.

Eleven radiocarbon age-determinations have been obtained on various seeds and charcoals from the Late Aksumite occupation at D site. Details are presented in Appendix VI while the implications, especially for agricultural history, are considered below on pp. 365 and 372-4. One result, 2190 bp ± 50 (OxA-8285) is aberrant and presumably based on residual material. Nine others form a tight group between 1595 bp ± 50 (OxA-8284) and 1285 bp ± 40 (OxA-8231). The most recent date, 1115 bp ± 45 (OxA-8286), may be based on an intrusive sample. The chronology of the Late Aksumite phases at D site is discussed in greater detail below (pp. 378-9 and 484, also Figs 329 and 332).

Post-Aksumite and recent, phase 14

Substantial superficial deposits, particularly in the southern, downslope, parts of D site, are disturbed by terracing, cultivation and road-construction. They contain numerous artefacts, including many which may be linked typologically with the Pre-Aksumite and Late Aksumite occupations, as well as later material some of which is demonstrably modern.



Fig. 244 Late Aksumite buildings exposed in trench D19. Part of the élite structure is visible in the left background of view *a*. Scales: 0.5 m.



Fig. 245 View of Late Aksumite walling in trench D16. Scales: 0.5 m.

Building construction techniques

Pre-Aksumite masonry: The earliest stone-building technique represented at D site employed massive unmortared boulders, both *in situ* and displaced. Later walls sometimes employed roughly dressed facing stones laid without clear courses in a weak mud mortar and a rubble infill. The few foundation trenches varied considerably, and some walls displayed an offset foundation. The buildings contrast markedly with the ashlar evidenced at broadly contemporary sites such as Yeha, and were clearly lower-status structures.

Late Aksumite masonry: The phase-7A élite structure is wholly distinct, using finely dressed square and interlocking syenite blocks as cornerstones and large sandstone slabs for stairs, paving and drainage channels. Construction techniques of the other Late Aksumite walls in D7, D16, D19 and D22 are markedly less elaborate. Lower-status construction shows roughly dressed uncoursed masonry in a weak mud mortar, with rubble infill (Figs 246c-e). Walls demolished during excavation sometimes revealed potsherds used as chinking. Foundations were variable, even along a single stretch of wall, with a combination of occasional foundation trenches and offsets, random rubble and finished faces. Walls exhibited no string coursing of any kind. The only significant change

from Pre-Aksumite walling was in the relative scale of facing stones and rubble infill, the latter now dominating the wall in both plan and section; the distinction may be clearly seen in Fig. 251, below, by comparing the Pre-Aksumite wall (355) with the Late Aksumite one (241). Entrances were provided with stone thresholds. Consistent wall thickness and right-angled corners were of little concern. Imprecise layout and construction were characteristic of these buildings, also evidenced by the processes of decay before their deliberate destruction or abandonment. None of the walls appear sufficient to have supported an upper storey and no evidence for stairs was found other than those at the élite structure, suggesting that the D-site lower-status buildings were all single-storeyed.

Brick: No *in situ* brick-built features were encountered at D site, and significant quantities of this material came only from the northern parts of D19 and D22, where it occurred in secondary contexts attributed to phases 4 to 5 and 10 to 13. In D22, bricks had been used on edge to cover a pit attributed to phase 12 or 13. Some nearly complete red bricks were recovered, along with numerous fragments. All had been fired, with little control over temperature, some being vitrified. Although some bricks showed traces of having been shaped with moulding boards, there was

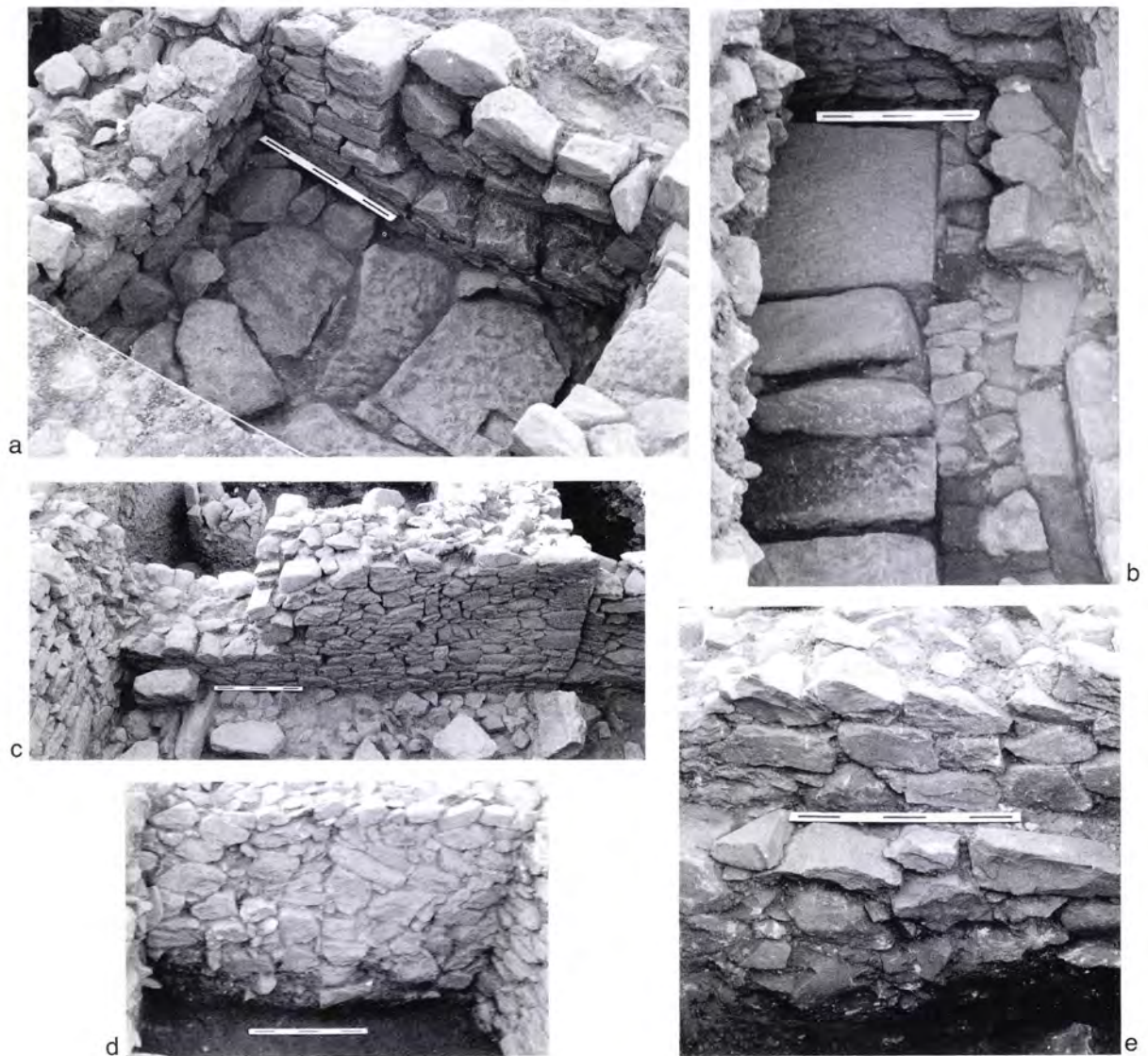


Fig. 246 Late Aksumite architecture in trench D19: **a, b** - dressed stone from the *élite* structure re-used as paving; **c-e** - details of walling. Scales: 0.5 m.

much variation in size and little effort had been made to obtain flat surfaces. Two basic brick shapes were represented, one essentially square and the other rectangular. The square type (Fig. 247b), apparently the earlier, is similar to that represented both at the Tomb of the Brick Arches and at the Brick Vaulted Structure to the west of Stela 1 described by Munro-Hay (1989: 162), with sizes respectively 200 by 200 by 70 mm and 270 by 280 by 60 mm. This type was also used in the Mausoleum arches where dimensions of 293 by 244 by 68 mm are recorded. At D site, it was

found in secondary contexts of Late Aksumite phases 4 and 5, the only complete example measuring 231 by 208 by 51 mm. The later, rectangular, shape (Fig. 247a) was recorded in phases 10 to 13 and occurred in much greater quantity, being essentially half the size of the old square brick. This reduction and change in shape may have been for easier manipulation or shorter firing time. The five complete examples range in length from 195 to 262 mm, in breadth from 129 to 168 mm, and in thickness from 51 to 77 mm. It seems likely that these bricks were derived from a

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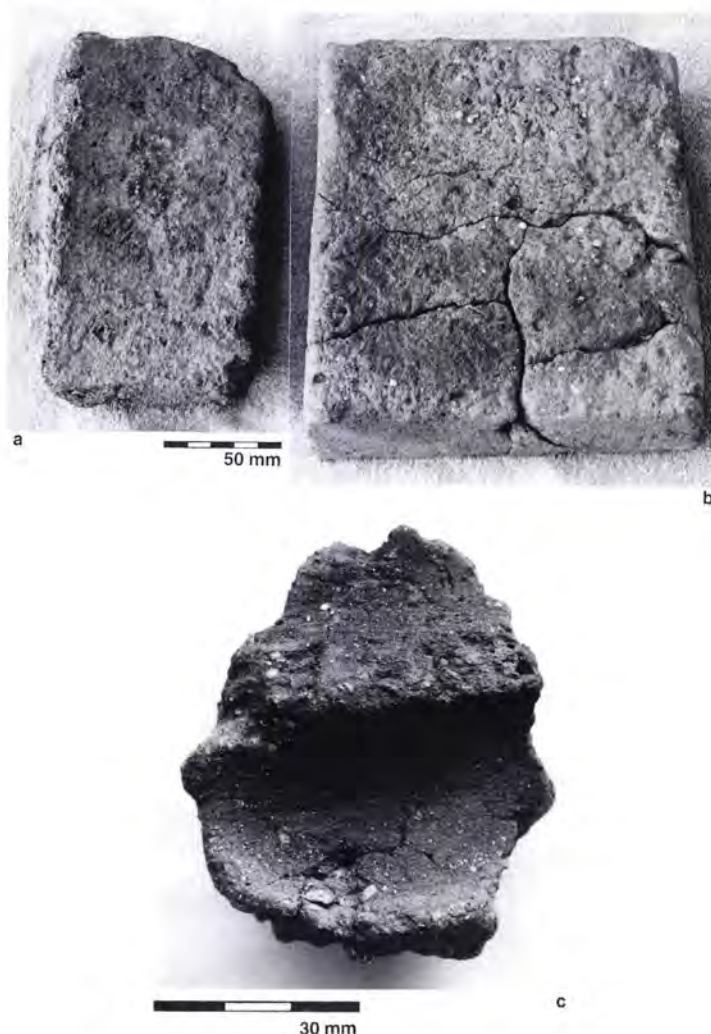


Fig. 247 *D-site building materials: a, b - bricks; c - pole-impressed daub.*

structure which had stood close to D19 and D22, perhaps on the uphill side.

Timber: No evidence was found for the use of timber in wall construction, although many walls were sufficiently preserved to retain such traces as may have been present. Timber may have been employed principally for roofs and, perhaps, for window apertures. Evidence for more extensive use of timber has been noted in elite structures at Aksum and other sites (cf. Munro-Hay 1989: 162-3, pls 8.4, 8.8, figs 8.3, 8.9, 8.14, 8.17); its absence here may be interpreted as reflecting the lower social or economic status of D-site buildings and/or their comparatively late date. Attention has been drawn elsewhere (D.W. Phillipson 1998: 93) to the tendency for later Aksumite buildings to make less use of structural timber than their earlier counterparts.

Pole and mud: Use of organic material in building construction is attested only by impressions on a piece of clay daub recovered in a phase-5 secondary context in D22, associated with redeposited Pre-Aksumite

pottery (Fig. 247c). Although clearly not *in situ*, it suggests the use of wattle-and-daub during Pre-Aksumite times or, less likely, the earliest phase of the Late Aksumite occupation. It may have come from a temporary structure otherwise represented only by post-holes or, possibly, from interior works or roofing. One surface is rough and flat; the other shows three deep parallel grooves *c.* 38 mm in diameter with, at one end, a single narrower groove at right angles, *c.* 23 mm in diameter. Each groove retains the texture of fibrous bark. The original structure incorporated poles laid closely side by side, bound at right-angles by more widely spaced smaller stalks, the whole being then coated with mud on one or both sides. This construction technique is common in many parts of Africa but less so in present-day Tigray where building stone is plentiful and timber is scarce.

Plaster: Five tiny fragments of plaster were recovered from a Pre-Aksumite phase-2A floor make-up deposit in D13. They were smoothed on one side and painted a light reddish-brown (2.5YR 7/4). A similar

fragment was found in D19, in phase-12 deposits covering Late Aksumite buildings. These fragments, 5-6 mm in present thickness, are insufficient to suggest that any D-site buildings were plastered or decorated.

STRUCTURES AND STRATIGRAPHY

(Jacke Phillips, Andrew Reynolds and Klara Spandl)

The excavations defining the overall stratigraphical sequence are in trenches D19 (incorporating D6 and D17) and D22, here discussed together. Other trenches are then discussed by general period, Pre-Aksumite followed by Late Aksumite, their phasing correlated with that of D19 and D22. Context numbers linked by '=' are definite equivalents, those connected by '≈' are probably the same. A summary of the sequence is provided in Fig. 332, below.

Trenches D19 and D22

These two trenches lay immediately east of the modern road on a terrace which slopes gently downward from northeast to southwest (Fig. 237). D19, adjacent to the road, began as an excavation measuring 10 by 10 m, surrounding and incorporating the earlier test-trench D6; it was subsequently extended northwards to incorporate D17 and also westwards, eventually encompassing a total area of some 130 sq. m. D22, an angled trench encompassing a further 99 sq. m, was excavated immediately to the east in order to expand and clarify the D19 evidence. The two trenches are here considered together, 14 major phases being recognised, divided into 21 sub-phases (Figs 248-50). Contexts (1 to 121) and rooms A to M belong to D19, whilst (200 to 390) and AA to LL are in D22. Phases 1 to 3 are ascribed to a Pre-Aksumite period, the Late Aksumite occupation beginning with phase 4.

Phase 1A: Sterile black clay, contexts (99) and (354), formed the subsoil underlying the site; its top 0.2 m contained potsherds apparently representing more than one trampling episode. Immediately over the trampled surface in the south (105=110=112) was the single surviving course of a 1-m-wide wall of large undressed stones (120) running from north-northwest to south-southeast. A second wall (390) in the southwestern part of D22 seems to have been completely robbed out in phase 1B. Trampled clay layers (105=110=113) and (344) may be associated with these walls.

Phase 1B: This phase is represented only in D22. The robber trench noted above (390), its backfill (342) and an overlying levelling layer (336) were all that

could be assigned to this phase. Contexts (342) and (336) contained joining potsherds including some from large storage jars which had been deliberately dumped, possibly to facilitate drainage, suggesting sedentary occupation at this time. Immediately to the north, levelling seems to have removed all original deposits associated with wall (120).

Phases 1C, 1D: These phases are represented only in trenches D13 and D23 (see below, pp. 295-6).

Phase 2A: A substantial wall composed of large rounded stones (93=355) was constructed within a tight foundation trench (389) set in the earlier robbing trench (390), mostly aligned from north-northeast to south-southwest but turning to the south-southeast at its southern end. A deposit (94=104) seems to have been laid against both sides of the earlier wall (120) in order to raise the surface level to its top. Wall (93) overlay wall (120) nearly at right angles and, at its exposed south (355) end, presumably followed the robbed phase-1A wall (Fig. 251). After a short period of use, wall (93=355) was itself demolished. No new floor levels were associated with this wall, and presumably layers (336) and (94=104) continued to serve.

Phase 2B: A downsloping silty clay deposit (327) was dumped from the east covering both layer (336) and the remnants of wall (355). A burnt patch (337) on its surface, possibly a hearth, suggests continued settlement at this time. A pit (388, fill 326) was dug in this deposit at its south end, truncating wall (355).

Phase 2 (general): Occupation in the northern part of the excavated area could be attributed to phase 2, but not to precise sub-phases. The pottery, even in the trampled deposits (91, 98, 112, 332-4, 343, 350), seems to be later than the phase-1A sherds, suggesting that the earliest occupation may have been restricted to the area south of wall (120), expanding upslope only when wall (93=355) was built in phase 2A. Earlier contexts may have been removed when layer (94=104) was deposited and wall (93=355) constructed. Unlike the phase-1A trampled material in the southern part discussed above, that directly above the trample in these areas appears unrelated in that no joining sherds were recovered between them. The overlying silty deposits (330, 349) may represent successive surfaces with subsequent wash layers (338, 345); these were extensively pitted during phase 3B in D22 but not in D19 where only wash layer (101) and redeposited layer (90) overlay the trample level. Any associated buildings must have been outside the excavation area to the east or north. A patch of *in situ* burning (333) at the east edge of the excavation may have been associated with such a building.

Phase 3A: The main centre of occupation in this phase was in the northern part of the excavated area (Fig. 252), especially in its northeast corner where

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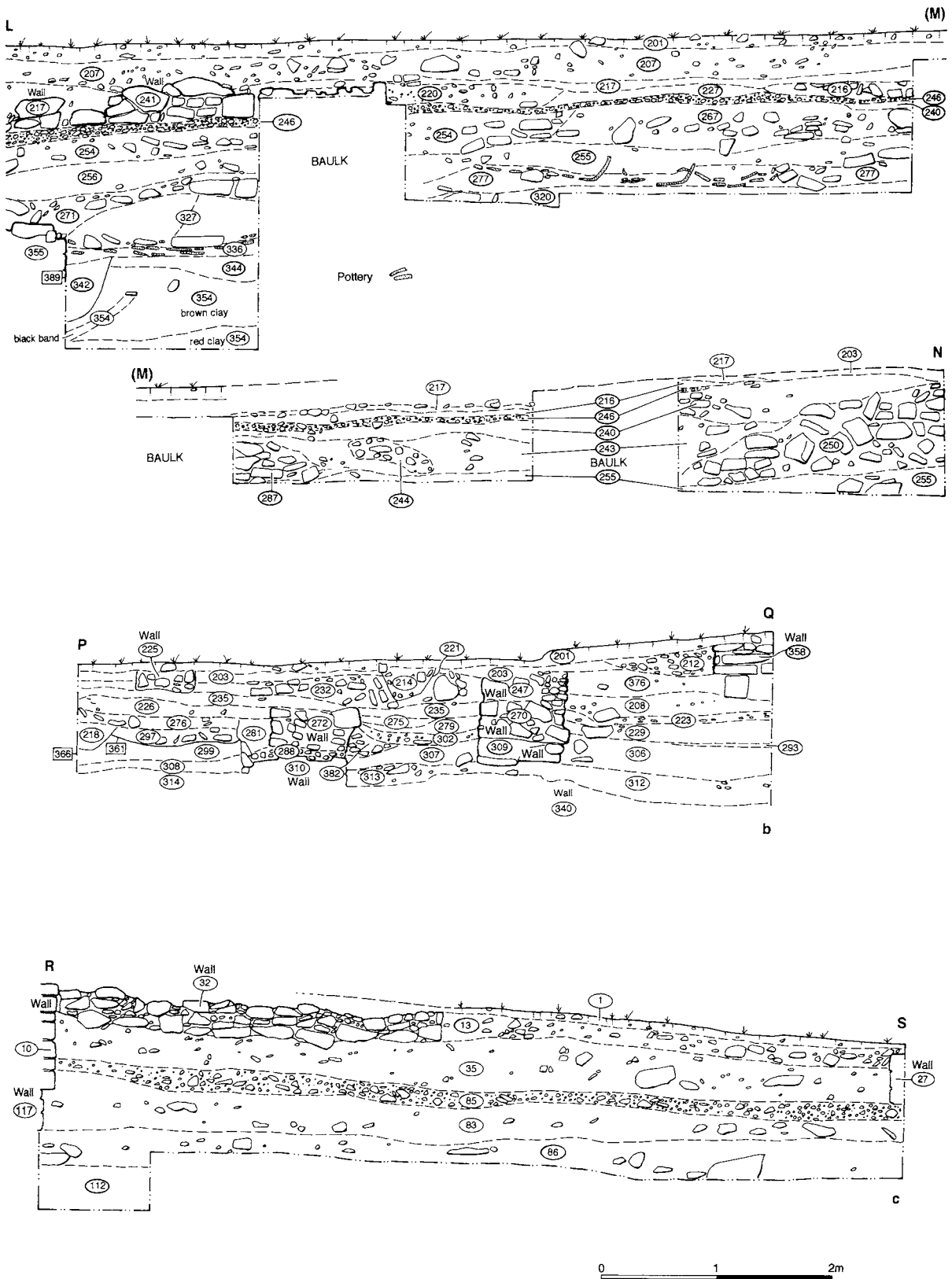
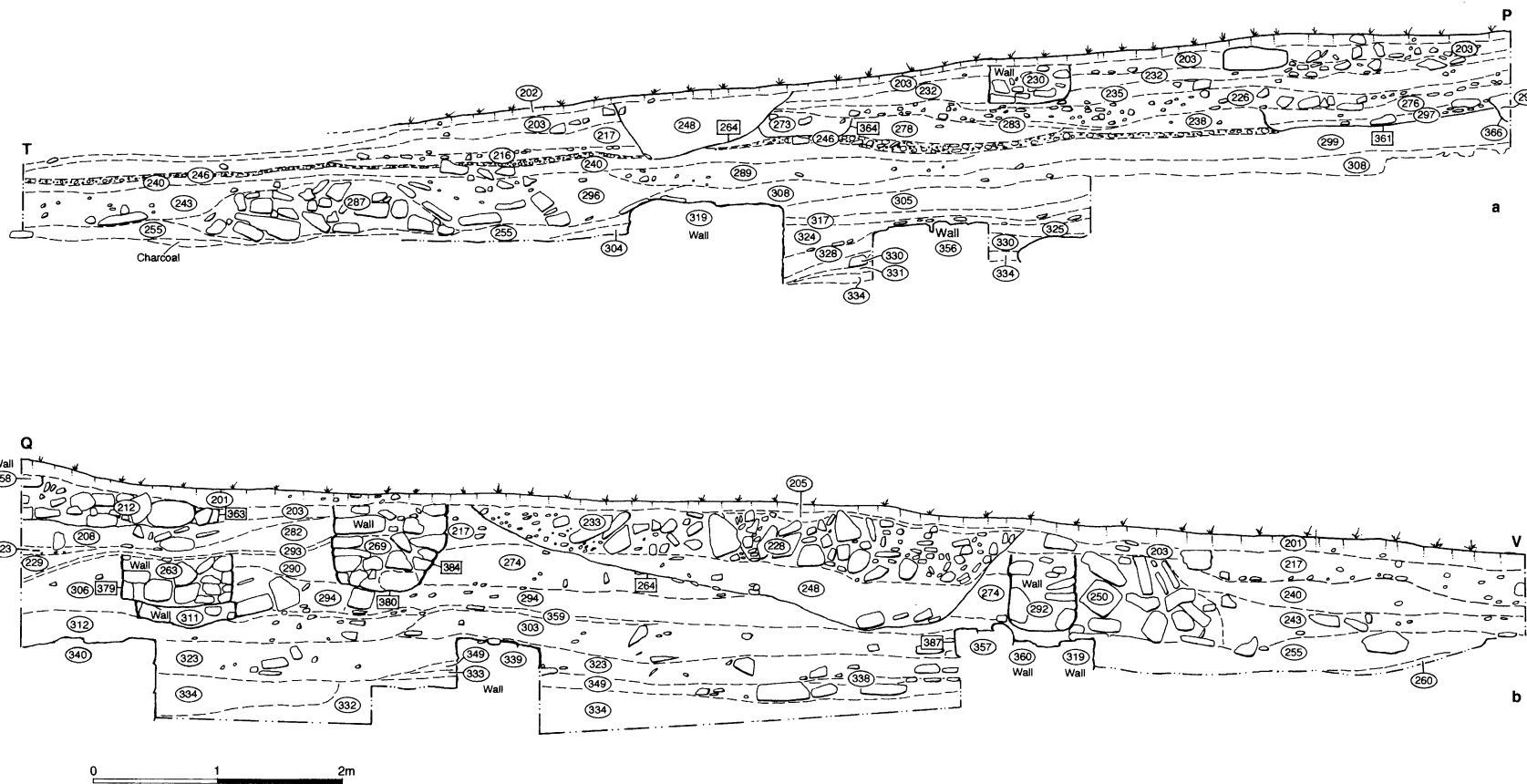


Fig. 248 Sections of trench D22: for locations, see plan at Fig. 256.



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Fig. 249 Sections of trench D22: for locations, see plan at Fig. 256.

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walls (339) and (340) represent three sides of a building aligned northwest to southeast, forming at least one interior space (room BB). Three other truncated walls (87, 356, 386) are on the same alignment further downslope. These walls, between 0.7 and 0.9 m wide, comprised large rounded stones bonded by weak mud mortar; no more than two courses survive. Building (339, 340) was unusual in that it incorporated some *in situ* boulders. Some associated surfaces, especially downslope, suggest both internal (320=328; room AA) and exterior (325=343) spaces, possibly indicating that walls (356) and (386) belonged to a single structure, whilst building (339, 340; room BB) was separate, with wall (87), which used earlier wall (120) as a solid foundation, perhaps representing a third.

Phase 3B: The phase-3A building (339, 340; room BB) may initially have remained in use, but make-up layer (323) was soon dumped in order to raise the surface to the top of its remaining walls while another (324) covered wall (356). Further occupation was indicated by a short-lived hearth (318) on top of a large *in situ* boulder, while a single post-hole (369, fill 348) suggests a possible structure beyond excavation limits. Post-demolition activity was indicated by two pits (373, fill 322; 371, fill 346) dug into the make-up layers. A further dumping layer here (260=261=277), with numerous reconstructable storage pots and other pottery, and further west (271) along the south end of the excavation area seems to represent a deliberate raising of the southern surface to the levels prevailing upslope.

Phase 4: The long hiatus which must have intervened between Pre-Aksumite and Late Aksumite occupations has left little physical evidence, suggesting that the northern part of the excavation area was stripped or levelled, perhaps in preparation for building at the beginning of the Late Aksumite period. The first evidence for Late Aksumite activity consists of an isolated layer (303=317) in the middle of D22. A slightly later pit (370, fill 321) and two small pits with characteristic green-tinged contents suggestive of cess (103, fill 102; 375, fill 347) were all cut into this surface (317) and phase-2 layer (91). The pit fill (347) may comprise similar cess, but mineralised seeds (which can provide direct evidence for diet) were not recovered. Quite substantial quantities of pottery, bone and glass were recovered from the pit, however, indicating that it was used for refuse from a range of sources, not solely as a latrine. The suggestion of levelling in the northern area is strengthened by the lack around pit (103) of recognisable Late Aksumite spoil similar to that surrounding (375).

Phase 5: This phase was represented only in D22 (Fig. 253). Construction on a large scale soon began, in the form of a substantial boundary or retaining wall

(319) of roughly coursed rounded stones, 0.7 m wide and extending from northwest to southeast. The D22 area suffered on several occasions and in several phases from hillslope erosion; hence the successive boundary walls which are not found farther west in D19. This may be the reason why the D22 Late Aksumite structures were repeatedly demolished and new walls constructed directly above, using the remaining courses as foundations. Shortly after its construction, wall (319) was partly shored on the north (357, fill 360) and other minor supports were provided on either side. Further shoring may be indicated downslope by a short truncated 0.8-m-wide east-northeast to west-southwest wall (385) of densely compacted rounded stones. Upslope, another truncated wall (316) of similar construction may represent the remnants of the building being shored. It seems that all associated surfaces abutted but did not overlie these walls, and that they were more-or-less contemporary. North of the retaining wall (319), an external yard of some kind (312-314) was indicated, with an internal surface (305; room CC) apparently defined by walls (316) and (319). Either the initial Late Aksumite building activity was concentrated farther east, or all evidence for this phase in D19 was subsequently removed: the fact that traces of this phase in D22 are largely denuded supports the latter interpretation. The division between northern and southern areas by wall (319) continued through several subsequent phases, for a later wall (265=292) was built directly atop it in phase 7A.

Phase 6A: This phase also was represented only in D22 (Fig. 253). The phase-5 walls seem to have continued in use, augmented by a substantial building in the northeast corner of the excavated area. Walls (309-311) defined at least one enclosed room (room DD) and what may have been a corridor (room EE), on a completely different north-northeast to south-southwest alignment which was maintained by all later walls in these trenches. The walls, of which only one or two courses survived, were between 0.8 and 1.1 m wide; unlike earlier structures, they consisted of a rubble core between carefully placed but undressed facing stones. No floor could be associated with this building, possibly because of later disturbance; and the phase-5 surfaces probably continued in use both north and south of the boundary wall.

Phase 6B: This phase was represented only by a single layer (67=86=89=92=106=306=307=308=294) spread over virtually the whole of D19 and the northern part of D22, where it reached and overlay both the phase-5 boundary wall (319) and the building represented by walls (309-311). Prior to this deposition, all phase-5 and -6A walls had been reduced to no more than two courses, as possibly had the northern exposed part of phase-2A wall (93). This work seems to have

D19

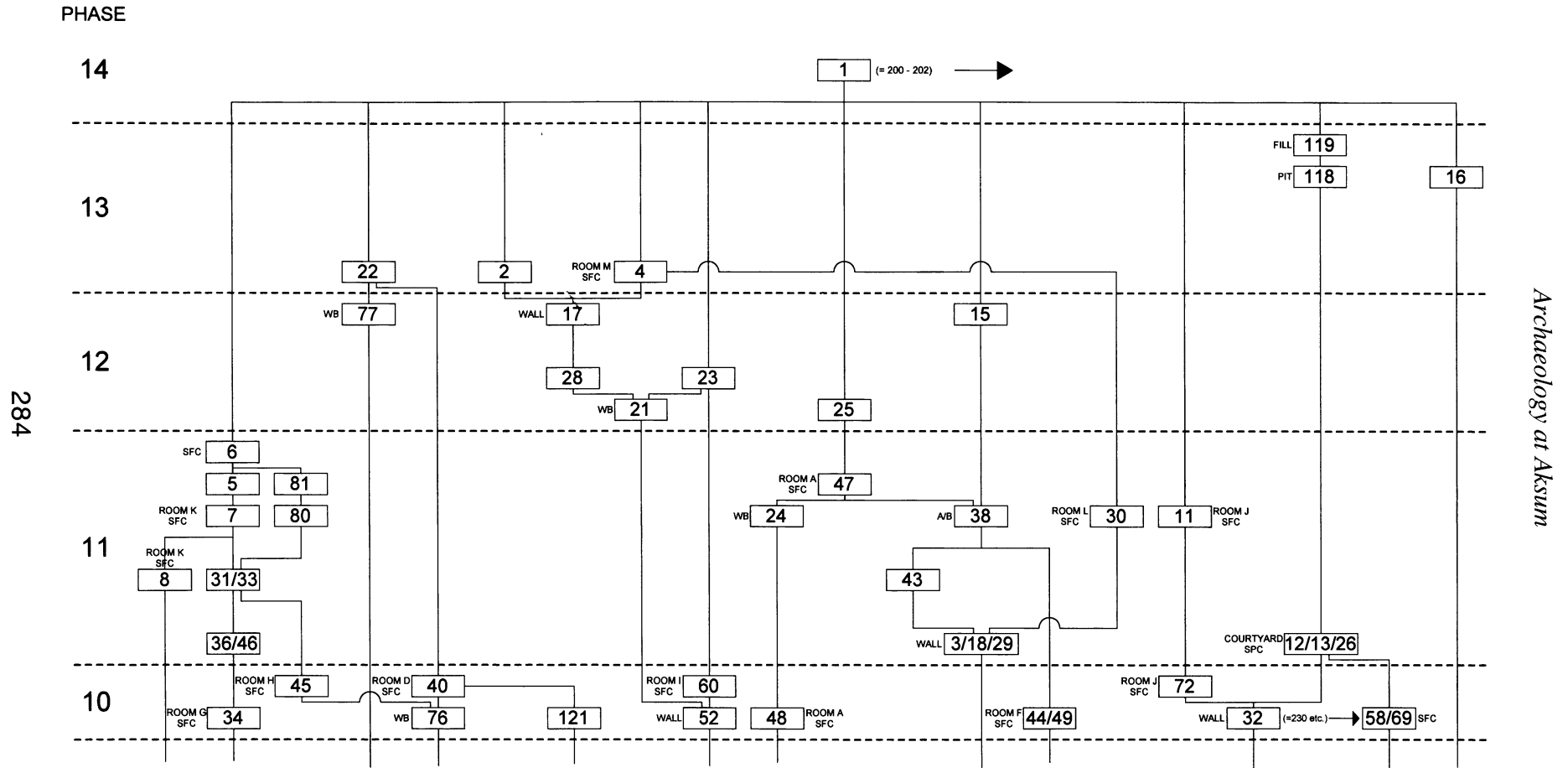


Fig. 250 Correlation chart of contexts in trenches D19 and D22: D19.

Key: FT = foundation trench; PH = post hole; SFC = surface (packing); WB = wall blocking.

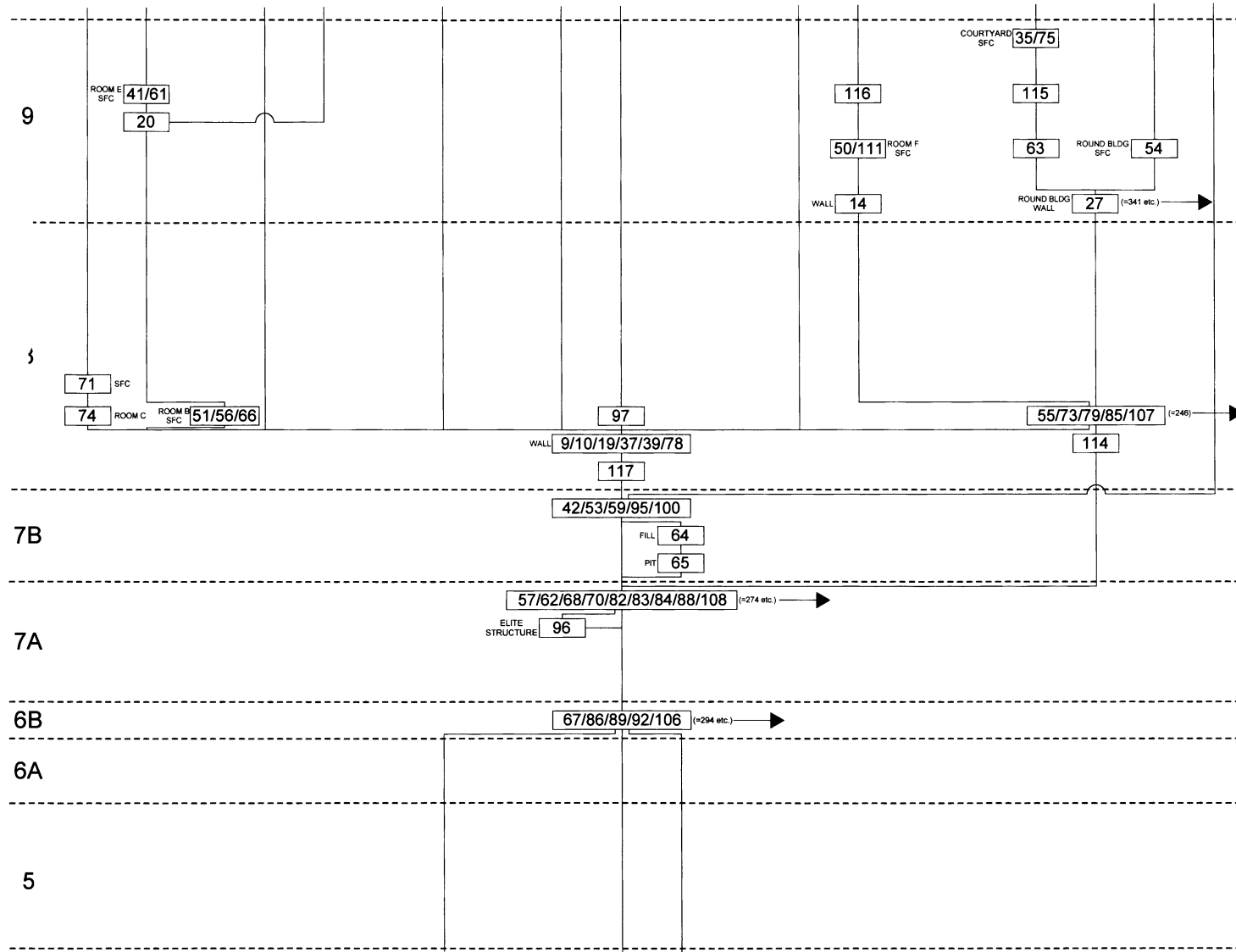


Fig. 250 D19 correlation chart, continued. For key, see p. 284.

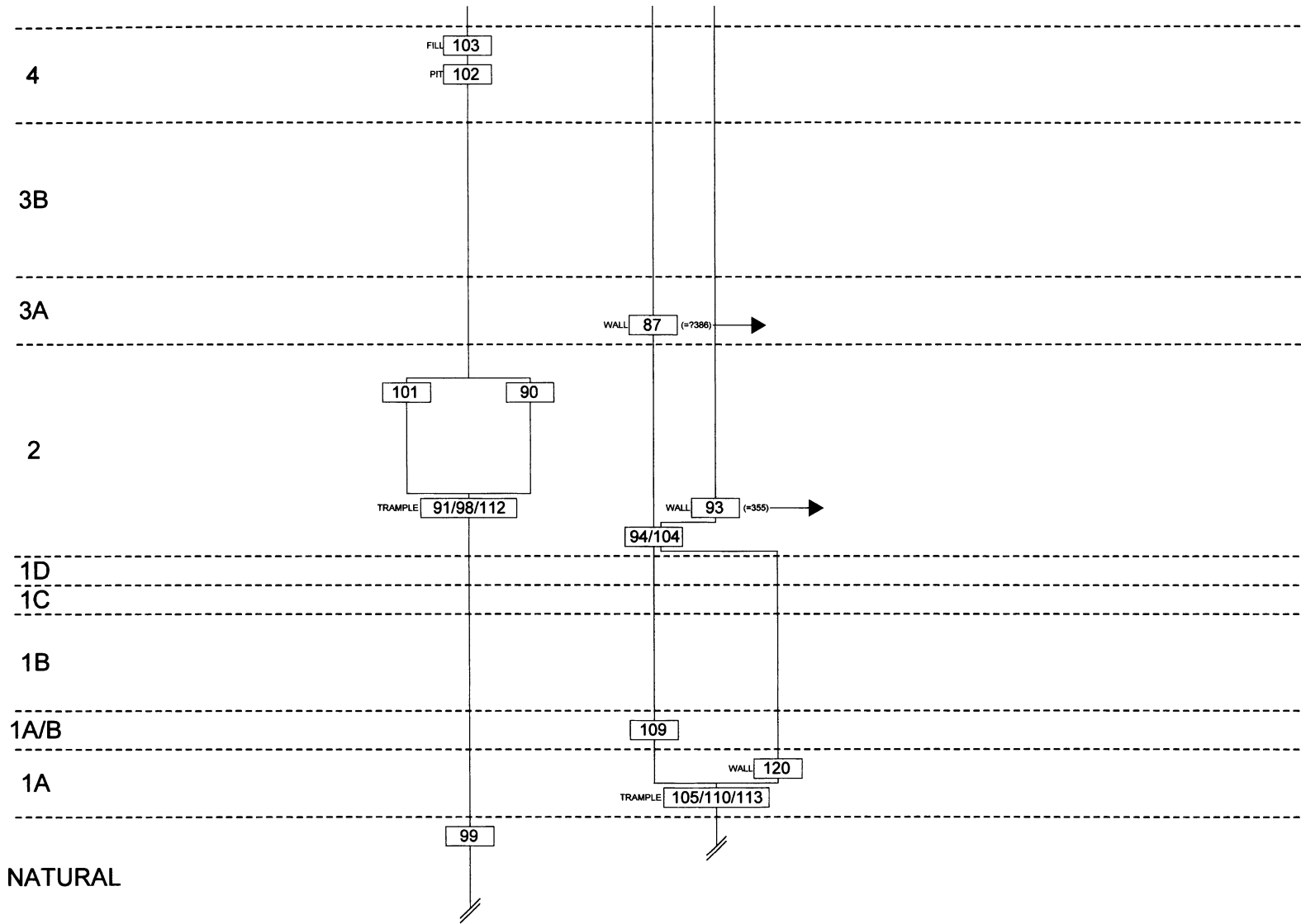


Fig. 250 D19 correlation chart, continued. For key, see p. 284.

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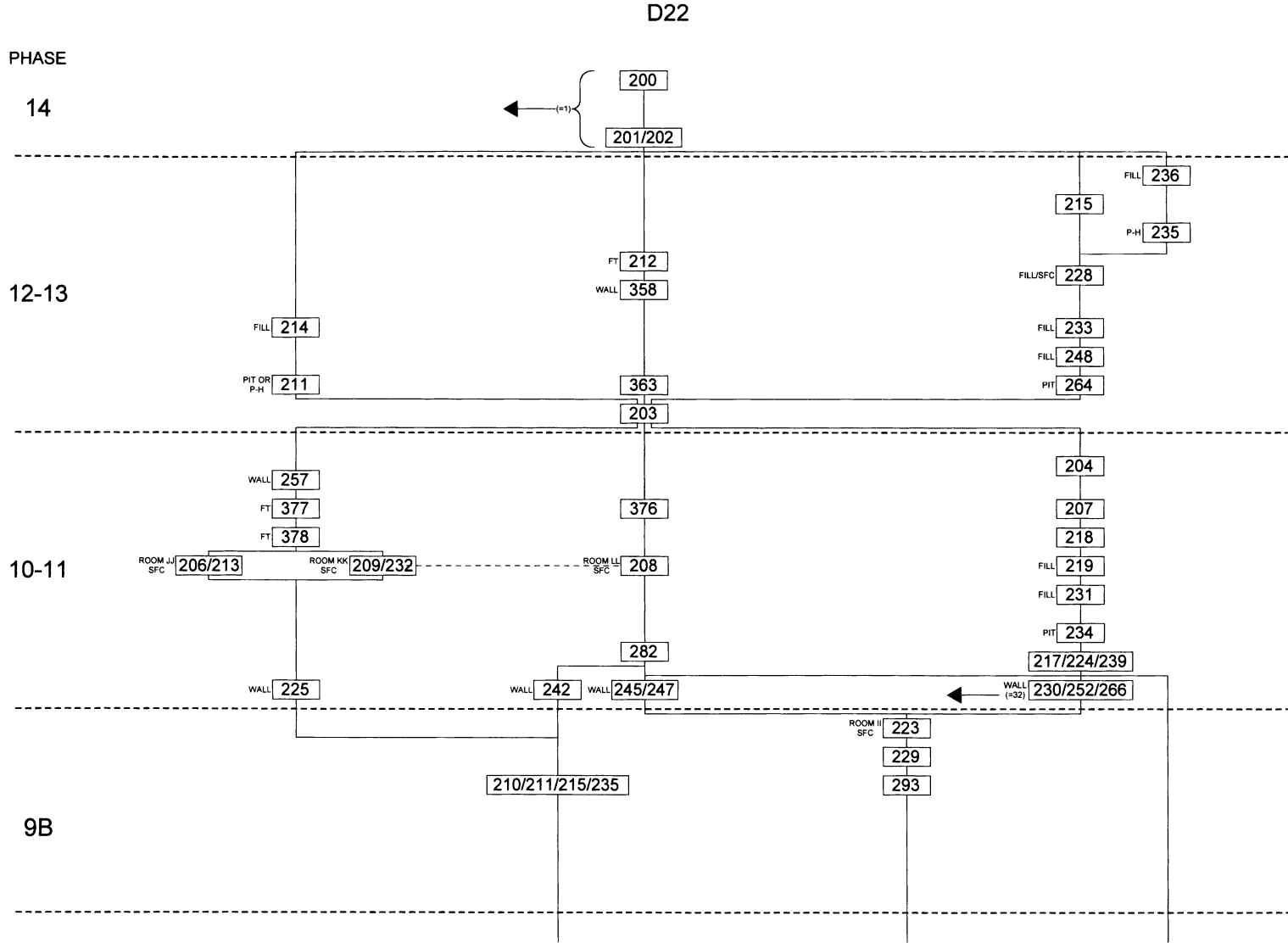


Fig. 250 continued: D22. For key, see p. 284.

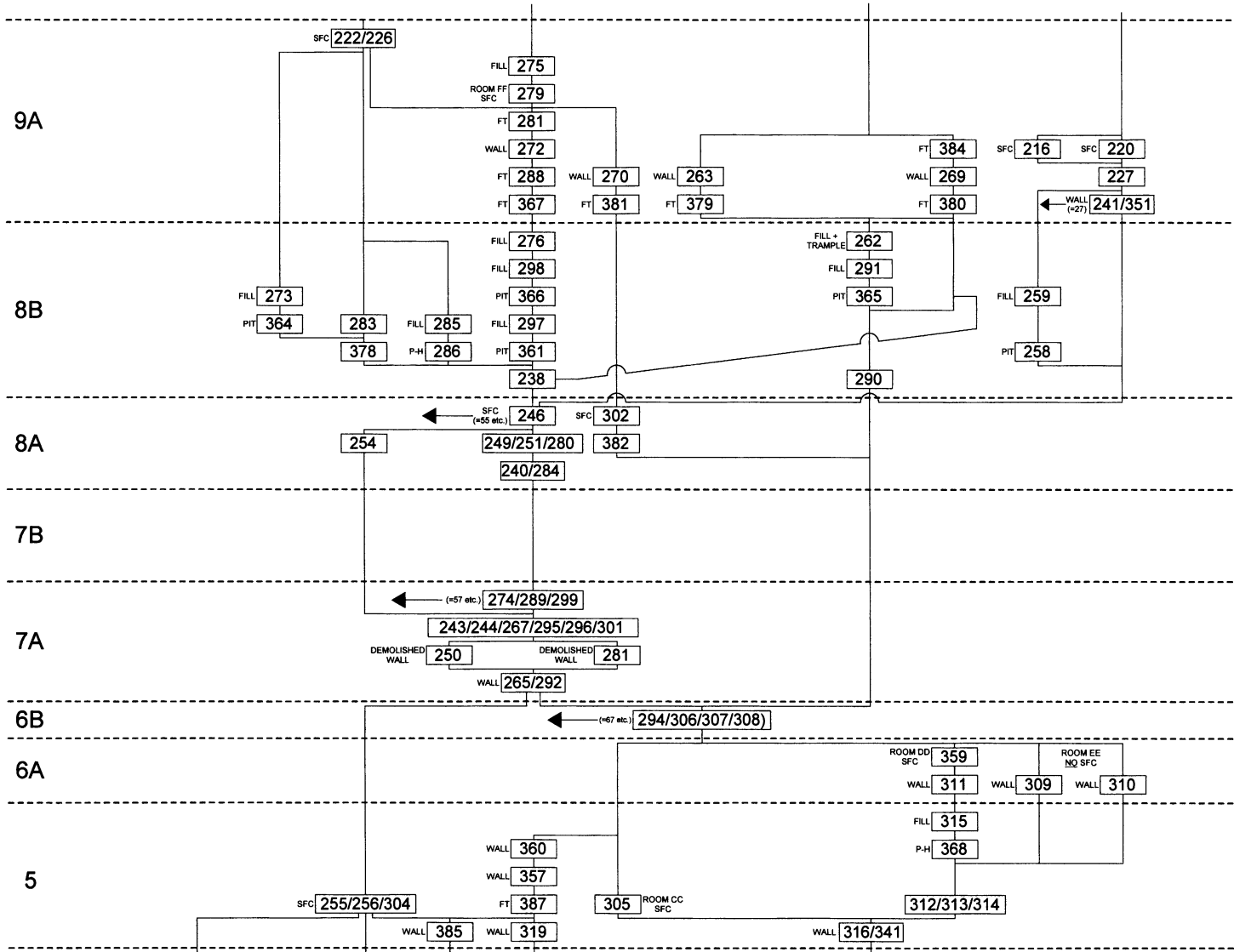


Fig. 250 D22 correlation chart, continued. For key, see p. 284.

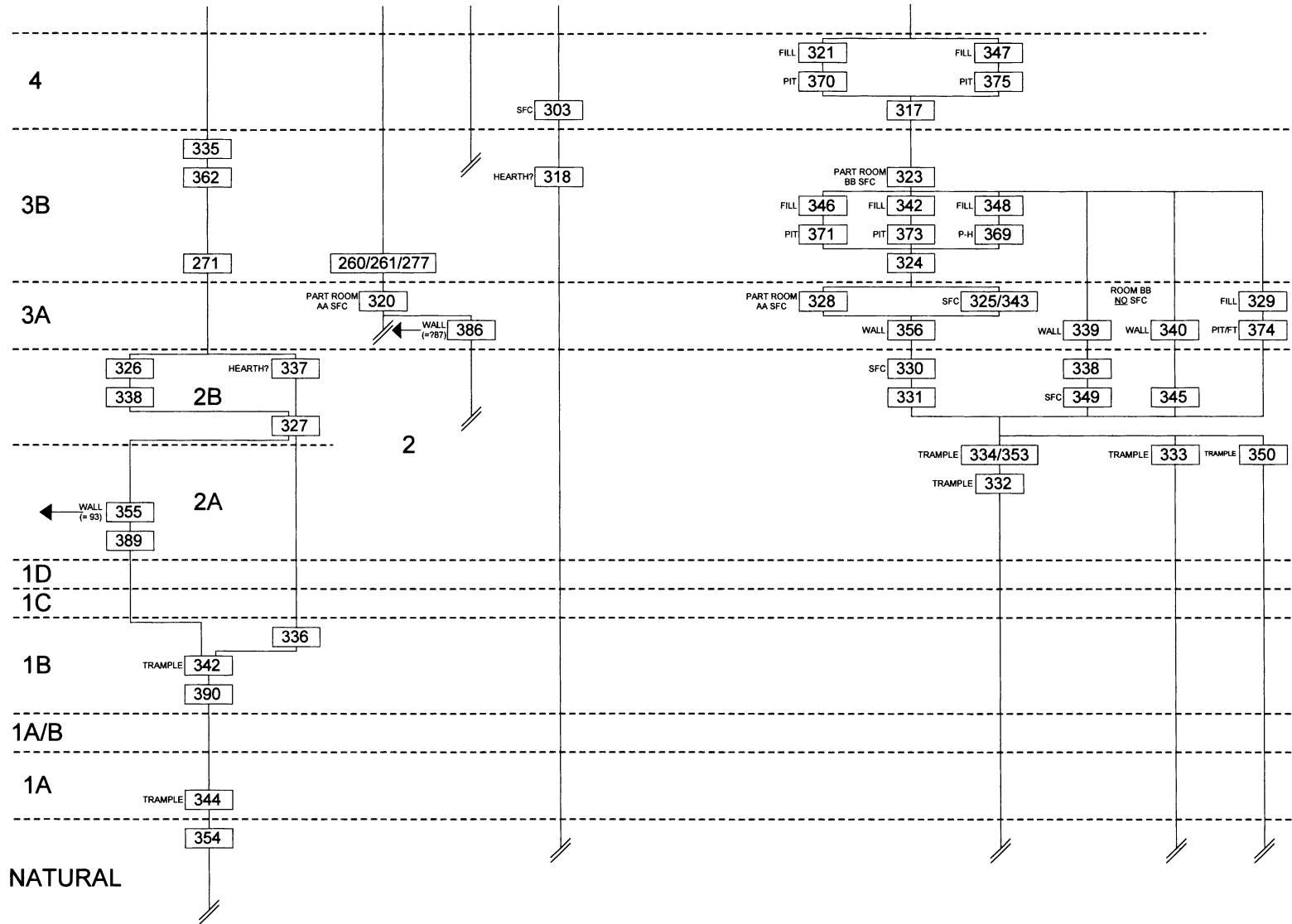


Fig. 250 D22 correlation chart, continued. For key, see p. 284.

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been in preparation for the construction of the élite structure (96) in phase 7A.

Phase 7A: Farther east, a new boundary wall (265=292), faced with roughly uniform rectangular slabs and filled with a core of large rubble, was constructed atop and on the same northwest-to-southeast alignment as phase-5 wall (319). This new wall was either demolished or collapsed (250=287) downslope to the south, although the boundary continued to be respected, as another layer of wash or make-up (243=244=267=295=296=301) was found around and above the collapsed walls in the southern part of the excavation, possibly to shore up the boundary itself. This phase also saw the construction of an élite structure (96) at the northern end of the excavation (Figs 254, 243) in the area originally excavated as D17. Only one small portion of the facade of this building, aligned west-northwest to east-southeast, was exposed against the terrace. Its features include neatly built rebated walls with massive corner blocks of finely dressed syenite and string courses of blue-grey slate, six steps of a sandstone staircase and a small paved forecourt with a stone drainage channel at its south end. It presents a striking architectural contrast with all other buildings at D site, earlier or later. Although this structure was not further investigated, some large finely dressed syenite blocks in the gully immediately to the west indicate its originally substantial scale while suggesting that road-construction may have removed much of the building. Another sealing layer (57=62=68=70=82=83=84=88=108=289=299=274) developed over the phase-6B deposits, apparently during the life of the building, again stopping at the boundary wall and overlying the wash/make-up layers to its south. Elite structure (96) was apparently in use for only a short time before being partly demolished, but

all subsequent walls followed its alignment and sometimes incorporated blocks taken from it.

Phase 7B: This phase was represented only in D19. In the northernmost area of D19, élite structure (96), after demolition, was covered and sealed by layer (42=53=59=95=100), apparently in preparation for the construction of the phase-8A building (10). At the very bottom of this layer at its south end and cutting into the phase-7A deposit was a small pit (65, fill 64), suggesting nearby occupation at this time.

Phase 8A: A long rectangular building (10) of at least three contiguous but apparently not interconnected rooms (rooms A, B and C) was constructed, parallel to and south of the earlier élite structure (96), sometimes but not always with foundation offsets, and several doorways with stone thresholds. Its masonry employed roughly hewn angular facing stones, randomly laid with a rubble core and bonded by mud mortar. The north and south walls showed distinct inset-offset construction unrelated to the interior spatial arrangement (Fig. 254). The central room B, the only one with all four walls exposed, measured 9.7 by 3.2 m inside. The flagged floor of room A incorporated a lower grindstone and a dressed syenite slab. Similar stones were recovered in room B, although its floor and that of room C were of hard-packed clay. South of the building, a distinctive pebbled yard surface (55=73=79=85=107=246) was laid, extending almost to the east edge of the excavation. To the south it overlay make-up deposits (240=254). The courtyard surface included chipping debris from building (10)'s construction.

Phase 8B: This phase was represented almost exclusively by shallow pits and wash layers in the yard, noted only in the eastern part of D22; phases 8A and 8B were not distinguished in D19. These pits

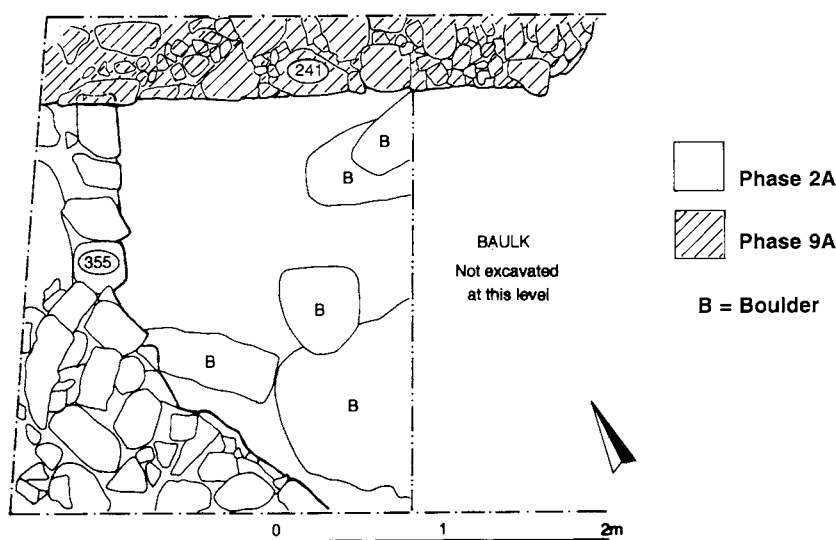


Fig. 251 Plan of trench D22, southwest area.

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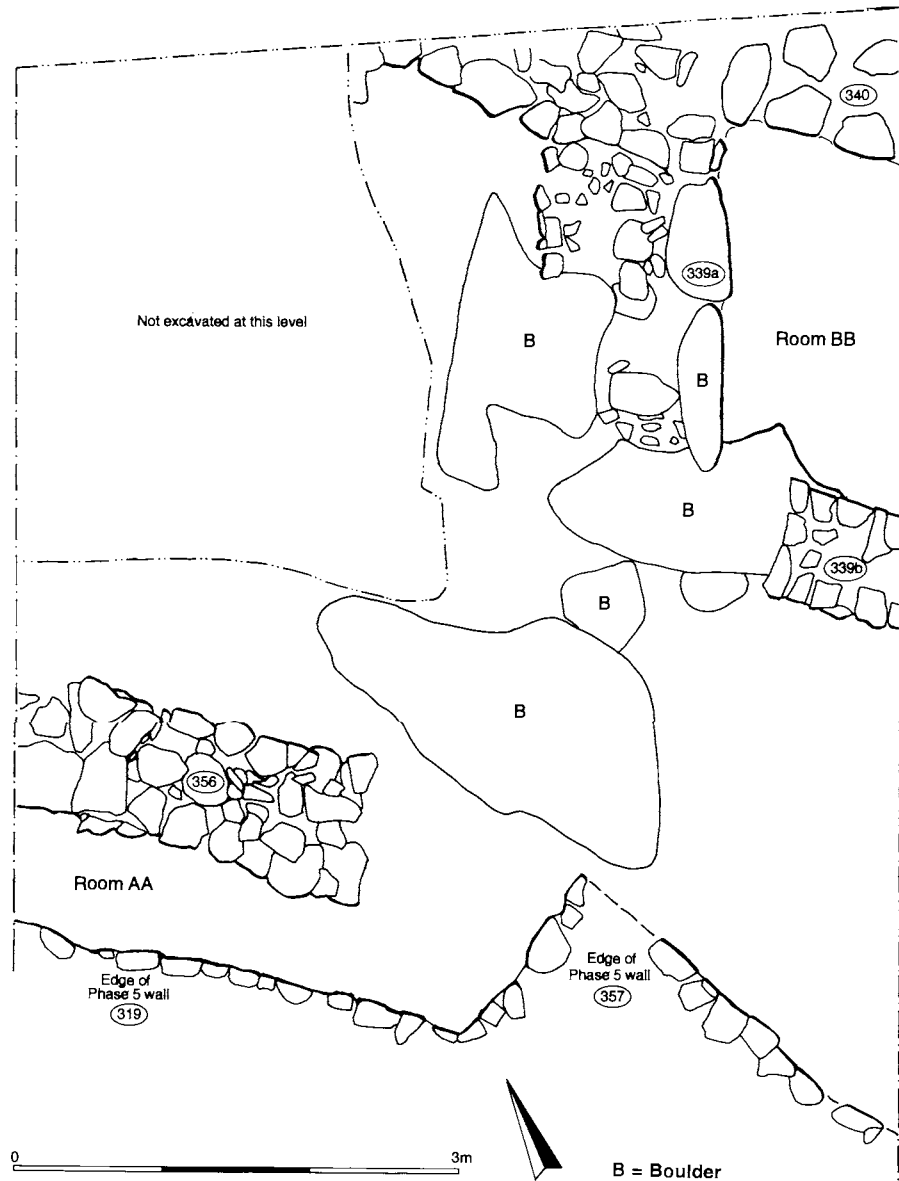


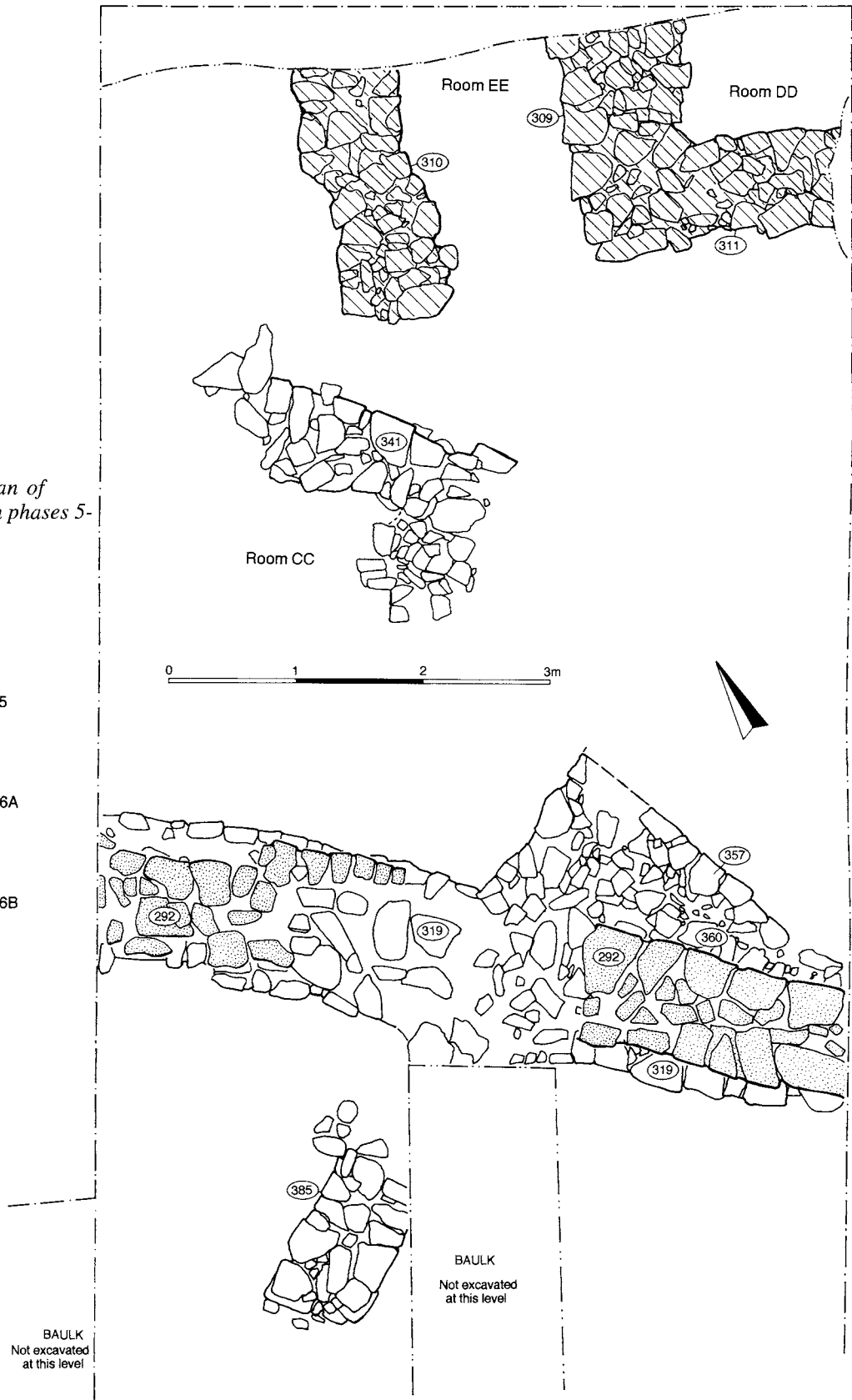
Fig. 252 Plan of trench D22 in phase 3A.

may represent deliberate cuttings or worn areas cleaned out and filled with rubble; none was more than 0.26 m deep. There was also a single post-hole (286, fill 285). One large pit (361) had been partly filled (297) when a small second pit (366, fill 298) was cut into it and stone-lined before being covered over by the remaining fill (276) of the large pit.

Phase 9A: Several major alterations were made to building (10) and its south courtyard (Figs 254-6). room B was subdivided by a cross-wall (20), with a doorway at its south end linking new rooms D and E, with a stone-built feature which may have been a pillar or the base for a grindstone in the centre of room D and a new floor (42=61) in room E. At least one additional new room F was attached to the south of room A, with a nearly square stone-built pier (possibly

another grindstone base) and a flagged stone floor. (No physical remains of pillars, which may have been wooden, were preserved.) At the east end of the excavation was exposed part of a new building, or an eastern extension of building (10), the alignment of which it shared, constructed with intermittent and inconsistent foundation trenches. At least three small rooms (rooms FF, GG and HH) were partly exposed, with four badly destroyed walls (263, 269, 270 and 272) made of roughly worked flat facing stones in random courses with a rubble core. At the south end, a single room 4.2 m square, building (27) (walls 27=241=351), was constructed in random courses of a distinctive roughly hewn off-white sandstone bonded by mud mortar. No parallels are known for its rounded corners nor for its compact white silt plaster-like floor (54).

Fig. 253 Plan of trench D22 in phases 5-6B.



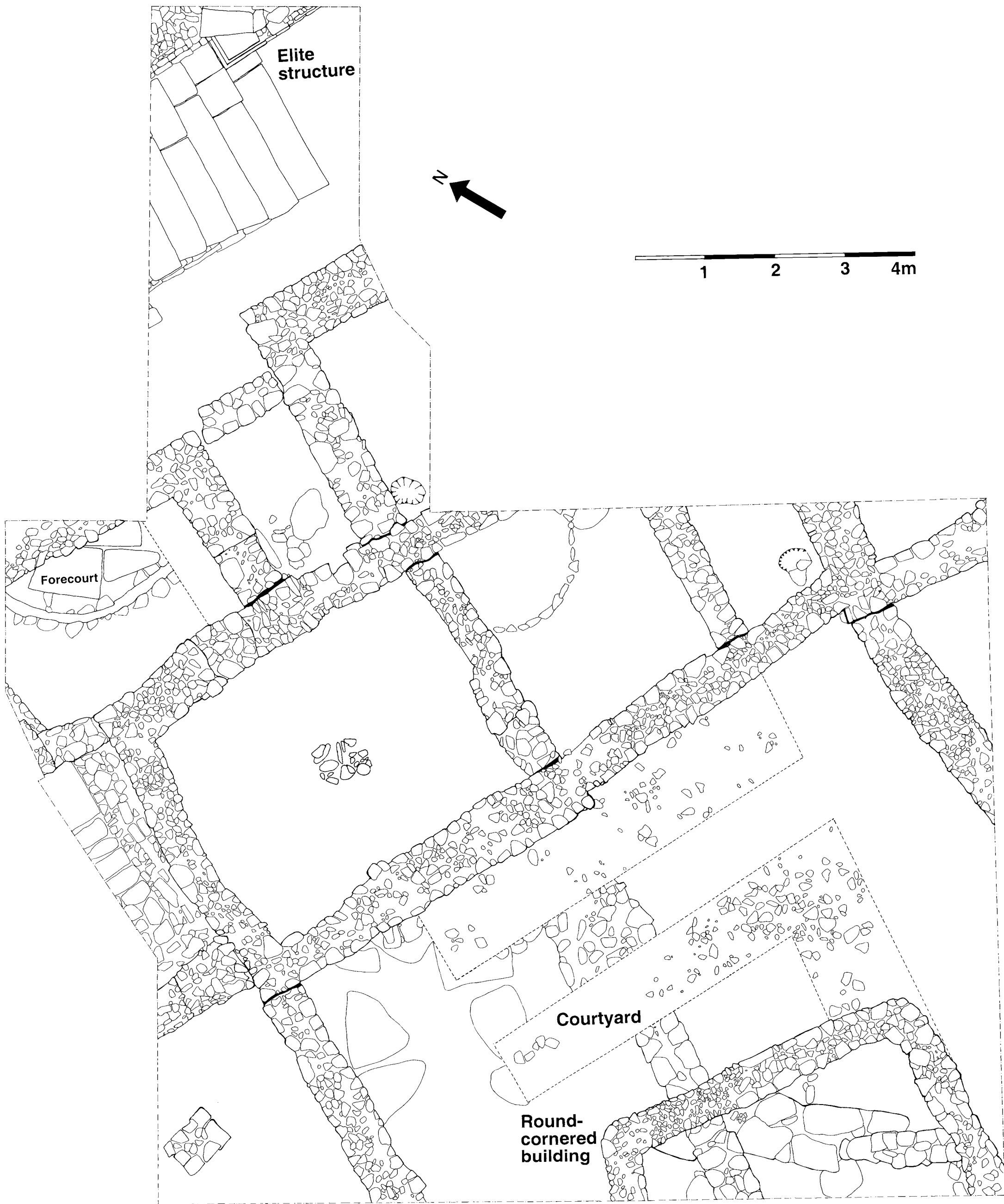


Fig. 254 Plan of trench D19.

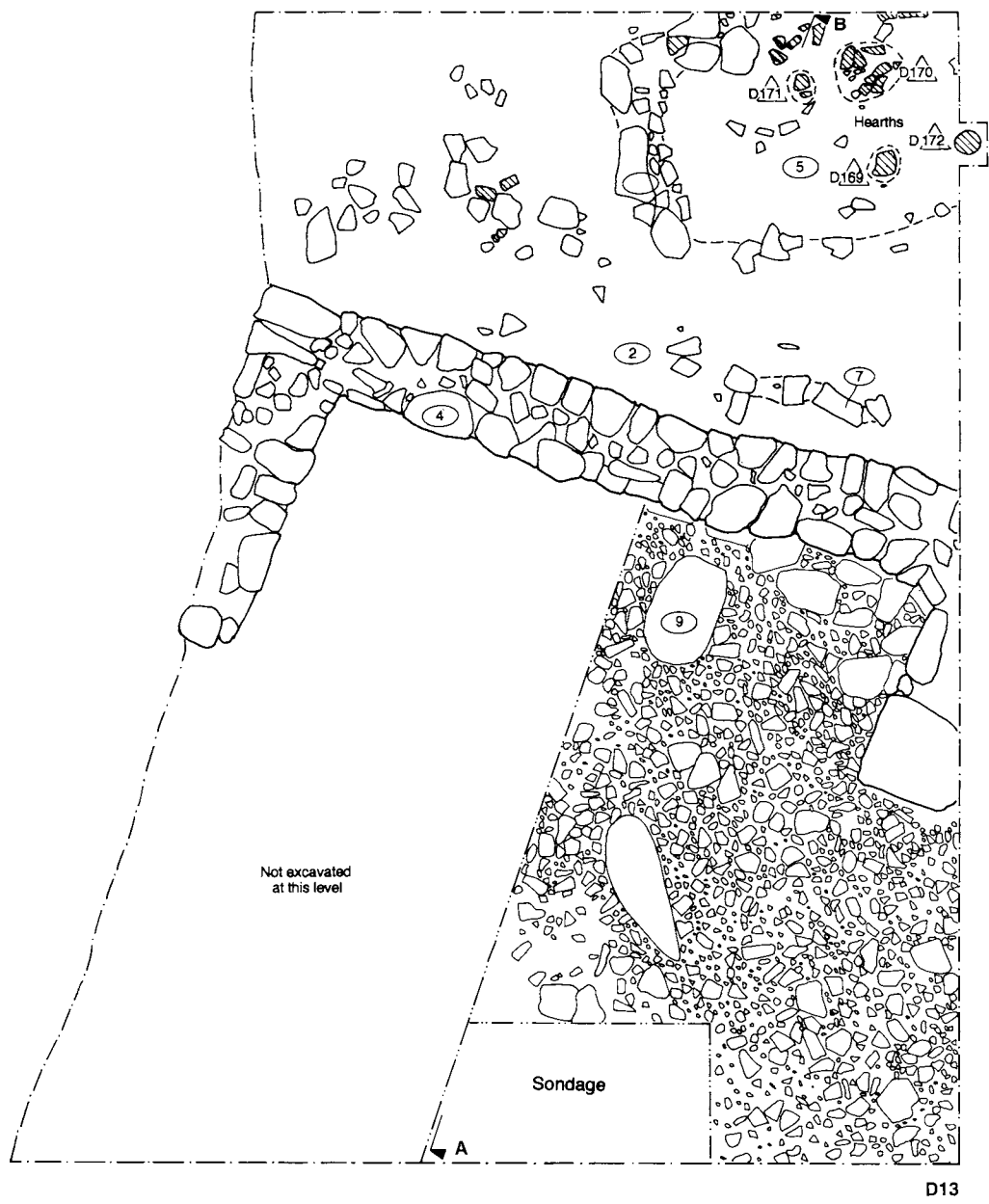


Fig. 257 Plan of trenches D13 and D23, showing locations of sections depicted in Fig. 258.

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Its walls were at least partly exposed on all four sides, but no entrance was located. A new courtyard surface (35=75≈222≈226≈220≈216) was then laid down, partly extending over the phase-8A floor and the supplementary make-up deposits (115, 227).

Phase 9B: Phases 9A and 9B were not distinguished in D19. The majority of the excavated area continued

in use, but the eastern building was demolished. Much of its stone was removed and a make-up layer (210=211=215=235) laid over its western part, while a series of wash layers (229, 293) and other deposits accumulated and levelled its eastern part. Nonetheless, the two walls (269, 270) surrounding this western part continued in use with a new floor (223; room II). The

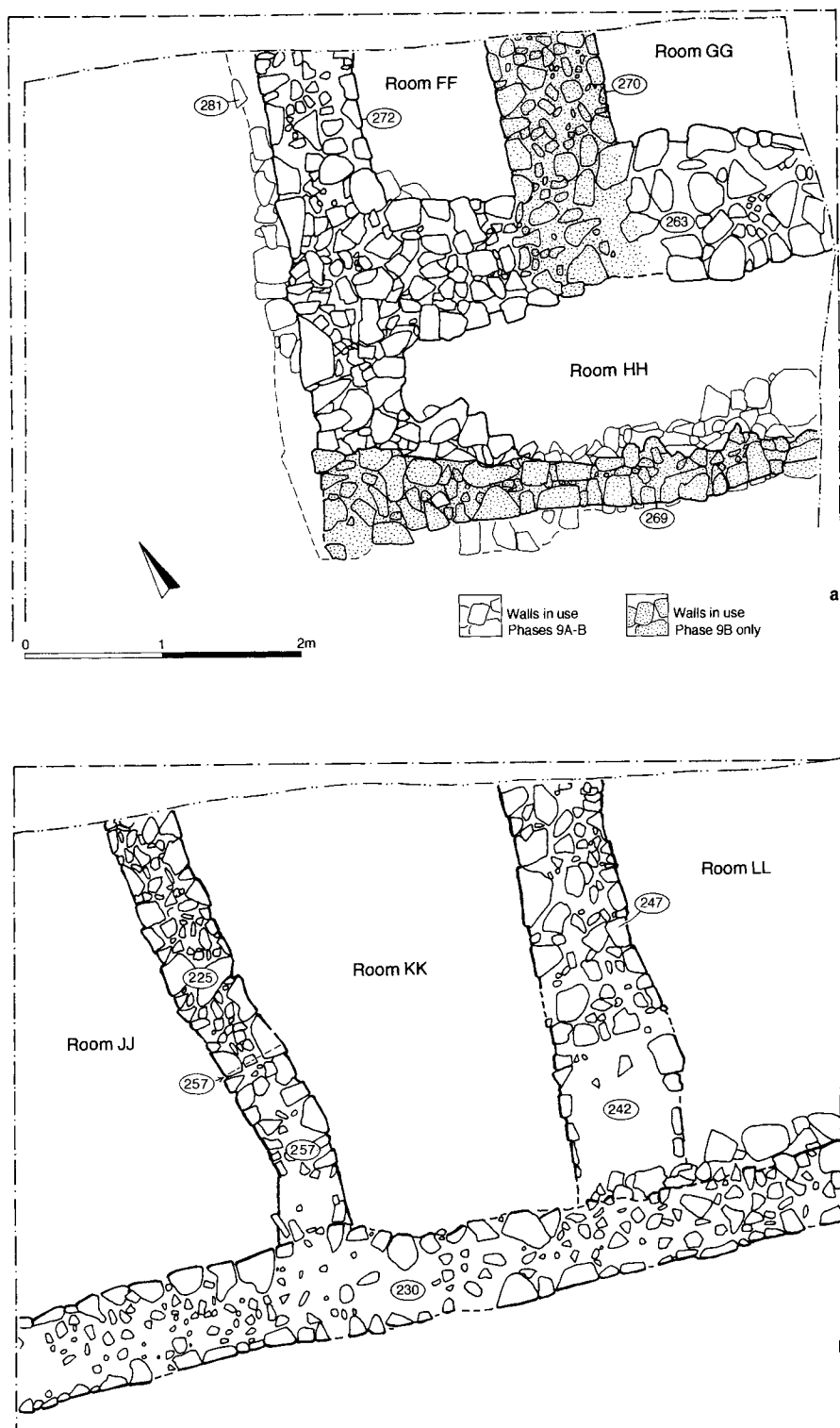


Fig. 255 Plans of the northern part of trench D22: **a** - phase 9; **b** - phases 10 and 11.

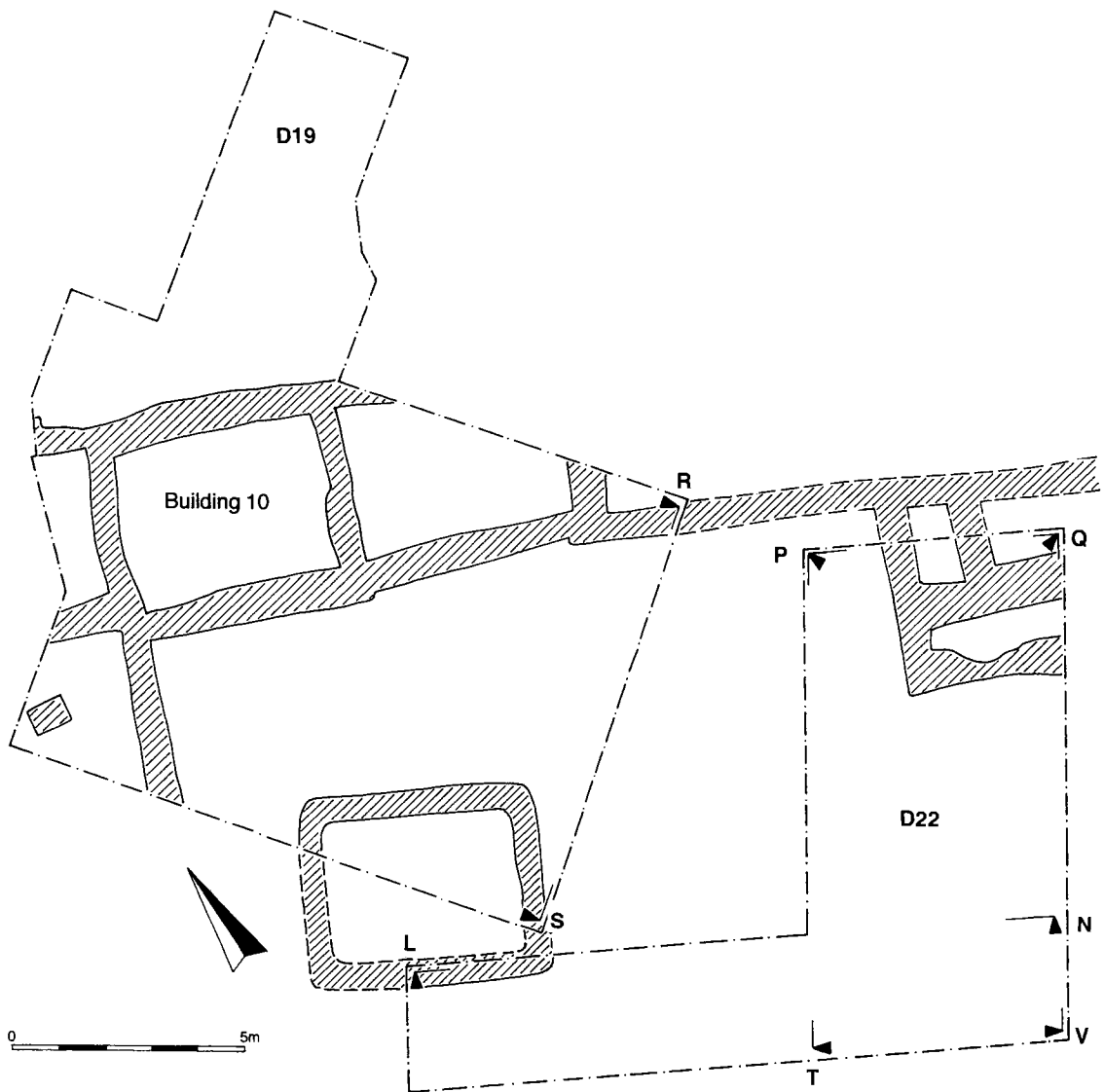


Fig. 256 Plan of trenches D19 and D22 in phase 9A, showing location of the sections in Figs 248 and 249.

resultant surface was probably used to support construction of the phase-10 building immediately above, both walls continuing in use.

Phase 10: A new building (Fig. 255b) was constructed in D22, atop and partly incorporating the foundations of the demolished phase-9A building, and on the same alignment. It greatly enlarged that represented by the earlier room II, which continued in use as room LL with a new floor (208). Three of its walls (225=257=377, 230=252-66 and 245=247) were exposed, the latter two being extended construction and repair of existing walls (269, 270). An internal doorway (242) with no surviving threshold now linked room LL with the two new rooms, JJ and KK, to the west. Building (10) received numerous alterations,

including a major eastern extension and, to the north, a new room I which extended over the forecourt area of the earlier élite structure (96), with an entrance and stone threshold on the east side. Both doorways of room D were blocked, and a new north entrance with a stone threshold led to room I. Room E was again subdivided into two new rooms, G and H, both presumably entered from the north. Another new room, J, was added immediately south of room C, aligned to the new building (rooms JJ to LL) in D22. All walls were of the by-now-usual construction of roughly dressed facing stones and rubble core in mud mortar, although some had inconsistent foundation trenching and offsetting. All rooms had compacted floors, as did building (27). The courtyard continued in use.

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Phase 11: Building (27) was demolished, but alterations and additions to building (10) continued, with the phase-10 wall (34) subdividing earlier rooms G and H and the original phase-8A wall dividing them from room C now removed to create a single long room K, with a 1-m-radius quadrant of upright stones, purpose unknown, in its north corner. Another new room, L, was added immediately to their north, creating an open passageway between rooms I and L. Both doorways of room A were blocked and the passage floor flagged. The eastern extension continued in use, but the courtyard was raised and resurfaced (12=13=26=204) incorporating to the north some distinctive white sandstone from the demolished building (27). The south end of the courtyard again needed to be stabilised with make-up and levelling layers (207, 217). A large pit (234, fills 231 and 219) was dug and filled with rubble and large stones, including two well dressed ashlar blocks possibly from the earlier élite structure (96); it may have served as further stabilisation for the courtyard directly south of the demolished building (27).

Phase 12: The west rooms of building (10) were deliberately filled (15, 22, 25, 28), with only rooms J and K possibly remaining in use. The eastern extension was apparently demolished. Much of the site was covered either by deliberate fill when the rooms were sufficiently well preserved (at the west end) or by wash and debris (to the east). Some occupation continued, doorways being blocked and room L enlarged by demolishing its western wall, thus incorporating the earlier passageway between rooms I and L: the new enlarged room is designated M, and extends to the east wall of earlier room I. At the south end of the excavated area a large pit (118, fill 119) was dug.

Phases 12 to 13: The D22 levels noted here might belong to either or both of the two phases defined in D19. The new arrangement of room M was not long-lived, but considerable and possibly associated activity may have occurred farther east where an extremely large pit (264) was dug deep into the ground between the earlier walls (230) and (265). This pit, some 4.5 m wide, more than 6.0 m long and up to 0.8 m deep, was filled with large stones and a quantity of bricks in several discernible layers (bottom to top: 248, 233, 222), before being capped by a roughly cobbled surface of up-ended bricks and undressed stone, perhaps a courtyard surface. Further occupation is evidenced by a small post-hole (237, fill 236) dug into this brick surface and by a well-constructed northwest-to-southeast wall (358) barely exposed in the northeast corner of the excavated area, above the earlier buildings. This wall had a different alignment and may have been constructed during or after the last use of building (10).

Phase 13: At the north end of the excavated area, the remnants of building (10) were abandoned. Erosion and

tumble from the terrace (16) covered the phase-7B deposits overlying élite structure (96).

Phase 14: This was represented by post-Aksumite and recent ploughsoil and topsoil, including material bulldozed during road construction.

Pre-Aksumite trenches D13 and D23

These two trenches lay immediately east of the modern road on a terrace which slopes slightly downward from north to south, three terraces below D19 and D22. D13, at the edge of the roadside gully, was a rectangular excavation of 48 sq. m (D.W. Philipson, Reynolds *et al.* 1996: 118). D23, an angled trench laid obliquely some 5 m to the east, initially encompassed a further 51 sq. m but was reduced to 22.4 sq. m after removal of the topsoil; the detailed plans (Fig. 257, above) show only the area fully excavated. The stratigraphy (Fig. 258) is summarised in Fig. 259. All phases were Pre-Aksumite, although there was some intrusive and surface material of later date. Contexts numbered (1) to (14) were excavated in D13, while (1000) to (1038) were in D23.

Phase 1C: Both trenches were excavated down to the natural black clay, but only D23 was occupied at this phase. The corner of a substantial building, (1032), was exposed, with walls extending northeast and northwest into the section; these walls (Fig. 260) were about 1.2 m thick, constructed of roughly squared and unworked facing stones with random infill in mud mortar within a foundation trench cut directly into the natural black clay. The surrounding material seemed to represent a trampled exterior surface (1025=1027=1030) demarcated by boulders. This and the following phase were exposed only in a small areas of D13, represented by two superimposed hillwash layers, of which only the lower (10=13) contained artefacts. The upper, sterile, layer (12) was found only in the north, with no counterpart in D23. Both building and deposits lay immediately above the natural clay, suggesting that the deposits may have related to unexcavated structures farther uphill. General wall alignment suggests that the later buildings (4, 1012) may be contemporary with the phase-2A building represented by wall (93=355) in D19/22. No other walls at the site share the alignment of building (1032); it is certainly earlier than building (1012) and its construction technique suggests it may be later than the phase-1A wall (120) in D19. The associated ceramics also are later than D19/22 phase 1A-B, and the building is therefore assigned to phase 1C and the later pebbled yard to phase 1D, neither of which was represented in D19/22. Construction technique and the lack of associated late ceramics except sparsely in the topsoil negate the possibility that these are Late Aksumite buildings.

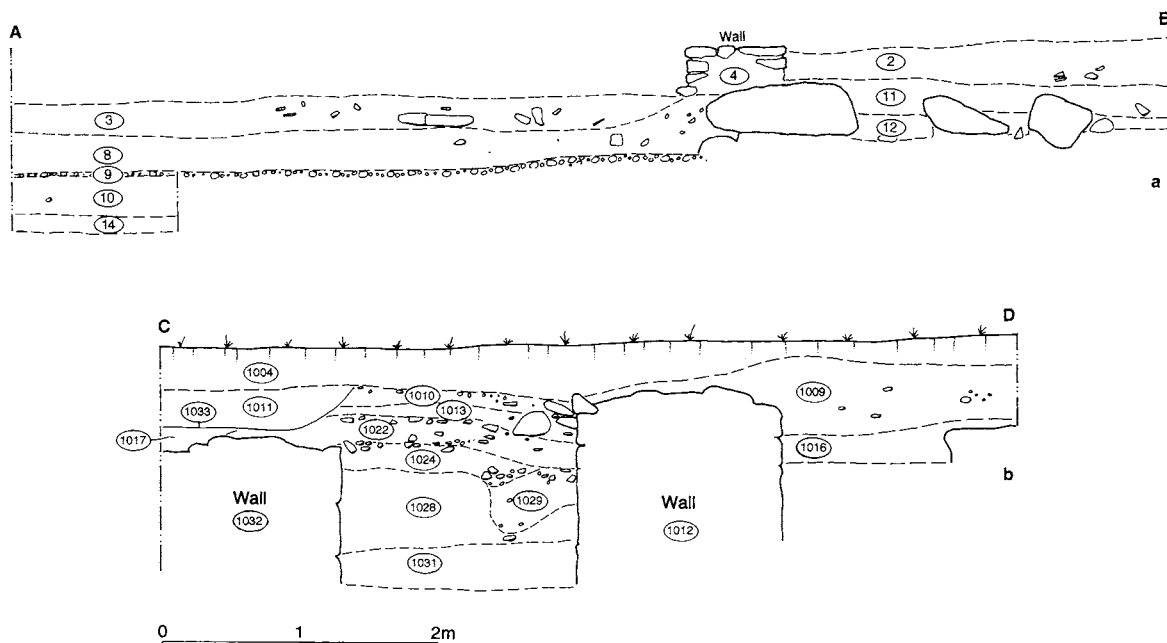


Fig. 258 Sections of trenches D13 and D23. For locations, see Fig. 257.

Phase 1D: A hard compacted pebbly surface (9≈1022), probably an external yard, was the defining context for this phase, recovered only below both later phase-2A building interiors. It was laid down after building (1032) had been demolished and before the phase-2A buildings were constructed.

Phase 2A: Building (4) was constructed above a levelling layer (8=11), its only exposed wall running west-northwest to east-southeast with two interior corners turning southwards to partly exposed walls, that on the east then turning again to create an L-shaped space, all constructed of undressed rounded stones randomly coursed. No entrances were found; they presumably lay outside the excavation area. Both an internal (3) and external (2) surface were noted, the latter including an external sherd-laid hearth (5) bordered by a sub-oval row of stones (6) and, against the north face of the building, a possibly temporary L-shaped structure defined by a single course of stones (7). The building seems to have been carefully dismantled or quarried away, since no demolition layer was apparent. A second, less substantial building (1012) was constructed on an alignment (north-northeast to south-southwest) similar to that of building (4), partly overlying the earlier demolished wall of building (1032); one corner turning west-northwest was just visible at the west edge of the trench. Some make-up levelling (1015, 1016=1020) also was laid as preparation for this building, probably contemporary with building (4). If contemporary, these may have belonged to two

separate structures, as building (1012) utilised roughly worked facing stones with rubble infill and offset foundations. A post-hole (1038, fill 1014) and later stone-lined pit (1033, fill 1011) on the interior and another exterior pit (1034, fill 1019) were associated with this building, as well as some badly preserved surfaces; the post-hole may have been associated with the building construction. At some time after the floors were laid, building (1012) was extended to the east by a less well built and thinner wall (1035); all walls were demolished by the end of this phase.

Phase 14: Few features could be associated with this phase, most notably another pit (1036, fill 1007) and a row of stones (1037) immediately to its north. They probably represent minor post-occupational agricultural activity, since little distinction could be made from the overlying topsoil, but they could represent the remnants of some further early occupational activity. No such features were found in D13.

Pre-Aksumite trenches D8 and D12

These two trenches (Figs 261a, b, d), the former located some 30 m west of the modern road and the latter at the east edge of the site about 90 m away, each exposed a very thick wall. Wall D12(3) is aligned from west-northwest to east-southeast and has two well-made faces with rubble infill, being constructed on a black clay with artefacts that may have been a trample or a depositional layer. Wall D8(4) is aligned north-west to southeast and was constructed of rounded

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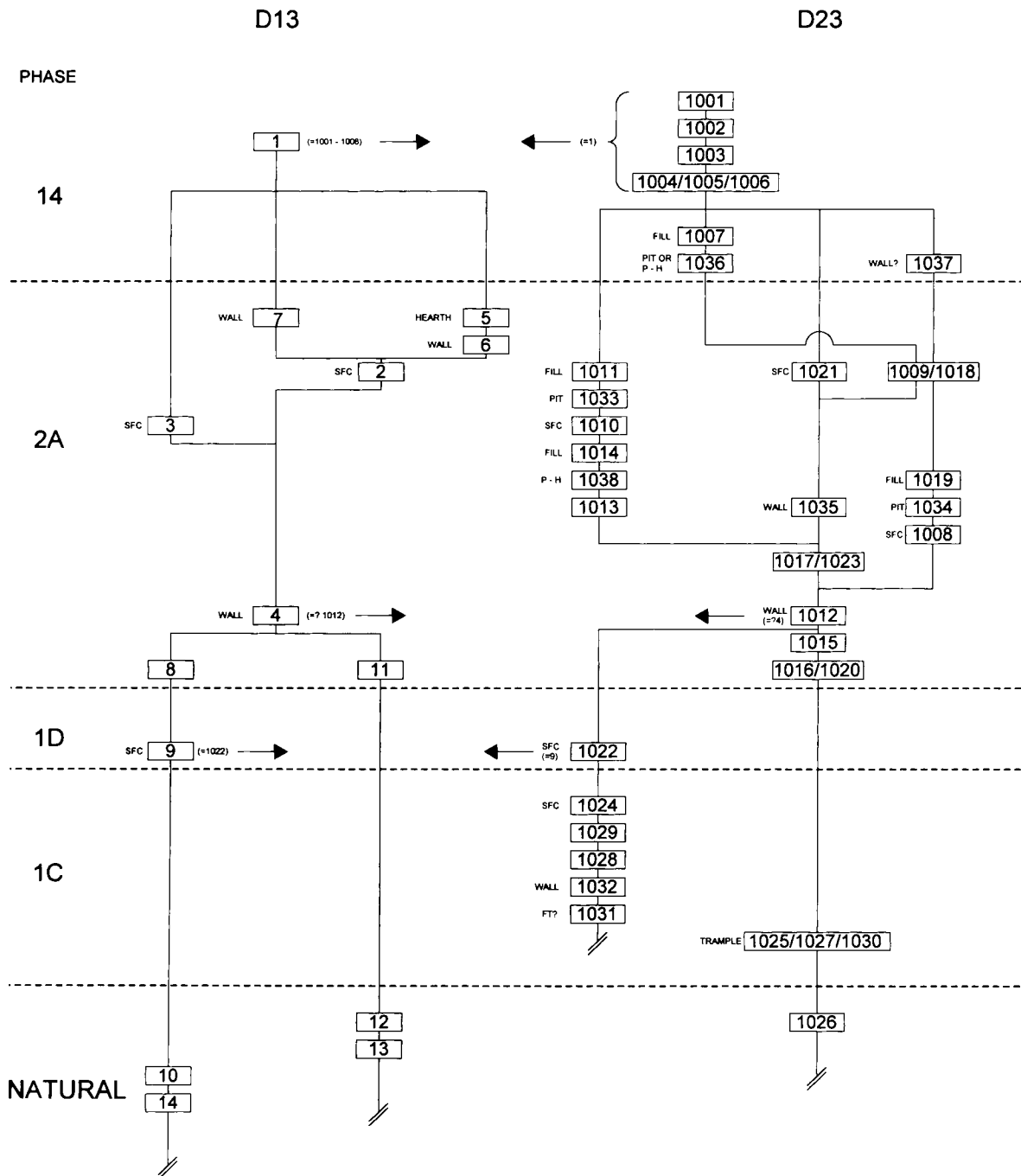


Fig. 259 Correlation chart of contexts in trenches D13 and D23. For key, see p. 284.



Fig. 260 Pre-Aksumite walls in trench D23. Scales: 0.5 m.

rubble in random courses. It was built following earlier occupation, as it was apparently constructed over a thick deposition layer; excavation did not penetrate to the natural clay. Both walls were apparently deliberately demolished and backfilled. Wall D12 (3) is on the same alignment as phase-2A building (4) in D13 and may be contemporary with it. Associated pottery in both trenches is Pre-Aksumite in type, attributed to phase 2, possibly continuing into phase 3.

Late Aksumite trench D16

This 5-by-5-m trench (Figs 245, above, and 262, 263), located two terraces uphill or about 150 m north of D19/22, lies some 10 to 15 m east of the modern road (D.W. Phillipson, Reynolds *et al.* 1996: 118-20). The earliest occupation is of Late Aksumite date. Exposure of substantial architectural remains limited access to the lower levels. All walls are aligned with those of the D19 elite structure (96) and building (10).

They may all represent a major series of contiguous spaces surrounding the elite structure, and thus may provide an indication of the maximum extent of that building behind its facade. Fifty-eight contexts, summarised in Fig. 264, were recorded.

Evidence for ancient activities is more explicit in this trench, with clear food-processing features such as *in situ* grindstones and hearths in the latest phases. If it was actually connected to the D19/22 building (10) as part of an elaborate hollow square building surrounding the defunct elite structure (96), this would suggest a variation in function for different areas of this building.³⁹ The architectural and spatial development nonetheless suggests social fragmentation or familial nucleation and compartmentalisation, with first a separate building (29) and then a new construction that may represent a communal space for several groups living outside the area excavated.

³⁹ This observation is supported by the archaeozoological studies presented below (pp. 369-72).

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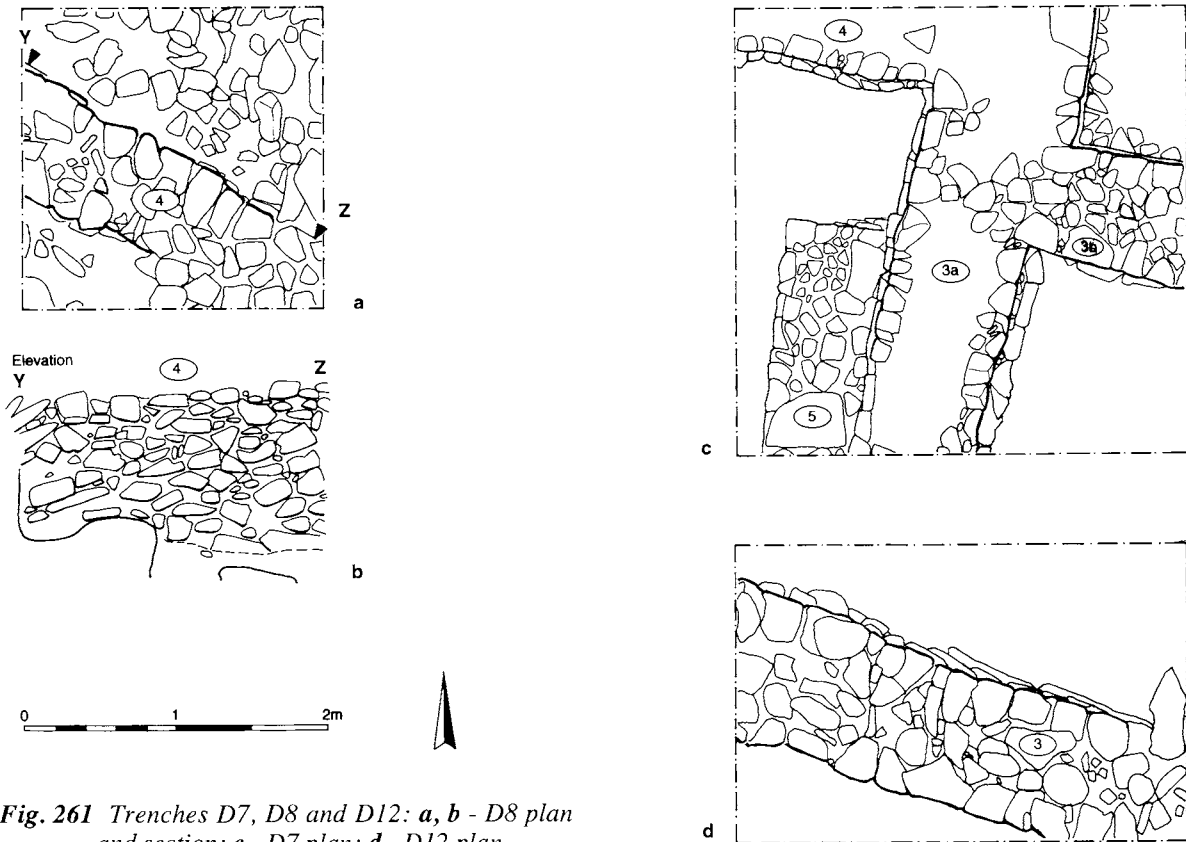


Fig. 261 Trenches D7, D8 and D12: *a, b* - D8 plan and section; *c* - D7 plan; *d* - D12 plan.

Phase 7B: The trench was taken down to natural clay, in the top of which was a trample of artefacts probably introduced from slightly further upslope. The ancient slope of the ground, like that of today, was about 20 degrees. No traces of buildings were found.

Phases 8A-9A: The trampled layer was cut back into the hillside to create a terrace, into which a substantial building (25) was constructed of roughly hewn facing stones with rubble core bonded by mud mortar. Some walls were provided with foundation offsets. Four rooms of a single structure were partly exposed, together with an exterior courtyard (30), on the same alignment as building (10) in D19. No room was completely exposed, nor were any entrances found. One room (D) was provided with an interior bench (41), behind which seems to have been a storage bin covered by a flat stone; this bench continued in use for a period of time represented by two successive floors.

Phase 9B: A single large pit (56, fill 57) was cut into the courtyard, perhaps in preparation for the phase-10 alterations.

Phase 10: Major structural alterations were made to the building (25), in that one wall (25c) was demolished and an entirely new and separate building (29) was constructed over both it and the earlier courtyard, retaining the former alignment. Incorporated into its wall was a displaced granite corbel, perhaps derived

from élite structure (96) farther downslope. Although otherwise of similar construction to building (25), no foundation trench or offsets were found; the earlier courtyard surface continued in use as its interior floor. Its south walls seem to have developed structural problems, as they lean alarmingly downhill, but building (25) continued to be inhabited, several new floors were laid in the south rooms C and D before room C went out of use and was filled at about the same time as the last floor of room D was laid.

Phase 11: Buildings (25) and (29) were deliberately demolished, perhaps because the leaning walls had become unsafe. The walls exposed at the west edge of building (25) as excavated were retained, however, as new buildings were constructed over the demolished remains independent of but in alignment with the earlier walls. A new wall (5=6) was attached to the stable remaining section of earlier building (25), and a new and parallel wall (9) was constructed opposite to create a single large room over most of the trench. A rectangular structure (21) was attached to wall (9) within the room, possibly to create a narrow passage to an entrance located beyond the excavation limits. All had roughly hewn facing stones with rubble core bonded by mud mortar, but no foundation offsets. The surrounding spaces were used for disposal of domestic rubbish, and the large room apparently for food

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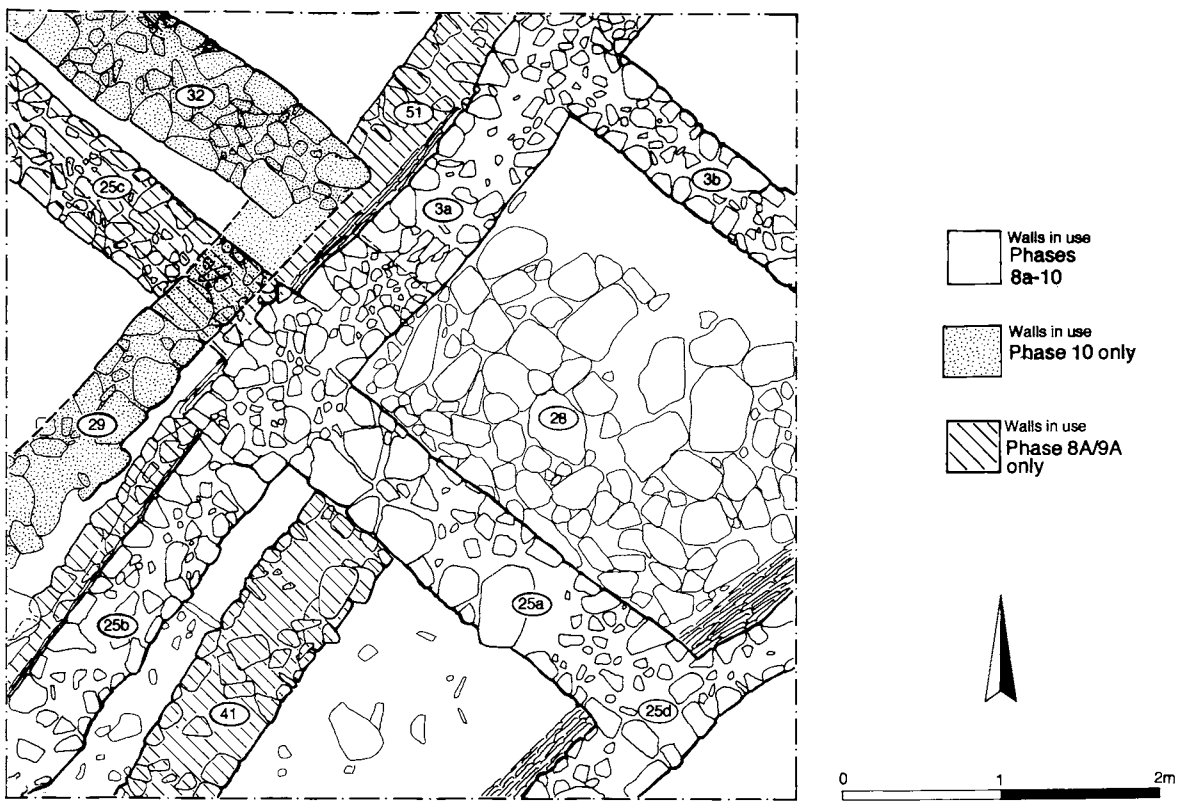


Fig. 262 Plans of trench D16, showing locations of sections depicted in Fig. 263.

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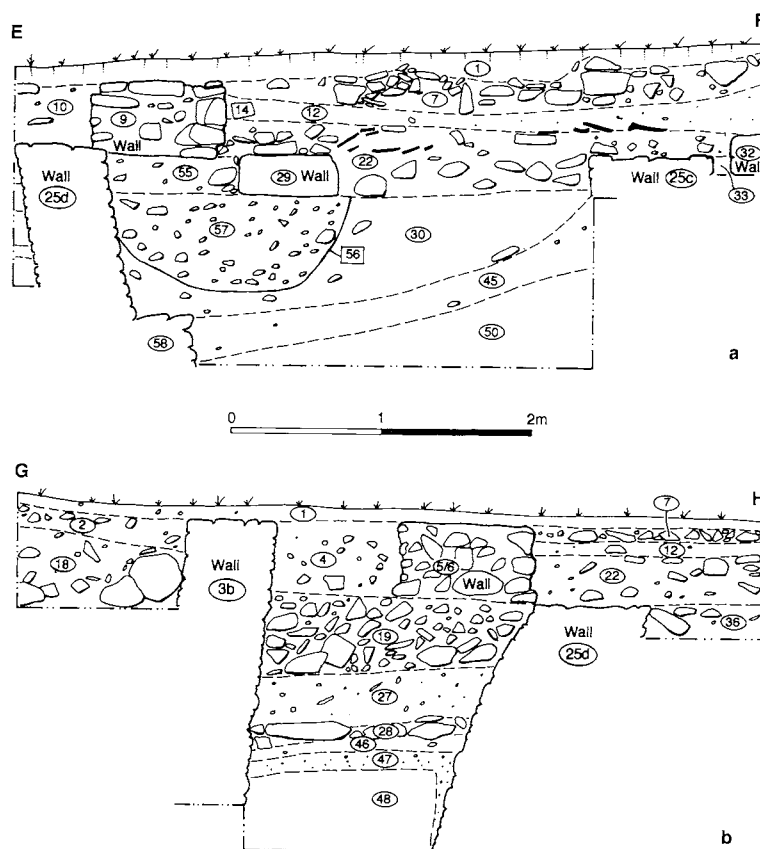


Fig. 263 Sections of trench D16. For locations, see Fig. 262.

processing as two grindstones were set into its floor (22) next to a much-used stone-lined hearth (23, fill 24).

Phases 12 to 13: Accumulating deposition continued to overlie the rubbish deposits, but the new floor (12) of the large room covered over the earlier structure (21), and a bench (14, fill 16) was built against wall (9) and a narrow shelf (15, fill 17) constructed against wall (6). A sherd-laid hearth (13) replaced the earlier stone hearth,⁴⁰ and other large sherds elsewhere on the floor may also have been used for this purpose. Further grindstones and a complete pot *in situ* also attest to its continued food-processing function. The structure was demolished and levelled at the end of this phase, and occupation ceased.

Late Aksumite trench D7

This 3 by 3 m test trench, located on the west side of the modern road, exposed a series of integrated walls on alignment with those of building (10) in D19 (Fig.

⁴⁰ The stone-laid and sherd-laid hearths of phases 10 to 12 in D16 suggest varied cooking facilities. The lack of such hearths elsewhere might indicate areas that were not used for this purpose. The sherds employed in D16 phase 12 were generally large and thick, clearly re-used as the majority were of Pre-Aksumite types; earlier Late Aksumite hearths were stone-laid.

261c). The walls were constructed of roughly hewn facing stones and rubble infill in random coursing, with foundation offsetting below, probably in phase 8A when building (10) was constructed, although attribution to a later phase is possible. In phase 12, or possibly before, an apparently internal bench (5) was built against one wall; it included a dressed sandstone slab which may have been taken from élite structure (96) a short distance to the east. Two probable floors were encountered, one (10) before and one (6=7≈8) following construction of the bench, probably associated with the wall and bench construction respectively. The building was demolished and filled, presumably in phase 13 at the same time as the D16 and D19 walls with which it was aligned and to which it was probably attached.

ARTEFACTS

In this section, the pottery from Pre-Aksumite and Late Aksumite contexts is discussed separately, followed by other categories of artefact. The account of Pre-Aksumite pottery is based on material recovered from stratified contexts attributed to phases 1 to 3,

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D16

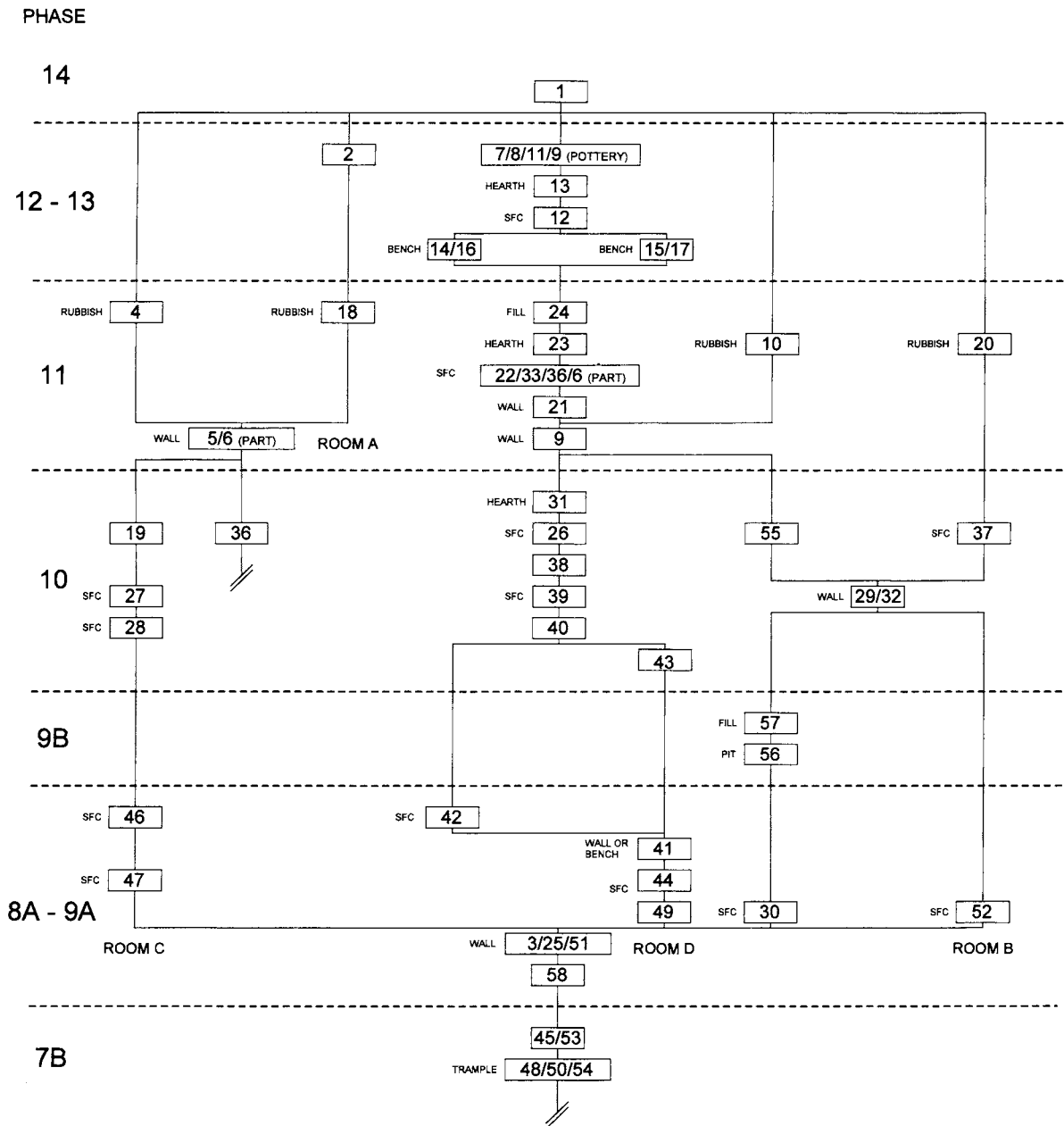


Fig. 264 Correlation chart of contexts in trench D16. For key, see p. 284.

with occasional reference to specimens from later contexts which may confidently be regarded as redeposited.

Interpretation of the artefacts recovered from Late Aksumite contexts is less than straightforward. Material of demonstrably earlier origin was frequently encountered, having been redeposited, retained in circulation or brought back into use. Make-up deposits yielded joining sherds which were often widely

separated both spatially and stratigraphically. It seems either that these fills were brought from some nearby location or that they represent spoil from building alterations; they sometimes incorporate substantial quantities of demonstrably earlier pottery. Artefacts that were recovered from Late Aksumite levels of this type thus need to be interpreted with caution and should not be regarded as belonging to sealed

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assemblages.⁴¹ Despite being stratigraphically divisible into ten principal phases, the Late Aksumite occupation of D site was evidently not prolonged, probably lasting little more than one and a half or, at the most, two centuries. Only in the case of the pottery were artefact assemblages sufficiently large to merit consideration by phase.

The superficial levels contained modern and post-Aksumite material, as well as objects which appeared on typological grounds to have originated during the Pre-Aksumite or Late Aksumite periods of occupation. Only those items of particular intrinsic interest are here discussed in detail.

Pottery and clay objects (Jacke Phillips)

PRE-AKSUMITE POTTERY

Pre-Aksumite pottery has not previously been reported from substantial habitation contexts, although some has been published from Yeha by Fattovich (1976, 1978, 1980: 39-41, pls xxvii-xxxii), and from Matara by Anfray (1966; see also Fattovich 1980: 36-7, pls xxxiii-xxxvi). The material discussed here, moreover, is the first reported Pre-Aksumite ceramic assemblage from the immediate Aksum area, and certainly the first substantial collection from a habitation (as opposed to religious or burial) context of this period in western Tigray, providing a valuable repertoire which contrasts with the broadly contemporary eastern style represented at Matara. The two sequential apparently *in situ* assemblages in D22 provide evidence for typological development.

The account given here is based on c. 825 kg of pottery recovered in the lowest levels at D site, from which Late Aksumite forms were markedly absent. Firing under controlled conditions produced black topped red ware (BTRW), with the exterior rim, upper body and interior fired black and most of the exterior fired red. These vessels also sometimes retain traces of red slip or wash. It appears that BTRW was produced only in Pre-Aksumite times, although its sherds were sometimes found redeposited in Late Aksumite contexts at D site. All Pre-Aksumite vessels, including BTRW, were made without use of a potter's wheel, both manufacture and firing being generally of a high standard.

The range of Pre-Aksumite vessels from D site is substantially different from that known at religious and burial sites such as Hawelti and the Yeha tombs. Beakers, goblets, chalices and footed bowls are

⁴¹ For example, joining sherds from one Pre-Aksumite vessel were recovered in a phase-3B make-up layer of D22 and in even later contexts farther uphill: a phase-5 pit fill and a wash layer attributed to phase 7A.

not represented. Bowls and storage pots are characteristic; lids, smaller pots and jars are present but less common. These are features to be expected at a habitation site. Almost all vessels have rounded bottoms. Decoration is limited and sparse, mainly comprising incised or combed bands, usually in combinations of straight and wavy or zig-zag lines, near the rims of bowls and lids and on the shoulders of pots and storage pots. Punctated, possibly rouletted, bands also appear regularly in the latter position, as do applied bosses, ridges and other more elaborate types. The assemblage is characterised by an emphasis on form, fabric and firing technology rather than on decoration.

Bowls

The basic and most common form is a medium to shallow thin-walled bowl with a rounded bottom. It occurs in a wide range of sizes and was often fired as BTRW. Profiles range from nearly straight-sided to convex, usually with little rim articulation. The convex profile is less common and largely restricted to BTRW. The rim is normally rounded, sometimes slightly thickened on the exterior or interior. No footed examples were recovered. Incised or applied embellishment shows considerable variation. Incised ticking around the lip is common (*e.g.* Fig. 265c). Applied decoration, generally a single round boss, is present on some BTRW vessels. Some vessels preserve interior designs of wavy lines made with a comb of three, four or five teeth; although similar decoration is found on concave lids, the smoothed interiors and rough exteriors of these examples suggest that they were probably bowls. Many have two large adjoining pre-firing holes c. 9 mm in diameter just below the rim. Others have a single large pre-firing hole in this position as adjunct to a triangular handle (Fig. 265i). Other distinctive rim forms are occasionally present. One form of large shallow bowl with rim diameters between 220 and 220 mm has a slightly rolled or short outflaring rounded rim (Fig. 265e). A smaller form, 110 to 160 mm in rim diameter, with strong exterior carination or wide lip, is never decorated (Fig. 265b).

Handles are generally rare, usually just below the rim on BTRW bowls. The general form is a short flat horizontal lug, square or elongated and curved, pierced by two punctate holes (Fig. 265h). A small number of BTRW bowls have a small coil handle, similar to those on the larger basins described below.

A few small bowls, c. 160 mm in rim diameter, have exteriors bearing shallow impressions of fine basketry (Fig. 265a). The slightly overhanging exterior rim and the interior are roughly smoothed and sometimes red-slipped.

Deep bowls and cups: Deep BTRW bowls generally have rounded rims, near-upright walls and

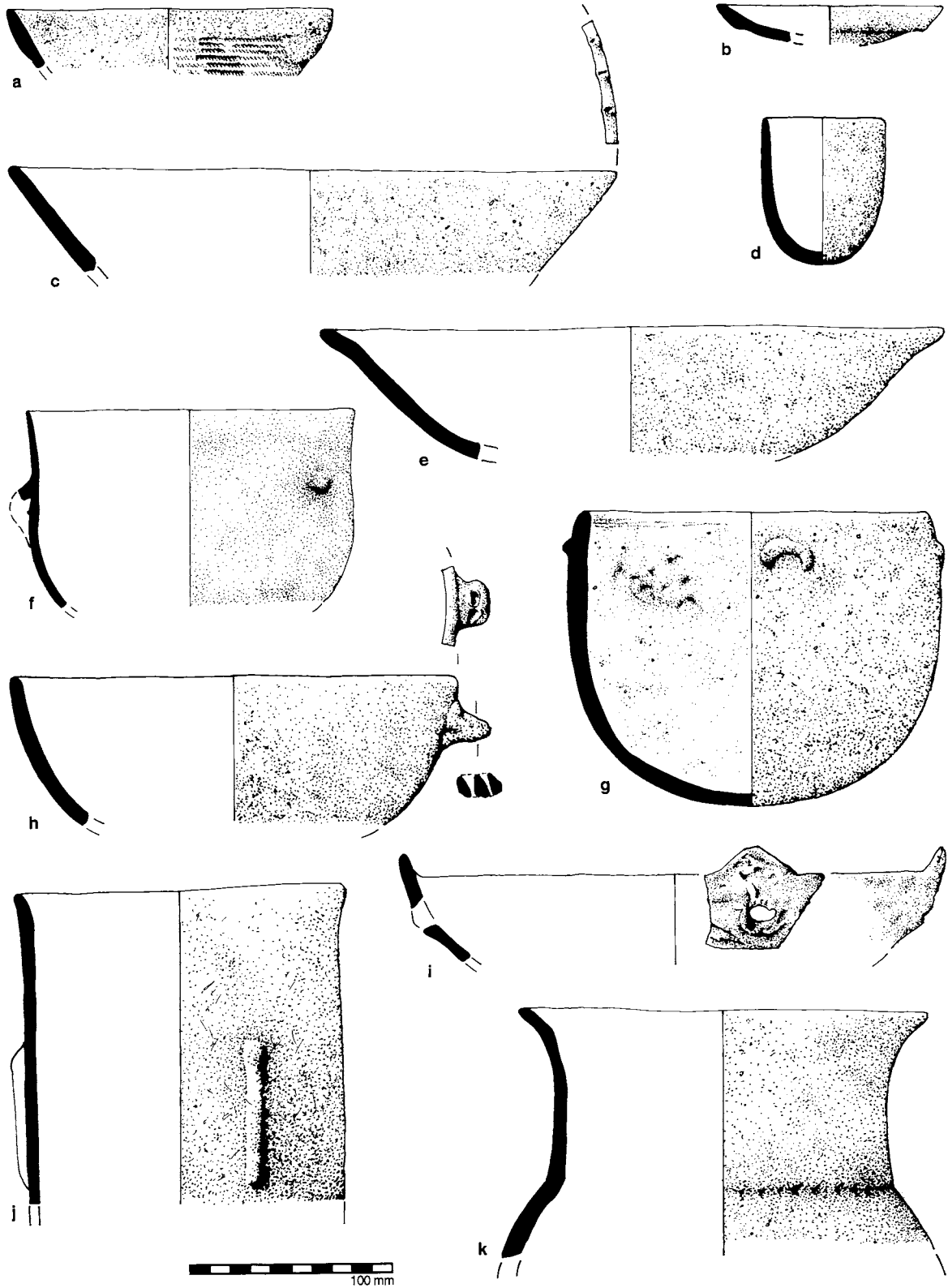


Fig. 265 Pre-Aksumite bowls and pots from D site.

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rounded bottoms. Diameters are usually between 150 and 220 mm, with vessel height at least half the diameter. Elaboration consists of bosses or a vertical coil handle (Fig. 265f) on the upper body. BTRW bowls with generally semi-globular body and slightly constricted aperture again usually have a rounded rim and rounded bottom. Variation is slight and consists of rim articulation or an applied arch on the upper body (Fig. 265g). A very few round-bottomed open vessels, with heights no less than their 50-to-120-mm diameters (Fig. 265d), can be held in one hand and may be classified as cups.

Basins

Basins are distinguished from bowls if they are both large and deep. They are generally at least 400 mm in diameter. All are BTRW; walls taper but are otherwise straight, with little if any articulation of the rim. Variation is largely limited to the handles, of which there are three basic types, presumably related to function: 1) vertical or near-vertical coil handle (Fig. 266a); 2) horizontal coil handle (cf. de Contenson 1963a: pls lix.b, lx.a.1 and Anfray 1963a: pls cxl.6, cxli.7 for parallels from Hawelti and Yeha respectively); and 3) horizontal lug handle. Rim diameters for vessels with type-1 handle and the sole example of type 3 range between 430 and 470 mm, but type 2 is noticeably smaller at 280 to 360 mm.

A different form of basin, with an everted ledge rim and combed bands on the exterior, has parallels at Yeha (Fattovich 1980: pl. xxv.9).

Pots

The most common pot form has a globular body, rounded bottom, sloping shoulder, collar and out-flaring rim, often with combed decoration on the shoulder in one of two basic designs. One such pattern, finely combed, has upper and lower borders with discontinuous horizontal tick lines between them in more-or-less vertical arrangement (Fig. 266b); these pots tend to have longer collars and less flaring rims. The other pattern has the same borders but a wavy combed line between or, alternatively, a horizontal central band with wavy borders (Fig. 266c); these have shorter collars with extremely flared almost horizontal rims (cf. de Contenson 1963: pls liii.b.3, liv.b). This band may be interrupted by one or two applied bosses or by a tiny vertical strap handle (D.W. Phillipson, Reynolds *et al.* 1996: fig. 27b). Rim diameters range between 50 and 285 mm. The comb used has four or five closely spaced teeth, apparently a development from the earlier type with two or three thicker teeth, more widely spaced. A variant of this type has two upright horizontal coil handles on the shoulder. Some have similar combed decoration, others an incised grid design

producing a large zig-zag cross-hatched band (Fig. 266f).

A taller collar neck (*e.g.* Fig. 265j) and elongated body characterise another common pot form, sometimes having a band around the neck or upper shoulder which was punctated, red-washed or red-slipped and then incised. The punctate pattern, like that on storage pots, is based on an uneven triangular impression (Fig. 265k). The incised pattern consists of a horizontal band of deep vertical ticks superimposed directly onto a band of shallow combed or incised lines. Another pattern involves horizontal incised lines with one or two angular zig-zag lines of incision or rouletted dots. Piriform pots with slightly constricted necks and flaring rounded rims (Fig. 266e) also appear, usually in BTRW. One example (Fig. 267b) has a large applied boss on the neck. An elongated globular pot (Fig. 266d) has a clearly defined neck/shoulder junction. Another (Fig. 266g), with a tapering body and rounded rim, bears a long horizontal strap handle.

Jars

Since few of the relevant vessels could be reconstructed, the dividing line between jars and pots is difficult to define other than by placing vessels with a wide aperture in the former category and those with a narrow aperture in the latter. The only jar body with constricted neck is piriform (Fig. 267c) having two short vertical applied ridges on the sloping shoulder (cf. de Contenson 1963: pls liii.b.1, liv.a), found in the later, phase-3 floor deposit in D22. Fig. 267a shows an example with a tiny applied handle at the defined neck/shoulder junction. The lower body and footed base of two jars (*e.g.* Fig. 267d) may be paralleled at Yeha (Anfray 1963a: pl. cxl.2).

Jugs

From the earlier, phase-1, floor deposit in D22 came a nearly intact jug (Fig. 267e), having a single vertical coil handle from neck to shoulder, and a conical boss opposite on the neck; it has a deeply drag-punctated horizontal band on the upper shoulder. Another possible jug, also from the earlier floor deposit, has a very sloping shoulder, concave neck and flaring rim which broadens as if to a spout. A shoulder fragment has the lower break of a vertical coil handle, which presumably joined either at the rim or neck; the body seems to have been piriform with a rounded bottom, and the entire vessel is red-washed on the exterior.

Storage pots

The D22 *in situ* deposits of phases 1B and 3B produced numerous large storage pots of distinctive type. The differences between these two groups offers the best evidence at Aksum for typological development

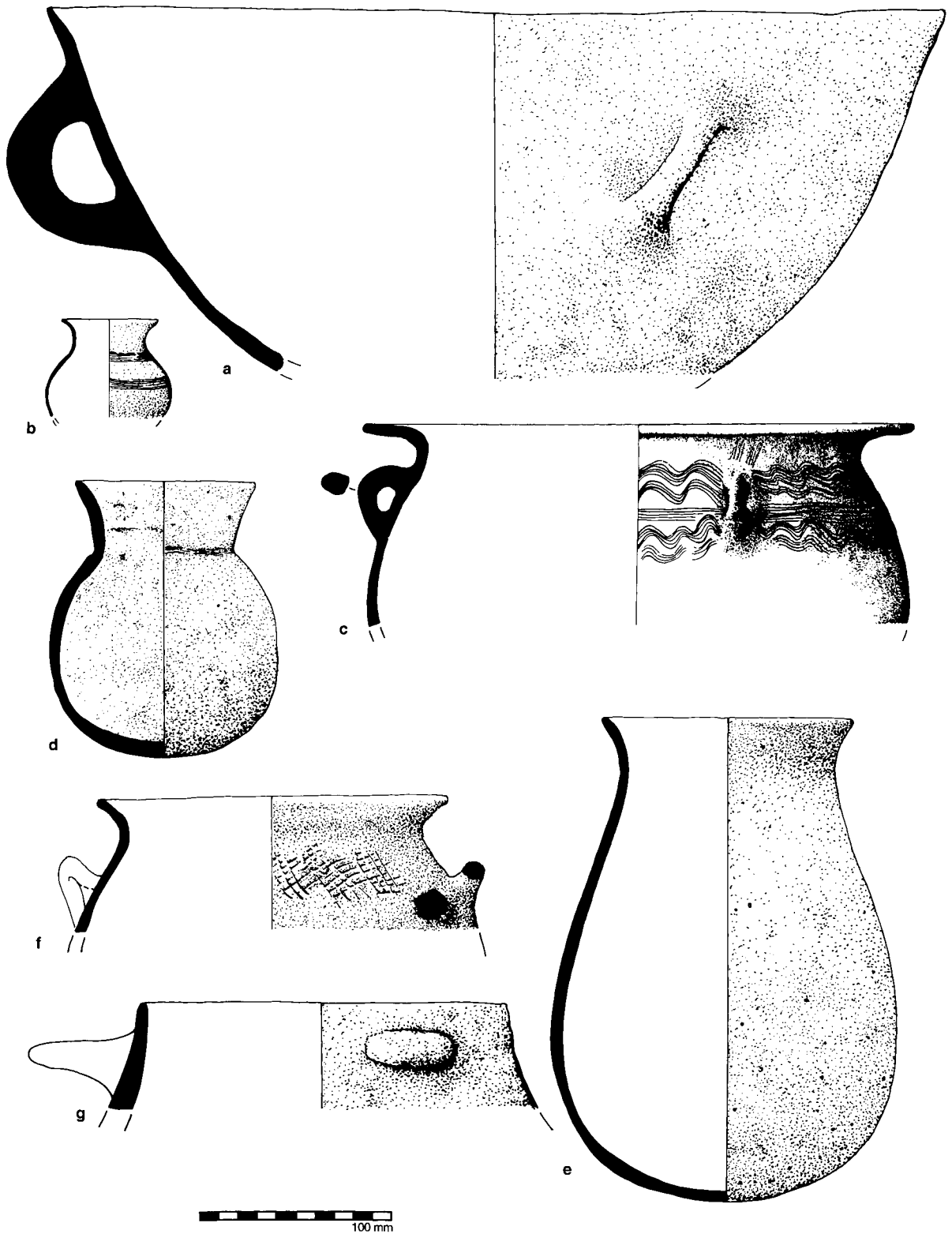


Fig. 266 Pre-Aksumite basin and pots from D site.

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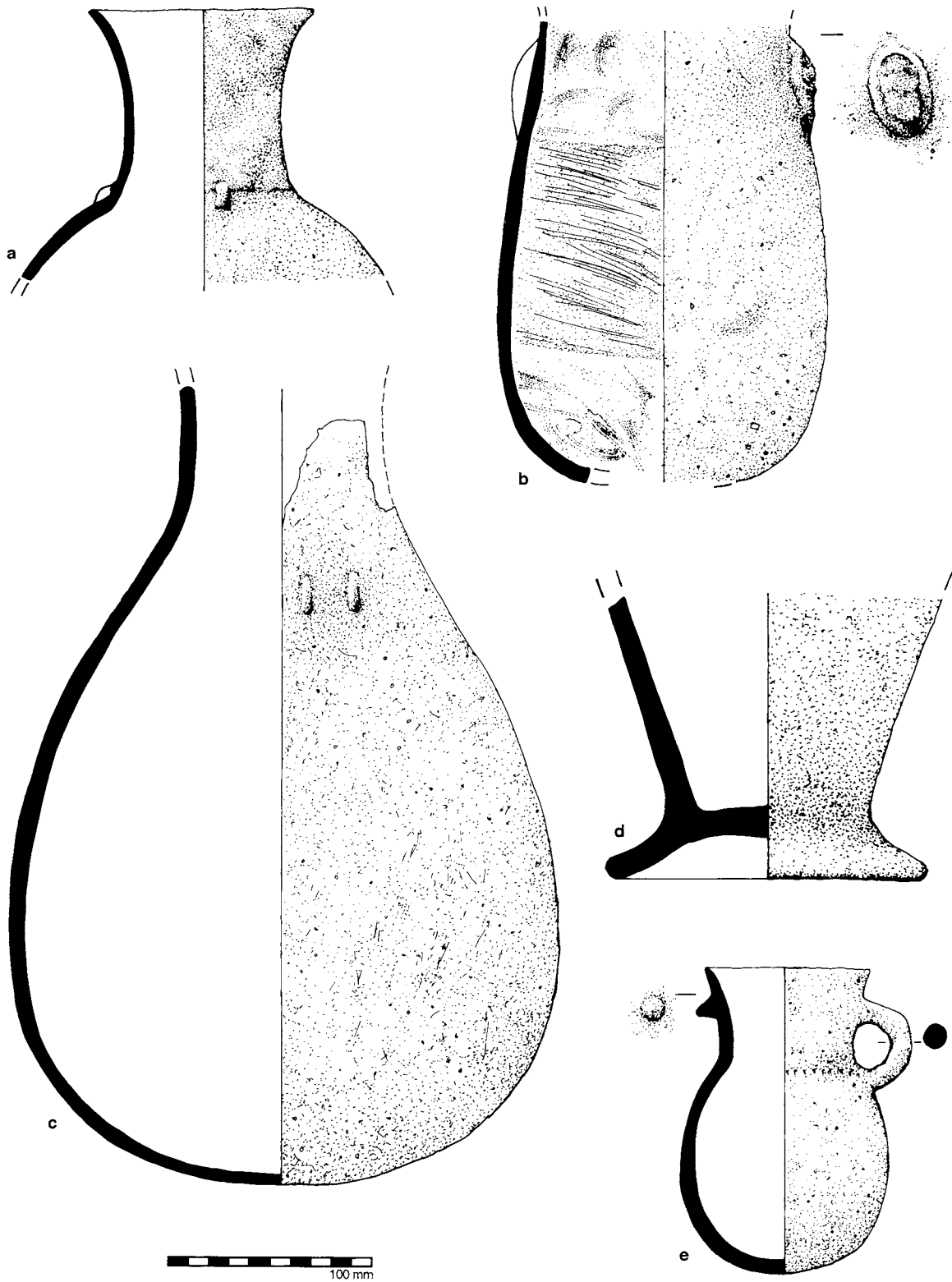


Fig. 267 Pre-Aksumite jars and jugs from D site.

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within the Pre-Aksumite period. No intermediate types are recognised and one type may have appeared as the other declined in popularity.

The earlier, phase-1, type is in BTRW with a smooth stone-polished exterior and roughly wiped interior. No complete vessel was recovered, but one was substantially reconstructed. The vessel has a slightly flaring rounded rim, concave neck, sloping shoulder without articulation, and slightly flattened rounded bottom. One example can be restored to a total surviving height of 880 mm. Decoration is limited to the lower neck, which is encircled by one or two wavy horizontal bands of punctates interrupted by a series of applied bosses (Fig. 269a). The punctates vary in type, from small lightly impressed triangular double lines to large and heavily impressed triangular single lines, and rings or circles.

The later, phase-3, type has an angular flaring rim, sloping shoulder, sleeker piriform profile and

slightly angular rounded bottom (Fig. 269c). These vessels sometimes bear an applied arch (Fig. 269b) or combed decoration (Fig. 270a) and range between 170 mm and nearly 800 mm in height (Fig. 268).

Braziers

The sole restorable brazier (Fig. 271) is probably of Pre-Aksumite manufacture, despite being recovered from a Late Aksumite context associated with many large Pre-Aksumite body sherds. It consists of a deep open bowl, 360 mm in rim diameter, with a wide splaying ring-foot base and three massive horizontal lugs attached to the interior of the rim and supported below by two vertical struts. Heavily burnt on the inside, it was clearly used as a portable brazier. A large lug of similar form was recovered in the phase-3 D22 floor deposit.

Lids

Two basic lid forms can be recognised; they range between 102 and 430 mm in diameter. Both employ a loop handle with an ellipsoid section, and are differentiated by their convex or concave profile. Incomplete examples, particularly of the former, can easily be mistaken for shallow bowls. The concave type (Fig. 270b) is more readily recognised since, unlike the convex type, it often bears decoration on the upper side. Designs include 2- and 3-tooth radiating and concentric combed patterns (D.W. Phillipson, Reynolds *et al.* 1996: fig. 27c), as well as four- and five-toothed comb interior rim patterns employing overlapping straight and wavy-line bands (cf. an example from Yeha illustrated by Anfray 1972b: 51, pl. xix.b). The convex examples (Fig. 270d) are found in contexts with the later storage-pot type suggesting that this may be a later form than the concave version found in the earliest levels. A lid from the phase-1 D22 floor, 125 mm in diameter, had been burnt on the upper surface and the edges of the underside whilst covering a vessel with a 110-mm rim diameter.

Strainer? vessels

A number of small fragments displayed closely and regularly spaced pre-firing holes *c.* 6 mm in diameter. The vessel forms are not restorable but the profiles are only slightly curved (Fig. 270e). A few sherds indicate that the holes were restricted to part of the vessel, suggesting some form of shallow strainer bowl; none shows signs of burning. One rim sherd (Fig. 270c), 250 mm in rim diameter and comparatively thin, may represent a small version of this form. Possible functions for these vessels include the making of beer and the extraction of salt.

Three sherds, otherwise similar to the others, had their holes drilled after firing. It is possible that



Fig. 268 Pre-Aksumite storage pot from D site.

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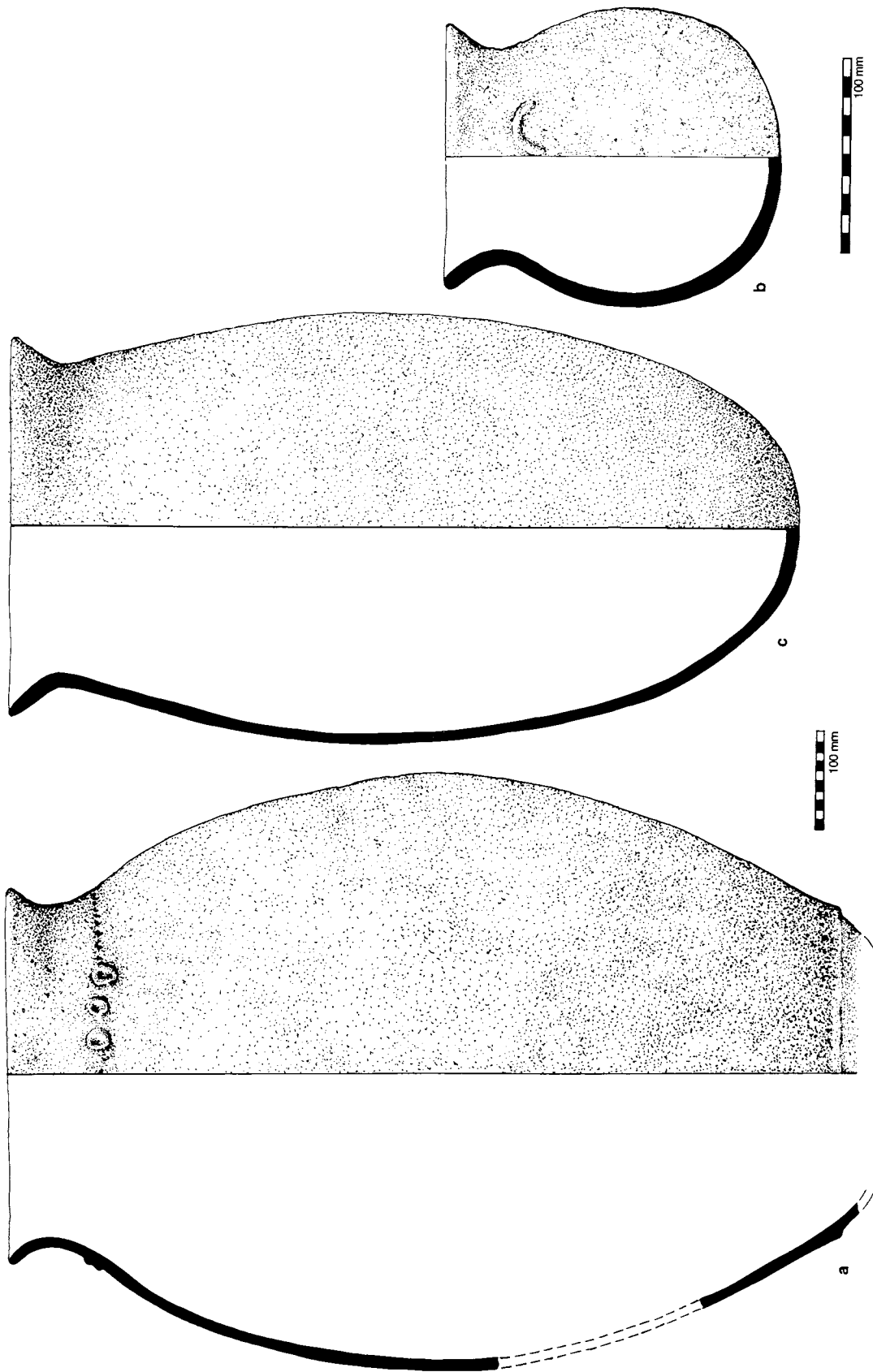


Fig. 269 Pre-Aksumite storage pots from D site.

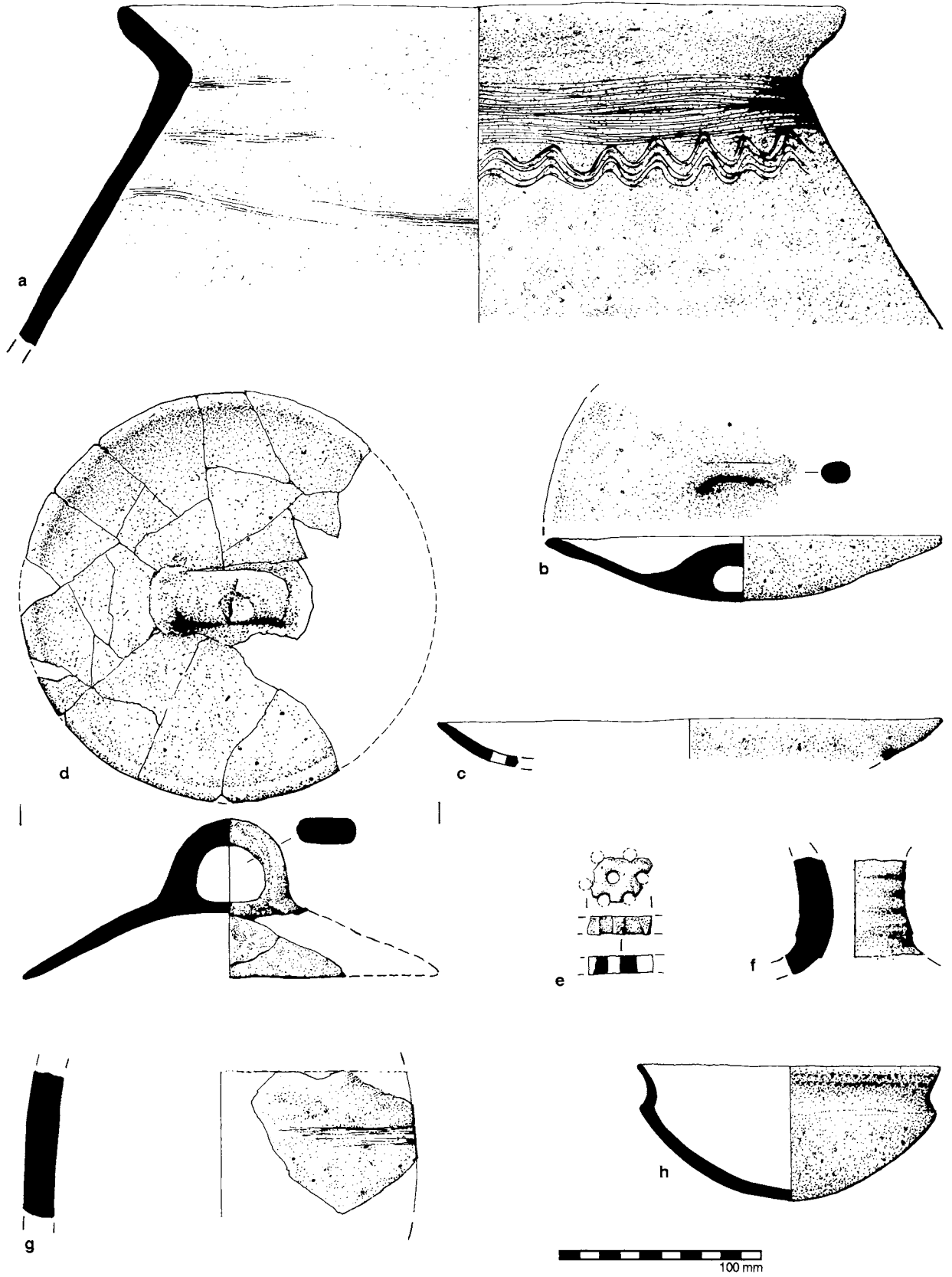


Fig. 270 Pre-Aksumite storage pot, lids, strainers and imported vessels from D site.

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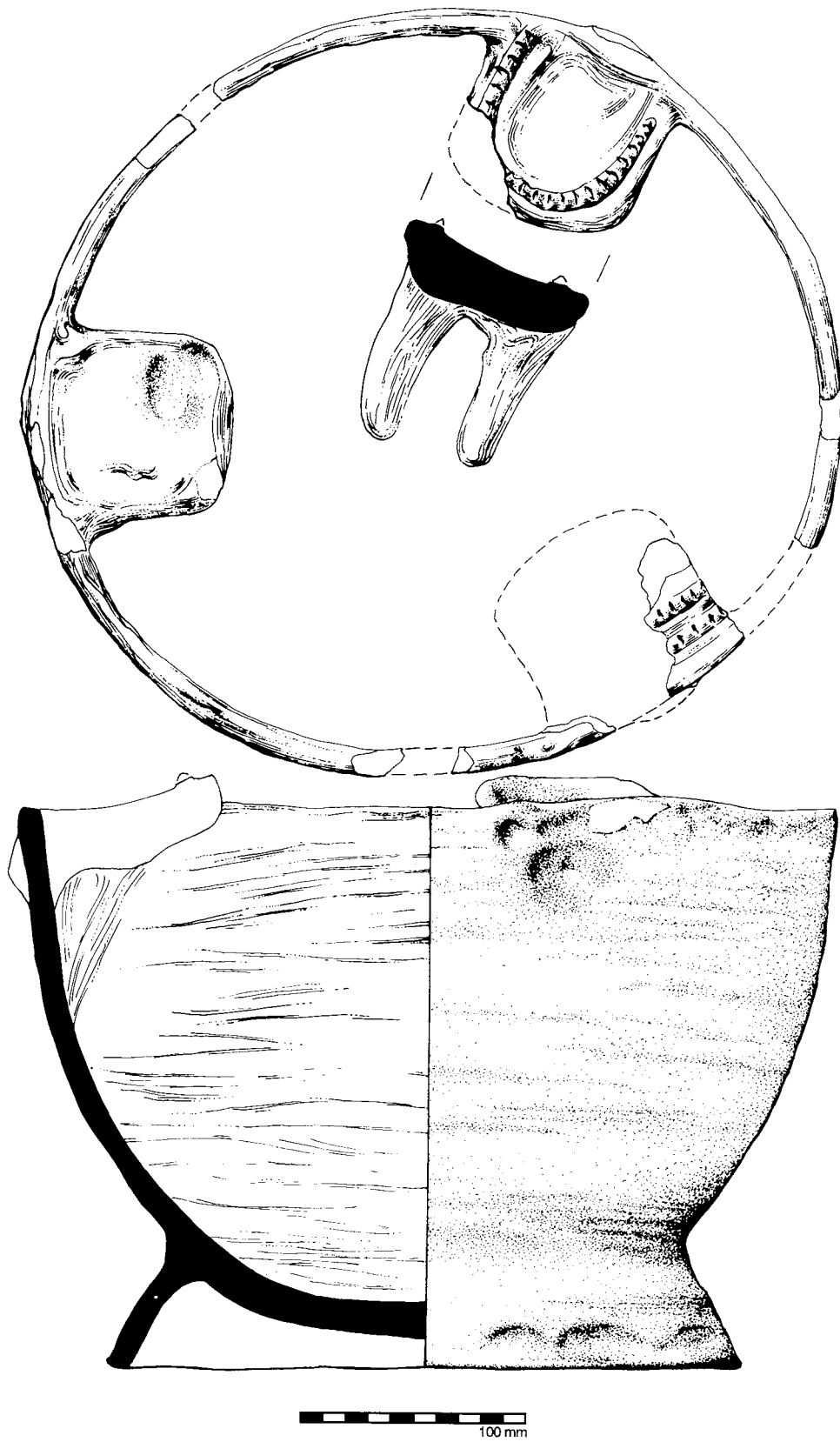


Fig. 271 Pre-Aksumite brazier from D site.

they represent bowls that were later converted for use as strainers.

Censer?

One tapering open-vessel rim with strong and localised burning marks may be that of censer. It has incised vertical lines on both surfaces (cf. de Contenson 1963: pl. lviii, for a comparable specimen from Hawelti with painted decoration in place of incision).

Legged vessel

One small red-washed tapering oval leg, from phase 2 in D22, may be from a tripod or quadripod vessel. Several larger fragments may come from snake figures of the type discussed below (p. 334).

Imported vessels

Two small sherds with incised rocker decoration strongly resemble material from Matara (Fattovich 1980: pls xxxiii.5-6, xxxiv.2). Their scarcity at Aksum suggests importation from elsewhere, although their fabric was not visually distinctive

Other vessels which appear to have been imported may be wheel-made, although wear precludes certainty. The body sherds (Fig. 270g) are generally thick-walled (15 to 18 mm) and wide-bodied. One example is from a vessel 190 mm in diameter although the single neck fragment (Fig. 270f) is very narrow at 65 mm; it should probably be restored as a type of amphora which might imply that a liquid was at this time brought to Aksum from some distance. At least one open carinated bowl (Fig. 270h) has two bands of punctate decoration on the exterior rim; no parallels can be cited.

POTTERY FROM LATE AKSUMITE LEVELS

This section generally follows Wilding's terminology (Munro-Hay 1989: 290-311), although some amendments are proposed. Problems inherent in the stratigraphy of the Late Aksumite deposits at D site have been noted above (pp. 302-3): it was emphasised that joining sherds were frequently recovered in horizontal and stratigraphical isolation from each other, which inhibits a clear view of typological development during what seems in any event to have been a relatively brief period. Pottery from the Late Aksumite levels at D site totalled c. 1350 kg.

Late Aksumite vessels are best differentiated by reference to their shape and/or decoration, the clays used being often indistinguishable, on the basis of visual inspection, from those of the earlier period. All vessels, except those that were imported, were hand-made. No coil fractures were observed. Some information on one method of manufacture is provided by the

basketry and mat impressions that are discussed on pp. 333-4, below.

Late Aksumite ceramics exhibit decreasing technological competence, firing being less controlled and at lower temperatures. There is an increased tendency towards reduction firing and flash-marks are common. In compensation, vessel walls and handles become thicker and fabrics coarser so as to maintain vessel strength, and increased use is made of burnishing, both wet and dry, for vessels requiring impermeability. These trends began in earlier times, as evidenced by comparison with the assemblage from the Tomb of the Brick Arches, and continued during the Late Aksumite period at D site. The decoration is usually incised and comparatively sparse and slapdash, although some vessels are highly decorated. Some forms continue to be well made, thin-walled in fine fabrics and fired at high temperatures, but these are rare and may represent survivals or imports from the eastern part of the Aksumite polity where similar vessels are found in greater quantity (Anfray 1966). An extensive petrological study of the fabrics is needed. The generally lower quality of the Late Aksumite D-site pottery could also be attributed to the lower economic status of the inhabitants compared with those of other excavated sites, and/or to the increasing scarcity of wood (p. 486, below) for fuel or other uses, which is attested at this time.

Beakers

The most numerous examples are tall, thick-walled vessels, usually red-slipped and burnished on the exterior and having a slightly in-tapering body and rounded rim (Fig. 272a). Their round bottoms are sometimes flattened (Fig. 272b). Exterior embellishments may include four horizontal incised lines below the rim, a single applied boss or short vertical ridge, or a post-firing incised cross design. Some of these beakers could possibly be redeposited Pre-Aksumite material, but this is considered unlikely since none was recovered in the Pre-Aksumite levels. A very few fine beakers have a pearlised interior (p. 330, below).

Bowls

Bowls are the most common basic vessel form, occurring in a variety of shapes, sizes and decorations.

Ledge-rim bowls: This form develops from earlier ledge-rim bowls such as those in the Tomb of the Brick Arches and may have been copied from the Roman wheel-made bowls of African Red Slip ware occasionally found on Aksumite sites. They are darker in colour than the earlier examples and often have an interior lip. All are hand-made, slipped and burnished, the slip ranging between red (2.5YR 5/6) and bright reddish yellow (5YR 6/6). Both round-bottomed (Fig.

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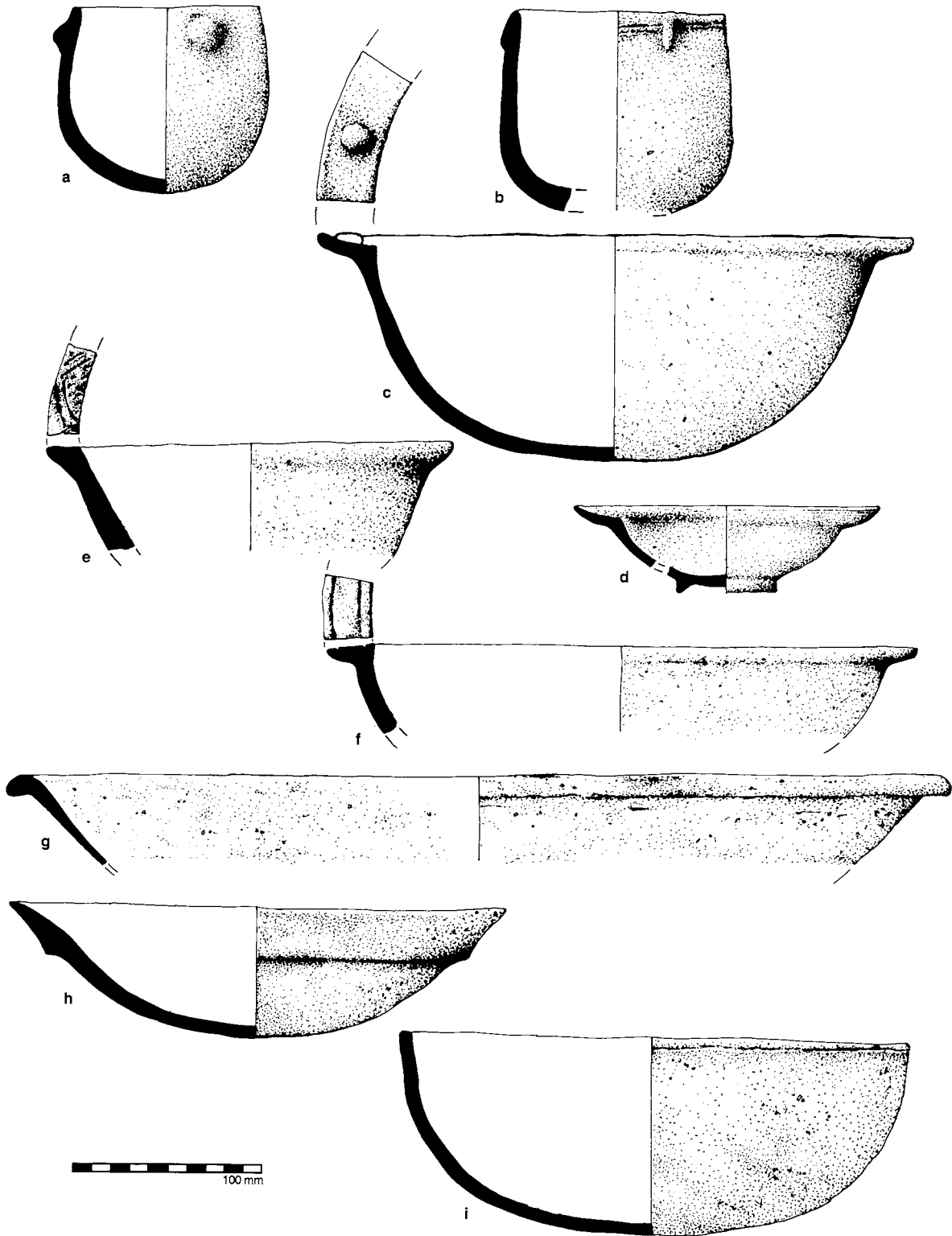


Fig. 272 Late Aksumite beakers and bowls from D site.

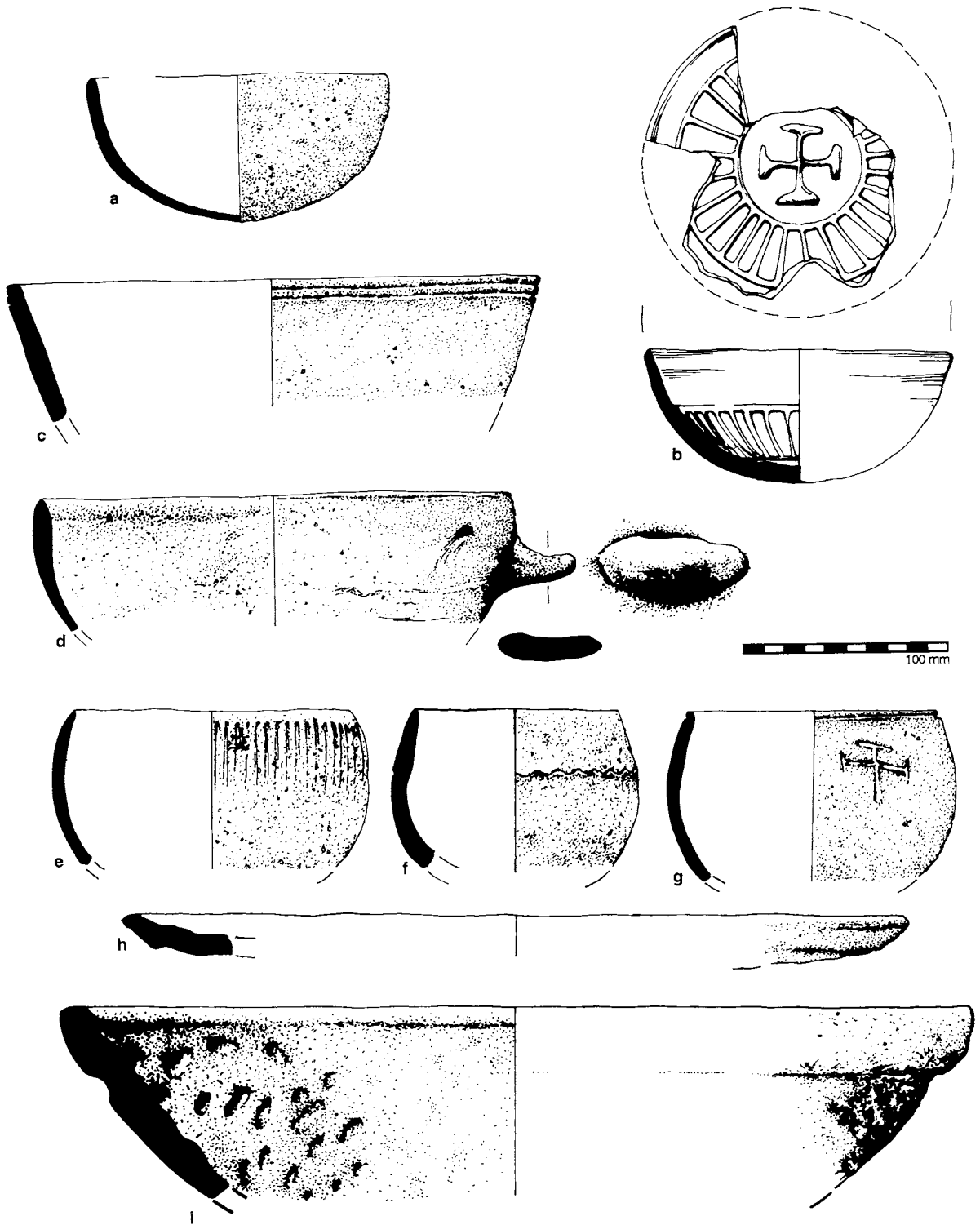


Fig. 273 Late Aksumite bowls and basin from D site.

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272c) and ring-foot (Fig. 272d) forms are represented. Some are clearly stone-burnished, with differential horizontal striations. Unlike the Roman forms, which tend to be somewhat diagonal in profile, the Aksumite ledge rim tends more to the horizontal. The form and decorative scheme became more varied as they were integrated into the Aksumite repertoire. The form remains generally deep in profile and the decoration is limited to the rim top and outer edge. The simplest type is plain and unembellished, or has one or two grooves on the rim top (Fig. 272f). A large bowl (Fig. 272c) has two large flat applied buttons on the top of the rim, whilst another seems to have a slightly pulled handle area at the rim edge. Other designs include an incised wavy line and, quite commonly, an applied wavy line punctated on its upper surface to produce what Wilding (Munro-Hay 1989: 252, fig. 16.138) called a 'snake motif'. Some are provided with a finger-impressed or pinched continuous wavy edge that may be a development of the earlier dentilated type; another is diagonally ticked at the inside rim top. Chevron decoration around the rim top is also found as a weak red (10YR 5/3) painted zig-zag band, usually with a similarly painted border on the exterior edge; the painting usually is quite sloppy. These bowls are generally large, between 190 and 400 mm in diameter, with occasional smaller examples. Many of the patterns are found also at K site, where some stratigraphical development may be discerned (p. 389). One small ledge rim bowl has two widely spaced post-firing incised Ethiopic letters (*le gu*) on the rim top (Fig. 282a); its pearlised surface suggests that it may have been imported from within the Aksumite tradition (p. 330). Others have a post-firing incised or pre-firing incised or impressed elaborated cross. Deep bowls with a less pronounced ledge rim are generally smaller, with a rim diameter between 150 and 240 mm. Decoration consists chiefly of an incised chevron pattern sometimes infilled with punctates (Fig. 272e).

Rolled rim bowls: These uncommon vessels are distinguished by an interior thickened rounded rim that rolls to become an overhanging outer lip (Fig. 272g). The bowls may be deep or shallow, round-bottomed, with wide rim diameters between 360 and 460 mm and very thin (4 to 5 mm) walls. The interiors and rims are usually wet-smoothed with the exterior rougher. They appear in the earliest Late Aksumite phase and in later contexts.

Bowls with strongly exterior-thickened overhanging rims: The shape and size (260 to 380 mm diameter) of these vessels show some resemblance to Sassanian blue-green glazed bowls, although they could equally be an indigenous development. They are round-bottomed, characteristically burnished on the interior with a rough unfinished exterior (Fig. 272h). A

smaller (190 mm) example has shallow diagonal zig-zag grooves on the exterior body.

Deep to medium open plain bowls: These are varied, large (220 to 320 mm) or small (150 to 160 mm) in rim diameter, roughly smoothed, red- or brown-slipped and/or burnished (Fig. 273a). Occasionally there is a horizontal incised line around the interior or exterior (Fig. 272i). A few are press-moulded on the interior to create a raised design surrounding a central raised cross (Fig. 273b). The most complete example is also the earliest, recovered in the earliest Late Aksumite phase 4 of trench D22; one of its joining fragments is light brown (7.5YR 6/4) and the rest have been burnt black. Thus, although a similar vessel was designated Black Aksumite by Wilding (Munro-Hay 1989: 304, fig. 16.426), it seems that the colour is the result of use rather than kiln firing.

Tapering straight-walled deep bowls: These are slipped and highly burnished, characteristically unembellished apart from one or two horizontal grooves around the exterior rim (Fig. 273c). They normally have a yellowish red slip but can be black, probably due to uncontrolled or variable firing.

Bowls with single extended lug handle: Two examples of this form were recovered, one from the earliest Late Aksumite phase. It is an open bowl with plain rounded rim some 220 mm in diameter and presumably rounded bottom (Fig. 273d). The single extended lug handle is only 27 mm long, precluding interpretation as a ladle. A painted bowl of similar form (Fig. 43i, above) was recovered from the Tomb of the Brick Arches.

Semi-globular bowls: These have a rounded bottom and tapering rim. A variety of decorative schemes provides the main distinctions, which may have chronological connotations. Red-slipped and burnished bowls with a thin section were recovered throughout the Late Aksumite sequence. They are vertically grooved around the body, with a cross either stamped before firing or incised after firing (Fig. 282c); one example (Fig. 273f) has an arcaded line on the body. More complete examples indicate a pattern of four crosses spaced around the bowl below the rim. The grooving appears to be a degraded version of Classical Aksumite corrugation. Post-firing incised crosses of varying complexity and elaboration often appear on these bowls, with or without the vertical grooving, the less common stamped variety occurring only with grooves. A particularly elaborate series of vertical and horizontal grooves with post-firing cross is also found (Fig. 282g). This decorative scheme also occurs rarely on closed vessels.

Post-firing incised crosses are present below a horizontal groove around the exterior rim on otherwise unembellished bowls. Thicker-walled bowls probably

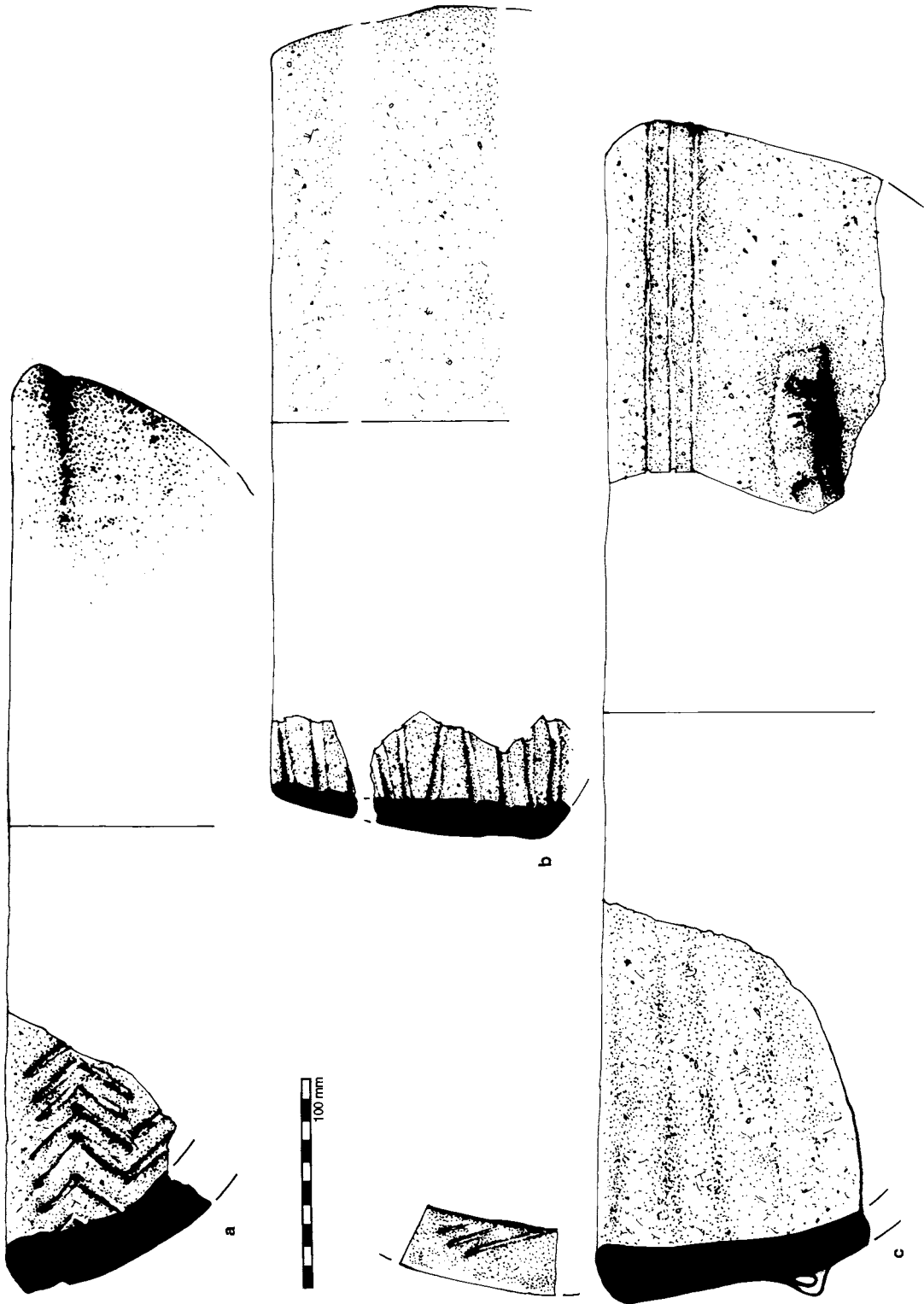


Fig. 274 Late Aksumite basins from D site.

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appeared later, having a shallow grooved cross with terminal lines on the upper body (Fig. 273g). Probably equally late are black or dark grey thick-walled bowls, characteristically having a horizontal wavy grooved line just above mid-body, subsequently wet-burnished to obscure the line. Other less common embellishment on the shoulder includes an elaborate post-firing incised cross (Figs 273e, 282f) and four groups of three vertical lines.

Shallow bowls: These bowls are large, shallow and open, with a highly burnished interior, rough or unsmoothed exterior, and an overhanging thickened rim (Fig. 273h). Similar vessels are used today for preparing, mixing and serving food. They are usually poorly fired in a reduced atmosphere, resulting in a soft fabric fired dark or black.

Carinated bowls: Other bowls, between 260 and 350 mm in diameter, are carinated and have tapering rims. They are highly varied, being either burnished on the interior with a rough exterior, or lightly smoothed on both surfaces.

Basins

Basins are so defined at D site if they are thick-walled and large, usually more than 400 mm in rim diameter (cf. p. 62, above). They are distinguished from the larger bowls by their lack of external embellishment.

Basins with deeply incised or impressed interior: These are shallower versions of the type found in the Tomb of the Brick Arches. Walls are between 19 and 22 mm thick, while rim diameters range from 420 to 460 mm. Individual lines of the herringbone pattern (Fig. 274a) are shorter than on the earlier examples; finger-punctated designs (Fig. 273i) also occur. The exterior can be quite rough, although the interior seems usually to have been slipped. One rim fragment preserves two pre-firing holes 13 mm in diameter and *c.* 90 mm apart.

Basins with shallow incised interior: These have a smoothed apparently in-tapering body, rounded rim and rough bottom. In contrast with the basins described above, walls are not more than 18 mm thick, tapering to the rim. The interior was deliberately fired black and bears horizontal grooves (Fig. 274b), although the exterior is dark brown (for a similar example from Matara, see Anfray 1966: fig. 13).

Smooth-walled basin: One sherd of an extremely large deep open vessel, *c.* 680 mm in rim diameter, bears two wide grooves below the exterior rim and, below that, a horizontal lug handle with finger depressions at either end (Fig. 274c). It is self-slipped and burnished on the interior.

Pots

Widely varied in size, pots are present throughout the sequence and vie with bowls as the most common

form at Late Aksumite D site. They are distinguished from jars by their comparatively wide aperture relative to body diameter.

Globular round-bottomed pots: Virtually all have a slightly squat globular body with rounded bottom, variation centring on the shape and size of the handle and on the profile of the neck and rim. The bottom, when preserved, is far more worn than the rest of the vessel: placement of these vessels on a hollowed surface might explain some of the numerous shallow pits observed during excavation. While most of these vessels are decorated with incised, applied or painted and burnished designs, others are not so elaborate. Seven examples from phases 10 and 11 could be restored: their heights and maximum diameters range from 80 to 306 mm and from 104 to 316 mm respectively, rim diameters being between 54% and 73% of the maximum. Necks are usually tall and in-tapering, slightly convex to bulging in profile (Fig. 275a). A demarcating exterior ridge is often found just above the shoulder, highlighted by incised patterns. If small vertical handles are present, this ridge also marks their upper junction. The rim can be upright and rounded or have a short everted or flat ledge profile. This last is sometimes ticked on the outer edge, with applied protrusions at intervals. Large handles are generally vertical oval-section straps extending from upper neck to upper shoulder, rounded angular in profile. They usually form opposing pairs, although single examples are also found (Fig. 276b). Some are pierced, the holes being carefully hand-formed before attachment. Handles, usually too small to be practical carrying devices, also link neck and shoulder and usually appear in sets of four around the collar, possibly to attach a cord for hanging; these too may be rounded (Fig. 275b) or angular (Fig. 275d). Handle embellishment usually consists of single or paired vertical incised lines at the edge, or of short horizontal lines or a series of short vertical dragged punctates (Fig. 275c). More elaborate embellishment includes the addition of an applied claw-terminal of varying length at the bottom, an incised substitute, or a horizontal punctated terminal bar (Fig. 275e). Pairs of non-matching handles are also often found on large vessels, presumably for ease of pouring heavy contents. One is always large and vertical, the other a small vertical strap from lower neck to upper shoulder, or a horizontal strap (Fig. 277a) or lug on the shoulder itself. Body decoration, confined to the shoulder, is usually demarcated by a simple or elaborate incised lower border band at or just above the maximum diameter level with the lower handle junction; it often comprises a horizontal zig-zag (Fig. 276a) or cross-hatched pattern with straight line border. The usual shoulder pattern involves a series of panels bordered by single or

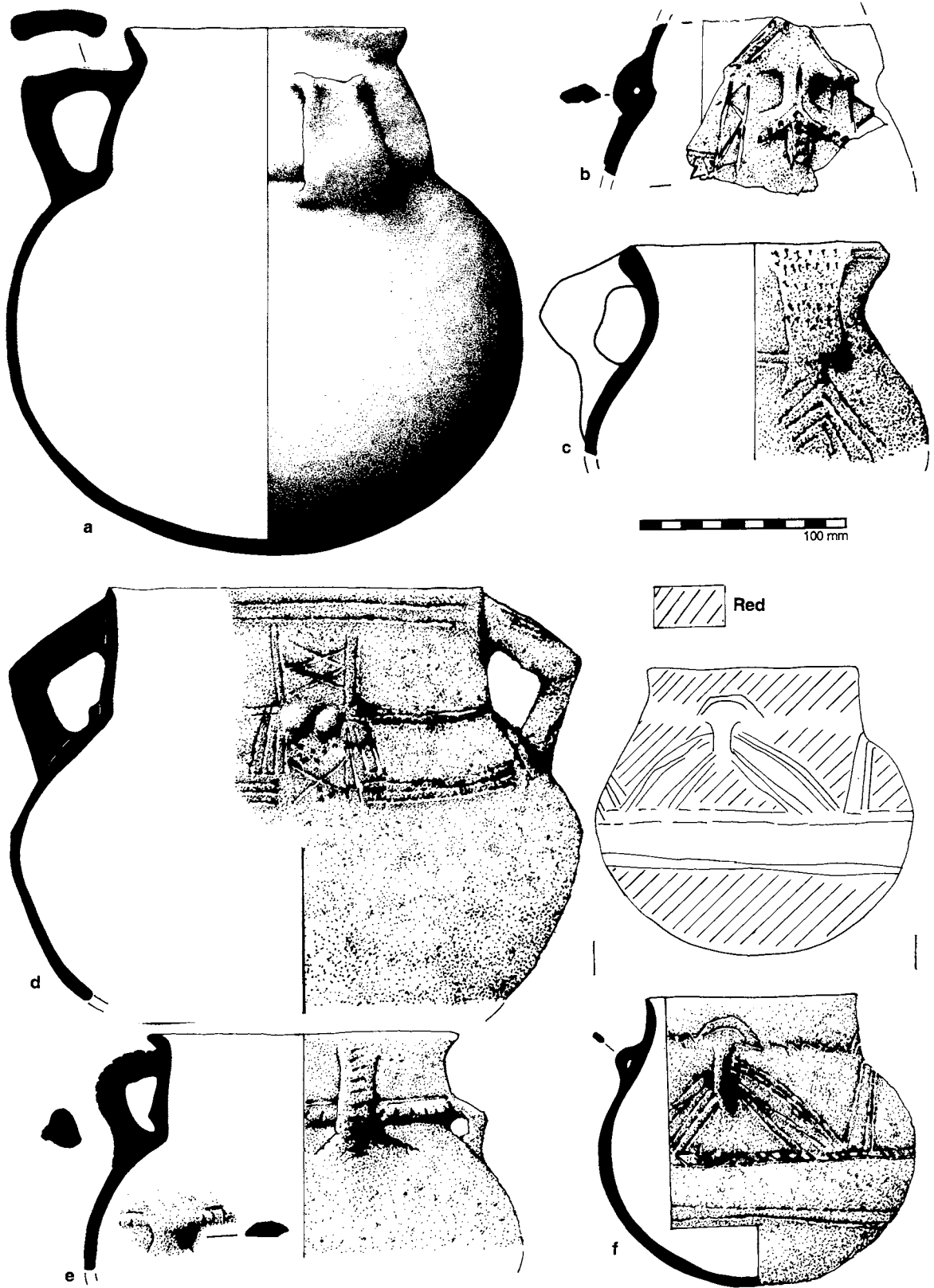


Fig. 275 Late Aksumite pots from D site.

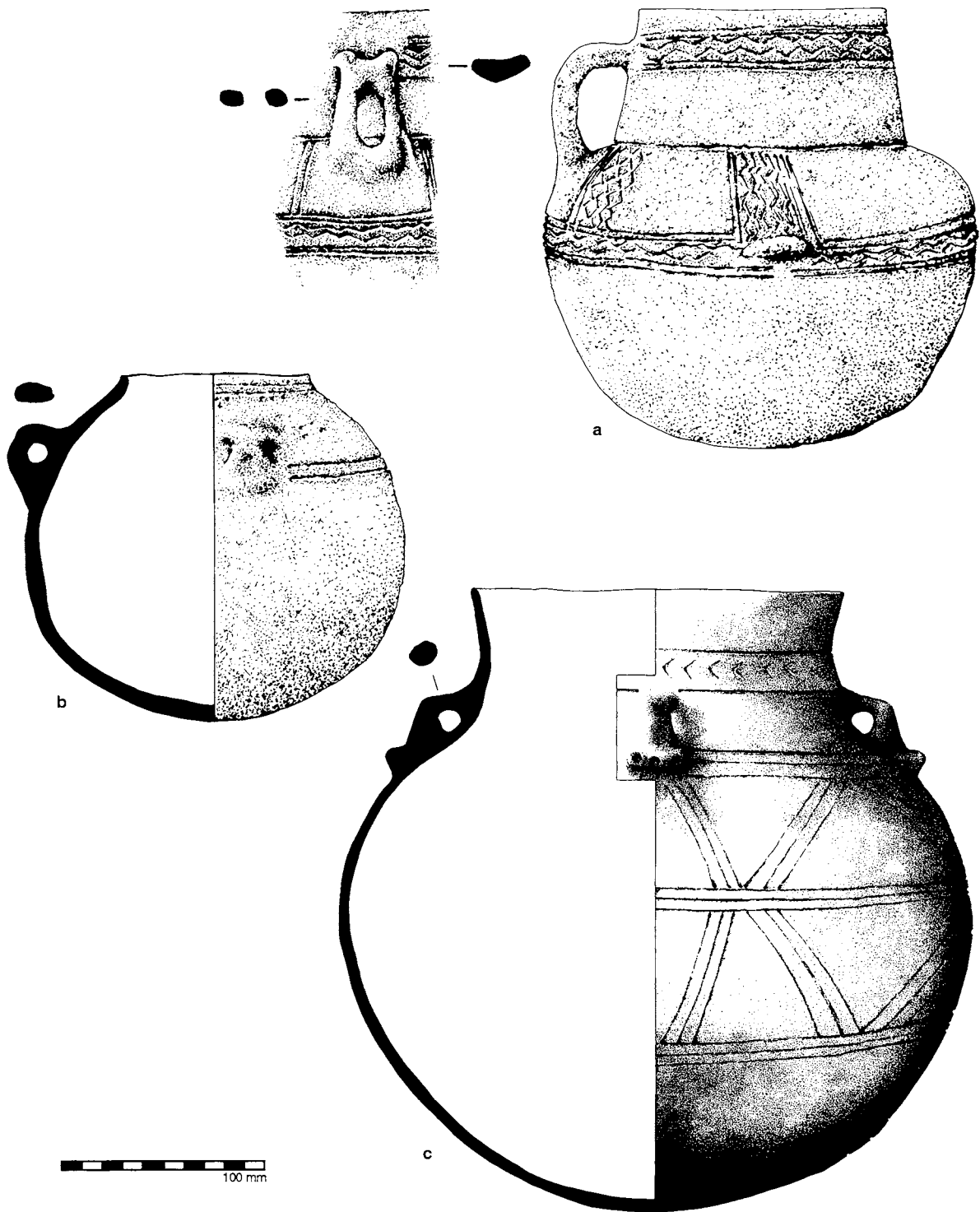


Fig. 276 Late Aksumite pots from D site.

double vertical incised lines, which also often surround the vertical handle. These panels are infilled diagonal lines, zig-zags (Fig. 276a), cross hatching (Fig. 277b), or vertical diamonds filled with dots. Occasionally, a series of applied bosses is also employed as part of the overall design. In one case (Fig. 277a), an elaborate pre-firing cross is found and, in another, a post-firing cross. A number of other shoulder sherds, presumably of pots but possibly of jars, preserve a variety of isolated individual crosses, both pre-firing and post-firing (cf. Figs 282d, e), as well as punctated appliqué. Neck decoration is usually linked with the shoulder design, with similar incised and upper border patterns. Small handles are often arched above (Fig. 275f) or punctated (Fig. 277b), although sometimes an applied arch is used instead. More elaborate designs, incorporating the use of isolated colour panels, cover the entire vessel body. These usually employ multiple opposed diagonal lines in tiers separated by multiple horizontal lines (Fig. 276c), the blank spaces being coloured and burnished. Single colour red is most common (Fig. 275f), although multi-coloured designs in red (2.5YR 4/6) and dark brown (7.5YR 3/2) are found, as are others in red (10R 5/6) and yellowish red (5YR 5/6).

Broad ledge-rim pots with splaying ring-foot: Some vessels, here considered pots, are related to the basin form found in the Tomb of the Brick Arches, have a broad ledge-rim and splaying ring-foot (for a complete example from Matara, see Anfray 1966: 33, pl. ix). They are uniformly red-slipped and burnished on the exterior. Decoration normally consists of an elaborate incised and punctated chevron pattern with impressed crosses (Fig. 278a). One rim fragment (Fig. 282b) has a single Ethiopic letter (*be*) incised after firing. The splaying ringfoot is represented by a base fragment with a pre-firing feather- or tree-design and post-firing elaborated cross.

Jars

The distinction between jars and pots is not absolute, and only a varied series of narrow-mouthed vessels is discussed here. Less common than pots, they include both round-bottomed and ring-foot vessels.

Round-bottomed jar: The earliest Late Aksumite phase produced a flattened globular round-bottomed jar with slightly in-tapering cylindrical neck and at least one vertical strap handle from upper neck to upper shoulder (Fig. 278b). Highly burnished reddish yellow (5YR 6/6) but otherwise undecorated on the exterior, it seems to have been formed initially as an open bowl with the upper body luted to it and the neck and handle added later. The handle is punched through the body wall for added support, suggesting that the vessel may have been used to carry heavy contents, whether liquid or granular.

Ring-footed jars: Scattered fragments come from a distinctive ring-footed jar, with sagging body, sloping shoulders, tall cylindrical neck and flaring rounded rim (Fig. 278c). Entirely slipped reddish brown (2.5YR 4/4) on the exterior, it has a horizontal applied ridge with punctated rope pattern around the bottom of the neck, both ends of the ridge drooping down the shoulder. No evidence for a handle was noted. A possible later example is a closed vessel ring-foot base with a punctated base edge and a large roughly incised cross on the underside.

Ledge-rim globular jars: These are thick-walled ledge-rim globular jars (Fig. 278d) of which many - albeit finer - examples were found in the Tomb of the Brick Arches. Apart from exterior self-slip and smoothing, they are unembellished. Like other vessels in this fabric, they are most numerous in the earlier Late Aksumite levels. Handles are the oval pulled strap type with a single large groove along the exterior. A large number of very heavy ring-foot base fragments, recovered in similar contexts and having the same fabric and surface, suggests that these vessels may have been ring-footed, although none could be fully reconstructed and similar bases are found on round high-wall stove braziers (see p. 325).

Jugs

The only possible jug form is represented by two unassociated sherds which may be compared with a complete but unstratified vessel published by Munro-Hay (1989: fig. 16.449). One is a red-slipped (2.5YR 4/6) rim and handle fragment (Fig. 278f), from the earliest Late Aksumite phase. A later context yielded a tapering spout (Fig. 278e), again red-slipped (2.5YR 5/6).

Storage pots

These vessels are assumed to be storage pots for several reasons, although none was found *in situ* in a context indicative of this function. Such large pots would be difficult to manoeuvre or carry, and are assumed to have remained in one position for a long period. No complete vessel has been recovered, nor can any fragment below the shoulder be identified with certainty, so the form of the lower body remains unknown.

Near-cylindrical storage pots: A probably tall near-cylindrical pot with very slightly constricted neck has a squared rim 250 mm in diameter. Two similar vessels (Fig. 279a), one very large with a rim diameter of 410 mm, have rope-ridge body decoration, the interior rim and exterior covered in a weak red (10YR 5/3) slip or wash. Their form suggests that they may have held dry contents. A broadly comparable vessel, possibly flat-based, may have been imported from elsewhere in the Aksumite tradition and is discussed below (p. 330).

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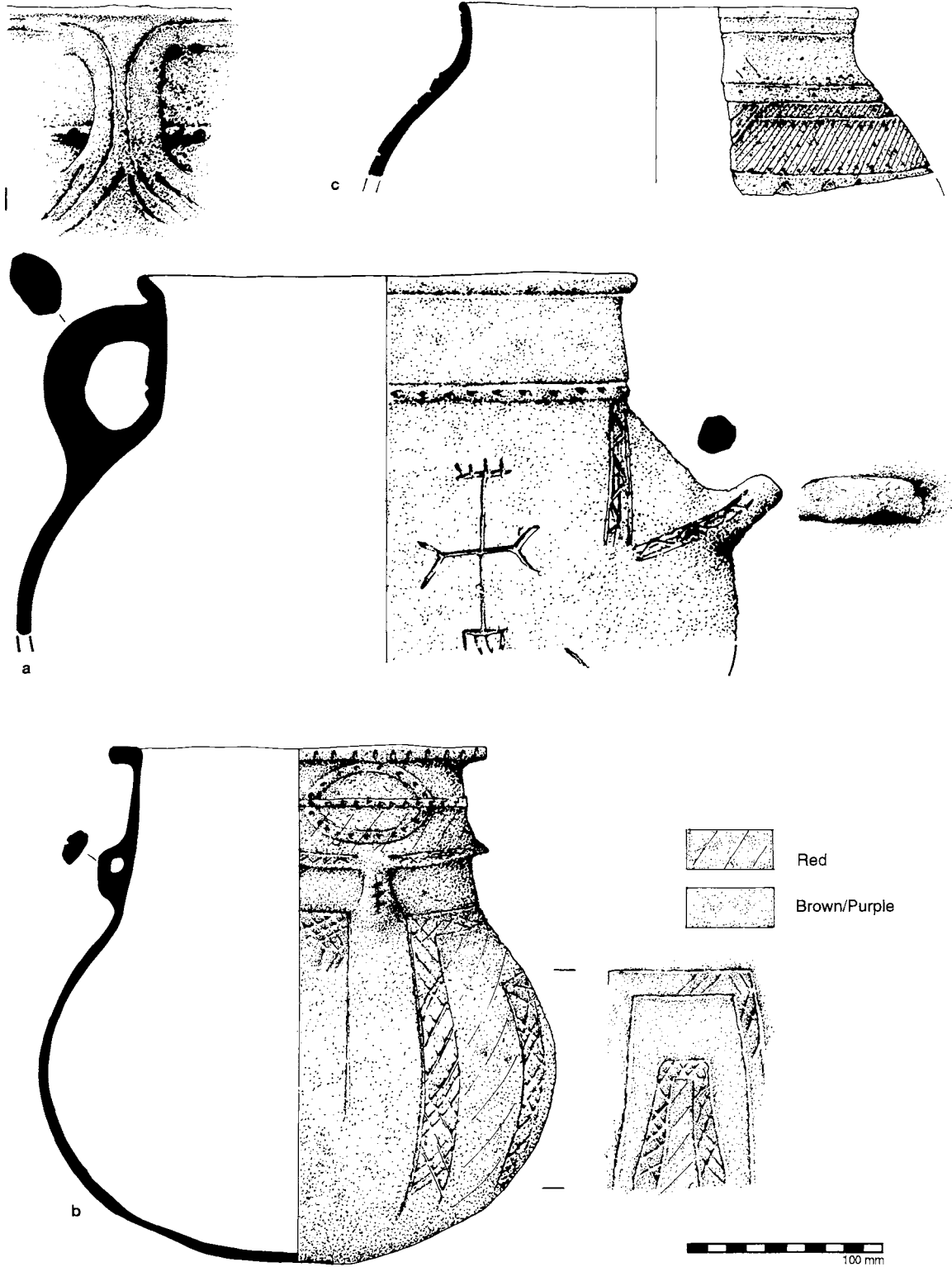


Fig. 277 Late Aksumite pots from D site.

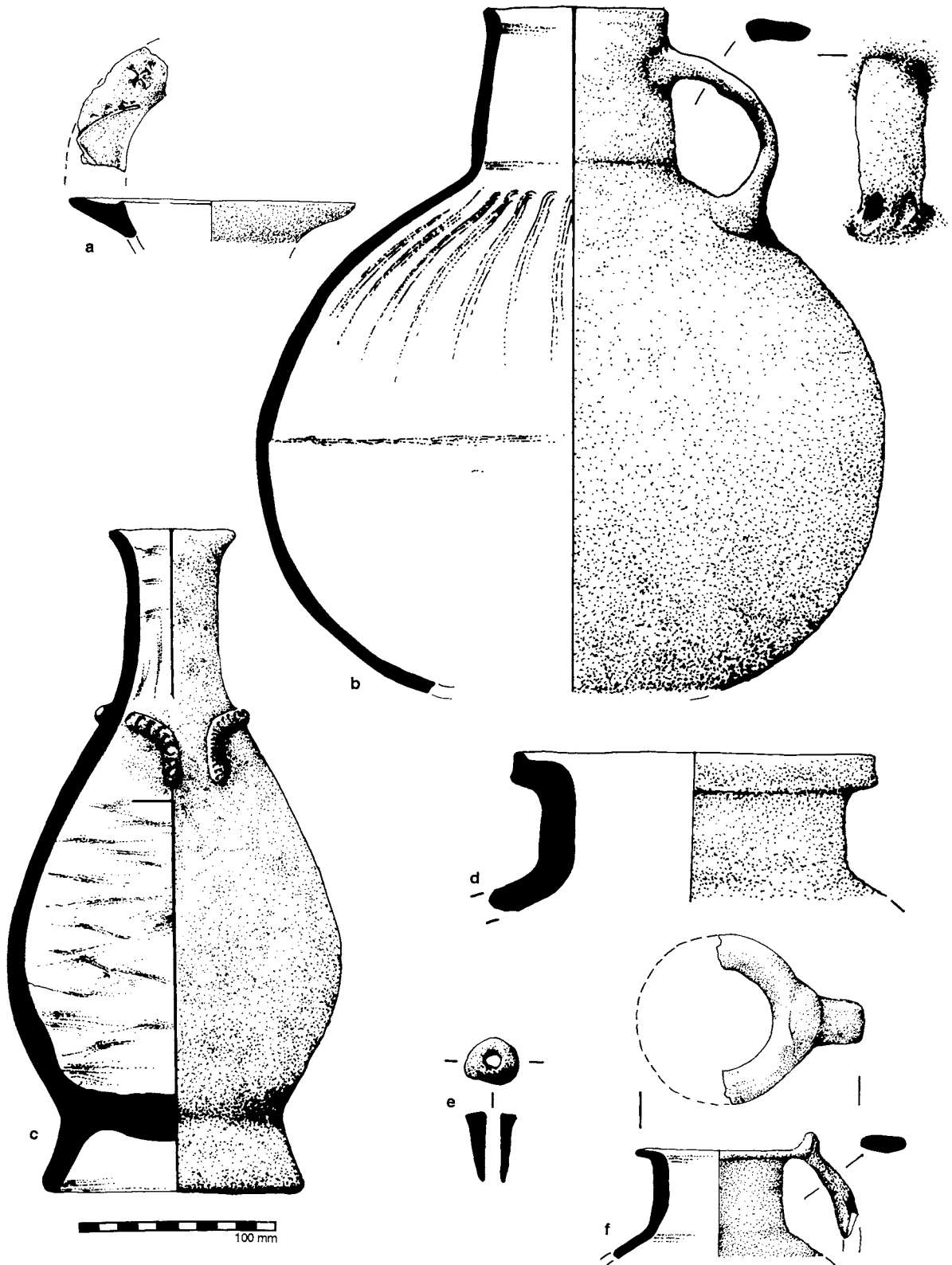


Fig. 278 Late Aksumite jars and jug from D site.

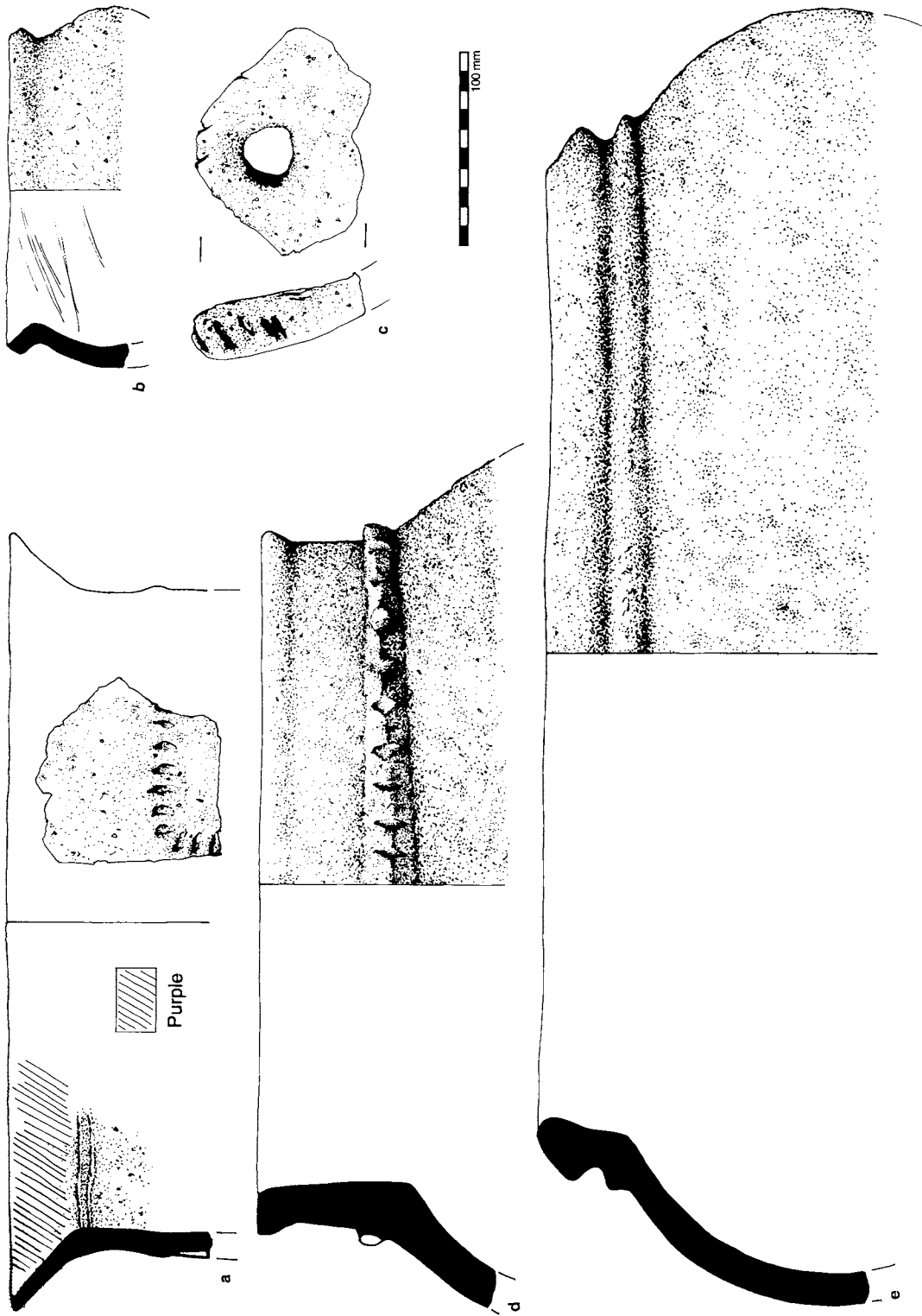


Fig. 279 Late Aksumite storage pots and cooking vessels from D site.

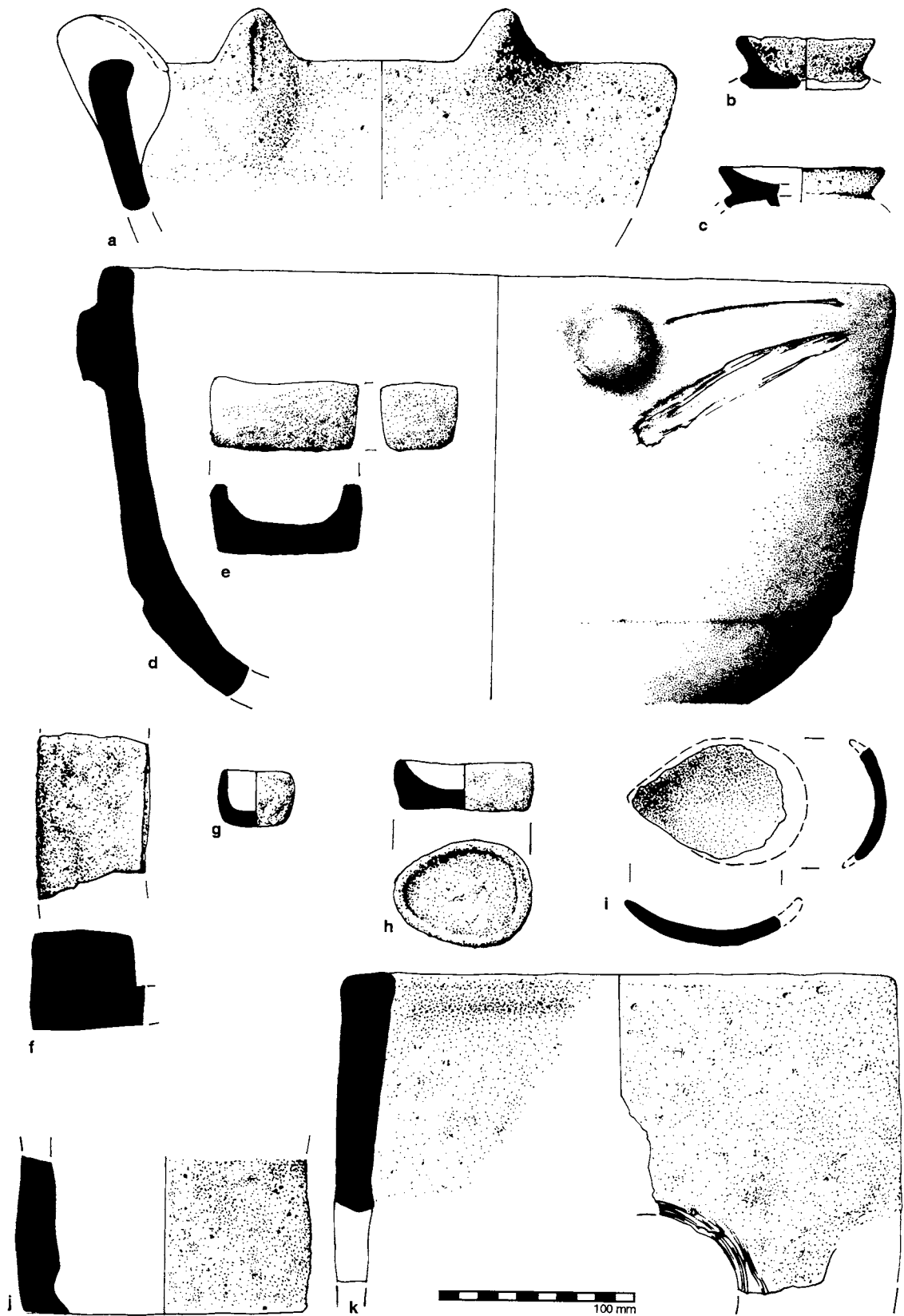


Fig. 280 Late Aksumite braziers, lamps, 'thumb-cup', pedestal and fenestrated vessels from D site.

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Shouldered storage pots: These substantial vessels are probably piriform. One form (Fig. 279e), up to 500 mm in rim diameter with a self-slipped exterior has a high sloping shoulder with applied ridge and an in-tapering exterior thickened rim. One example has a grooved wavy line along the ridge, suggesting a rope pattern. Another form, with high shoulder and upright collar and rim, is red-burnished on the exterior, the top of its rim being finger-impressed. From phase 11 in both D16 and D19 came concentrations of distinctive thick sherds. Although little reconstruction was possible, a variety of vessel forms was identified: most were substantial storage pots, although there were also some basins. The majority have a high sloping shoulder, nearly upright short neck and square rim some 350 to 360 mm in diameter. Most (*e.g.* Fig. 279d) but not all have an applied collar ridge with punctate and/or wide incised vertical lines suggesting a rope pattern. The association of these storage vessels with hearths and grindstones in D16 suggest that they may have been used in connection with food processing.

Cooking vessels

A small number of vessels display burnt surfaces with an oily residue and were probably used for cooking. Their form can rarely be distinguished, although one was an open and probably shallow bowl (Fig. 279c) with coil loop handle.

A pot (Fig. 279b) from an interior floor of phase 10, with apparently globular body, sloping shoulder and short square everted rim, has extensive burning marks around the interior rim and spilling over in places to the exterior, suggesting a container used for heating some vessel-staining substance.

Braziers

This term, *pace* Wilding (Munro-Hay 1989: 284-6), is preferred since it emphasises the portable nature of these objects.

Round high-wall braziers: Numerous fragments were recovered, most notably rim-sherds with a bulbous projection or pommel, one of which bears incised decoration (Fig. 280a). Rim diameters range between 300 and 400 mm. All are from redeposited contexts, their latest occurrence being in phase 9. A complete example illustrated by Wilding (Munro-Hay 1989: fig. 16.312) was excavated at Enda Kaleb, associated with an early-fifth-century coin of Ouazebas. It is possible that this form went out of use prior to the Late Aksumite occupation.

Deep straight-walled circular braziers: These very thick vessels are in a soft sandy fabric otherwise used only for large shouldered storage pots. They have a flattened bottom, slightly out-tapering body and square rim, with four large knob-like bosses

below the exterior rim (Fig. 280d). The exterior bottom is marked by fire, and the rim-edge and interior strongly reduced black, in contrast to the normal reddish yellow (7.5YR 6/6) of the fabric; it is possible that these vessels were employed as braziers.

Lamps

Lamps can generally be recognised by the clear burnt oil stains on the rim, often localised. Most were made of clay; stone lamps are discussed below (pp. 348-9).

Purpose-made lamps: Specialised purpose-made lamps were found in phases 4, 8 and 10. As always, the extent of secondary deposition at D site makes typological development difficult to ascertain, but it seems that the earlier Late Aksumite examples are open forms, round- (Fig. 280i) or flat-bottomed (Fig. 280h), the open spout formed by pulling and slightly pinching the rim. In later, roughly rectangular, specimens the sides are almost vertical (Fig. 280e).

Lamps converted from other vessels: Broken vessels were sometimes converted into lamps, especially in the later phases. The ring-foot fragments (Figs 280b, c) of bowls and jars were abraded into a relatively flat rim and used upside-down as lamps, as evidenced by the oily residue around the edge. One miniature Classical Aksumite bowl (Fig. 287c, below) was found intact, clearly re-used as a lamp. Others appear to have been broken long before their transformation.

Lids

The only true lids found in Late Aksumite levels were clearly redeposited Pre-Aksumite forms. Some roughly circular sherds may have been shaped and re-used as lids; and vessels with an internal lip below the rim (*e.g.* Fig. 278d, above) were presumably designed to accommodate lids.

Pedestal vessels

Two pedestals with vertical profiles and flat bases 140 and 170 mm in diameter were recovered, one having a flattened exterior and both an interior lip (Fig. 280j). The exterior is smoothed and self-slipped but the interior and bottom are rough.

Fenestrated vessels

Two large pot-rim fragments each display a pre-firing hole *c.* 80 mm in diameter. Both pots have a similar profile: one (Fig. 280k) has a 280 mm rim diameter and almost vertical body and the other has a 440 mm rim diameter and a strongly in-tapering upper body. Each has a self-slipped and smoothed interior.

'Thumb-cups'

This term is used to designate miniature, crudely formed and poorly fired semi-globular vessels with a

tapering rim and sometimes flattened rounded bottom (Fig. 280g). Rim-diameters range from 30 to 65 mm, and heights from 25 to 40 mm. Some show burning around the rim and may have served as crucibles.

Bird-shaped vessel

The tail of what was clearly a bird vessel is heavily red-slipped (2.5YR 5/6) and burnished. Its upper surface is incised with six rows of a feather-pattern (Fig. 281). These vessels are widely distributed but always uncommon; no two are alike. The present example lacks the orifice under the tail seen on the specimen from the Tomb of the Brick Arches (Fig. 56, above). The closest parallel, albeit incised with elaborated crosses on the tail, is a complete vessel from Matara illustrated by Anfray 1966: 9, 41, pl. xviii.4).



Fig. 261 Trenches D7, D8 and D12: a, b - D8 plan and section; c - D7 plan; d - D12 plan.

‘Tray’

The edge fragment of a tray-like object with a 50-mm-thick square raised edge and rough flat base was recovered in an unstratified context (Fig. 280f). Straight rather than curved in plan, its function is unknown.

Imported vessels

Most of the recognisable imported vessels at D site came from the Mediterranean world, generally transport amphorae and African Red Slip ware bowls of types already known elsewhere at Aksum (Munro-Hay 1989: 314-15). Also represented are Sassanian blue-green glazed wares, both bowls and jars, often misleadingly designated Sassanian-Islamic (Munro-Hay 1989: *loc. cit.*).

Vessels seem also to have been imported from other parts of Aksumite territory, and these are more difficult to recognise. Purple-painted Aksumite ware is uncommon at D site: Wilding has noted that it is ‘very much commoner in surface collections from sites in Eastern Tigray and Eritrea’ (Munro-Hay 1989: 311-12). It seems likely that this pottery was probably imported to Aksum from this easterly region; and it is possible that certain other fine wares represented at D site share this origin.

Amphorae: These vessels (Figs 283a, c) are easily recognised by their distinctive fabric and wheel-manufacture. 275 sherds including rim, handle and base fragments were recovered, exclusively from phase 7A and later levels. A few had been converted and re-used as a spindle whorl, disc and lids. There is no evidence for their re-use for drainage or infant burial, as recorded at Matara (Anfray 1974: pls. ii.1, iv.2). Most are from redeposited contexts, the age of which must be considered irrelevant to the date of their original importation. As virtually all are from D19/22, it is possible they were originally associated with the adjacent elite structure. The majority are of the type already well-known from Aksum, with strongly ribbed body, tall neck with sloping shoulder, two vertical sloping handles from upper neck to shoulder, interior rim inset, and button base. They are generally dated between the fifth and seventh centuries AD. Some, possibly earlier (Peacock and Williams 1986), are smooth-walled, but no specific type can be established for them. The variety of fabrics and ribbing styles suggest a range of sources (see Appendix III).

African Red Slip (ARS) ware: Although these vessels clearly influenced Aksumite ceramic styles, very few imported examples were recovered. Two sherds of ledge-rim bowls and a possible tile fragment (pp. 336-7), all from phases 9 to 14, are the only examples found at D site; they are consistently later than those from K site. One rim (Figs 283d, 284a) is of an early fifth-century type (Hayes 1972: type 72B) type already known at Aksum (Munro-Hay 1989: 315) and Matara (Anfray 1966: 17, 44, pl. xxi.10); the other (Fig. 283h) has only grooving around the top of its rim.

Sassanian blue-green glazed ware: At least five vessel forms are distinguished among the 45 sherds recovered: three bowls, a potstand and one jar. As with the amphorae and ARS bowls, the fragments were recovered in secondary contexts from phase 7A onwards. This material is sufficiently uniform and similar to that from Chittick’s 1972-4 excavations (Munro-Hay 1989: 315-16) analysed by the Department of Scientific Research at the British Museum (Project 6870) that a similar provenance may be attributed to it. Its age at Aksum precludes designation as

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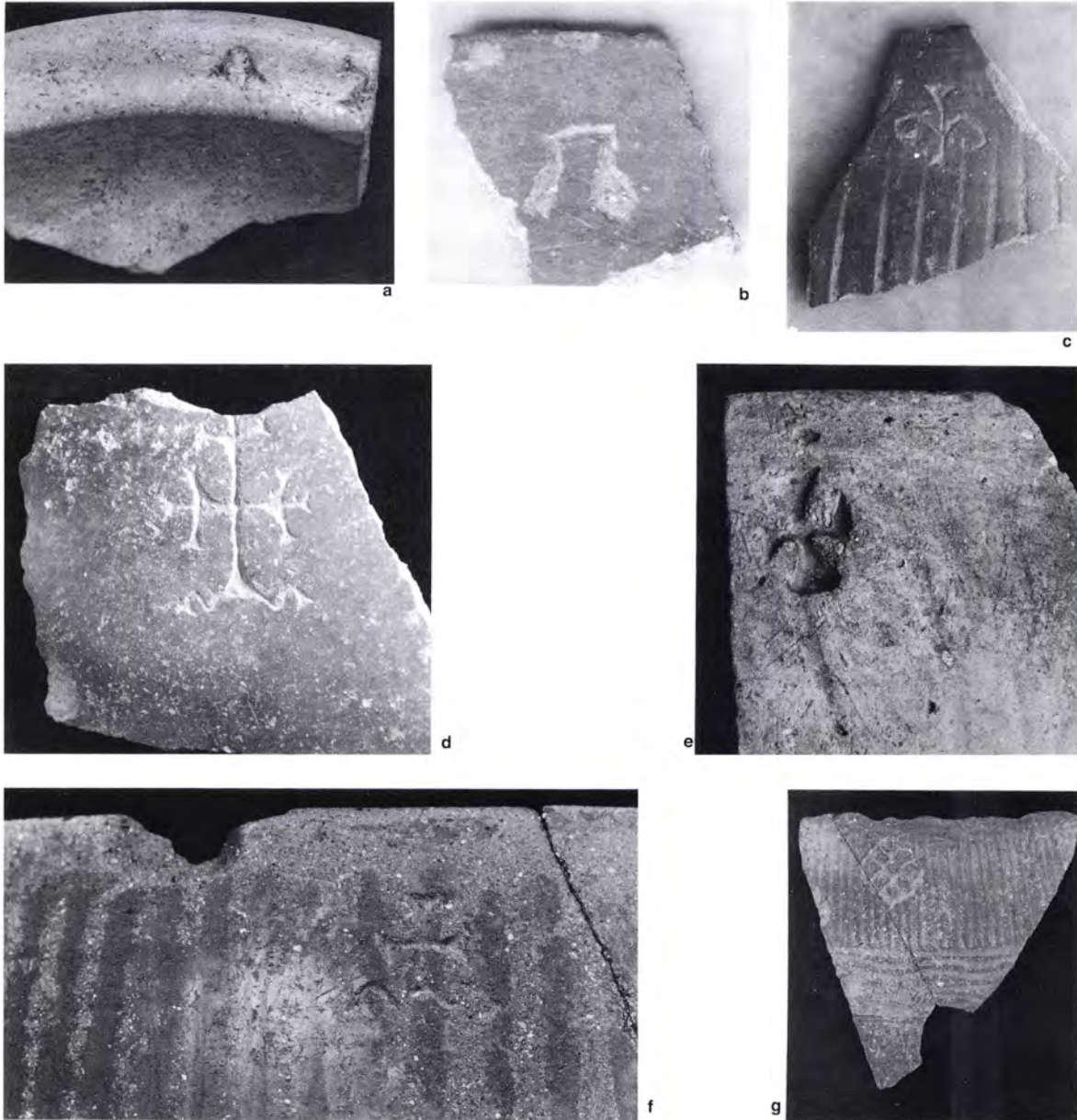


Fig. 282 Inscriptions and crosses on D-site Late Aksumite pottery.

Sassanian-Islamic ware, and it is here called Sassanian blue-green glazed to avoid any implication of Islamic date.⁴² The majority of vessels are thick-walled open bowls and closed jars, distinguishable as body sherds by the respective presence or absence of interior glaze. The jar form is exemplified in Fig. 283b; body thickness ranges between 9.0 and 12.8 mm. Although no rim fragments were recovered, it may be compared with others found at Aksum (Munro-Hay 1989: fig. 16.472) and with a complete footed jar from Matara (Anfray 1974: 759, fig. 6; cf. also Anfray and Annequin 1965: pl. lxxviii.6). The open bowl form, typified

⁴² The term was kindly suggested by Dr St. John Simpson, Department of Western Asiatic Antiquities, British Museum.

by Fig. 283j, has a strongly exterior-thickened overhanging rim 320 mm in diameter and is generally between 12 and 18 mm in thickness. Two thinner bowl types also occur, one a shallow open form (Fig. 283f) only 6 mm thick with slightly thickened rounded rim, which is found in the earlier Late Aksumite levels apparently contemporary with numerous examples at K site (p. 396, below). The other has a square rim and upright profile, with a deep exterior groove just below the rim, moulded or impressed fret pattern on the rim top, and moulded horizontal grooving on the interior: only one rim sherd (Fig. 283e) was recovered, although a comparable form is represented at K site (Fig. 343c, below). A hollow potstand (Fig. 283k),

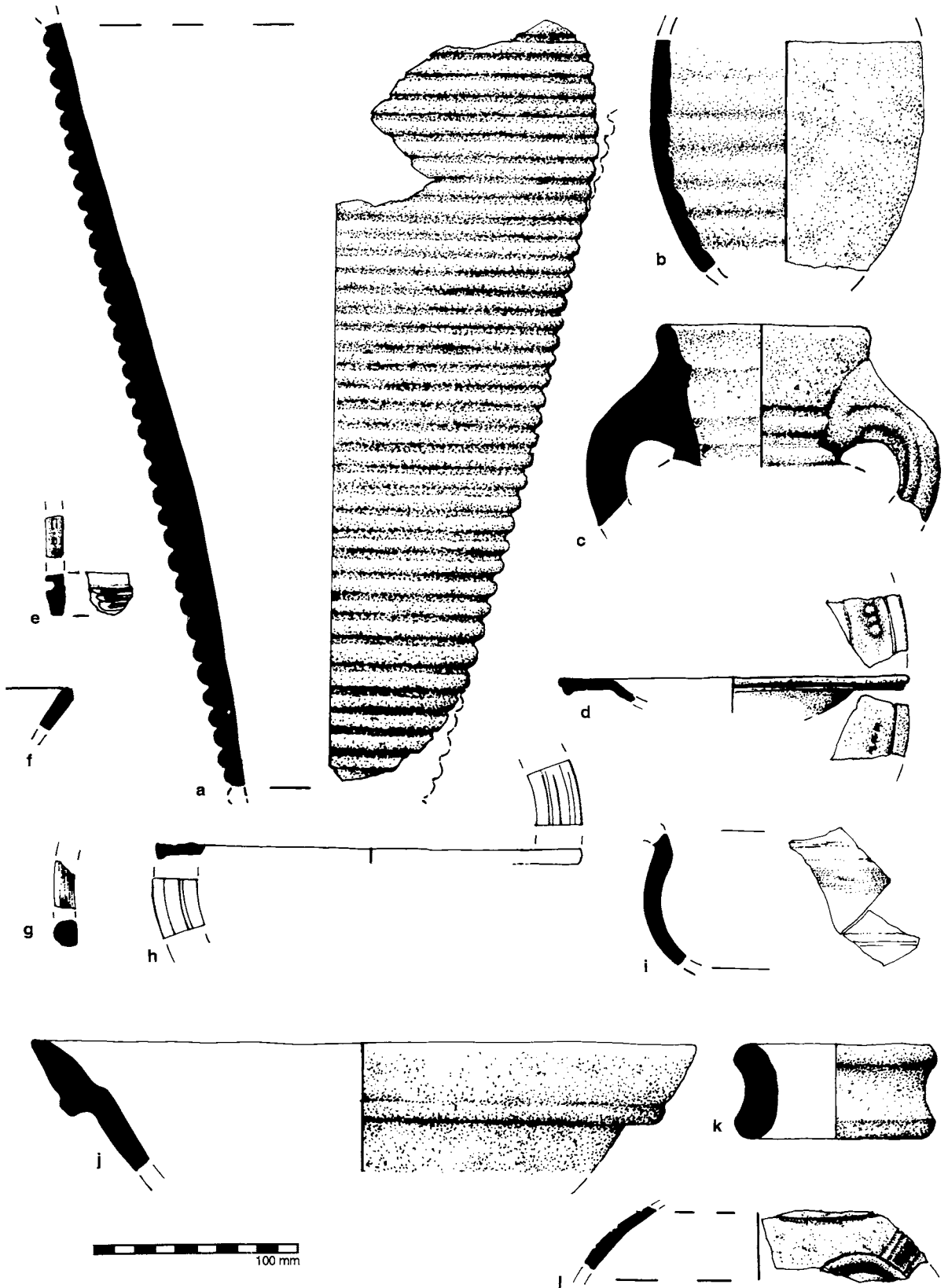


Fig. 283 Amphorae, African Red Slip, Sassanian and other imported pottery from Late Aksumite contexts at D site.

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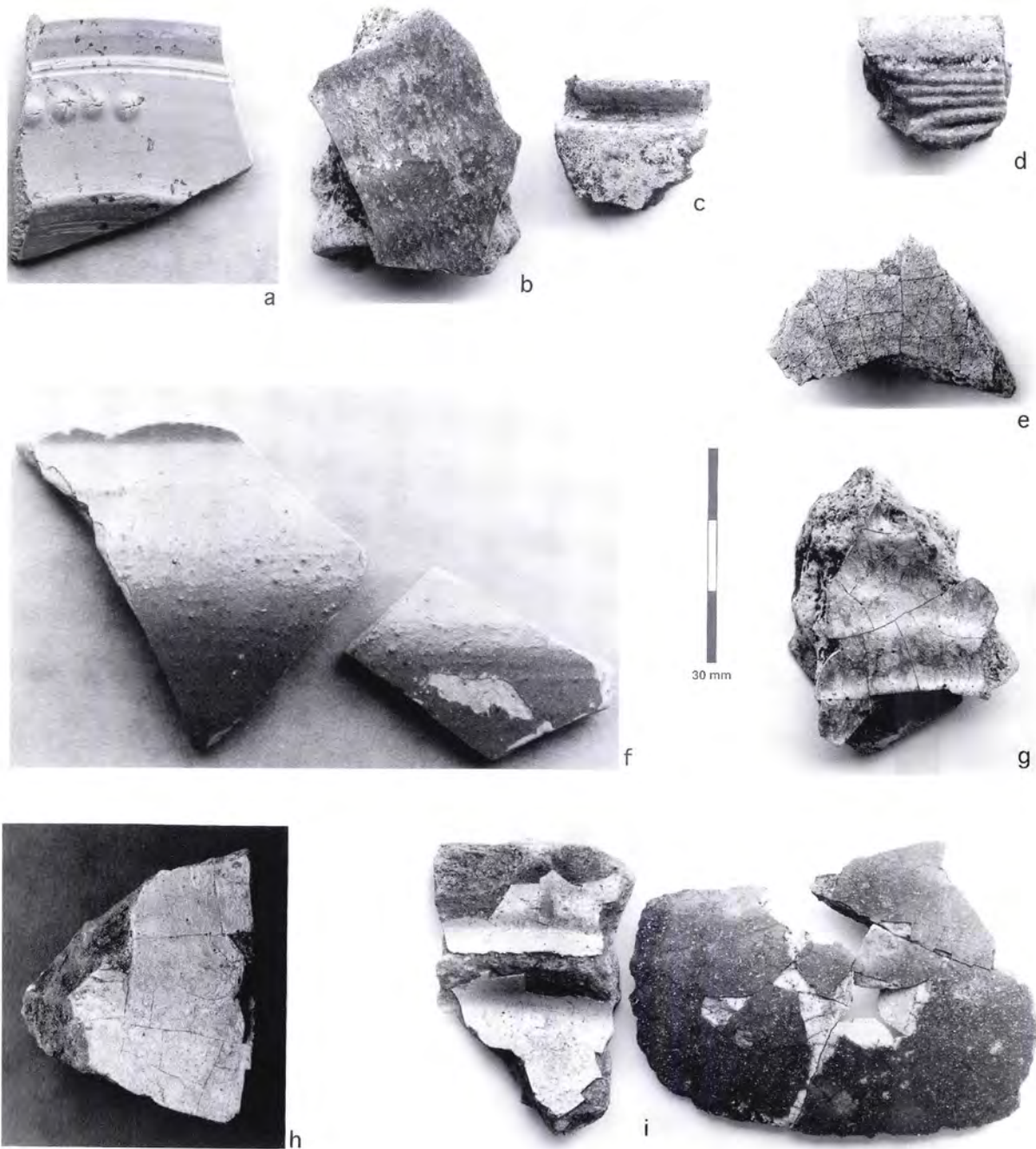


Fig. 284 Sherds of imported pottery from Late Aksumite contexts at D site.

thick-walled and concave in profile with a rounded rim and base, is unique. A small handle fragment (Fig. 283g) with D-shaped section was also recovered.

Other wheel-made imported wares: Two small joining body fragments (Fig. 283i) of a large closed vessel at least 560 mm in maximum diameter were recovered in phase 10. The yellowish brown (10YR 5/6) exterior surface bears what seems to be a

thin lead-glaze, quite unlike that of the Sassanian material, while the fabric itself is soft and reddish yellow (7.5YR 6/6). So far, it has defied attempts to identify its origin, although it probably came from farther east than Iraq and does not appear to be Chinese.

Hand-made possibly imported sherds: Three sherds of a closed vessel bear a design of opposed diagonal bands of a possible rocker or roll-impressed



Fig. 285 Sherds of imported pottery from Late Aksumite contexts at D site.

pattern with a cord-impressed double-line border, linked by a relief arch with an impressed string border, and a pair of horizontal cord-impressed bands atop the shoulder (Figs 2831, 285a). Its decoration, unusual at Aksum, suggests that the vessel may derive from elsewhere, but its origin remains unknown. Several other sherds are of a fabric containing silvery inclusions for which no source has been noted in the Aksum area. They come from a large vessel of tall open shape with apparently flat base and slightly out-turned rim; this form resembles others from Aksum, raising the possibility that the vessel may have been brought from elsewhere in Aksumite territory.

Purple-painted Aksumite ware: Readily recognisable but represented at D site by only 21 sherds, PPA ware is distinct from other, locally made, pottery in that the fabric is extremely fine and almost without inclusions, well-fired at a high temperature in an oxidising atmosphere with a finely smoothed and wet-burnished surface. Painted designs comprising horizontal bands, triangles, and other simple shapes were often applied within incised guide-lines, a technique not seen on other ceramics at Aksum. At D site it comes from phase-7 and later levels in clearly secondary contexts. Globular vessels were left rough on the interior. At least one sherd (Fig. 286i) turns to a neck or collar. The design generally incorporates wide horizontal purple banding alternating with a creamy burnished surface; embellishments include a row of triangles replacing the band (Fig. 286e), a painted trefoil cross on the creamy band (Fig. 286d), and other less well-preserved designs involving thinner and often wavy lines. A hole-mouth bowl is distinguished from the pot form discussed above by the equal treatment of its interior and exterior surfaces. One fragment shows alternating thinner straight and wavy-line bands. Open bowls with tapering rims have not only the usual

horizontal bands but also a repeated series of arcaded bands pendant from a wider rim band (Fig. 286b). The one example of a ledge-rim bowl (Fig. 286c) has wide radiating bands on the rim top. A footed bowl with a probable trefoil cross on the interior bottom (Figs 285b, 286a) may also be noted. A post-firing drill hole on one bowl suggests that these vessels were sufficiently prized to be repaired when broken.

Vessels with pearlised interior surface: Very few of these vessels were found, but the opaque whitish sheen of their surface finish is unmistakable. This iridescent pearlised finish is in two cases limited to the interior of small low open bowls. Another example is a beaker (Fig. 286g) with low and slightly in-tapering straight body, having a single horizontal incised line below the exterior rim; the other is a flattened semi-globular bowl (Fig. 286h). Pearlised on both interior and exterior is a ledge-rim bowl (Fig. 286f) with Ethiopic letters incised on the rim top after firing (Fig. 282a). The extreme rarity of this finish suggests that it had great value and/or that it was brought from some other part of Aksumite territory (possibly, like the PPA ware, from the east). Recovered only in D19 phases 7, 8 and 11, it may originally have been used at the nearby élite structure.

Vessels with white-infilled decoration: A very few collared pots with sloping shoulder are decorated in horizontal red-painted panels bordered by deeply incised lines alternating with chevron bands. The design incorporates punctate lines and motifs in which traces of a white infill substance are retained. A semi-globular bowl of black ware with a red-painted surface and an incised chevron pattern on the shoulder likewise has its decoration infilled with a similar white substance (Fig. 277c). These vessels may have been imported, perhaps from the lowland areas to the west or north, being similar to material from Jebel

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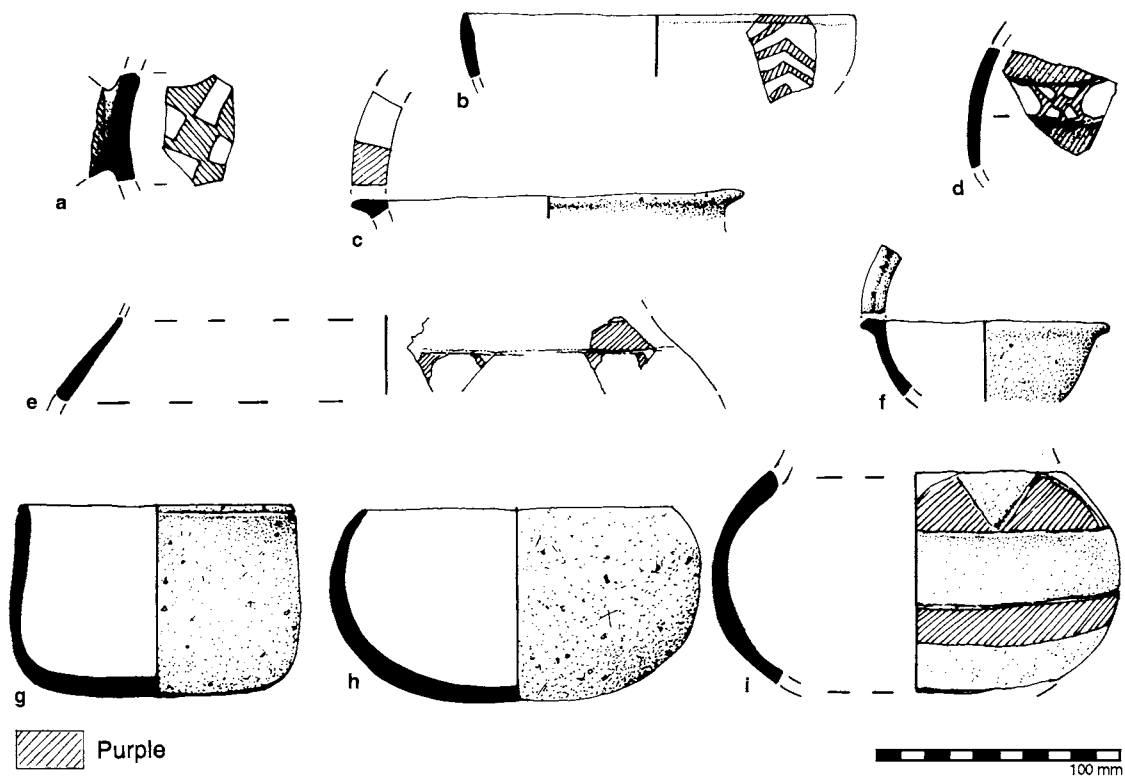


Fig. 286 Purple-painted and other imported pottery from Late Aksumite contexts at D site.

Mokram (C. Perlingieri *pers. comm.*). One other sherd with white infill is more typically Aksumite in character. It has an incised neck panel design, a cross-hatched horizontal band on the collar ridge and, on the collar, a horizontal band of rough cross-hatched triangles with border lines above and below. The plain areas seem to have been red-painted, and the incised lines have white infilling. This may have a lowland origin, possibly in a tradition influenced by Aksumite style.

Residual material

In addition to the large quantity of residual and clearly redeposited Pre-Aksumite pottery, the Late Aksumite levels at D site also yielded sherds which are attributed on typological grounds to the intervening periods, showing particular affinity with vessels found elsewhere in funerary contexts (cf. pp. 57-77, 194-7 above and 455-8, below). While no evidence for occupation of D site during these periods was found in the present excavations, Michels (1990: figs 2, 3), has placed an 'Early' Aksumite palace and free-standing houses in this area, but no 'Middle' or Late Aksumite occupation. The present excavations have not confirmed this attribution, but some activity may have taken place in the immediate area.

Proto-Aksumite and Early Aksumite: These vessels are distinguished partly by their fineness, characteristically dark red (10R-5YR 4/6-5/6) slip, and some specific decorative embellishments. Proto-Aksumite pottery has only recently been studied by Fattovich and Perlingieri (in Bard *et al.* 1997), and caution has been employed in its recognition at D site. Vessels so attributed include shallow open bowls with a slightly overhanging lip and horizontal diagonally ticked applied ridge near mid-body (Fig. 287a), and squat globular rounded-based jars with wide slightly conical neck and tapering rim. The chief development in Proto-Aksumite and Early Aksumite (cf. p. 455-6, below) closed vessels is the neck, which becomes cylindrical. At D site, jars were found with a wide cylindrical neck (Fig. 287b) and pots with cylindrical collar, all with squat globular body and rounded bottom. The handle scar on the lower neck of one jar (Fig. 287e) indicates that it is coil-made like Pre- and Proto-Aksumite handles but unlike Classical Aksumite ones. Characteristic of both periods is a horizontal applied ridge, often but not always diagonally slashed, found both on bowls and jars. Walls tend to be thin in section, and the red slip is highly burnished. At least one nearly complete fine-ware jar may have been re-used for heating presumably liquid contents, as its

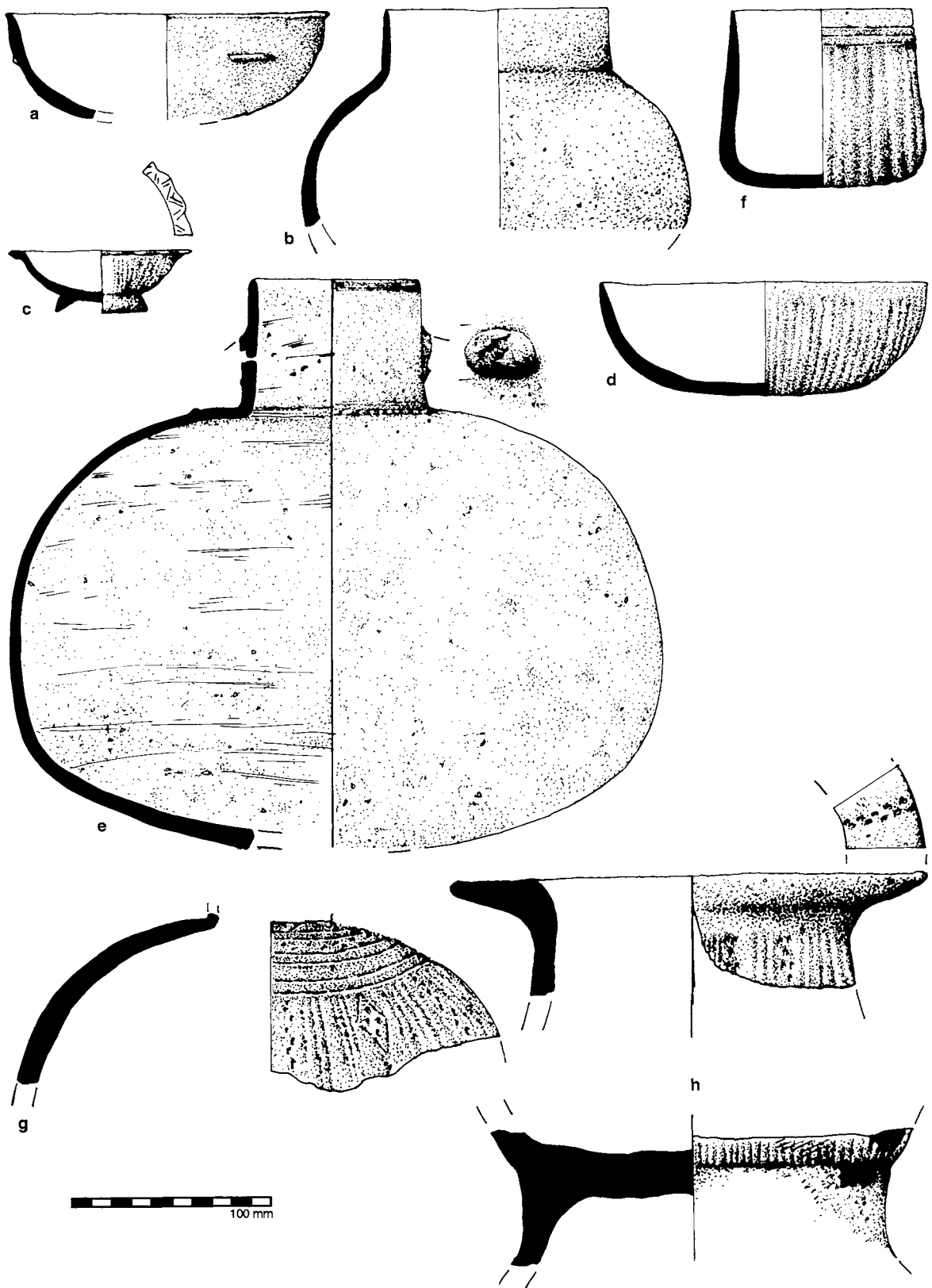


Fig. 287 Residual pottery recovered from Late Aksumite contexts at D site.

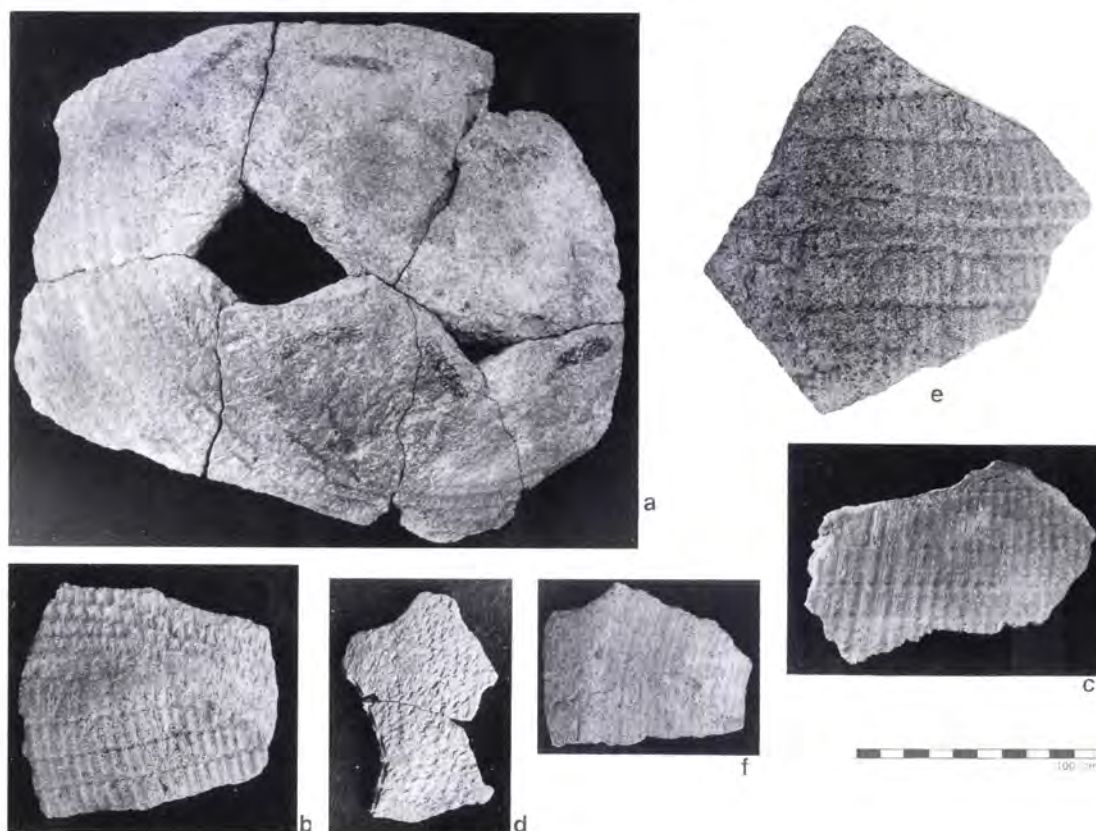


Fig. 288 Basket- and mat-impressed pottery from D site.

bottom has been subjected to fire. Phase 10 in D16 yielded substantial remains of three Proto/Early Aksumite vessels, perhaps derived from a single source nearby.

Classical Aksumite: Much, but not all, of the D-site material with Classical Aksumite decoration⁴³ is poorly made and fired, with slapdash incised patterns that mark the latest development of the style. It probably dates prior to, or early in, the Late Aksumite occupation. Similar material occurs in greater quantity at K site (p. 398, below). Most of the better made and probably earlier Classical Aksumite sherds from D site appear to represent jars: one shoulder (Fig. 287g) has pattern [H3] which was represented in the Tomb of the Brick Arches by a single jar (Fig. 47d, above). Others have the more common patterns [1] to [3], and a band of alternating corrugation and infilled diamonds not found in the Tomb of the Brick Arches. Their presence suggests some activity in the D-site vicinity immediately prior to the main Late Aksumite occupation. Another small group of Classical Aksumite sherds is more varied in form, representing beakers, bowls, closed vessels (jars?), and perhaps an animal-model basin. They are more evenly fired and more finely decorated than those discussed above, and some may

⁴³ For the terminology and abbreviations used in describing this material, see pp. 55-77 and Appendix II.

be earlier than the Tomb of the Brick Arches. A closed BTRW vessel employs an OWP band bordered by incised lines. Another has incised vertical lines in parallel groups of three, perhaps an early version of pattern [1]. A beaker (Fig. 287f) has type-1a decoration and a shallow bowl (Fig. 287d) with tapering rim has vertical type-[1] corrugation - an early pattern which is rare in the Brick Arches tomb. A smaller footed bowl (Fig. 287c) with a wavy ledge rim bearing an incised chevron pattern around its top in addition to the type-[1] body pattern was re-used as a lamp, perhaps in Late Aksumite times. A broad ledge-rim basin with splaying ring-foot (Fig. 287h) has type-[2] decoration on the exterior body and rim top. Both are paralleled in the Tomb of the Brick Arches.

IMPRESSED SHERDS

Finally, it is necessary to discuss sherds which bear impressions of organic materials, notably baskets and mats (Fig. 288). Pre-Aksumite evidence is limited to shallow impressions of fine basketry on a small number of bowls. The following account is based on Late Aksumite material.

The sherds represent a variety of forms, mostly open bowls but including a few closed vessels, and occur as early as phase 4, although most are later.

They were made by using the interior of a basketry vessel as an open mould, producing an impression on the exterior surface. In several cases (Figs 288b, c), the impressions are of sieves with a coarse base surrounded by coiled basketry, remarkably similar to examples still in use today (Fig. 331, below). Both coarse and fine sieves are represented as impressions. The clay vessels generally overhang the original rim to produce a strongly undercut exterior profile. One closed vessel in a local mica-rich fabric, probably a storage pot (Fig. 288a), has the impression of coarser horizontal cording around the lower body but not on the rounded bottom. One sherd shows the impression of a tightly coiled round-bottomed basket. The cording of this basket was much finer than the sieves discussed above, and it was probably intended to be watertight.

Two other vessels preserve impressions of a coarse plain weave similar to that on the mat-impressed pots noted by Chittick (Munro-Hay 1989: 315). The impression may have been formed after the vessel was made by wrapping the woven object around the clay vessel. Munro-Hay (*loc. cit.*) suggested that such mat-impressed vessels may have been imported from Nubia, but the profile of one necked jar, for example, with its sloping shoulder, short neck and interior rim thickening, is distinct from Nubian types, and a local Aksumite origin is to be preferred.

Impressions of chaff were noted on the exteriors of two bowls and of grasses on another, indicating that the vessels had been pressed against a chaff- or grass-covered surface while the clay was still soft, probably during manufacture.

OTHER CLAY OBJECTS

Few clay objects were recovered from Pre-Aksumite contexts or in other than re-used condition in Late Aksumite contexts, so it is often difficult to separate unquestioned Pre-Aksumite objects. No pierced cones or sherds abraded into pierced or unpierced discs were recovered in Pre-Aksumite levels, suggesting that these objects were not introduced until later. Two clay stamp seals are considered below (pp. 350-1). The following are considered to be of Pre-Aksumite date:

Snake figurines: Several pieces of massive snake-like figurines were found, mostly in mixed contexts. Recovery of four fragments in D22 contexts of phases 2 and 3 shows, however, that this type of figurine was present in Pre-Aksumite times. Each head is slightly different (*e.g.* Fig. 289), but eyes are generally indicated by depressed bosses and other decoration consists of incised parallel lines. The heads may be those of snakes, with curving necks and incised mouths. The other end of these figures may be represented by large tapering fragments of roughly equivalent ellipsoid section and bearing similar incised decoration.



Fig. 289 Head of Pre-Aksumite snake figurine from D site.

Plaque: The only other certainly Pre-Aksumite clay object is an incomplete ellipsoid plaque, 28 mm wide, 11 mm thick and surviving to a length of 42 mm, abraded to shape from a potsherd and retaining five drilled depressions on one surface (Fig. 290a). Its purpose is unknown.

The clay objects recovered in Late Aksumite levels are noted here, although it is emphasised that redeposited items of earlier origin may be included.

Figurines: These are represented by varied fragments, including a small, probably human, foot and lower leg, the torso of a pot-bellied seated male, possibly a child (Fig. 290b), the head and neck of what may be a camel (Fig. 290c; D.W. Phillipson, Reynolds *et al.* 1996: fig. 33), and two highly stylised humpless oxen. One of the oxen is virtually legless and humpless (Fig. 290d); although unstratified, it may be of Late Aksumite date since demonstrably Pre-Aksumite examples from Hawelti (de Contenson, 1963: pls xxxv.c, xxxvi) are more detailed. The other (Fig. 290e) may be from an animal-model basin similar to those from the Tomb of the Brick Arches illustrated in Fig. 46, above.

Pierced cones: Nine small (22 to 31 mm diameter by 12 to 18 mm height) and one large (63 mm diameter by 51 mm height) examples were recovered. They include both convex (Fig. 290f) and concave (Fig. 290g) body profiles, but all have concave ends; the perforations range between 2.1 and 3.6 mm in diameter. Similar artefacts from Aksum are illustrated by Munro-Hay (1989: fig. 16.466 and pl. 16.1.) Their function is unknown, but their weight of less than 8 g makes it unlikely that they were loom weights or spindle whorls.

Crosses: These appear to be cones with a flat underside and four projecting arms in the form of a Maltese cross (Fig. 290h), although two (*e.g.* Fig. 290i) taper to a rounded point and one is square-ended. With two exceptions they were found in the phase-11 yard of D19. Most are about 40 mm across, the hole diameter being between 3 and 5 mm.

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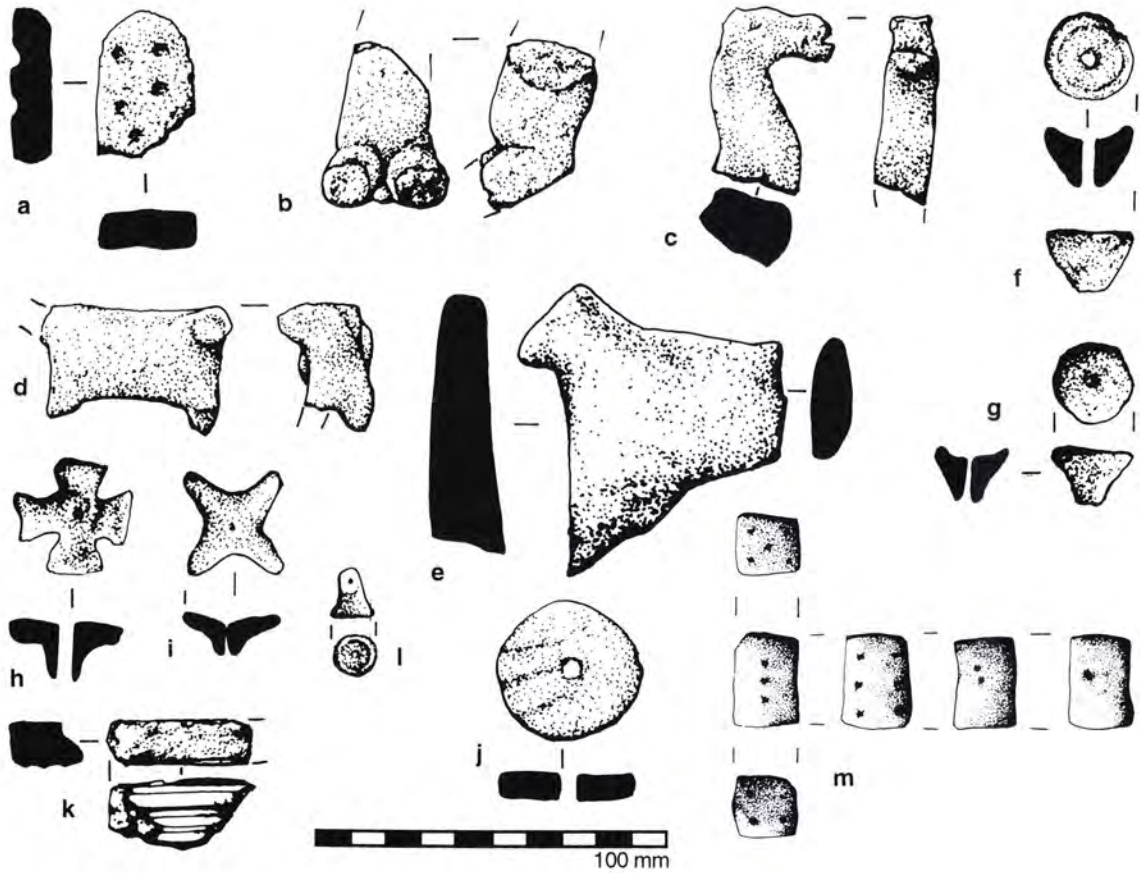


Fig. 290 Clay objects from Late Aksumite contexts at *D* site.

Discs: Rough discs were abraded to shape from potsherds. Larger examples, generally between 36 and 40 mm across, are perforated with a central hole 3.4 to 6.0 mm in diameter. One sherd (Fig. 290j) of an

imported amphora was abraded to remove the characteristic ribbing. The conventional 'spindle whorl' designation need not imply their function, since many seem too small and light for such a purpose.

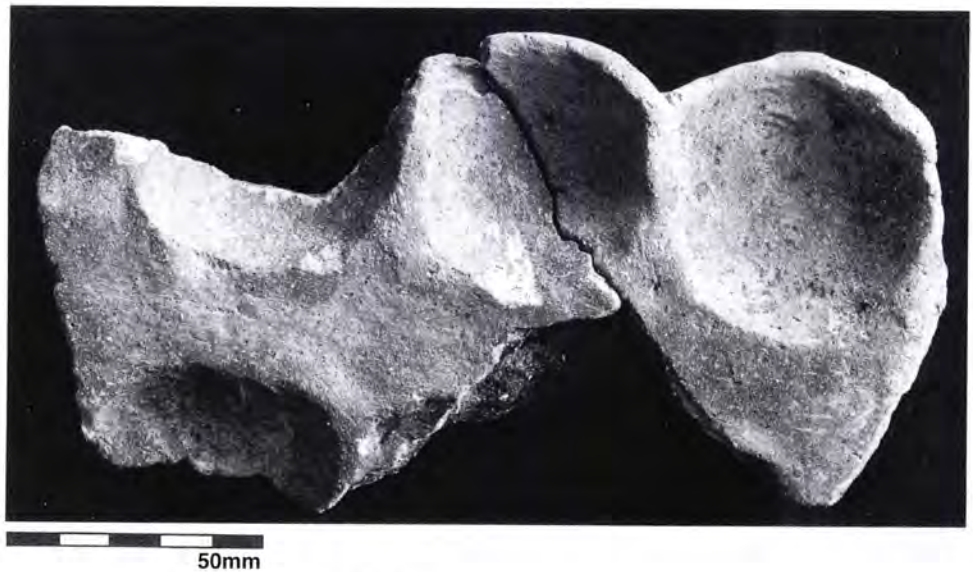


Fig. 291
Fragment of
clay gebeta
board from
D site.

		pale burgundy red	dark burgundy red	cobalt blue	blue	colourless	yellow tinged colourless	green tinged colourless	brown	green	turquoise	green/yellow	yellow	other	Total
Pre-Aksumite															
	D13	-	-	-	-	-	1	-	-	-	-	-	-	-	-
	D14	-	-	-	-	-	-	-	-	-	-	-	-	3	-
	D22	-	-	-	-	-	-	3	-	-	2	-	-	-	-
Totals		-	-	-	-	-	1	3	-	-	2	-	-	3	9
Late Aksumite															
Phases 4-5		-	-	-	-	-	-	-	-	-	-	-	-	-	0
Phases 6-7	D19	-	-	-	-	2	5	-	-	-	1	2	-	3	} 25
	D22	-	-	-	9	-	2	-	-	-	-	1	-	-	
Phases 8-9	D16	-	-	-	1	-	-	-	-	-	-	-	-	-	} 103
	D19	2	1	4	4	5	32	14	1	9	9	2	-	4	
	D22	-	-	1	1	2	1	6	-	-	1	3	-	-	
Phases 10-11	D16	-	-	2	2	1	4	-	-	-	-	-	-	1	} 147
	D19	1	3	-	-	6	3	8	61	17	14	5	2	-	
	D22	-	-	1	-	2	3	4	-	-	1	5	-	1	
Phases 12-13	D19	-	-	-	-	-	-	-	-	-	1	-	-	-	} 14
	D22	-	-	-	-	4	4	3	-	-	1	1	-	-	
Totals		3	4	8	17	22	54	35	62	26	28	19	2	9	289

Fig. 292 Summary of glass from D site.

Unperforated discs are usually smaller and their abraded edges tend to be less regular than those of the 'spindle whorls': one, made from a Sassanian blue-green glazed sherd, is only 11 mm in diameter.

Equipment for games: Two and possibly three pieces of gaming equipment were recovered: a fragmentary *gebeta* game⁴⁴ board (Fig. 291) preserving seven circular depressions in two parallel rows, a small clay ball 12 mm in diameter which could have been used in *gebeta*, and a rectangular gaming die 27 by 18 by 18 mm with punctate holes indicating counts on all six sides (Fig. 290m). Parallels for the latter object, from Matara and Aksum, are noted by Anfray (1965: 83, pl. lxvi.4).

⁴⁴ *Gebeta* is described by Pankhurst 1982; see also Nat-soulas 1994 and de Voogt 1997.

Ear-studs: One complete and one partial example were recorded. The first is biconical, with tapering ends and a waisted centre, similar to a stone example from the Stelae Park (Munro-Hay 1989: fig. 18.10). The second (Fig. 290l) is pierced and otherwise similar in appearance to the concave-profile cones described above; its maximum diameter is 12.4 mm. Intact examples of similar size, usually in glass or stone (Fig. 294a, below; Munro-Hay 1989: figs 14.187-92, 18.4,7), suggest that these objects are best interpreted as ear-studs.

Tile: The small fragment illustrated in Fig. 290k, 13 mm thick, is a flat corner edge of what may be a tile. Possibly imported, its fabric is not unlike that of ARS ware. It is ribbed or fluted and red-slipped

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(2.5YR 5/6) only on the upper surface, rough below and on the corner edges. Clearly it is not part of a vessel, as the flutes are straight and parallel.

Glass, beads and pendants

(Michael Harlow)

GLASS

A total of 316 fragments of glass was excavated from D site, including many that were recovered during the wet-sieving of samples taken for archaeobotanical study. Nine fragments came from contexts attributed to the Pre-Aksumite occupation, 289 from Late Aksumite contexts, and the remaining 15 from uncertain or later contexts. The fragments varied considerably in size with none exceeding *c.* 60 mm in maximum dimension and many as small as 4 mm. A detailed tabulation is available in the Project Archive. The majority were body fragments from which the original vessel form could not be reconstructed. There were only sixteen recognisable fragments of rim, five of neck, four of shoulder, one base and one handle. In addition, there were two pieces from solid bangles and one or two ear studs. Beads are considered separately.

The trenches and phases from which the glass fragments were recovered are summarised in Fig. 292, together with their colours. The following features are noteworthy:

- Of the stratified glass, 97% came from Late Aksumite horizons. Two D19 contexts, phase-9 yard make-up (35) and phase-11 yard surface

(13), featured prominently, yielding 70 and 95 fragments respectively. The fragments were otherwise dispersed, most contexts producing fewer than ten specimens.

- The material from each context was very mixed, few fragments of the same type of glass being found together. One exception in D19 contained 60 comminuted fragments of pale brownish glass, although it proved impossible to reconstruct a diagnostic part of a vessel from them.

The colours of the glass fragments recovered from the D-site trenches included a high proportion of almost colourless glass with a yellowish or greenish tinge and pale green or turquoise glass. The darker colours - blue, cobalt blue, burgundy and red - were rare. The predominance of colourless tinged and bluish green glass follows a pattern established in the Roman world by the fourth century (Price and Cottam 1998: 16). Munsell colour readings were not recorded for all fragments but some were as follows:

- pale yellowish green: 3GY 7/5.5, 5GY 7/4
- pale turquoise: 5BG 7/2
- colourless with yellowish tinge: 2Y 7/7
- colourless with greenish tinge: 5GY 7/4
- colourless with greenish yellow tinge: 5Y 8/4
- cobalt blue: 5PB 4/9, 2.5PB 3/8
- burgundy red: 5R 3/6, (dark) 7.5R 2/2.

The nine pieces of glass from Pre-Aksumite contexts are problematic. This occupation is dated between the eighth and fourth centuries BC, before blown glass was developed (Israeli 1991). All the

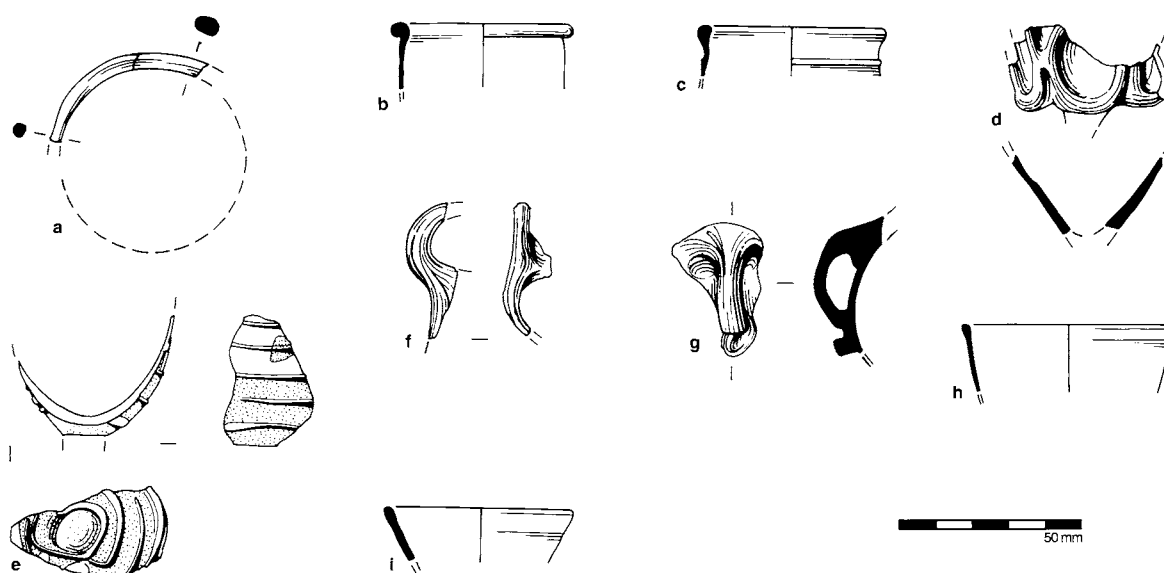


Fig. 293 Glass from D site.



Fig. 294 Glass from D site.

fragments recovered are, however, of blown glass, including some colourless pieces with a yellowish or greenish tinge and one fragment with a dark brownish red blob and trail marvered onto a dark bluish green body. The collection is very similar to that from the overlying Late Aksumite contexts and would, indeed, be fully typical of post-fourth-century AD glass assemblages in much of the Roman world. It must be assumed that small amounts of later material, including the glass, were intrusive to the contexts concerned (cf. the modern coin noted on p. 342, below). The descriptions which follow relate to Late Aksumite material.

The main forms of decoration are marvered blobs and trails in a contrasting colour and type of glass to the main vessel, looped trails of the same colour and type as the main vessel, raised horizontal trails parallel and near to the rim of a goblet (Fig. 293c), and contrasting coloured and colour-striated handles (Figs 293g, 294a). Rims are rolled, thickened, or everted. One faintly engraved band below a beaker

or goblet rim and one beaker fragment with two concentric engraved circles on it were also recorded. A base fragment of colourless glass with a yellowish green tinge has, on one steeply curved side, a domed protrusion which seems to be the remains of a blow-moulded bubble of the kind found on the bodies of certain 'grape-cluster' or human-headed glass flasks of late Roman type (Munro-Hay 1989: 195, figs. 14. 88-90).

Forms

Bangle: Three fragments of bangle in dark purple glass were recovered. Two of them join (Fig. 293a); and it is possible that all three come from the same apparently wound bangle about 50 mm in circumference, flattened on the inside and rounded on the outside. Bangles of deep blue and black glass were also reported from the 1973-4 excavations (Munro-Hay 1989: 207, figs 14.193-5). A Late Aksumite stone bangle of rather similar form is noted below (p. 348, Fig. 307b).

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Ear-stud: A small object of button mushroom shape is interpreted as an ear-stud (Fig. 294b), being 12.2 mm long and having a diameter at the top of 10.7 mm narrowing to 6 mm at the waist and widening again to 8.9 mm at the base. It was made of opaque yellow glass with mottled spots of blue and black and could have been a piece of earlier millefiore glass ground to its waisted shape. Similar ear-lobe plugs were reported in 1973-4 (Munro-Hay 1989: 207, figs 14.186-92, citing parallels from Egypt, the Sudan and India). What may be a second example is noted on p. 341, below.

Goblets: The goblet fragments are mainly recognisable from their rims (Figs 293b, c) which are about 50 mm in diameter. The first has a horizontal raised trail encircling it just below the rim. Both were of colourless green-tinged glass. Figs 293d and 294c illustrate a goblet body fragment of translucent dark turquoise glass with a heavy looped trail applied to the exterior; it narrows sharply on the inside towards the base. Part of the base of a goblet in colourless glass with a pale greenish tinge is also illustrated (Fig. 294d). These goblet fragments are very similar to those recorded by Munro-Hay (1989: 189, figs 14.2-14), all but one of which were of this same type of glass.

Stemmed cup: One specimen (Fig. 293e) differs from the goblet fragments by its rounder, fuller shape with the scar of a stem clearly visible at the base. The body is of colourless glass with a yellowish green tinge, decorated on the outside by an applied spiral trail of opaque turquoise glass, the rings being roughly horizontal and about 7 mm apart. No similar vessel has previously been reported from Aksum.

Flasks: Two fragments probably come from flasks. One (Figs 293f) is a collar fragment in pale greenish yellow glass with a small fragment of the neck of the vessel attached to the inside and possible traces of a handle attached to the collar. The other is a base fragment in pale greenish yellow glass comprising part of the bottom and the steeply upward-curving body of the vessel. It is unlikely that the two fragments come from the same flask.

Lamps: Fragments of glass lamps are most readily recognised if they come from the rim or one of the vertical loop handles. They include a fragment of thin colourless glass with a sharply everted rim and an everted rim fragment of colourless glass with a yellowish green tinge. A loop handle of clear glass with a greenish tinge (Figs 293g, 294a) comes from a globular vessel which may also have been a lamp. Similar lamp rims from Aksum have been illustrated by Munro-Hay (1989: figs 14. 114-6 and 137-9).

Cups or beakers: Two rim fragments (Figs 293h, i) are difficult to interpret. The former, of pale blue glass with a greenish tinge, seems to come from

a U-shaped cup and the latter, of colourless glass with a yellowish green tinge, from a V-shaped vessel such as a beaker or cup. It is possible however that both are fragments from the particular Aksumite type of beaker described by Munro-Hay (1989: 189, figs 14.15-35).

Miscellaneous fragments: Among the many undiagnostic fragments, two from late or mixed contexts have particular features which should be recorded:

- A fragment of pale yellowish brown moulded glass with a raised net pattern on the exterior, possibly part of an hexagonal pattern. It could have come from a bowl and resembles fragments illustrated by Munro-Hay (1989: figs 14.161-4).
- A fragment of a narrow neck, only 9 mm in diameter, in pale yellowish green glass, probably from a phial or flask.

BEADS AND PENDANTS

The beads from D site comprise 78 of glass and ten (including pendants and one ring bezel) of stone. Most came from trenches D19 and D22. Five stone and two glass specimens came from Pre-Aksumite contexts, with six of glass and one of stone from later or mixed deposits. The remaining 77 specimens are regarded as Late Aksumite. A full listing is incorporated in the Project Archive, with a summary tabulation here as Fig. 295. Three metal beads are excluded from these totals, being noted separately below (p. 344 and Figs 299h-j).

The colour range of the D-site glass beads is restricted to blue, turquoise, green, yellow and red with a few white and black. Turquoise is predominant, but not in so high a ratio to the other colours as at K site. The yellow beads are all small or tiny and usually drawn oblates *i.e.* rounded with their length along the perforation being shorter than the maximum diameter of their cross-section. The translucent/opaque ratio is slightly in favour of translucent overall, but the reds are all opaque.

Glass bead forms

Standard and short rounded drawn oblates are the most common (28), followed by standard cylinders (13). Then come barrels (7) and, interestingly, the distinctive hexagonally faceted bicones (4) which are common in the Tomb of the Brick Arches and in primary Mausoleum contexts and seem to have been popular at Aksum over a long period. At D site two of these beads come from Late Aksumite and two from later or mixed contexts where they may have been redeposited. Four large long rectangular cubes with chamfered corners in dark blue or turquoise glass were recovered from widely different contexts, again suggesting redeposition. Unusual single forms include a tetragonally

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	black O	cobalt blue O	cobalt blue T	blue O	blue T	colourless T	green O	green T	turquoise O	turquoise T	yellow O	yellow T	red O	white O	stone	copper alloy	Total
Pre-Aksumite	-	-	-	-	-	1	-	-	-	1	-	-	-	-	5	-	7
Late Aksumite																	
phases 5-7	-	1	-	4	2	1	2	4	-	-	3	2	6	1	-	-	26
phases 8-9	3	-	-	1	1	-	-	2	1	2	3	-	2	-	-	-	15
phases 10-11	-	1	2	-	-	-	2	1	-	7	2	-	3	-	3	2	23
phases 12-13	1	-	2	1	-	-	3	-	1	1	-	-	-	-	1	1	11
?	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	2
Total	4	2	4	6	3	1	7	8	2	11	8	2	11	1	4	3	77
post-Aksumite / mixed																	
	-	-	-	-	1	-	-	1	1	2	1	-	-	-	1	-	7

Fig. 295 Summary of beads from D site. (O = opaque, T = translucent)

faceted bicone, a standard cylindrical bicone and an elliptical bicone. The two glass beads recovered from Pre-Aksumite contexts are colourless and dark turquoise, respectively a long cylinder and an oblate. They seem generally similar to the rest of the D glass-bead collection despite the difference in date between the two occupations.

Bicones: Three of the hexagonally faceted bicones (Morrison's type IIc, Munro-Hay 1989: 169 and figs 11.7-10) are illustrated. Those in Figs 296a-c, all made of pale translucent turquoise glass. One example has a medial band of six small diamond shaped facets between the faceted cones at each end, but the others are without that feature. The fourth specimen is of dark translucent turquoise glass. A tetragonally faceted bicone of translucent dark blue glass (Fig. 296d) is of Morrison's type II d (Munro-Hay 1989: 169, fig. 11.11). A truncated bicone without facets and with an oval rather than a circular cross-section (Fig. 296e) is made of translucent dark turquoise glass, being similar apart from its oval section to Morrison's type VIIa, although it could equally be ascribed to type Ia (Munro-Hay 1989: 168, 170, figs 11.1, 25).

Rectangular cubes: A long rectangular cube of translucent yellowish green glass with chamfered corners (Fig. 296f) belongs to Morrison's type XIII (Munro-Hay 1989: 172, figs 11.46-8).

Cylinders: An unusual short cylinder bead in opaque red glass with cones at each end (Fig. 296g) has no close parallels among the beads described by Morrison (in Munro-Hay (1989)). A standard square-ended cylinder of translucent pale turquoise glass (Fig. 296h)

from a late or mixed context, is similar to Morrison's type IVa. From a Pre-Aksumite context comes a 25-mm-long broken cylinder bead in cloudy colourless glass (Fig. 298i); it is much larger than any comparable specimen described by Morrison.

Spheres: A small (5 mm diameter) plain bead of opaque pale cobalt blue glass is illustrated in Fig. 296j. From a subsequent phase of the Late Aksumite sequence comes a slightly larger example, of opaque dark blue glass, decorated around the middle with a wavy opaque white band which has a thin trail of red glass in the centre. Some plain wound spheroids are described by Morrison as type XIXa (Munro-Hay 1989: 173, figs 11.55-7).

Oblates: Oblate beads show a range of sizes and features, including a small short (2 mm) bead of opaque mid-green drawn glass (Fig. 296k), and a slightly larger standard translucent green bead (Fig. 296l). A standard bead of translucent dark blue glass with a large perforation is more than 5 mm long. Oblates from the 1973-4 excavations have been discussed by Morrison as her type X (Munro-Hay 1989: 172, figs 11.37-40).

Glass bead manufacture

Evidence for bead making at or around D site is provided by the dark green translucent bead fragment illustrated at Fig. 296m, which appears to have broken while the perforation was being made. Also recovered was a rough blank in the shape of a standard, slightly waisted cylinder of translucent blue glass but with no perforation; its conical ends had been very roughly

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chipped when the glass was cold; it is possible that this object was intended to be an ear-stud, similar to that noted on p. 339, above.

Stone beads and related items

Five of the ten stone beads/pendants recovered from D site were from Pre-Aksumite contexts in D19 and D22. Four others, including a ring-bezel, were from Late Aksumite contexts.

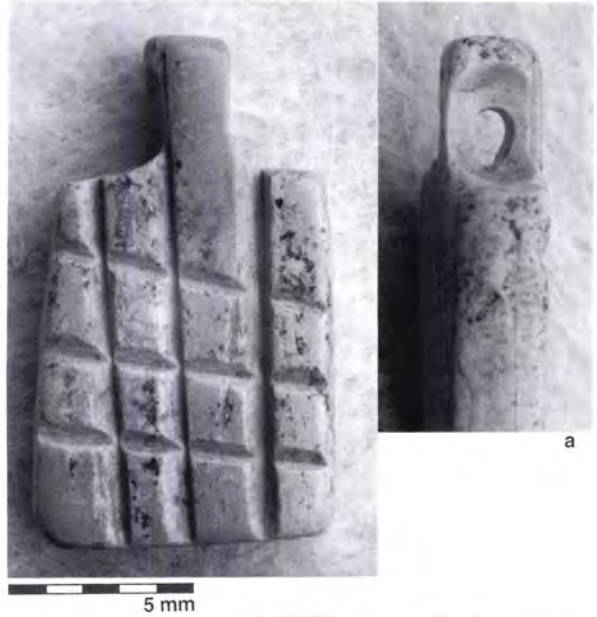
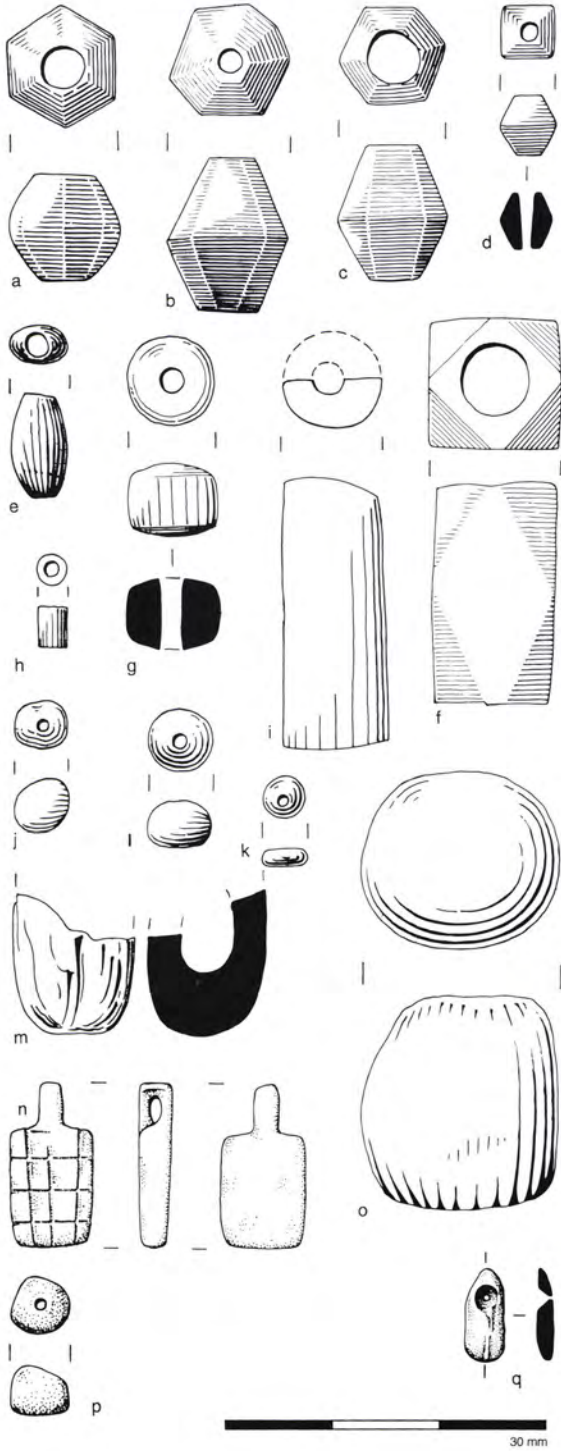


Fig. 296 Beads and pendants from D site.

Fig. 297 Beads and pendants from D site.

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Triangular bead: A very large (34 mm across by 12 mm thick) bead or weight of pale red-purple stone with white veins, probably a fine-grained marble, was found in a mixed surface context containing Pre-Aksumite material. It has a thick ovoid form with a triangular cross-section, rounded edges and a large hourglass perforation (Fig. 297b), being well polished overall.

Barrel-shaped beads: A large (22 by 20 mm) unperforated barrel-shaped object (Fig. 296o), of polished creamy white marble veined with red and black was found in a Pre-Aksumite context. It could be a bead which has not been completed. The object from the 1973-4 excavations which most closely resembles it is a rounded rectangular greenstone form with a circular depression bored in one end (Munro-Hay 1989: fig. 18.20). A complete but smaller bead of this type, in milky banded agate, was recovered in a Late Aksumite context.

Carnelian bead: A small pale orange slightly pear-shaped carnelian bead from a Late Aksumite context is illustrated in Fig. 296p.

Pendants: Three nearly identical pendants in greyish white steatite were recovered in a single context of the earliest Pre-Aksumite phase in D22. Examples are illustrated in Figs 296n and 297a. They are flat rectangles measuring 14 by 8 mm with a perforated projection at the top giving an overall length of 14 mm. Incised lines form a lattice pattern on one flat side of each.

Drilled stones: A Pre-Aksumite context yielded a fine-grained opaque grey-brown ovoid pebble, 26 by 7 by 5 mm, drilled through near an end from one side only (Fig. 296q). From a Late Aksumite context came a piece of polished chert (Fig. 297c), 36 mm long by 19 mm wide, with two hourglass perforations of unequal sizes, retaining drill-marks.

Ring bezel: An unfacetted polished plano-convex oval deep-red stone, 4 by 3 by 2 mm in maximum dimensions seems to have been a ring bezel. Its hardness and bright colour have the appearance of a gemstone, probably a ruby. It was recovered from a Late Aksumite floor make-up context.

Metal (D.W.P.)

Metal artefacts at D site were notably uncommon, especially in Pre-Aksumite contexts, where iron was completely absent. Even in Late Aksumite horizons, artefacts of copper alloy, excluding coins, were eight times more numerous than those of iron.

Coins

A total of thirty Aksumite coins was recovered from excavations at D site. They are summarised here, using the type-numbers proposed by Munro-Hay and Juel-Jensen (1995) and, in square brackets, the designations according to Munro-Hay (1984). Their distribution between phases is discussed below (pp. 485-6), while more comprehensive details of the specimens themselves are provided in Appendix V.

Late Aksumite deposits yielded the following twenty-six coins: type 51-2 [Anonymous AE 1] (1 - D/656\); type 76 [Anonymous AE 2] (3 - D/6\, D/229\, D/295\); type 118-23 [Wazena AE 1] (2 - D/249\, D/414\); type 130 [Ioel AR 2] (2 - D/341\, D/387\); type 131-2 [Ioel AE 1] (2 - D/276\, D/277\ and 2 uncertain - D/270\, D/335\); type 134 [Ioel AE 3] (2 - D/262\, D/267\); type 137 [Hataz AR 1] (3 - D/49\, D/256\, D/351\); type 140 [Hataz AE 1] (4 - D/251\, D/272\, D/274\, D/721\); type 141 [Hataz AE 2] (3 - D/228b\, D/337\, D/374\); type 147 [Gersem AR 1] (1 - D/231\); type 148 (Gersem AE 1 (1 - D/363\).

From deposits of post-Aksumite or mixed deposition came the following four coins: type 137 [Hataz AR 1] (1: D/426\), type 141 [Hataz AE 2] (1: D/183\), type 149 [Gersem AE 1a] (1 - D/168\), type 153 [Armah AE 1a] (1 - D/382\).

In trench D23, an apparently Pre-Aksumite horizon yielded a South African penny dated 1935. It bears traces of solder, perhaps from a loop attachment. It was found immediately adjacent to a wall, beside which it had presumably slipped into deposits where the pottery was exclusively of Pre-Aksumite type.

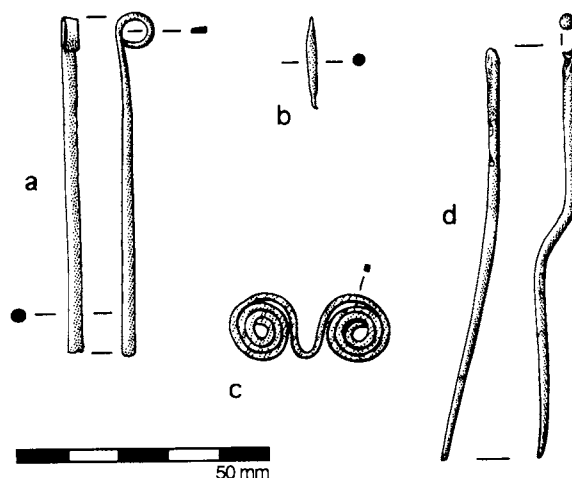


Fig. 298 Pre-Aksumite copper alloy artefacts from D site.

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Gold

Two tiny fragments of foil were recovered from Late Aksumite contexts.

Copper alloy

Seven copper alloy artefacts were recovered from Pre-Aksumite deposits, one of them showing traces of gilding:

Sheet fragments: One of the two specimens retains traces of gilding on one side.

Ear-ring: A length of rectangular-sectioned wire is twisted into a double spiral with overall dimensions 28 by 15 mm (Fig. 298c).

Rods: The remaining four specimens are all round-sectioned rods, one made of rolled sheet, the others solid. One piece (Fig. 298a) is 68 mm long, looped at one end. Another, 77 mm long (Fig. 298d), has worn or rounded ends and may have served for applying pigment or cosmetic. A third (Fig. 298b) is 18 mm long, pointed at both ends.

Late Aksumite deposits yielded thirty-nine copper alloy objects, one of them gilt:

Applicator: This is a double-ended rod (Fig. 299a), 149 mm long and decorated with a band of five bosses in the centre.

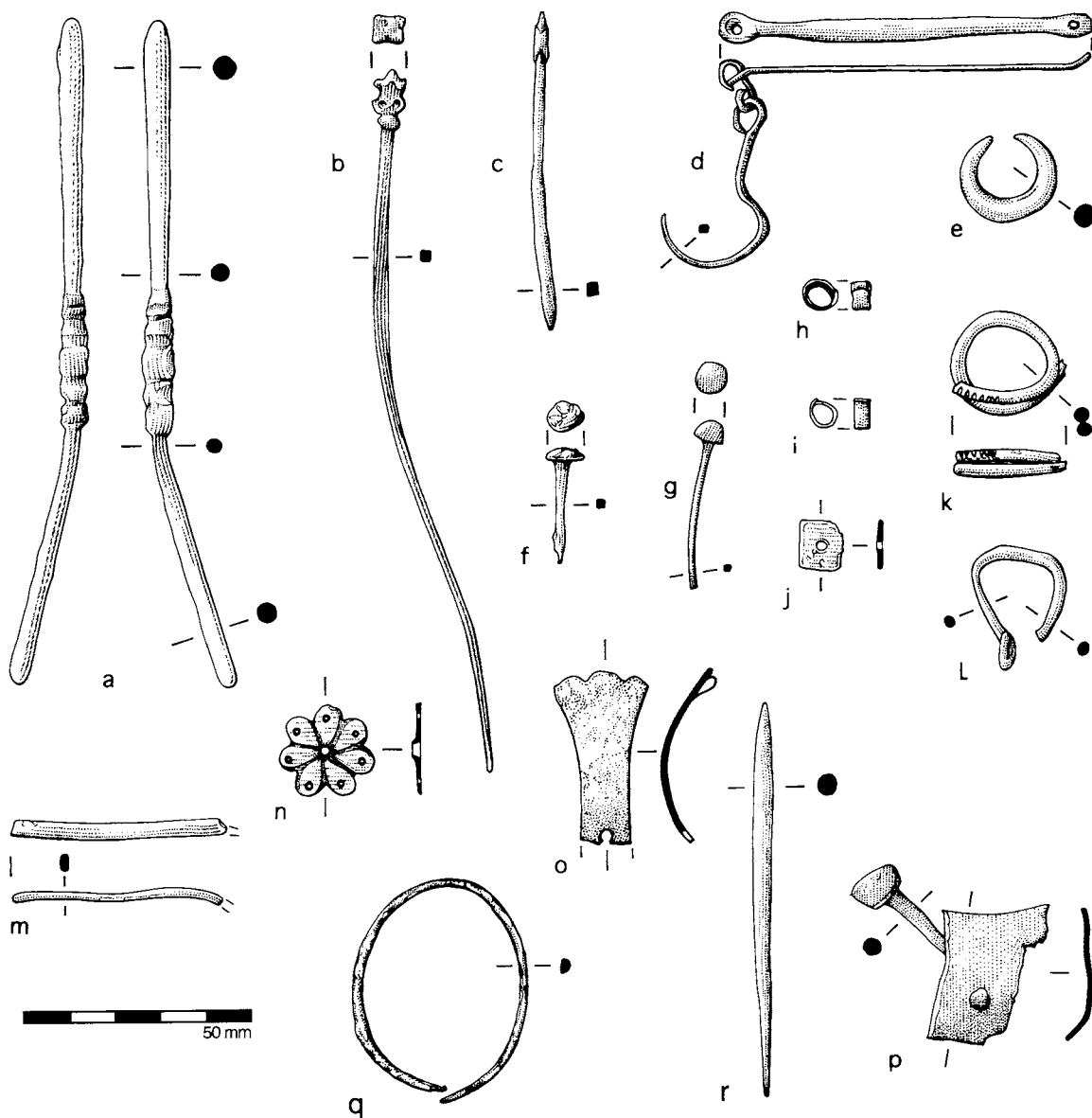


Fig. 299 Late Aksumite copper alloy artefacts from D site.

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Pin: This 158-mm-long specimen has a twisted square-sectioned shank, becoming rounded towards the point (Fig. 299b). Its head is decorated with a high central boss surrounded by four lower ones.

Awls: Both examples are complete and pointed at both ends. One (Fig. 299c), 72 mm long, has a square section. The other (Fig. 299r) is 86 mm long and round-sectioned, 3.5 mm in diameter at the centre.

Hook on strip: This complex object (Fig. 299d) comprises a 124-mm strip, rounded and pierced at each end, a twisted wire link and a loop-ended hook.

Floral boss: This, 20 mm in diameter, is carefully made of sheet metal, each of the seven petals being perforated (Fig. 299n).

Nails: Both have square-sectioned shanks (Figs 299f, g). The head on the latter is domed, that on the former decorated with radiating flutes.

Looped pins: A single complete example, 75 mm long, with round section, has one end flattened and curved into a loop 6 mm in diameter. Four specimens could be broken heads from similar but larger artefacts.

Rings: Three different artefacts may be considered under this head. A 23-mm diameter loop of round-sectioned wire, the ends overlapping (Fig. 299k), is of appropriate size for a finger-ring. The pointed ends of a carefully made lunate specimen (Fig. 299e), 10 mm in diameter, do not meet and the object may have been an ear-ring. A very similar example from the Gudit Stelae Field is illustrated by Munro-Hay (1989: fig. 15.189). Lastly, a 58-mm diameter loop of D-sectioned wire (Fig. 299q) is interpreted as a bracelet.

Beads: Two are made of bent strip, 3 mm wide, producing loops 6 to 7 mm in diameter (Figs 299h, i). The third (Fig. 299j) resembles a square washer, 10 mm across, with a central perforation.

Rods: These two specimens are larger, with sections 4 by 2 mm, one semi-circular (Fig. 299m) and the other rectangular. A third example has a looped end (Fig. 299l).

Shanks: There are three short broken lengths, all with square sections.

Sheet fragments: There are nine, including one shaped (Fig. 299o), one gilt, one pierced and one (Fig. 299p) transfixed with a copper alloy nail.

Miscellaneous fragments: The eight pieces, all from trench D19, included a 7-mm globule, a piece that may be from a failed casting, and a possible piece of smelting residue. These suggest that cuprous metal may have been worked in the general vicinity of this trench, although not in the precise area excavated.

Finally, twelve copper alloy artefacts were recovered from post-Aksumite or mixed deposits. Three, from topsoil contexts, appear to be modern. The others comprise:

Applicator: This specimen is 106 mm long, with a rounded section 3.5 mm in maximum diameter (Fig. 300a). One end tapers to a rounded point; the other is carefully squared and notched.

Tube: A narrow tube of thin metal sheet, 24 mm long and 3 mm in diameter, is pierced by a row of four equidistant holes (Fig. 300d). Its purpose is unknown.

Nails: There are two examples (Figs 300b, c), both with round-sectioned shanks. One has a flat round head, that of the other being a low dome.

Staple: This (Fig. 300e) is a length of rod, bent to a U-shape and sharp at both ends.

Miscellaneous fragments: There are four, including a globule, a piece of smelting waste, and a bent fragment of shank with square cross-section.

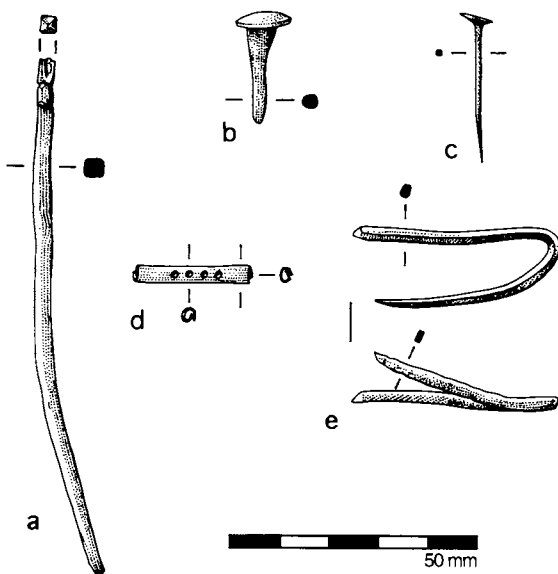


Fig. 300 Copper alloy artefacts from D-site post-Aksumite/mixed contexts.

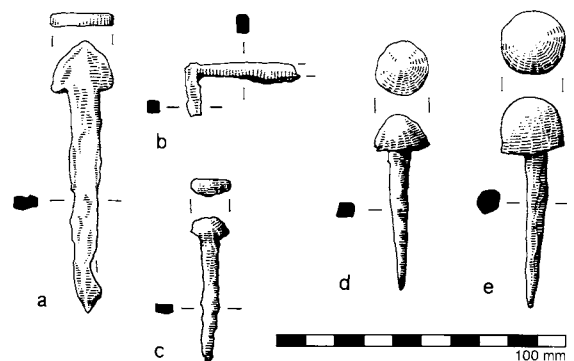


Fig. 301 Iron artefacts from D site.

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Iron

It is noteworthy that no iron objects were recovered from Pre-Aksumite contexts. There were five from those attributed to Late Aksumite times:

Nail: This unusual specimen (Fig. 301a) has a square-sectioned shank and a pointed head.

Angled spike: Illustrated in Fig. 301b, this piece of square-sectioned rod resembles those from the Tomb of the Brick Arches (Figs 92a-c, above).

Miscellaneous fragments: These total three, including two pieces of shank.

In the post-Aksumite and mixed horizons, two pieces of iron are demonstrably modern, the other three are nails with square shanks and domed heads, 72, 59 and 52 mm in overall length (Figs 301c-e).

Ivory and bone (D.W.P.)

All artefacts of these materials were recovered from Late Aksumite contexts, although two fragments of hippopotamus ivory were recovered from Pre-Aksumite levels in trench D13. Highly fragmented elephant ivory came from Late Aksumite D22 (Fig. 324, below).

Cylindrical ivory box: The fragments are so poorly preserved that the original dimensions cannot be estimated. Some bear grooves which may be traces of decoration or tool marks. Further fragments of worked ivory from the same context may also belong to this object.

Ivory handle: Incomplete and fragmented remains probably originally formed an elongated faceted and tapering handle (Fig. 302a; see also Figs. 406a, b). It survives to a length of 109 mm and maximum diameter of 24 mm, and is further discussed on pp. 462-3, below.

Bone point: This (Fig. 302b) is 53 mm long, 7 by 3 mm in rectangular cross-section, tapering to a point at one end, and was cut and polished from a splinter of bone which retains traces of its marrow-cavity.

Textiles (Sheila Boardman)

Six extremely fragile fragments of charred textile were recovered from the heavy residue fraction of a soil-sample taken from D22 (312), a phase-5 deposit. All appear to derive from a single piece of cloth which may have become further fragmented during flotation, sample drying and sorting. Although similarly fragile material may have been lost during excavation and sample-processing, the survival of these fragments confirms the gentle nature of the recovery-methods employed (cf. Appendix VII).

The textile fragments (Fig. 303) were examined at the National Herbarium, Addis Ababa University by low- to medium-power (10x to 160x) microscopy. Comparison with modern materials permitted the textile to be identified as cotton. There was no sign of admixture with other fibres. The ancient fibres

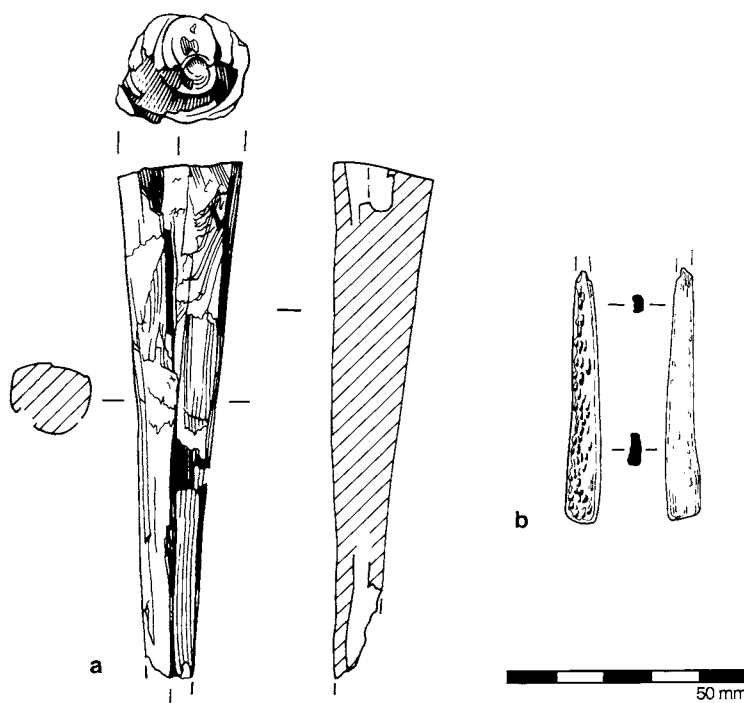


Fig. 302 Ivory and bone artefacts from D site.

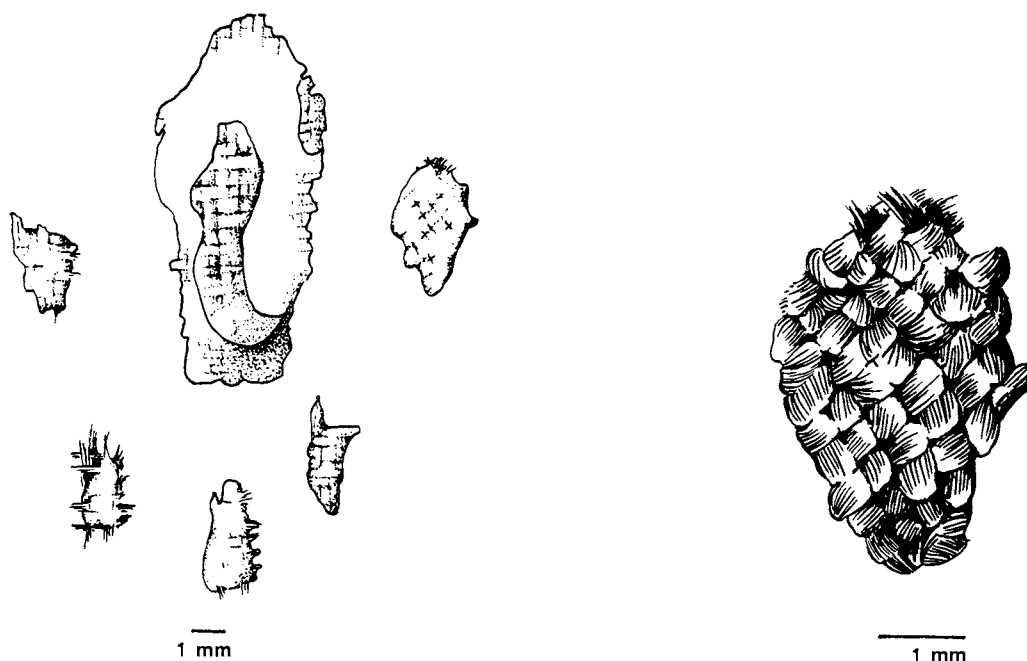


Fig. 303 Textile fragments from D site.

were compared with modern specimens taken from New-World cottons (*Gossypium hirsutum*, *G. barbadense*), and one species of indigenous cotton (*G. herbaceum*) which is still cultivated today in more southerly parts of Ethiopia. The archaeological specimens and the indigenous cotton both have much finer fibres than the American cottons, regardless of whether the latter were raw (still attached to cotton seeds) or fully processed (woven into cloth). Whether this is a general distinction between Old- and New-World cottons, or a function of selection for modern manufacturing purposes, remains uncertain.

The textile employs a simple plain weave, similar to, but much tighter than, that used in modern *shammas*. Where textile fragments do survive in the archaeological record, it is frequently the reinforced, decorated or more tightly woven edges that are found, presumably because of their greater durability. No decoration or original edges are, however, visible on the Aksum fragments which may have come from a heavier cloth.

Ground and carved stone (D.W.P. and Laurel Phillipson)

Food-processing equipment

All from Late Aksumite contexts, as discussed on p. 368, the range includes both upper and lower grind-

stones as well as two types of pestle. Examples are illustrated in Figs 304-6. The excavated grindstones and related artefacts appear so similar to those currently in use in private homes in Aksum in sizes, shapes and raw materials that it may be assumed that modern and ancient specimens were used for the same purposes of preparing foodstuffs, cosmetics, medicines and paint.

Raw materials range from a relatively fine breccia through sandstone breccia and coarse to medium sandstone, with some examples in granite, basalt and one small fine example in marble. The pounding and resharpening stones are of syenite, basalt or granite, with one of nodular chalcedony.

Two cylindrical stone pestles were found together in a phase-6 context of trench D19 (Fig. 305). The one complete example, found broken in two pieces, measures 415 mm long and 50 mm in average diameter; it is battered through use at one end. Only the battered half of the second example was preserved (Figs 305b, 306).

In plan shape the lower grindstones may be rectangular, sub-rectangular, sub-ovate, ovate or long ovate and in profile they may be relatively flat, plano-convex or concavo-convex. While some lower grindstones were roughly shaped by circumferential trimming, many were not and the plan shape appears to have been inconsequential. The depth of concavity on the upper surface of the lower grindstones and thickness of the stone is dependent on the amount of use it had received. Smoothness of the utilised surface is

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proportionate to the amount of use since the most recent resharpening. Today and presumably in the past resharpening is achieved by hammering the grinding face with an approximately fist-sized sharpening stone of harder rock. On occasion, frequent resharpening

results in breakage along some line of weakness, usually near an edge. Most frequently, broken grindstones continued to be used, with the fractured edge gradually becoming worn and merged with other scars indicative of previous accidental damage or deliberate trimming.

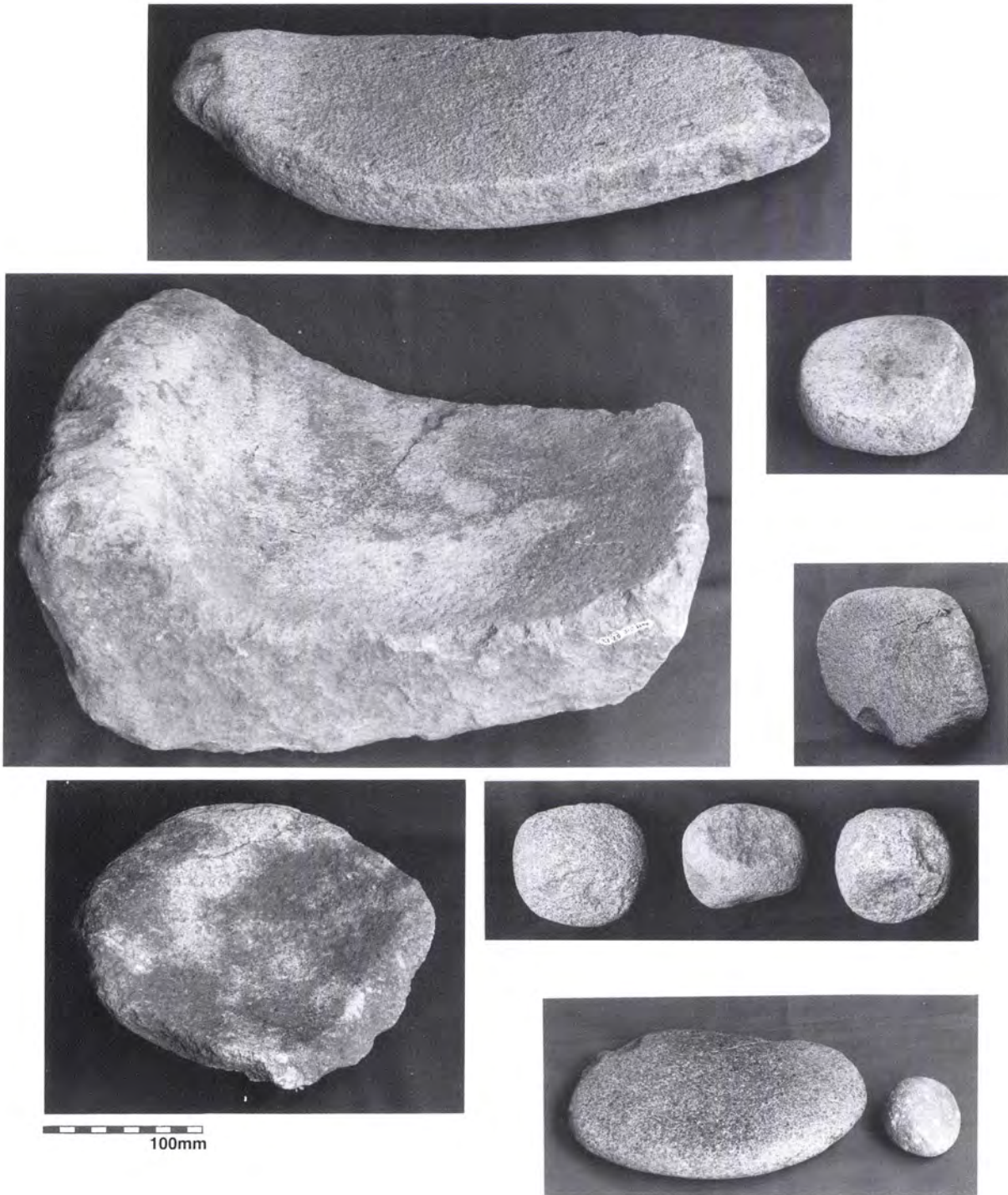


Fig. 304 Grindstones from Late Aksumite contexts at D site.

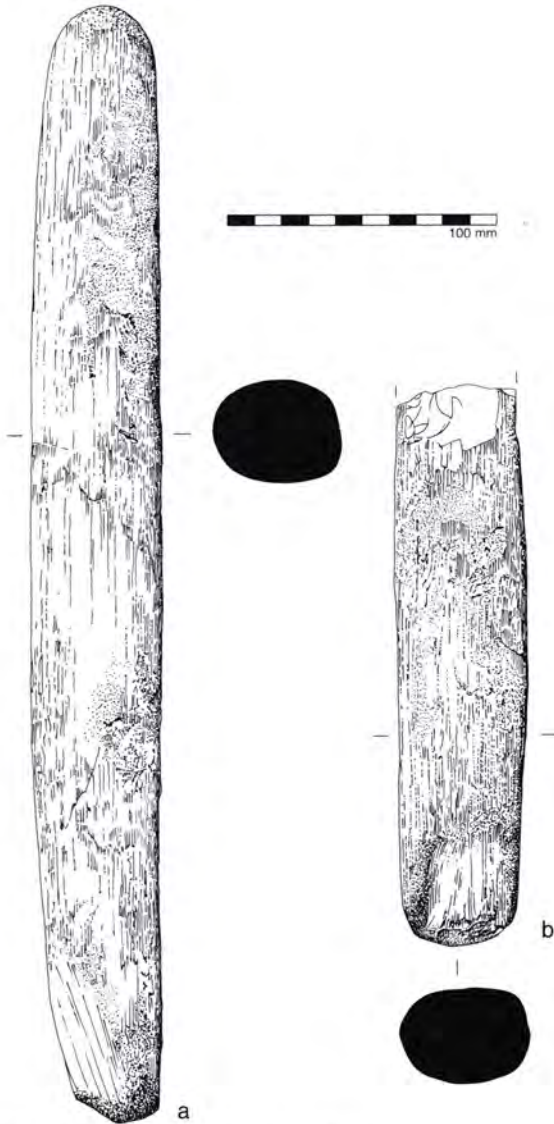


Fig. 305 Stone pestles from D site.

While modern grindstones are not discarded when broken, but used and re-used until they are completely worn away, a different use pattern seems to have prevailed among the excavated examples, more than half of which appear to have been deliberately broken transversely. Most of the grindstones broken in this way were more than 50 mm thick and many showed no sign of use subsequent to the breakage. Such deliberate destruction of grindstones is not known as a modern practice and most modern examples of accidental damage occur at the edges and corners of grindstones.

A survey of the contemporary use and nomenclature of grindstones and mortars revealed a considerable overlap between various sizes and shapes of stones and the uses to which they are put. In general,

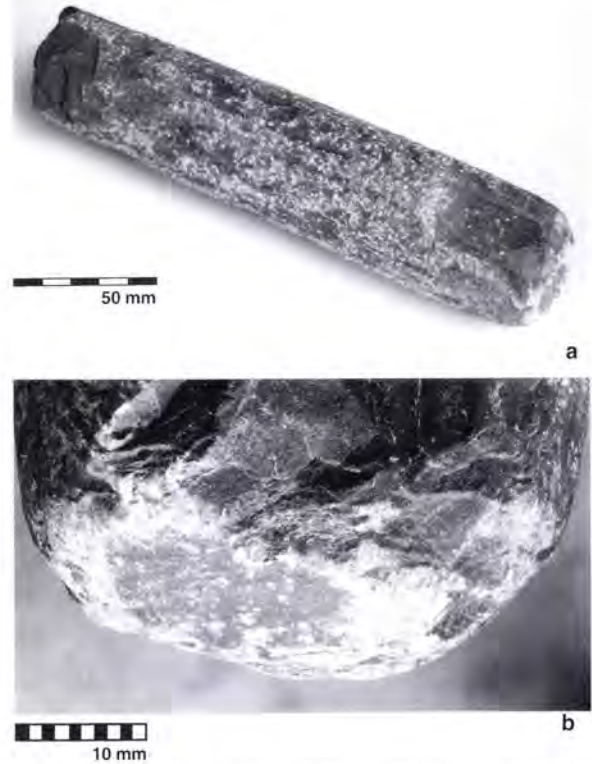


Fig. 306 Stone pestle from D site, cf. Fig. 305b: a - general view; b - detail of heavily worn end.

the largest and most numerous are used for grinding grain; the smallest and finest for preparing cosmetics, spices or medicaments. Stones of intermediate sizes, often the broken or worn remnants of larger specimens, are used for preparing vegetable relishes, paint or for other miscellaneous purposes. Moderately prosperous households own several grindstones, as a single stone is not usually used for multiple purposes. It is the use to which a particular grindstone is put, not its shape or size, that determines its name.

Bangles

From a Late Aksumite level came a polished but somewhat irregular bangle in blue-black soapstone. Half the circumference is preserved, indicating an original diameter of about 83 mm. Illustrated in Fig. 307b, it has a rounded subtriangular section.

From a post-Aksumite or mixed horizon was recovered a second well polished specimen (Fig. 307c) in fine-grained pink stone with darker pink veining, perhaps trachyte. It is a 30 mm length, 25 by 7 mm in section, from a bangle or vessel handle with an estimated diameter of some 80 mm.

Lamps

A substantial fragment of black stone, probably hornfels, measures 78 by 40 by 39 mm (Figs 307a, 308).

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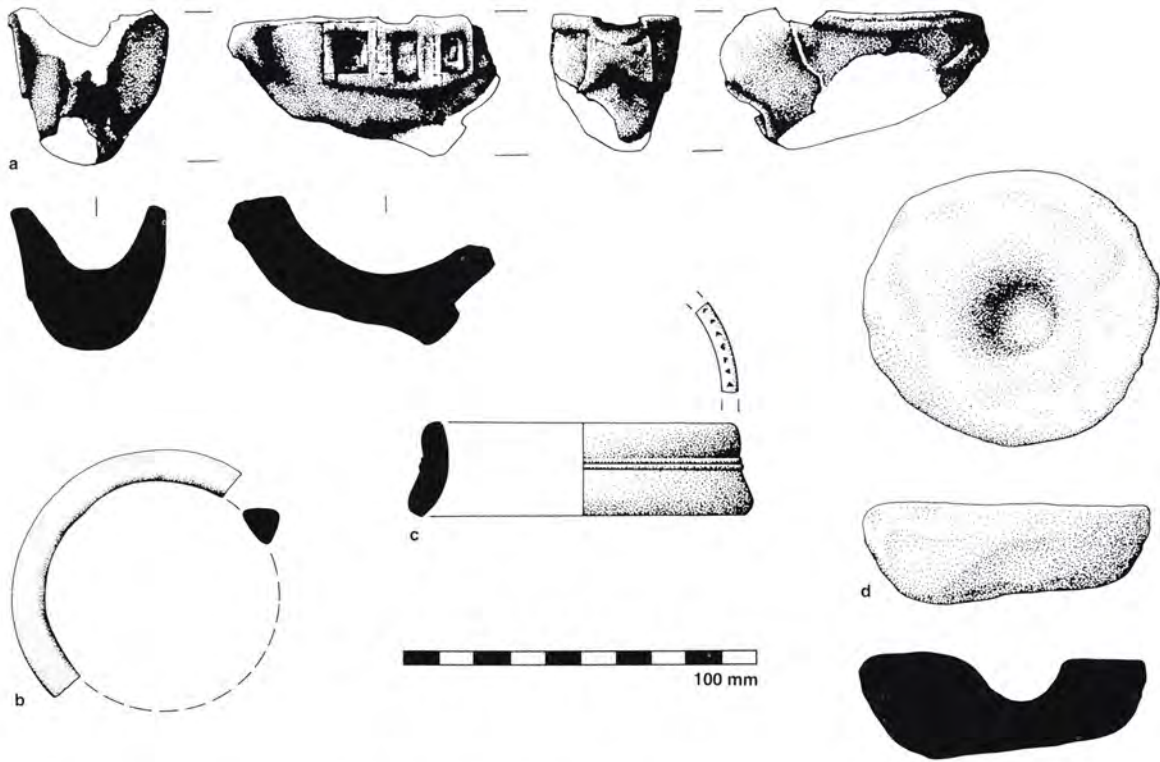


Fig. 307 Stone artefacts from D site: a, d - lamps; b, c - bangles.

The fine carving resembles the representation of windows on the multi-storeyed stelae. Although found in a post-Aksumite or mixed horizon, this item may be of Aksumite origin.

From a Pre-Aksumite context was recovered a roughly shaped circular block of pinkish white stone, perhaps trachyte, 84 mm across and 34 mm thick (Fig. 307d). A pecked circular depression in the centre

of one flat face displays no evidence for subsequent use: it could have been intended to serve as a lamp or mortar.

Slab

A 275 by 145 mm slab of weathered sandstone, from a post-Aksumite or mixed context, bears random incised lines.



Fig. 308 Stone lamp from D site, cf. Fig. 307a.

30 mm

349

Seals
(D.W.P.)

D site yielded a varied series of seals in both stone and clay. For convenience they are described together in this section.

The two specimens from Pre-Aksumite contexts are probably both fragments of clay stamp-seals. The larger represents roughly two-thirds of a rectangular ellipsoid seal, 33 mm wide, preserved to a length

of 46 mm, the perforated loop on the back being broken (Fig. 309a). It bears an impressed design comprising a longitudinal line with, at right-angles, a series of further lines of which three are preserved, the whole design being enclosed by a line of punctate dots of which thirteen survive. The second object (Fig. 309b) may be part of a lozenge-shaped stamp seal with an uncertain design, apparently executed before firing, of lines and loops. It is 29 mm wide and survives to a length of 30 mm. It appears to have been perforated through the centre of the design.



Fig. 309 Seals from D site: a, b - Pre-Aksumite, clay; c-g - Late Aksumite, stone.

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Fig. 310 Late Aksumite stone seals from D site.

Five stone seals came from Late Aksumite contexts. The first (Fig. 309c), of greenish black soapstone, is oval in shape, 37 by 16 mm, and 21 mm thick including the perforated projection on the back. The design comprises an irregular setting of ten ovoid depressions roughly gouged with a sharp pointed tool (see Fig. 317, below).

A somewhat similar specimen (Fig. 309d), in black soapstone, comprises roughly half of an oval seal, 26 mm wide, preserved to a length 24 mm, part

of a perforated projection on back bringing the preserved thickness to 16 mm. The thinness of the projection adjacent to the perforation may suggest either prolonged wear or breakage during manufacture. The design comprises six surviving irregular depressions deeply gouged from a polished surface.

The specimen shown in Fig. 309e is in greenish-black soapstone, well polished. The roughly oval stamp surface measures 34 by 18 mm, divided by a ridge into two unequal sections each of which is divided by another ridge. On the back is a cuboid projection bringing the specimen's total thickness to 23 mm. This projection is transversely perforated, with another perforation from the top intersecting the first.

The remaining two seals are of finer workmanship and inscribed. That illustrated in Figs 309f and 310a is a specimen in dense greyish-white stone (probably chert or limestone), smoothly worked. The broken upper part survives to a total thickness of 23 mm, and was carved in possible representation of an animal seated or crouching in a feline manner, two paws being clearly represented. The flat incised surface measures 33 by 20 mm and has a plain border within which are four symbols possibly resembling the Ethiopic letters BDHZ. Photographs have been examined by Dr Roger Schneider (Addis Ababa University), who comments that the style of lettering suggests an date in the first or second century AD, long before the age of the context in which the seal was found; the letters could represent a personal name, not otherwise attested (*in litt.* November 2000).

Lastly, a much smaller seal is made of very similar creamy-buff stone, finely shaped as a truncated pyramid with rounded edges, both top and bottom being square, respectively 9 and 11 mm across, finely polished overall (Figs 309g, 310b). A simple cross is incised on the top, each vertical angle is elaborated with a groove, and there is a single perforation worn to an oval shape, near the top. The main design on the base comprises a cross potent surrounded by six symbols resembling Greek letters. Dr Martin Henig (Institute of Archaeology, University of Oxford) has examined illustrations of this seal and notes its general Byzantine appearance, with a Christian cross and Greek lettering, suggesting a date in the sixth or seventh centuries AD (*in litt.* September 1998). 'Letters were sealed either with a seal-ring, the bezel of which bore a reversed inscription, or by means of a conical seal which had a suspension loop for ease of use and its base engraved in the same way: both were impressed on wax. ... In proto-Byzantine times they were often made of stone' (Cheynet 1997: 113). Mr David Buckton (Department of Medieval and Later Antiquities, British Museum) suggests a fifth-century date, citing specimens acquired in Egypt.

Lithics
(Laurel Phillipson)

It is not, unfortunately, possible to draw firm conclusions from a statistical comparison of the lithic artefacts recovered from Pre-Aksumite and Late Aksumite contexts at D site, as only a small proportion of these

artefacts was recovered for analysis. Even in trenches D22 and D23, where concerted attempts were made to recover the small lithic materials, the recovery rate was probably less than fifty per cent owing primarily to the difficulty for untrained labourers in recognising artificially chipped stones in a stony matrix when their attention was primarily focused on the elucidation of stone wall complexes. Many of the chipped stones,

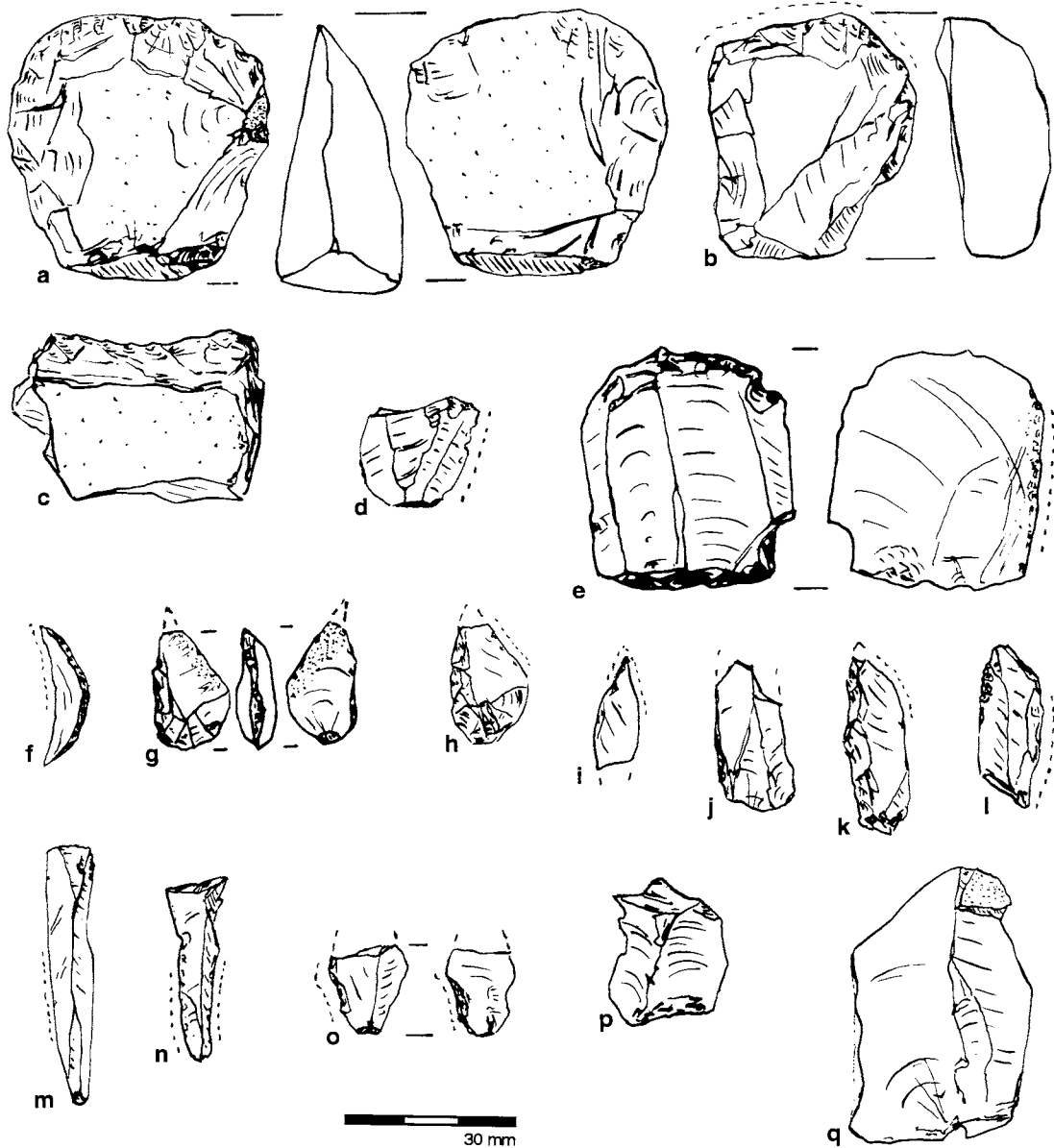


Fig. 311 Lithics excavated from Pre-Aksumite contexts at D site (dashed lines indicate areas of heavy utilisation and microscarring): **a, b** - steep convex scrapers (chert); **c** - concave scraper (siltstone); **d, e** - Likanos flakes (obsidian); **f** - bifacially trimmed crescent (obsidian); **g, h** - unifacially trimmed tranchets (obsidian, very heavily utilised); **i-k** - minimally backed bladelets (obsidian); **l** - minimally backed bladelet (crystal quartz); **m** - utilised bladelet (obsidian); **n** - utilised bladelet (chalcedony); **o** - utilised flake (obsidian); **p** - apparently pristine flake (obsidian); **q** - apparently pristine flake (siltstone).

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Fig. 312 Lithic tools excavated from Late Aksumite contexts at D site (dashed lines indicate areas of heavy utilisation and microscarring): **a** - Guditi scraper (chert, heavily utilised); **b-e** - steep convex scrapers (chert); **f-k** - Likanos flakes (obsidian); **l** - bifacially trimmed crescent (crystalline quartz); **m-s** bifacially trimmed crescents and crescent fragments (obsidian); **t-v** - unifacially trimmed crescents (obsidian); **w** - bifacially trimmed tranchet (chert, burnt and heat-spalled); **x, y** - bifacially trimmed tranchets (obsidian, both very heavily utilised); **z, aa** - minimally backed bladelets (obsidian); **bb, cc** - microlithic scrapers (obsidian).

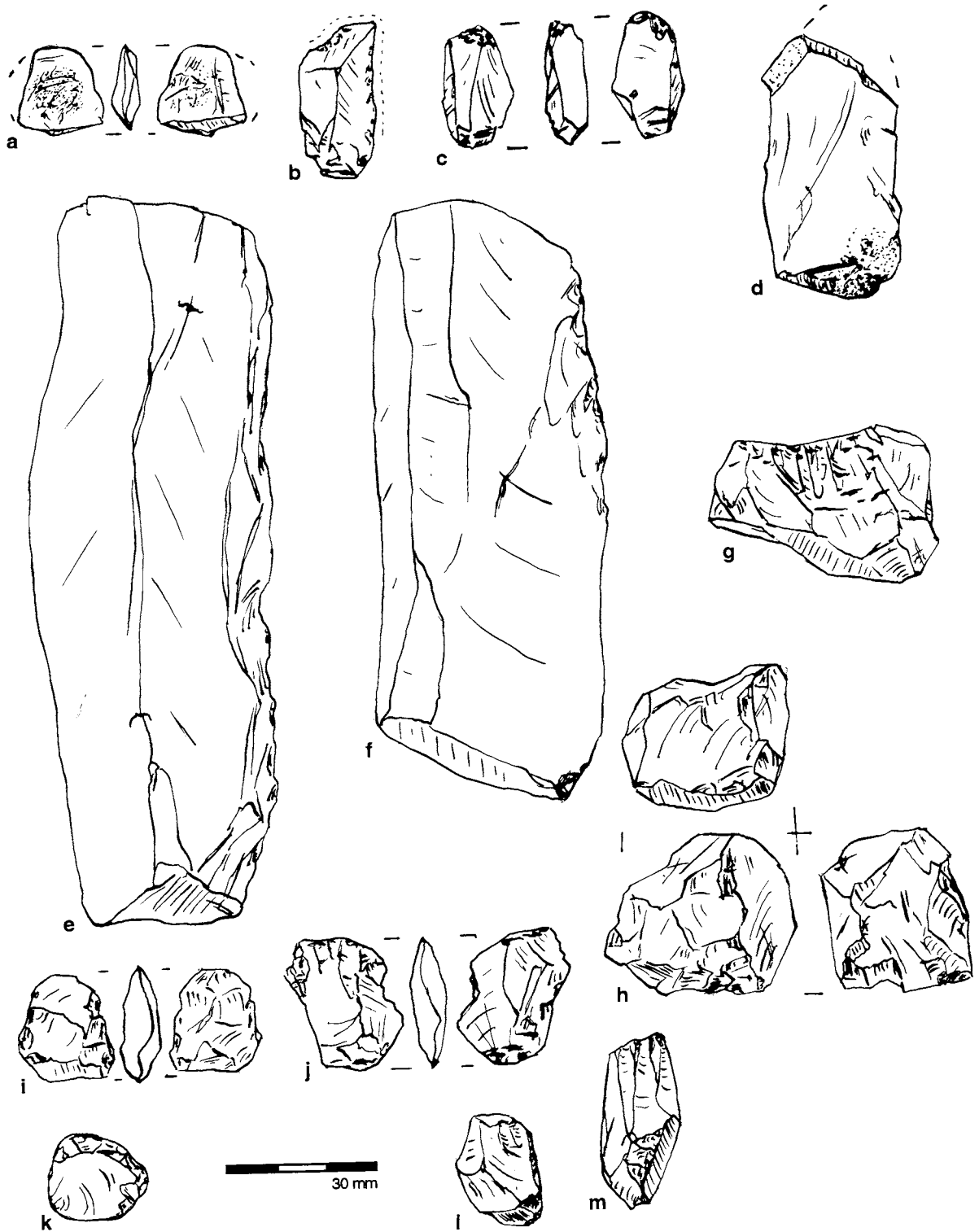


Fig. 313 Utilised lithics and cores excavated from Late Aksumite contexts at D site (dashed lines indicate areas of heavy utilisation and microscarring): **a** - burnisher for unfired pottery (obsidian, heavily scratched on ventral face, finger polished on dorsus); **b** - heavily utilised blade (obsidian); **c** - outil écaillé (obsidian); **d** - flake (chert); **e** - casual knife (phonolitic basalt); **f** - casual knife (basalt); **g** - multi-platform core (chert); **h** - multi-platform core (obsidian); **i-k** - exhausted cores (obsidian); **l, m** - bipolar cores (chert).

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including most pieces with maximum dimensions of less than 3 mm, all of the broken crescent tips and several of the scrapers and larger flakes were not recovered by direct excavation, but from the bulk soil flotation samples. Without this treatment, we would have had a much less comprehensive picture of the lithic assemblages. Had it been possible to treat more of the excavation with such meticulous care, the total of Late Aksumite lithic artefacts would certainly have been several times greater and that of Pre-Aksumite ones many times greater. Some additional tool types might also have been recovered. It was likewise impossible to demonstrate the relationships between architectural elements of the site and the exact findspots and associations of particular lithic implements and

manufacturing or resharpening debris. Such problems must remain to challenge further excavations.

Despite these limitations, it is now incontrovertible that abundant, varied and highly specialised chipped stone artefacts were major components of the material culture in both Pre-Aksumite and Aksumite times (Figs 311-14). Detailed study of these artefacts and of the types and placement of use-wear and resharpening traces which many of them exhibit gives significant information about aspects of the local economy. Similar artefacts recovered from K site and from surface collections are equally significant and revealing (pp. 408-11 and Chapter 13, below).

As may be seen in the tabulation (Fig. 315), significant trends between Pre-Aksumite and Late

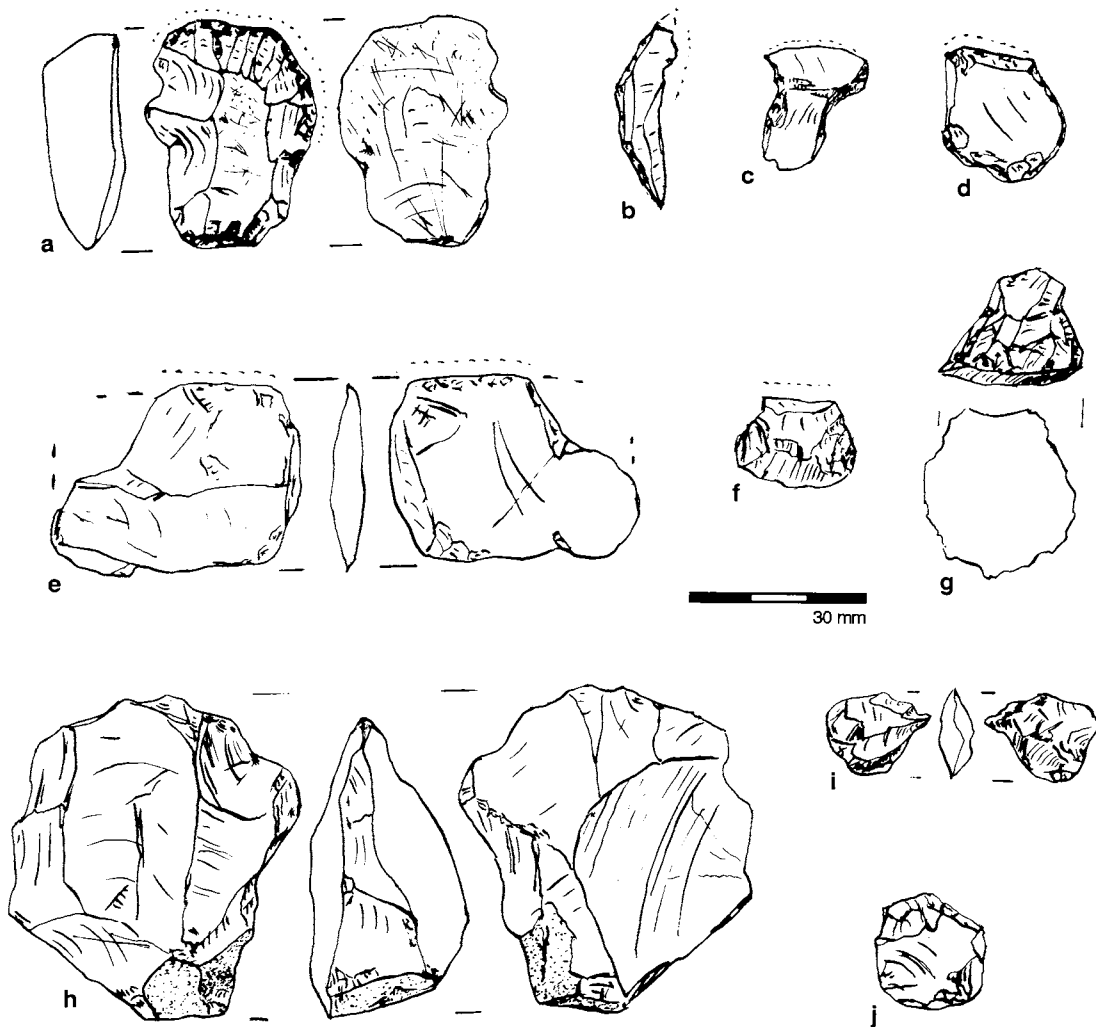


Fig. 314 Lithics excavated from Post-Aksumite / mixed contexts at D site (dashed lines indicate areas of heavy utilisation and microscarring): **a** - steep convex scraper with abrasion marks and parallel scratches on ventral face (obsidian); **b** - unifacially trimmed crescent (obsidian); **c, d** - tranchets (obsidian); **e, f** - Likanos flakes (obsidian); **g** - conical core (obsidian); **h** - plano-convex radial core (basalt, perhaps of pre-LSA date); **i, j** - exhausted cores (obsidian).

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Aksumite times include a greater frequency of steeply retouched scrapers relative to shallow scrapers and the increased use of chert and chalcedony in the Late Aksumite period. The increase in debitage and the reduced proportion of cores in Late Aksumite contexts may also be significant. These factors seem to relate to the Late Aksumite appearance of highly standardised, steeply trimmed chert scrapers which were probably mass-produced elsewhere and used and resharpened at D site. This observation correlates well with assessments of the surface distributions of much larger samples of Gudut and steep convex scrapers in association with Classical and Late Aksumite potsherds (pp. 443, 447). In all periods of the D site occupation, obsidian was apparently imported as a raw material for the production of bladelets, crescents and other microlithic forms, the Late Aksumite backed microliths tending to be smaller than their Pre-Aksumite counterparts. Evidence that the obsidian was probably imported and certainly highly valued is provided by the fact that most of the obsidian cores were fully worked out before they were discarded. The maximum dimensions of the largest obsidian core recovered (Late Aksumite) was 40 mm and the smallest (Pre-Aksumite) was 19 mm. Cores of the locally abundant cherts and chalcedonies were not worked down to such small sizes, nor were they so carefully shaped. No source of glassy obsidian

has yet been located within 10 km of Aksum, though it is reported to be abundant near Mekelle, about 120 km to the southeast. The minute sizes of most of the backed blades and crescents recovered from this site is another suggestive indication of the value of the material from which they were produced, as well as testifying to the considerable technical skill of the producers and employers of such tools.

Another point to be noted concerning the presence in excavated contexts of obsidian artefacts is the extreme fragility of these apparently pristine flakes and fragments, many with maximum thicknesses of less than 3 mm. They can only have been in primary context, not intrusive to the deposits from which they were recovered, as they would have been most unlikely to have survived any processes of exposure, transportation or redeposition. While a few pieces of worked obsidian have been found at surface sites elsewhere in the Aksum area, none were found on the surface at D site despite repeated careful searches.

The lithic assemblages from D site are distinguished from others at Aksum by their greater reliance on obsidian as a raw material, by the presence of Likanos flakes, a tool type not as yet found elsewhere (with the exception of one - presumably redeposited - example from the later fill of the Mausoleum illustrated in Fig. 197, above), and by the absence of angular

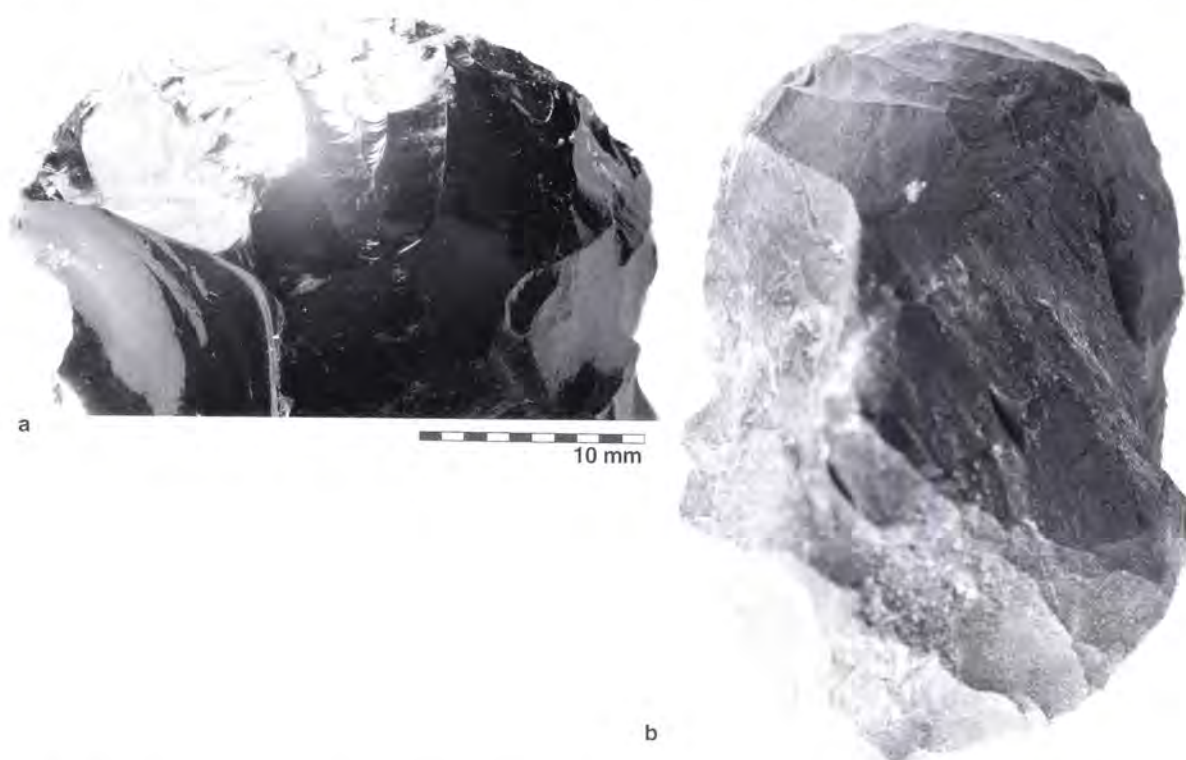


Fig. 316 Late Aksumite steep convex scrapers from D site. **a** is obsidian; **b** is chert. The working edges of both are rounded and polished by use; cf. the unutilised edges shown in Figs 389, 392.

about the patterns and types of use-wear are supported by microscopic studies and replication experiments reported elsewhere (L. Phillipson 2000 a, b).



Fig. 317 Detail of the Late Aksumite soapstone seal shown in Fig. 309c. The tooling marks may be replicated on soapstone by use of a chert scraper.

backed microliths. These points would seem to suggest the possibility of some measure of cultural as well as economic or industrial distinction between the inhabitants of D site and their contemporaneous neighbours.

As the recovered tool sample sizes are not sufficient to permit significant statistical comparison of material from Pre-Aksumite and later contexts, the main lithic tool types are here described together, with emphasis on one of their most interesting features: the distinct and distinctive evidence of use-wear on most of the obsidian tools. These traces are so clear as to be indicative of the specific uses to which the various implements were put and even, in several instances, of the manner in which they were held. Conclusions

Shallow scrapers

These include two Pre-Aksumite concave examples, one of obsidian 16 mm long and one of siltstone 45 mm long. Another concave example, 20 mm long, a slightly convex shallow example 33 mm long, and a broken fragment of a second convex shallow scraper, all of obsidian, are Late Aksumite. These scrapers can all be classed as flake end- or sidescrapers, but are not as highly standardised as the steep scrapers. Edge modification, considerable on some pieces, consists of relatively broad, shallow scars of somewhat irregular size, much of it seemingly resulting from utilisation, perhaps to smooth wooden shafts or similar items of small diameter.

Steep convex scrapers

These are made on flakes or chunks of approximately equal length and breadth and have a trimmed edge which approximates the even curvature of an arc of a circle (Fig. 316). Trimming scars tend to be shallow relative to their width and closely spaced or overlapping, probably made by direct percussion of stone on stone, producing a regular edge which replication experiments have shown is effective at scraping wet or dried hides without cutting, tearing or unduly scratching them. Except for one Pre-Aksumite obsidian specimen, all the steep convex scrapers are of chert, chalcedony or other silicates. In size, shape, range of variation and raw material, they appear identical to the more numerous specimens from surface collections described in Chapter 13, below.

Irregular Gudit scrapers

These are convex endscrapers made on stout endstruck flakes of approximately triangular cross section. Trimming scars are deep relative to their breadth and spaced so as not to overlap, probably produced by pressure or percussion from a narrow metal edge or point. The result is a minutely denticulated or crenellated edge which is unsatisfactory for hide-scraping but demonstrably successful for working wood, soft stone and, probably, ivory (Fig. 317; see also pp. 465-7, below). These scrapers resemble Gudit scrapers (pp. 437-43) in the types of flakes on which they are made and, most importantly, in the type of edge modification, but not in their edge plan which lacks the spurred corner and neat asymmetry of the finest Gudit scrapers. It is postulated that the difference between irregular Gudit and Gudit scrapers lies not in their manufacture, but in the skill with which they were subsequently resharpened. Irregular Gudit scrapers have not been recovered from

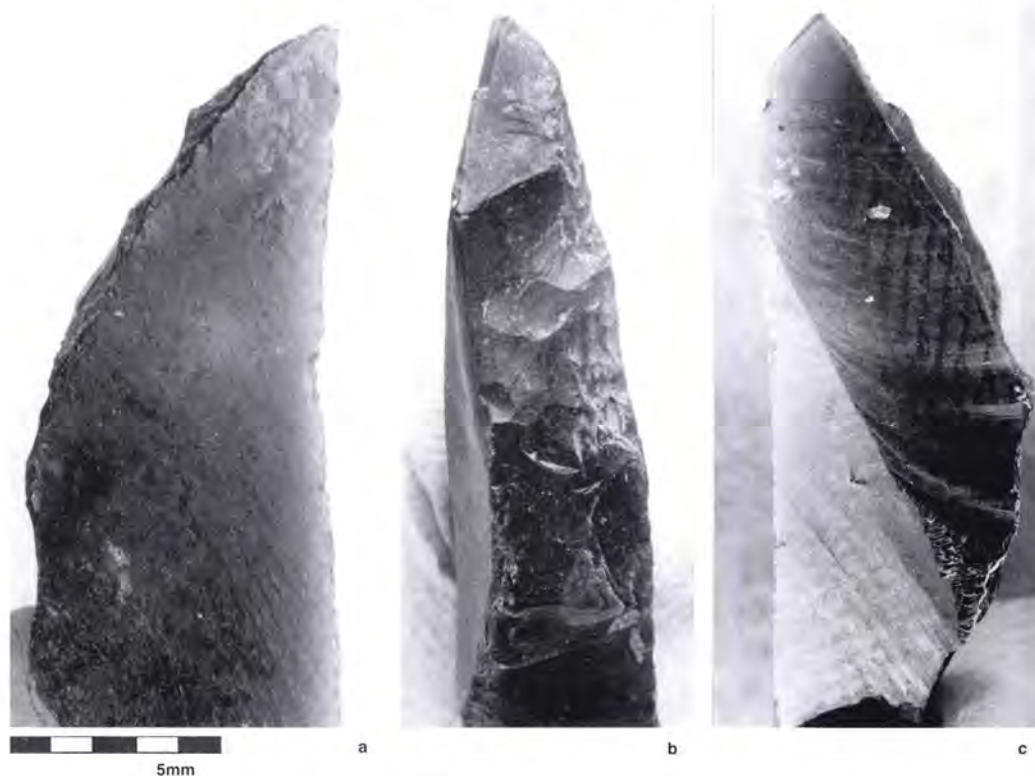


Fig. 318 Late Aksumite obsidian crescents from D site: *a,b* - with surface attrition and abrasion of backing near the distal end; *c* - with broken tip and minute scarring of the sharp edge at the distal end.

the Pre-Aksumite deposits. Neither here nor elsewhere in the area is there good evidence of Gudit, irregular Gudit, nor standardised steep convex scrapers predating Classical or Late Aksumite times.

Backed and utilised bladelets

Some examples show only the most scanty blunting or dulling of the non-utilised edge; others have areas of neat unifacial or bifacial backing along at least a portion of one long edge. All Pre-Aksumite examples and, with the exception of two crystal quartz specimens, all Late Aksumite ones are of obsidian. The dimensions of Late Aksumite examples range from 27 by 12 by 3 mm to just 13 by 6 by 2 mm. Pre-Aksumite specimens have similar proportions, but are from 42 to 29 mm long. Utilisation scars extend over most of the non-blunted long edge, are not concentrated near the tip, and can be duplicated by holding a bladelet lightly between thumb and forefinger and using it to cut delicate fibres, spun thread, or woven cloth.

Crescents

Crescents are very highly standardised in both the Pre-Aksumite and the Late Aksumite assemblages, although at 26 mm long the single complete Pre-Aksumite example is larger than any of the complete Late Aksumite specimens, which are between 22 and 18

mm long (Fig. 318). All crescents and crescent fragments are of obsidian, have neatly curved backs and a more acute point at one end than at the other. While the larger specimens tend to be bifacially backed, the smaller are unifacially backed, often with a small extent of bifacial backing at the more pointed tip. Edge modification and use-wear on the crescents is very distinctive. There is heavy scarring of the sharp edge at and close to the pointed end, moderate to heavy dulling of the arrises of the backed edge, and slight dulling or polishing of the dorsal and ventral faces on some of the pieces. Only one complete Pre-Aksumite crescent was recovered and three complete Late Aksumite examples. Three additional crescents had had their tips broken off, apparently from heavy utilisation. Complementing the broken crescents were two minute crescent tips recovered from Pre-Aksumite contexts and three from Late Aksumite deposits.

Although it is commonly assumed that crescents and similar backed microliths were employed as arrow barbs, clearly these examples were not so used. Heavy abrasion on the backed edges of several specimens demonstrates that they were not mounted in any haft or handle; the type of damage to and breakage of the tips is indicative of the application of sustained pressure, but not of sharp or sudden blows which would have completely shattered the fragile artefacts.

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Recovery of the broken tips in the same deposits as the whole and broken crescents demonstrates that their use and discard took place at D site, most probably in the houses or their courtyards. This combination of wear patterns is consistent with the crescents having been held between thumb and second finger while pressure was exerted by the forefinger resting on the backed edge as the crescent was used to pierce dressed skins or raw hides, perhaps as an initial stage in sewing or decorating leather clothing.

Tranchets

These are apparently the most heavily utilised of the backed microliths; all but one are of obsidian. The single Pre-Aksumite specimen is within the size range of those from Late Aksumite levels: 24 by 22 by 6 mm to 18 by 13 by 5 mm. The one chert example is the largest of the four specimens. Bifacially stepped damage to the utilised edge suggests that these tools were employed for some small-scale chopping or hacking task. That the chert tranchet has been burnt and fire spalled raises the conjecture that the tranchets were used at or near hearths, perhaps in conjunction with the preparation of food.

Utilised flakes

Included in this category are a number of pieces which were apparently employed as casual cutting or scraping implements and a circular obsidian flake from a Late Aksumite context, with a maximum dimension of 19

mm, which was undoubtedly used as a burnisher for unfired ceramic vessels, its smoothly curved ventral surface being much scratched and abraded by the grit and temper of the pottery fabric (Fig. 319). The centre of its dorsal surface is finger-polished and part of the margin has been snapped off. In use, it was held at its edges between the user's thumb and second finger while the forefinger applied considerable downwards pressure as the flake was rubbed firmly on the almost-hard clay fabric to compact and polish it. Small amounts of clay on the potter's finger tip would have been sufficient to polish the flake's dorsal surface. The size and curvature of this object and the actual burnishing marks on Aksumite sherds are compatible. Had there been any doubt, this single utilised flake would be sufficient to demonstrate the contemporaneity of Aksumite lithic and ceramic industries. Other utilised flakes were apparently used as casual cutting or scraping implements.

Likanos flakes

A newly recognised type, these are the most abundant lithic implement recovered from D site. They are rectangular obsidian flakes of approximately equal length and breadth, produced by bipolar percussion of an appropriately shaped core. Subsequent trimming or shaping of these flakes is minimal, being restricted to thinning of the distal and proximal ends of the ventral face if this was needed to give an approximate uniformity of thickness to the flake. On some examples,



Fig. 319 D-site Late Aksumite pot-burnisher in obsidian, ventral and dorsal faces. The pale area on each face is significantly worn or abraded.

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this apparent trimming was probably a consequence of the method by which the flakes were struck, but in other cases it seems to have been the result of deliberate retouch. Likewise, many of the Likanos flakes as struck had one blunt and one sharp long edge; on some examples there was deliberate minimal retouch of a long edge to blunt it. It is not apparent whether the removal of two corners from one edge of some examples represents deliberate retouch or results from subsequent utilisation.

Irregular scaled damage on the sharper long edge is clearly a result of use of the flakes, as are faint scratches, abrasion marks and dulling of the flake surfaces near that edge (Fig. 320). These marks tend to run in directions parallel or at a low inclination to the edge. The blunter edges of the Likanos flakes and the surfaces close to them appear to have been protected from wear by having been encased in a haft or mounting. Their use as parts of composite sickles or knives seems most probable. Pre-Aksumite Likanos flakes range from 46 by 34 by 6 mm to 19 by 17 by 5 mm; Late Aksumite examples from 25 by 17 by 5 mm to 13 by 16 by 3 mm.

The name Likanos is derived from a church and monastery dedicated to one of Ethiopia's Nine Saints (Sergew 1972: 115-17), situated on a hill adjacent to and overlooking D site. Until more work is done on the detailed excavation of non-élite, non-urban Aksumite residential sites and the recovery of all their associated artefactual material, it is not possible to know whether the production and use of Likanos flakes was unique to this site, nor to what cultural, economic or social factors the heavy reliance on obsidian tools at this site may be attributed.

Knives

Two roughly trimmed basalt knives recovered from Late Aksumite deposits are illustrated (Figs 313e, f). These measure 120 by 48 by 16 mm and 149 by 50 by 14 mm. They are not extensively retouched, but owe most of their regular shaping to the natural fracture properties of the stone.

Quartz crystal

A single quartz crystal, 13 mm in length from a Pre-Aksumite context, has a worn and battered tip, probably from its use as an engraving tool, but possibly from a failed attempt to strike flakes from it (Fig. 321a). A backed bladelet of transparent crystalline quartz and an opposed platform core of the same material were also recovered from Pre-Aksumite contexts at D site. Two additional backed bladelets of crystalline quartz were likewise recovered from the Late Aksumite deposits. This raw material is only available in small pieces, is very hard and difficult to work. That

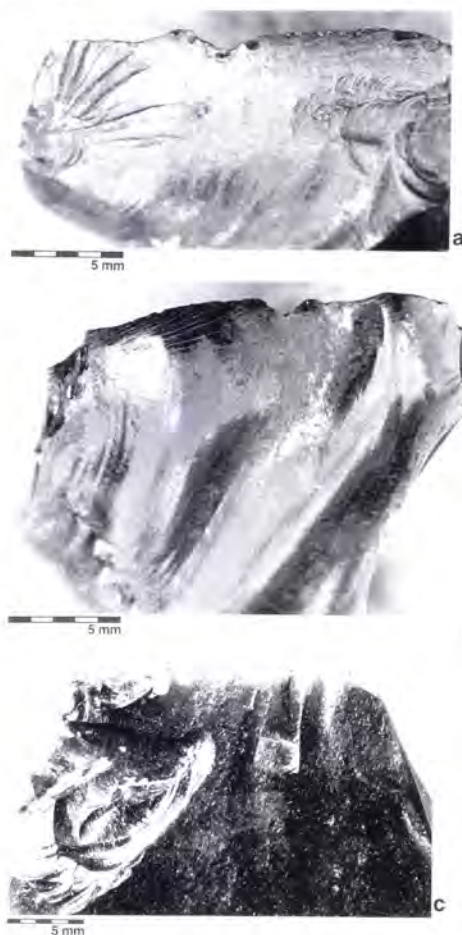


Fig. 320 D-site Late Aksumite Likanos flakes in obsidian. The glossy worn edges are probably silica-polished from use as a component of harvesting knives.

retouched tools were made from it is indicative of the technical expertise of the artisans.

Cores

Almost all cores from all phases, including multi-platform, opposed-platform and exhausted cores, were struck by a bipolar technique. Probably stone on stone percussion was used for the larger cores; a metal punch may have been used to strike the smaller cores. Opposed-platform, multi-platform and exhausted examples are likely to represent stages of a single core reduction sequence rather than distinct core-types. If so, Likanos flakes would have been struck from these cores at an early stage in their reduction, small and very small bladelets in the final stages. Seven of the eight radial cores recovered were of chert or chalcedony; no obsidian radial cores were found.

Evidence for the careful husbanding of obsidian as a raw material is provided by comparing the maximum dimensions of the cores with those of the

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unretouched and utilised obsidian flakes and bladelets. In Pre-Aksumite times, maximum dimensions of the obsidian cores are between 24 and 19 mm, flakes and blades are from 42 to 27 mm long. Late Aksumite obsidian cores have maximum dimensions between 40 and 19 mm, while corresponding flakes are from 39 to 14 mm long. The cores must have begun as obsidian lumps with maximum dimensions of about 40 mm or somewhat larger and been reduced until they were too small to work further or to produce usable flakes or blades (Figs 321b, c).

Debitage

Although the unretouched flakes, flake fragments, chips and chunks were measured and tabulated according to their raw materials, no significant trends were noted in their distributions. The rate of recovery may have been as much a product of the excavation techniques as of the processes of stone tool manufacture.

ECONOMIC INFERENCES

From the evidence of the lithic tools, it is possible to infer a number of economic activities, which do not



10 mm

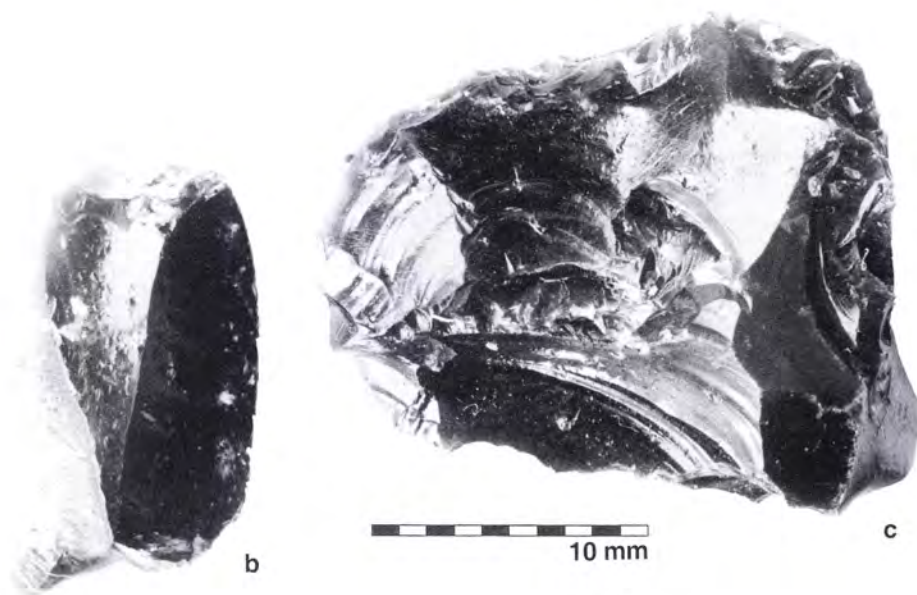


Fig. 321 Quartz crystal and exhausted cores from D site: **a** - Pre-Aksumite quartz crystal with a heavily utilised tip; **b, c** - Late Aksumite exhausted cores (obsidian), the final flakes removed would have been about 10 mm long.

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seem to have changed in any marked fashion between the Pre-Aksumite and Late Aksumite periods of occupation at D site. The constancy of lithic tool types is at least suggestive of a major continuity of population and of fundamental agrarian economy during a period in which significant political and élite cultural innovations were instituted.

At D site, cores of imported high-grade glassy obsidian were used to produce minute bladelets for fashioning into delicate crescents and backed pieces. So tiny are these implements that it may be conjectured that this work was done by children or young adults with keen eyesight whose fingers had not become dulled by rougher work. Although the backed microliths and Likanos flakes are well standardised and technically accomplished, they are not so numerous as to suggest mass-production for a market economy.

Particularly in Late Aksumite times, locally available chert and chalcedony were more extensively worked, but the few tools found in these materials are not sufficient to account for the number of cores and amount of debitage recovered. If, as at other local sites, chert was the preferred material for industrial tools, particularly skin dressing, their use is most likely to have taken place away from the immediate D-site residential area. The steep convex and, in Late Aksumite contexts, irregular Gudit scrapers indicate that skins or hides were dressed and wood and perhaps ivory worked. The several concave scrapers were most probably used for shaping and finishing narrow shafts or spindles. While these could have been arrow shafts, nothing suitable for use as arrow points or barbs was recovered from the site and the production of shafts of smaller diameter seems more probable; bone or ivory bodkins or spindles for producing thread are likely. It is suggested that the crescents were used to pierce stitching holes in hides or leather and that other backed and utilised bladelets may have served to cut threads, cloth or fibres. Taken together, these tools seem to provide evidence for the production of leather garments, woven cloth and/or basketry and matting at D site. The other major class, that of the Likanos flakes, gives evidence of the manner in which cultivated grain was harvested. The rectangular shape of the flakes makes it most likely that they were set into straight sickles or knives, not into curved shafts.

HUMAN SKELETAL REMAINS

(Helen Cook)

The human remains from D site came only from two contexts, both of them Pre-Aksumite: a single adult tooth from D22 and a small group of juvenile bones from D19.

The tooth from D22 is a lower second premolar lacking dental calculus which may have been lost after excavation. Lovejoy's dental attrition criteria⁴⁵ (cited in White 1991: 312) suggest that the owner was between 35 and 45 years old at death or when the tooth was lost. The crown enamel displayed the horizontal striations of dental hypoplasia. At some time during the tooth's formation its owner suffered from severe stress, perhaps due to life-threatening disease or extreme nutritional hardship (Langsjoen in Aufderheide and Rodriguez-Martin 1998: 405-7).

The bones from D19 include four deciduous teeth, five limb bones, some rib fragments, one scapula and a partial cranium consisting of the left and right petrous portions of the temporal bone, maxillary sinus fragments, a broken frontal crest, and parietal fragments. The bones are hard, moderately mineralised and light brown in colour, showing signs of having been exposed to fire or mineral-rich associations such as limestone. The skull bones are small, thin and unfused, belonging to a foetus or neonate. The left ulna and radius are also foetal. The humerus and left femur are from a child aged at least five years at death (W.Bass 1995: 150, 221). Dental development has been assessed following Ubelaker (cited in W.Bass 1995: 303-4). The four deciduous teeth include an unerupted lower canine with no root growth (age 3 to 9 months), a lower second molar that has a root but no wear facets or attrition (age 12 to 24 months), a lower first molar and root with very small inter-proximal wear facets but no occlusal attrition (age 2 to 3 years), and an upper first molar and root with a small crown carries on the disto-lingual surface and the occlusal surface slightly worn (age 12 to 24 months). This last tooth also has an example of the extra cusp known as Carabelli's Cusp, examples of which occur in most modern populations (W.Bass 1995: 296). It is clear that the human remains from D19 do not derive from an *in situ* burial but represent at least three individuals: a toddler, an infant in its first year and an unborn baby.

ARCHAEOBOTANY

(Sheila Boardman)

Pre-Aksumite period

Pre-Aksumite deposits were sampled in trenches D13/23 and in D19/22. In total, samples from 29 individual contexts yielded charred plant material, to a total of 1057 quantifiable specimens. Detailed tabulations are available in the Project Archive; a summary is provided here in Fig. 322.

⁴⁵ These criteria are based on prehistoric Native American populations.

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	<i>Trenches</i>			
	D13	D23	D19	D22
CEREALS				
Oat (<i>Avena</i> sp.)	4	-	-	8
Teff (<i>Eragrostis tef</i>)	-	-	5	13
? teff (<i>E. cf. tef</i>)	-	-	15	25
Barley (<i>Hordeum vulgare</i>)	-	-	4	-
Barley (<i>Hordeum</i> sp)	43	2	5	27
Emmer (<i>Triticum dicoccum</i>)	8	2	7	7
Wheat (<i>Triticum</i> sp.)	2	1	3	6
indeterminate	36	5	8	39
LEGUMES				
Lentil (<i>Lens culinaris</i>)	-	-	1	3
Vicieae	1	-	-	3
OIL & FIBRE CROPS				
Noog (<i>Guizotia abyssinica</i>)	-	-	4	5
Flax (<i>Linum usitatissimum</i>)	4	-	12	43
WILD SEEDS & FRUITS				
Brassicaceae	2	12	-	3
Chenopodiaceae/Amaranthaceae	1	-	-	6
Compositae	16	-	-	9
Fabaceae	-	4	2	8
<i>Galium</i> sp.	-	-	-	1
Labiatae	2	-	-	-
Poaceae	-	112	10	279
Polygonaceae	-	-	-	2
Rubiaceae	-	-	-	1
<i>Rumex</i> sp.	4	-	-	1
Solanaceae	-	1	7	12
<i>Trifolium</i> sp.	-	-	-	4
Umbelliferae	-	-	2	17
indeterminate	14	32	35	107
Total quantifiable remains	137	171	120	629
Total contexts sampled	4	7	3	15

Fig. 322 Archaeobotanical materials identified from Pre-Aksumite contexts at D site.

Productive deposits in D13/23 attributed to phases 1C, 1D and 2A included internal and external floors and surfaces, make-up layers, pit fills and wash layers in the main building and its associated external deposits. Crops represented included hulled two row barley (*Hordeum vulgare*), emmer wheat (*Triticum dicoccon*), indeterminate wheat (*T. sp.*, which may also include breadwheat *T. aestivum*), linseed (*Linum usitatissimum*) and a legume (Vicieae). The grasses (Poaceae) present in many samples include species of *Eragrostis*. Turgid grains of the latter were absent, however, and all grains were well below 1 mm in length. Therefore, grains of definite teff (*E. tef*) and probable teff (*E. cf. tef*) are considered to be absent

from these deposits.⁴⁶ Other African and Ethiopian crops, such as finger millet (*Eleusine coracana*), sorghum (*Sorghum bicolor*), noog (*Guizotia abyssinica*) and cotton (*Gossypium* sp.), were also absent from these samples. The other seeds and fruits come from the Brassicaceae, Chenopodiaceae/Amaranthaceae, Compositae, Fabaceae, Labiatae, Polygonaceae and Solanaceae families, all of which are well represented at Aksum. Indeterminate fragments of nutshell were recovered from two samples.

Charred plant material was found trampled into the uppermost 0.2 m of the natural clay in D19,

⁴⁶ Classification of material attributed to *Eragrostis*, with particular reference to the recognition of cultivated teff, is discussed in Appendix VII.

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while in both D19 and D22 it was present in contexts extending throughout the building sequence attributed to phases 2A, 2B, 3A and 3B. This occupation was, however, overlain by substantial Late Aksumite deposits: as noted above (pp. 301-3), a certain amount of admixture had taken place, as was confirmed by the results of radiocarbon analyses, discussed below (pp. 372-5). In addition to the plants noted above from D13/23, the following were represented in apparently Pre-Aksumite contexts of D19/22: teff (*Eragrostis tef*), probable teff (*E. cf. tef*) (plus *Eragrostis* sp.), oat (*Avena* sp.), lentil (*Lens culinaris*), a large-seeded legume (Viciae), noog (*Guizotia abyssinica*), and cotton (cf. *Gossypium* sp.), Poaceae, *Rumex* sp., Umbelliferae and further indeterminate seeds, fruits and nut shell fragments. The evidence for admixture with more recent deposits renders it unsafe to assume that all these plants are correctly assigned to the Pre-Aksumite phases. In particular, material from contexts (94), (104), (260), (277) and (320) is considered probably intrusive, as was confirmed in the case of (277) by AMS dating (OxA-8228) of a cotton seed. There is thus no convincing evidence for the presence of Pre-Aksumite cotton, oat, teff or noog at D site.

In both D13/23 and D19/22 hulled barley (*Hordeum* sp.), emmer wheat (*Triticum dicoccon*) and oat (*Avena* sp.) were recovered, together with the oil and fibre plant linseed (*Linum usitatissimum*). A single indeterminate pea (Viciae) came from D13. If the problematic contexts in D19/22 are omitted, both definite teff (*Eragrostis tef*) and probable teff (*E. cf. tef*) are excluded from the Pre-Aksumite list, although possibly wild *Eragrostis* sp. remains. Lentil (*Lens culinaris*), noog (*Guizotia abyssinica*) and cotton (*Gossypium* sp.) are also excluded.

There is, however, clear evidence from the direct AMS dating of charred seeds that emmer wheat (*Triticum dicoccon*) was cultivated in Pre-Aksumite times, two samples having been dated, OxA-8229 from D13(2) and OxA-8282 from D22(349), attributed respectively to phases 2A and 1B/2B. A sample of barley (*Hordeum vulgare*) grains recovered from a phase-9A context, D19(35), but presumably redeposited, also yielded a date late in the Pre-Aksumite range (OxA-8285).

Fig. 322 summarises the possible crops, including those from the contexts - D19(94), D19(104), D22(260), D22(277) and D22(320) - where there is thought to be significant possibility of mixture with later material. When these problematic contexts are excluded, the Pre-Aksumite plant assemblage is so small that any conclusions drawn from it must be regarded as highly tentative.

The Pre-Aksumite crops most firmly attested at D site thus appear to be largely Near Eastern in

origin with the possible, but by no means definite, exception of teff. The position of oat is unclear: it is found in many contexts but without its floret bases, so its species cannot be ascertained. There are no records of oat being cultivated as a crop in its own right in the Ethiopian highlands although, today, it is a frequent weed of other crops.

Late Aksumite period

Deposits attributed to Late Aksumite phases 4 to 13 were sampled in trenches D16, D19 and D22. Samples from 85 contexts yielded charred plant remains, to a total of 8024 quantifiable specimens (Fig. 323). As noted above, many contexts contained residual Pre-Aksumite pottery and there is no reason to believe that the archaeobotanical materials have not suffered similar admixture.

The radiocarbon dates, however, show remarkable consistency: of eight crop-material samples from Late Aksumite contexts one (noted above) gave a result in the Pre-Aksumite range, and one - chickpea from phase-10 D19(40) - was evidently post-Aksumite (OxA-8286). The other six fell clearly in the Late Aksumite period, confirming that the following crops were definitely available at that time: barley (OxA-8283) from phase-7B D19(100) and (OxA-8337) from phase-9A D22(220), lentil (OxA-8983) from phase-7B D19(95), gourd (OxA-8230) from phase-10 D16(26), linseed (OxA-8231) from phase-11 D16(18), and grape (OxA-8287) from phase-12/13 D22(248).

In deposits attributed to the earliest Late Aksumite phase, 4, hulled barley, emmer wheat and oat are accompanied by numerous *Eragrostis* seeds including teff and probable teff. Lentil and indeterminate pea (Viciae) were also recovered. There was a concentration of linseed and noog seeds in D22(317), and one cotton seed was recovered from pit-fill D22 (347) together with traces of grape (*Vitis vinifera*) and gourd (*Lagenaria siceraria*). *Brassica* seeds were more numerous than in Pre-Aksumite contexts and may indicate use of additional vegetables, oil-rich species, condiments and/or medicinal plants. Likewise, the Fabaceae and Poaceae may incorporate important additional crops such as fenugreek (*Trigonella foenum-graecum*) and/or forage plants that were not identified in the limited study seasons. The smaller seeds and fruits included *Chenopodium* sp., Chenopodiaceae/ Amaranthaceae, *Galium spurium*, *Galium* sp., Malvaceae, *Plantago* sp., *Rumex* sp. and Solanaceae. The wild plants incorporate a number of possible weeds of cultivation, but of which crops, we cannot tell. The charred seeds in D22 contexts (347) and (317) are probably derived from domestic activities nearby; possibly from hearth and floor sweepings which incorporated debris from a number of small-scale cleaning

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	Phases				
	4-5	6-7	8-9	10-11	12-13
CEREALS					
Oat (<i>Avena</i> sp.)	26	10	21	76	4
Finger millet (<i>Eleusine coracana</i>)	-	-	-	2	-
Teff (<i>Eragrostis tef</i>)	96	-	8	89	13
? teff (<i>E. cf. tef</i>)	114	-	9	94	13
Barley (<i>Hordeum vulgare</i>)	-	-	-	1	-
Barley (<i>Hordeum</i> sp.)	39	53	40	103	21
Sorghum (<i>Sorghum</i> sp.)	-	-	1	-	-
Emmer (<i>Triticum dicoccum</i>)	25	24	1	23	1
Breadwheat (<i>Triticum aestivum</i>)	-	1	-	6	-
Wheat (<i>Triticum</i> sp.)	12	7	13	27	3
indeterminate	65	47	-	78	17
LEGUMES					
Chickpea (<i>Cicer arietinum</i>)	-	5	2	17	-
Grass pea (<i>Lathyrus sativus</i>)	-	6	-	18	1
Lentil (<i>Lens culinaris</i>)	5	6	-	22	1
Pea (<i>Pisum</i> sp.)	-	-	-	4	1
Faba bean (<i>Vicia faba</i>)	-	1	-	6	-
Vicieae	4	7	13	55	3
OIL & FIBRE CROPS					
Noog (<i>Guizotia abyssinica</i>)	22	1	6	96	8
Flax (<i>Linum usitatissimum</i>)	52	70	27	164	2
Cotton (<i>Gossypium</i> sp.)	1	4	11	285	3
OTHER CROPS					
Gourd (<i>Lagenaria siceraria</i>)	1	2	-	26	1
Cress (<i>Lepidum sativum</i>)	-	-	1	9	1
Grape (<i>Vitis vinifera</i>)	1	-	-	1	1
WILD SEEDS & FRUITS					
Brassicaceae	51	2	7	220	7
Caryophyllaceae	-	8	-	1	1
Chenopodiaceae/Amaranthaceae	14	-	2	35	5
Compositae	41	2	3	21	37
Convolvulaceae	-	-	-	3	-
<i>Cordia africana</i>	-	1	-	-	1
Cyperaceae	-	-	1	6	-
Fabaceae	2	3	1	95	4
<i>Galium</i> sp.	20	1	5	83	1
Labiatae	-	-	-	5	-
<i>Lepidum</i> sp.	-	1	4	13	-
Malvaceae	2	2	2	4	-
<i>Menticago</i> sp.	-	-	-	1	-
<i>Plantago</i> sp.	1	-	2	2	-
Poaceae	922	120	281	1721	294
Polygonaceae	-	1	2	4	2
Resedaceae	-	1	-	5	1
Rubiaceae	-	-	6	2	-
<i>Rumex</i> sp.	1	-	2	26	17
Solanaceae	20	33	27	72	5
Umbelliferae	-	-	-	3	-
<i>Verbena</i> sp.	9	1	-	16	-
indeterminate	337	185	176	736	117
Total quantifiable remains	1883	605	674	4276	586
Total contexts sampled					
(D16)	-	-	3	11	2
(D19)	-	5	5	15	3
(D22)	<u>9</u>	<u>-</u>	<u>18</u>	<u>8</u>	<u>6</u>
	9	5	26	34	11

Fig. 323
Archaeobotanical
materials identified from
Late Aksumite contexts
at D site.

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operations, cooking accidents, and so on. It should also be borne in mind, however, that all these phase-4 contexts contained mixed Pre-Aksumite and Late Aksumite pottery: disturbance and redeposition may also have involved plant material.

The crops and possible crops represented in contexts of phases 5 and 6 are teff, hulled barley, emmer wheat, indeterminate wheat, oat, lentil, a legume (Viciae), noog and linseed. The seeds and fruits of wild plants include *Amaranthus* sp., *Brassica* sp. and Brassicaceae, *Chenopodium* sp., Chenopodiaceae/Amaranthaceae, Compositae, Poaceae, Solanaceae, *Verbena* sp. and *Lepidium* sp., which may indicate cress (*Lepidium sativum*). As previously, some admixture is likely.

Contexts attributed to phase 7 yielded few plant remains, mostly poorly preserved. The one exception, D19(95), overlying elite structure (96), is a rubble/make-up deposit which may have incorporated a dump of plant material including the earliest examples in D19/22 of chick pea (*Cicer arietinum*), grass pea (*Lathyrus sativus*), fava or faba bean (*Vicia faba* var. *minor*) and bread wheat; also identified were hulled barley, emmer wheat, oat, indeterminate cereals, lentil, and cotton, plus some wild plants, predominantly grasses. On stratigraphical grounds, the three legumes are the earliest such finds recorded at Aksum. Another interesting find from D19(95) was a fruit stone from the edible fruit of Sudan teak (*Cordia africana*). Indeterminate fruit-stone fragments recovered throughout the deposits may also mostly be from this species.

Phase 8 in D19/22 saw the establishment of a building complex (10) and associated features which remained in use throughout the rest of the D-site Late Aksumite occupation. Charred grains and seeds were recovered from room floors, yard surfaces, pits, post-holes, internal and external make-up layers, lenses of wash and demolition rubble. The plant remains from phase-8 samples were extremely sparse. The majority came from floor deposits in rooms A and B of building 10, and from the associated yard. Crops represented included barley, indeterminate wheat, a legume (Viciae) and linseed; plus possibly oat, teff (only *Eragrostis* sp. seeds) and *Brassica* sp. Wild plants included *Galium* sp. and Rubiaceae, Malvaceae, *Plantago* sp., Poaceae, *Rumex* sp. and Polygonaceae and Solanaceae. To phases 8A to 9A are attributed the earliest material in D16 room D where, in addition to the plants noted above, a pea (Viciae undifferentiated), linseed and sorghum (*Sorghum* sp.) were represented, the last by a single grain.

In phase 9, major alterations were made to building (10) and the round-cornered building (27) was erected to its south. Plant remains were recovered from the floor of building (27), from yard surfaces and from

mixed floor/make-up layers in rooms FF and II of building (10) in D22, as well as from the core of an associated wall. In addition to the crops represented in phase 8, the following were identified: teff and probable teff, emmer wheat, bread wheat, chick pea, noog, cotton, possible cotton and cress. The presence of bread wheat in a Late Aksumite context is confirmed by the single rachis internode from D22(275) representing floor repair or make-up in room FF of building (10). Wild plants included *Lepidium* sp. and Brassicaceae, *Chenopodium* sp., Compositae, Cyperaceae, *Galium* sp. and Rubiaceae, *Medicago* sp., Poaceae, *Rumex* sp. and Polygonaceae and Solanaceae. While the charred remains from these phases were generally very sparse, small concentrations of material in samples from the yard surfaces and room FF hint that some crop-related activity continued in these areas. The floor of building (27) yielded only two seeds, one a grass and the other unidentifiable, providing no indication of this round-cornered structure's function.

During phases 10 and 11, building (10) in D19/22 was again altered several times and building (27) was given a new floor and then demolished. Samples attributed to these phases were exceptionally rich in plant material, notably floors in rooms D, F, H, J, L, K, JJ, LL and KK, an external surface, possible occupation debris, pit fills, make-up, washand various infill, rubble and blocking deposits. Similar abundance was noted for these phases in D16, rooms A, B, C and D. The crops and possible crops represented almost the full range of Late Aksumite crops and possible crops identified from Late Aksumite D site: teff, probable teff, two-row barley, hulled barley, emmer wheat, bread wheat, indeterminate wheat, oat, chickpea (*Cicer arietinum*), grass pea (*Lathyrus sativus*), lentil (*Lens culinaris*), pea (*Pisum sativum*), fava or faba bean (*Vicia faba* var. *minor*), indeterminate pea (Viciae), noog, linseed, cotton, possible cotton, gourd (*Lagenaria siceraria*), grape (*Vitis vinifera*), cress and *Brassica* sp.. These phases yielded the only two grains of finger millet (*Eleusine coracana*) recovered at D site. A phase-11 sample from wall blocking (38) between rooms A and F of building (10) produced, stratigraphically, the earliest pea (*Pisum* sp.) from D site. The smaller seeds and fruits included *Lepidium* sp. and Brassicaceae, Caryophyllaceae, *Amaranthus* sp. and Chenopodiaceae/Amaranthaceae, Compositae, Cyperaceae, Fabaceae, *Galium spurium*, *Galium* sp. and Rubiaceae, *Plantago* sp., Poaceae, *Polygonum* sp., *Rumex* sp. and Polygonaceae, Resedaceae, Solanaceae, Umbelliferae, *Verbena* sp. and indeterminate seeds, fruits and fruit stone fragments. Among the wild plants is a range of taxa which could include weeds of cultivation: e.g. Brassicaceae, Chenopodiaceae/Amaranthaceae, *Galium spurium*, *Galium* sp., Poaceae,

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Polygonum sp., *Rumex* sp. and Polygonaceae. In building (10), floor deposits in rooms D and L, make-up in room K and the yard surface proved particularly rich, producing a mixture of cereals, pulses, oil and/or fibre plants, vegetables and other possibly useful plants (e.g. cress, *Brassica*/Brassicaceae), probably resulting from a range of different sources and activities. The mixture of crops and absence of chaff and other crop-cleaning debris make it difficult to be precise about the crop-processing activities which took place in the various areas. In these phases, however, there is also a marked increase in the number of grindstones, pounders and rubbing stones recovered from room-floors and from the yard. (Prior to phase 9 such artefacts, significantly rarer, were largely confined to wash or other re-deposited contexts.) This suggests a substantial amount of grinding, possibly together with other final, crop-processing activity, in and around building (10). The upper fill of pit (234) produced charred plant material (including at least seven crops), a grindstone, large amounts of animal bone, some ivory fragments and a quantity of Late Aksumite pottery indicating use for a wide range of domestic refuse. In trench D16 a similar increase in such finds was noted in contexts of phases 10 and 11 although these, described as infill or midden, may largely comprise material derived from elsewhere. These rooms exposed in D16 may have become filled gradually and discretely, as refuse accumulated from occupation nearby, or by material removed from other areas containing earlier plant material: the mixed pottery from these contexts supports the latter possibility although the excavator suggested that the room C infill - D16(19) - was largely composed of demolition material from room C itself.

In phases 12 and 13, the final alterations were made to building (10) in D19/22 before it was abandoned and/or demolished. To the east, evidence of more limited activity is provided by a number of pits and a post-hole, the fills of which yielded small amounts of plant material, as did door-blocking, and terrace back-fill deposits. Only an infill or make-up layer in room M of building (10) produced plant material in any quantity. The crops and possible crops here were hulled barley, wheat, oat and possibly teff (only *Eragrostis* sp. seeds were identified), plus grass pea, lentil, noog, linseed, cotton, gourd and *Brassica* sp. Other deposits of these phases yielded teff, pea, cress and grape; the last has been dated (OxA-8287). The smaller seeds and fruits included Brassicaceae, Caryophyllaceae, Compositae, Fabaceae, *Galium* sp., *Plantago* sp., Poaceae, *Rumex* sp., Resedaceae and Solanaceae. A single fruit stone of Sudan teak (*Cordia africana*) was also recovered. Deposits in D16 are also attributed to these phases: they yielded teff, possible

teff, indeterminate cereal grains and remains of wild plants (Brassicaceae, Poaceae, Solanaceae).

The evidence for Late Aksumite crops is far more abundant and comprehensive than that for their Pre-Aksumite counterparts. It may also be more secure stratigraphically since, although the site has been cultivated in post-Aksumite times, there is no evidence that this has involved large-scale disturbance of the underlying deposits. The general integrity of the Late Aksumite plant material is supported by the radiocarbon determinations. The Pre-Aksumite crops continued in evidence, with the addition of thirteen others: African crops now firmly attested are noog, cotton, finger millet (*Eleusine coracana*) and sorghum (*Sorghum bicolor*), while the evidence for cultivated teff is now conclusive. New Near Eastern crops comprise bread wheat (*Triticum aestivum*), lentil, pea (*Pisum sativum*), grass pea (*Lathyrus sativus*), fava or faba bean (*Vicia faba* var. *minor*) and chick pea (*Cicer arietinum*). Grape (*Vitis vinifera*), gourd (*Lagenaria siceraria*) brassicas (*Brassica* spp.) and cress (*Lepidium sativum*) are also indicated. The increase in African crops is thus not associated with any decline in foreign ones; the pattern is rather one of general diversification of cereals, pulses, oil/fibre plants, fruits and vegetables. The increase in pulses will have helped, by accident or design, to maintain soil fertility. The broadening of the range of cultigens may indicate economic intensification and increasing specialisation, perhaps accompanying the shift towards a market economy. The remains of edible wild plants appear to be rare in these deposits, but this may be largely due to the limited identifications so far carried out on the smaller seeds and fruits.

Wood charcoal

The few samples identified by Rowena Gale indicate that the following tree and shrub taxa probably grew locally during the Pre-Aksumite period: *Aconkanthera*, *Combretum*, *Ficus* and *Olea*. With the exception of *Combretum* (possibly from scrub or bushland?), these are characteristic of dry single-dominant Afromontane forest, which occurs today in the northwest Ethiopian Highlands at altitudes between roughly 2200 and 3200 m (Friis 1992). These forests are typically dominated by *Juniperus* and *Olea*, and are thought to be part of the original, indigenous forests of the region. Late Aksumite material again included taxa which are predominantly associated today with dry single-dominant Afromontane forest (i.e. *Acokanthera*, *Rhus* type, *Ficus* and *Maesa* type). Two other taxa tentatively identified, *Ilex mitis* type and *Pittosporum* type, may represent this or other types of upland plant community, such as montane evergreen bushland (Friis 1992).

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ARCHAEOZOOLOGY
(*Chester R. Cain*)

Approximately two-thirds of the faunal assemblage excavated at D site was studied and recorded during the 1996 and 1997 field seasons. 13,559 fragments were analysed from hand-collected faunal samples obtained in trenches D1 to D4, D6 to D8, D12 to D14, D16 and part of D22. No faunal remains were recovered from D5, D9, D10, D11, D20 and D21. D15, D17 to D19, part of D22 and D23 were not studied.

For analysis, the material was grouped as Pre-Aksumite or Late Aksumite within excavation units. The small quantities of faunal material recovered from the exploratory trenches D1 to D12 was generally eroded and very fragmented; it was also, I suspect, affected by density-mediated modification (*e.g.* Binford 1978; Lyman 1984, 1994). It is not therefore included in the main analysis and discussion, which is based on a total of 9454 specimens from Pre-Aksumite contexts in D13 and D22 and from Late Aksumite contexts in D16 and D22. Faunal remains from individual rooms and features were not studied separately because sample

sizes would be too small to be meaningful and because much bone came from redeposited contexts. The recording and analytical methods employed are explained in Appendix VIII.

Species representation

The species identified at D site are listed in Fig. 324. Most identifiable remains were from domestic species: cattle, sheep, and goat. As in other non-élite areas of ancient Aksum, cattle was the most common taxon identified, followed by caprines. Identification of both sheep and goat was based on Boessneck's (1969) criteria but, with only three elements so identified, discussion of their respective frequency is not practicable. Additional domestic species were dog, equid (perhaps donkey), and chicken. Approximately 10% of the assemblage represented non-domestic species. The Pre-Aksumite contexts at D site show less taxonomic diversity, perhaps because their faunal assemblages are smaller than those from later contexts, although canids, wild bovids and hippopotamus (ivory) were also recorded. D16 has a restricted taxonomic diversity for its assemblage size, but hippopotamus/elephant, fish and possible chicken were recorded. The Late Aksumite assemblage from D22 included elephant (ivory)

	<i>Pre-Aksumite</i>			<i>Late Aksumite</i>		
	D13	D22	Total	D16	D22	Total
<i>Bos</i> /cf. <i>Bos</i>	185	31	216	163	327	490
Caprine/ <i>Ovis</i> / <i>Capra</i>	5	-	5	3	12	15
<i>Equus</i> sp./cf. <i>Equus</i>	1	1	2	1	-	1
<i>Canis familiaris</i> /Canid	1	5	6	-	-	-
Rodent	-	-	-	-	1	1
Alcelaphinae	1	-	1	-	-	-
cf. Antilopinae	-	1	1	-	-	-
cf. Hippotraginae	-	1	1	-	-	-
cf. <i>Tragelaphus scriptus</i>	1	-	1	-	-	-
<i>Loxodonta afr.</i> /cf. <i>Loxo</i>	-	-	-	-	68*	68
<i>Hippopotamus amphibius</i> /cf. <i>Hippo.</i>	2	-	2	1	-	1
<i>Gallus gallus</i> /cf. <i>Gallus</i>	-	-	-	1	2	3
Other birds/cf. <i>Aves</i>	5	-	5	2	1	3
Not identified	2696	626	3322	2304	6568	8872
Total	2897	665	3562	2475	6979	9454

*highly fragmented

Fig. 324 Faunal taxa (NISP) from D-site contexts. Specimens from flotation samples, which included fish from Late Aksumite contexts, are excluded.

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Element	Pre-Aksumite		Late Aksumite	
	D13	D22	D16	D22
Metacarpal	7.3%	5.4%	0.8%	5.2%
Metatarsal	5.7%	5.4%	3.8%	5.2%
Astragalus	0.8%	-	2.5%	0.8%
Calcaneum	0.8%	-	1.9%	0.4%
Femur	4.5%	5.4%	8.8%	4.0%
Tibia	1.2%	1.1%	4.6%	1.2%
Humerus	4.5%	10.9%	9.3%	4.0%
Radius	7.3%	-	7.2%	1.2%
Ulna	4.0%	-	2.3%	1.5%
Scapula	7.3%	2.2%	7.4%	6.8%
Pelvis	4.9%	3.3%	1.5%	2.1%
Vertebral	1.6%	3.3%	2.3%	6.2%
Rib	1.6%	8.7%	5.9%	21.8%
Cranial	2.4%	5.4%	2.3%	2.2%
Mandibular/ Maxillar	-	-	5.3%	7.2%
Mandibular	10.5%	4.3%	4.0%	4.9%
Teeth	35.6%	44.6%	30.1%	25.4%
	N = 247	N = 92	N = 475	N = 853

Fig. 325 Body-part representation by selected skeletal element (NISP) for size-class III ungulates in D-site contexts.

and chicken, having a greater range of species than others at D site, but fewer than those at K site.

Body part representation

The recovery methods employed may have distorted body-part representation. Even though this bias prohibits direct comparison with other assemblages, I believe that the differences identified between different Aksum excavation units reflect real differences within the archaeological record; excavation bias may have masked additional weaker distinctions. Body-part representation in the Pre-Aksumite and Late Aksumite assemblages is summarised in Fig. 325, while Fig. 326 combines the skeletal parts into zones of the animal, as defined in Appendix VII. There is considerable variation, Late Aksumite D16 and D22 offering the clearest contrast. Based on the number of identifiable specimens (NISP), the general pattern for D site is approximately 15-20% distal limb-bone fragments (metatarsal and metacarpal) and less than 10% hind-limb fragments (femur and tibia). In D16, however, distal limb

elements are under-represented, and hind-limb fragments are over-represented relative to the general picture. Similarly, fore-limb fragments are over-represented in the Pre-Aksumite contexts and in Late Aksumite D16. In the Late Aksumite levels of D22 axial (rib and vertebra) fragments are over-represented. A similar pattern was observed at K site, as noted below (pp. 414-6). According to the model of meat distribution proposed by Zeder (1988), the even-part distribution is consistent with direct meat acquisition – that is animals were acquired directly (or produced locally) and butchered locally, as is most apparent in Late Aksumite D16. A similar pattern may be seen in the Pre-Aksumite contexts. In all three of these situations (Pre-Aksumite D13, Pre-Aksumite D22 and Late Aksumite D16) cranial fragments comprise at least 40% of NISP, and axial fragments are between only 10 and 20% of NISP.

Age

Few tooth-rows with teeth *in situ* were recovered at D site, and therefore the most reliable means of determining age at death was not available (Marshall 1990; Payne 1973; Silver 1969; Wilson *et al.* 1982). Recording of wear on isolated teeth in four general stages did not produce useful results. Study of bone fusion based on NISP (Fig. 327) provided the largest set of data indicative of age of cattle at death (Grigson 1982; Marshall 1990; Wapnish and Hesse 1988; cf. Rackham 1983). This method does not accurately identify the proportion of animals in each age group, as in a traditional age-profile based on the minimum number of individual animals represented (MNI), but it can give the relative proportion of animals that were culled before periods of bone fusion. Insufficient elements with recordable fusion status were available from Pre-Aksumite D22 to give reliable results. In the rest of the D-site assemblage, animals seem very rarely to have been butchered prior to 18 months. A small number were butchered before 42 and between 42 and

Zones	Pre-Aksumite		Late Aksumite	
	D13	D22	D16	D22
Cranial	44.0%	48.1%	41.2%	37.2%
Axial	13.5%	15.4%	16.2%	34.1%
Fore limb	13.8%	9.6%	17.6%	6.2%
Hind limb	5.0%	5.8%	12.7%	4.9%
Distal limb	23.8%	21.2%	12.3%	17.6%
	N = 282	N = 104	N = 505	N = 924

Fig. 326 Body-part representation by zone (NISP) for size-class III ungulates in D-site contexts.

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48 months. It appears that a large proportion of cattle were butchered after 48 months. Studies of modern (*e.g.* Dahl and Hjort 1976) and ancient pastoralists (*e.g.* Marshall 1990) indicate that the Aksumite people allowed a larger proportion of their animals to pass their peak meat-yield. Mixed agriculturalists in the highlands of modern Ethiopia often keep cattle for traction beyond their meat-production peak (Gryseels and Anderson 1983).

Modification

Only basic recording was undertaken of bone modification data. Future studies can be designed specifically to study this aspect of the Aksum fauna. Only 8.2% of identifiable material at D site was burned. Because of the fragility of burned bone, burning was probably slightly more common for less identifiable fragments; this fact is reflected in the higher proportion of burned fragments recovered in the flotation samples. Cut marks on maximally identifiable elements are quite consistent between contexts (Fig. 328). Elements

with cut marks are uncommon (6.5%), which is consistent with other assemblages from East Africa (Bunn and Kroll 1986; Marshall 1990). Most contexts at D site yielded a small amount of bone with traces of carnivore and rodent gnawing, this being observed on less than 1% of identifiable fragments. Destruction by domestic dogs may have impacted caprine-sized element representation (*e.g.* Hudson 1993; Lyon 1970). Both measures of fragmentation used in this analysis (average maximum dimension and average circumference per skeletal part) indicated that fragmentation was consistent between contexts, although recovery bias would probably have masked high fragmentation if it did exist.

SUMMARY OF RESULTS

Comparison of the D-site faunal assemblages suggests that the Pre-Aksumite ones and that from Late Aksumite D16 are similar to one another but different from Late Aksumite D22, which bears a closer similarity to material from K site. As a result, I believe that the

Probable age of fusion	Element	<i>Pre-Aksumite</i>				<i>Late Aksumite</i>			
		D13		D22		D16		D22	
		Fused	Unfused	Fused	Unfused	Fused	Unfused	Fused	Unfused
c. 7 - 18 months	Humerus dist.	3	-	-	1	7	-	14	-
	Radius prox.	12	-	-	-	15	-	6	-
	First, second phalanges	9	-	5	-	8	-	24	2
c. 24 - 36 months	Metacarpal dist.	6	-	2	-	-	-	11	2
	Metatarsal dist.	2	1	1	-	6	-	11	2
	Tibia dist.	2	1	1	-	8	1	2	-
c. 36 - 42 months	Calcaneum	1	-	-	-	1	-	1	-
c. 42 - 48 months	Humerus prox.	1	-	-	-	6	3	1	-
	Radius dist.	1	-	-	-	5	-	-	-
	Ulna	-	-	-	-	1	-	2	1
	Femur prox.	-	1	-	-	1	4	-	1
	Femur dist.	4	-	1	-	4	1	1	-
	Tibia prox.	-	-	-	-	6	-	-	-
Number of elements with recordable fusion status		44		11		77		81	

Fig. 327 Age of elements (NISP) in D-site contexts.

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Zones	<u>Pre-Aksumite</u>		<u>Late Aksumite</u>	
	D13	D22	D16	D22
Cranial	14	-	11	11
Axial	2	-	6	-
Fore limb	14	3	9	7
Hind limb	9	2	6	15
Distal limb	6	1	5	3
Totals	45	6	37	36

Fig. 328 Occurrence of cutmarks on fully identifiable faunal elements from D-site contexts.

activities relating to animal products did not change between the Pre-Aksumite and Late Aksumite period. The results from D13, D16 and Pre-Aksumite D22 suggest that these areas had access to whole animals that were older than those in the rest of the Aksum sample. These areas seem likely to have been connected with local food production. I believe that the pattern of faunal remains from the Late Aksumite D22 contexts, on the other hand, represents economic specialisation and complexity related to craft production, participation in an animal-product redistribution system or other situation in which D22 (and similarly K site) were not receiving or consuming whole animals and had slightly greater species-diversity and more animals of prime age.

Subsistence activities at D site in both Pre-Aksumite and Late Aksumite periods were apparently heavily reliant on animal husbandry rather than on collection of wild animal species. Domestic bovinds (cattle, sheep and goat) were the most important animals in the economy. Additional animals may have supplemented the diet of the site's occupants: chicken, fish and possibly wild bovinds.

The proportion of wild animals in the assemblage was minimal. Too little information is available to identify how and for what purpose many of these animals were acquired. The rarity of their remains suggests that wild animals were not procured regularly either for food consumption or other uses (*e.g.* hides). Some ivory working may have been conducted in Late Aksumite D22. The few fish and shell remains were not identified.

Cattle dominate the assemblage, and represent mostly older animals with varying evenness of body-part representation by context. According to Zeder's (1988) model of animal redistribution in complex societies, D16 most closely resembles a location with direct access to animals, whereas the Late Aksumite

contexts of D22 may have acquired meat through indirect channels, such as a market or central redistribution authority. It therefore seems likely that Late Aksumite D site was partially connected with the food production system of ancient Aksum.

The conclusions presented here reflect the results from a limited number of contexts. Additional excavation and analysis are necessary to refine the conclusions of this initial study for the Late Aksumite period and to further illuminate animal exploitation during the Pre-Aksumite period.

OVERVIEW

(D.W.P.)

D site has proved of exceptional interest on several counts. First, contrary to expectations before excavation began, it revealed evidence for two discrete phases of occupation separated in date by many centuries, although the distinction between them was generally marked more clearly in the typology of the associated pottery and other artefacts than by the physical stratigraphy. In Pre-Aksumite times, D site may have been an isolated settlement. The Late Aksumite occupation, on the other hand, took place adjacent to but separate from the main built area of the Aksumite capital, with the economy of which it must have been intimately linked. The valley to the west and northwest shows surface scatters of Aksumite artefacts broadly analogous to those from D site itself, perhaps suggesting extensive cultivation, although no further traces of stone buildings were noted.

In view of the stratigraphical uncertainties noted above, claims for similarity and continuity between the Pre-Aksumite and Late Aksumite periods of occupation at D site should be evaluated with care. The stratigraphy was indeed marred by mixture and contamination: nine fragments of blown glass found in putatively Pre-Aksumite horizons were presumably introduced from higher levels, and numerous sherds of clear Pre-Aksumite typological affinity were recovered from Late Aksumite contexts. On the other hand, the extent of this mixture should not be exaggerated: of four radiocarbon analyses on samples taken from Pre-Aksumite deposits and eleven from Late Aksumite ones (Fig. 329), only two yielded results within the chronological parameters of the other group.

The earlier, Pre-Aksumite, occupation is dated by radiocarbon between the eighth and the fifth centuries BC, significantly earlier than any yet known from Aksum itself, although contemporary discoveries have been made on nearby Beta Giyorgis. Broadly contemporary with the 'temple' and élite settlement at

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Ref.	Co-ordinates	Sample	Age bp	Age cal. BC/AD (68.2% confid.)	Age cal. BC/AD (95.4% confid.)
PRE-AKSUMITE					
Phase 2A					
OxA-8229	D13(2)	<i>Triticum</i> seed	2485bp ±40	770- 750 BC (0.08) 710- 530 BC (0.92)	800- 470 BC (0.96) 450- 410 BC (0.04)
Phase 2					
OxA-8282	D22(349)	<i>Triticum</i> seed	2430bp ±50	760- 690 BC (0.32) 650- 640 BC (0.02) 550- 400 BC (0.66)	770- 400 BC (1.00)
Phase 3B					
OxA-8228	D22(277)	<i>Gossypium</i> seed	1240bp ±35	AD 690- 810 (1.00)	AD 680- 880 (1.00)
OxA-8334	D22(277)	<i>Ficus</i> & <i>Acokanthera</i> charcoal	2480bp ±45	770- 750 BC (0.08) 720- 520 BC (0.92)	790- 470 BC (0.94) 450- 410 BC (0.06)
LATE AKSUMITE					
Phase 7B					
OxA-8283	D19(100)	<i>Hordeum</i> seed	1430bp ±50	AD 565- 580 (0.07) AD 590- 660 (0.93)	AD 530- 680 (1.00)
OxA-8983	D19(100)	<i>Leus</i> seed	1415bp ±50	AD 595- 665 (1.00)	AD 540- 690 (1.00)
Phase 9A					
OxA-8285	D19(35)	<i>Hordeum</i> seed	2190bp ±50	AD 370- 380 BC (0.56) AD 260- 190 BC (0.44)	AD 390- 120 BC (1.00)
OxA-8336	D19(35)	<i>Ficus</i> & <i>Acokanthera</i> charcoal	1590bp ±40	AD 420- 530 (1.00)	AD 380- 570 (1.00)
OxA-8337	D22(220)	<i>Hordeum</i> seed	1520bp ±50	AD 450- 600 (1.00)	AD 420- 630 (1.00)
Phase 10					
OxA-8230	D16(26)	<i>Lagendua</i> seed	1360bp ±40	AD 630- 685 (1.00)	AD 600- 720 (0.94) AD 740- 770 (0.06)
OxA-8286	D19(40)	<i>Cicer</i> seed	1115bp ±45	AD 885- 975 (1.00)	AD 800-1010 (1.00)
Phase 11					
OxA-8231	D16(18)	<i>Linum</i> seed	1285bp ±40	AD 675- 725 (0.60) AD 735- 770 (0.40)	AD 650- 820 (1.00)
OxA-8335	D16(18)	<i>Acacia</i> & <i>Acokanthera</i> charcoal	1290bp ±45	AD 670- 725 (0.62) AD 735- 770 (0.38)	AD 650- 860 (1.00)
Phases 12/13					
OxA-8287	D22(248)	<i>Vitis</i> seed	1305bp ±50	AD 660- 770 (1.00)	AD 640- 860 (1.00)

Fig. 329 D-site radiocarbon dates.

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Yeha (Littmann *et al.* 1913 II: 79-87; Anfray 1972b, 1973; Fattovich 1978; D.W. Phillipson 1998: 45-7), this is the first Pre-Aksumite peasant settlement to be published in detail. The difference in status is reflected in the artefact assemblages: metal was significantly scarcer at D site, the pottery was markedly distinct, including storage vessels and other domestic types not represented at Yeha. At D site, important evidence was obtained relating to the Pre-Aksumite subsistence economy. It is clear that cattle were the principal livestock species; cultivated crops included wheat, barley and, less certainly, the local cereal teff. The whole shows remarkable similarity to the practices followed subsequently in Late Aksumite times and to modern Tigray subsistence farming. It is unfortunate that, due to the stratigraphic uncertainty noted above, it remains unclear whether the indigenous teff was represented in the Pre-Aksumite plant assemblage. Direct AMS dating does, however, confirm the Pre-Aksumite exploitation of wheat and barley. Material culture included rare cuprous artefacts but no iron, abundant hand-made pottery including storage vessels over 80 cm high, microlithic tools, stone beads and pendants.

No evidence was recovered as to why the Pre-Aksumite settlement at D site was abandoned. The long hiatus in occupation which followed was marked by virtually no deposition. If the site was cultivated during part of this period, the resultant ploughsoil was subsequently removed, either by erosion or by deliberate levelling.

The site was re-occupied, probably late in the fifth century AD. The initial phases, 4 to 6, are poorly represented in the areas excavated and their duration was probably brief. Activity attributed to these phases seems largely to have involved preparation for the erection of the phase-7A élite structure. This enigmatic building was in a most unusual location and, although not investigated on a scale sufficient to permit certainty or to ascertain its function, seems either to have been exceptionally small or to have been never completed. In any event, it was evidently short-lived. The structure may be compared both with the élite structures (formerly known as 'palaces') at Dungur, Ta'akha Maryam and others at Aksum and elsewhere (*e.g.* Munro-Hay 1991: 118-25), and with the superstructure of the nearby Tombs of Kaleb and Gabra Maskal (D.W. Phillipson 1994a: fig. 27, 1997: 73-88 and pp. 427-31, below).

No radiocarbon dates are currently available for the phase-7A élite structure, but the date of its construction is best estimated as early in the sixth century AD; apparently soon after its initial construction, it was levelled and the main Late Aksumite D-site settlement established. This was based on a rapidly changing complex of rectangular-roomed buildings.

It is clear that the settlement was not contiguous with the main built area of Aksum, from which it was separated by a belt of open country. The Ezana inscription may have marked the fourth-century limit of Aksum itself. The inhabitants of Late Aksumite D site were mainly engaged in producing and processing food. While sheep and goats were herded, cattle was the dominant domestic species being used both for food and for traction. Donkeys and chickens were also available. Inscriptions indicate that the herds were augmented by capture and tribute in the course of military campaigns. The range of cultivated crops was remarkably similar to that exploited in the region during more recent times, including wheats, barley, teff, finger millet and sorghum as well as chick peas, noog and linseed. Cereals thus predominated, including varieties originating in the Near East as well as local domesticates. Oil was obtained from linseed and from the locally domesticated noog. Grape-pips and both seeds and textile fragments of cotton have also been recovered; in neither case can one be certain whether the plants were grown locally or their produce imported from elsewhere. The pottery assemblage is large; beads, glass and artefacts of both iron and copper alloy were present in small quantities. In the absence of comprehensively published comparanda, D site provides our best and most closely dated insight into the economy and material culture of a non-élite settlement of the Late Aksumite period.

The evidence from D site would appear to represent a middle-rank settlement close to, but set apart from, the metropolis. The Late Aksumite occupation appears to have had a status well above that of a peasant farmstead, although it should be emphasised here that no traces of occupation at the lowest level of the socio-economic hierarchy have yet been found. Non-organic evidence for substantial processing of crops was recovered in the form of components of obsidian harvesting knives and of a large and varied assemblage of grindstones. The excavations at D site have succeeded in revealing a class of site and a range of associated material that contributes significantly to an understanding of the social and economic organisation of Late Aksumite society.

A total of eleven radiocarbon dates are available for the Late Aksumite occupation at D site; they permit the chronological parameters to be defined with some precision, as summarised in Fig. 329. It appears that the Late Aksumite phases lasted from the early or middle decades of the sixth century AD until early in the eighth. The implications for these radiocarbon dates for our understanding of the coinage chronology and for dating the demise of Aksum are considered in Chapter 15 (pp. 485-6, below). Materials dated include seeds of barley, lentil, gourd, linseed and grape,

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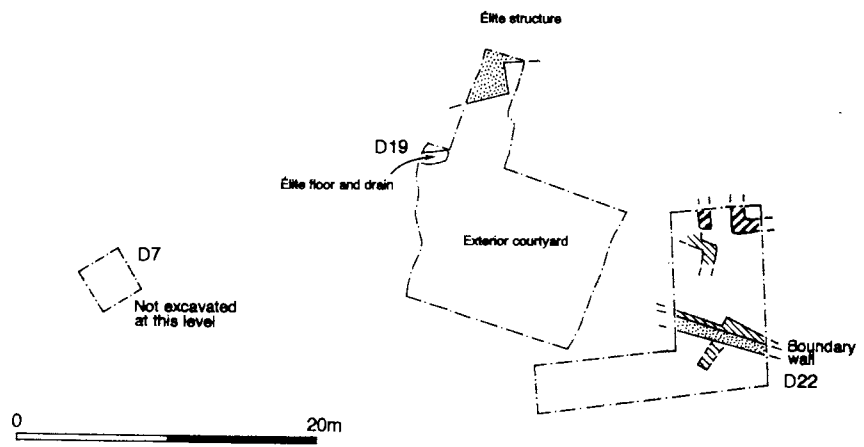
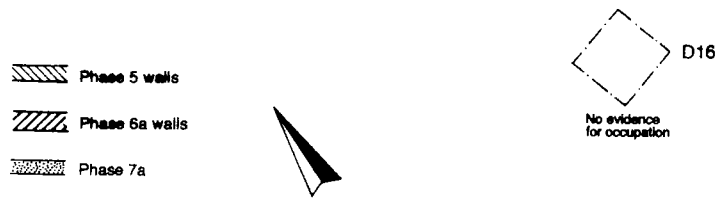
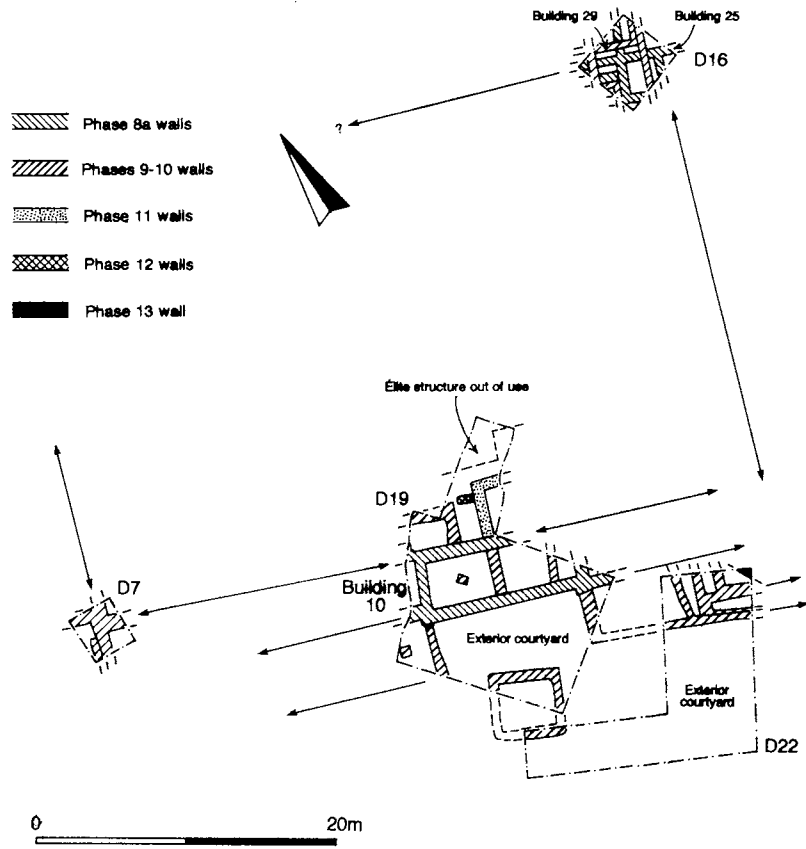


Fig. 330 *General plans of trenches D7, D16, D19 and D22.*

proving that these crops were among those available in Late Aksumite times.

The style of the main domestic building complexes in this area shows less refinement than that of the élite building. As Fig. 330 demonstrates, these complexes covered a substantial area and apparently took their alignment from that of the élite building. The rough masonry was not sorted by size, and was laid in random courses. Foundations were variable, even along a single stretch of wall, with a combination of offsets, random rubble and finished faces sometimes apparent. Correspondingly, consistent wall thickness or right-angle corners were of little concern. To some extent, the lack of quoin-stressed corners and consistent foundations, with the use of mud mortar, may explain certain irregularities in the structural remains. In general, little care seems to have been taken over the setting out and construction of domestic buildings, and this is evidenced by the processes of frequent modification, decay and abandonment which have been recorded. The phase-9A round-cornered structure in D19/22 is unique and may have served some specialised function.

In its broadest sense, probably the most important result of the 1994-6 excavations is that a new category of settlement site has been revealed. Various authors have speculated on the nature of Aksumite social organisation, land allotment and sub-élite settlement but, apart from Michels' (1990, 1994) study based upon surface data and inadequately published excavations at Matara and Adulis (Anfray 1963b, 1974), there has previously been no concrete or readily interpretable evidence for a class of occupation site below that of the élite residences. The D site thus provides evidence for an aspect of Late Aksumite settlement archaeology previously unknown at Aksum itself.

Detailed analysis has yielded a remarkably comprehensive picture of the activities carried out at Late Aksumite D site. General aspects of Aksumite culture and economy are considered below in Chapter 15; this section is concerned only with those particular to D site. In addition to the obvious features described above, such as stone architecture, pottery, metalwork *etc.*, we have direct or indirect evidence for many other elements of material culture and the activities associated with them. Cotton is represented by textile fragments, while seeds indicate that it may have been processed and, perhaps, grown in the vicinity; certain of the microliths may have been used to trim delicate fibres. Concave scrapers of flaked stone may have been used to prepare wooden spindles, perhaps weighted by perforated pottery discs. The preparation of hides is suggested by use-wear on certain lithic artefacts, others being apparently employed for working wood, ivory and soft stone.

The sole evidence for basketry comes from impressions acquired intentionally or unintentionally during pottery manufacture. An obsidian flake used for burnishing clay very strongly suggests that the pottery was actually made at D site itself; it is thus a reasonable assumption that basketry items were also used there. In the complete absence of such corded and basketry vessels in the archaeological record, this (and analogous evidence from K site noted on p. 394, below) provides the only indication for their existence and use in Late Aksumite times. At least two different basketwork vessel types are attested in the Late Aksumite period, one a riddling sieve in several grades of fineness (cf. Fig. 331), and the other a container for liquids or finely ground solids such as flour.

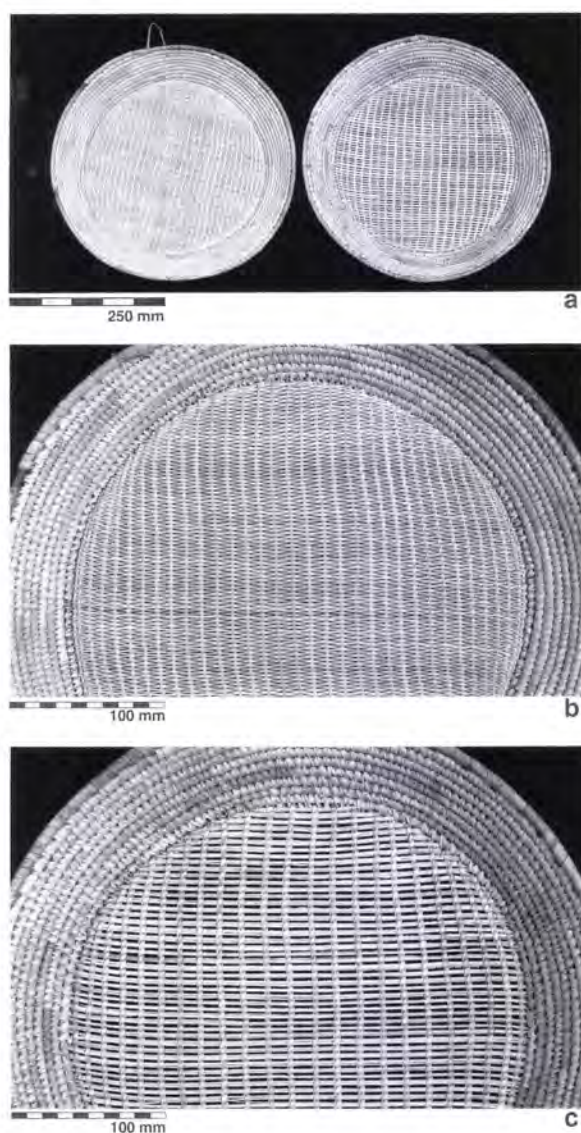


Fig. 331 Modern baskets for comparison with impressions on Aksumite pottery from D site (cf. Fig. 288).

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More leisurely pursuits are indicated by a broken board for the game *gebeta*, still played today, and by a clay die. Beads, predominantly of glass, represent personal adornment, as do a stone ring bezel, metal rings, bangles of metal, glass and stone, and metal instruments which may have been used for the application of cosmetics.

Numerous cross-symbols stamped or incised on pottery imply that Christianity was at least recognised by some of the site's inhabitants. It is noteworthy that bones of pig, an animal strictly avoided by present-day Ethiopian Christians, although indicated by a single specimen at K site (cf. p. 414, below), were not represented in the faunal assemblage from D site. That some of the inhabitants may have been literate is suggested both by letters incised on locally produced pottery, and by the presence of inscribed seals.

The production and processing of food seem to have been important tasks for the Late Aksumite inhabitants of D site. In view of their location on the edge of a major, prosperous and specialised population centre, this is hardly surprising. The plants and animals exploited were largely, but not exclusively, domestic. Analysis of faunal remains suggests important distinctions between practices in different parts of the site. The area of trench D16 seems to have continued the basic form of husbandry which had prevailed in Pre-Aksumite times, with whole carcasses available from animals that were often kept past their meat-producing prime, in the case of cattle perhaps for traction, breeding or possibly milk. Plant foods were also processed in the D16 area on a substantial scale. The D19 and D22 areas, however, representing what may have been a different part of the same building-complex only 35 m distant from D16, witnessed more

				Estimated age (AD unless noted)	
	Phase	Activity			
<i>Pre-Aksumite</i>					
	1A	rectilinear buildings with open courtyards in use throughout the Pre-Aksumite occupation)unknown)duration)within)period)of 8 - 5)cent. BC	
	1B				
	1C				
	1D				
	2				
	3A				
	3B				
H	I	A	T	U	S
<i>Late Aksumite</i>					
	4	resumption of activity, including site-levelling boundary / retaining wall and other building		late 5 cent.	
	5				
	6A, B	further construction including rectilinear building élite structure erected		early 6 cent.	
	7A				
	7B	élite structure abandoned and covered rectilinear buildings north and south of elite structure, remained in use with frequent alteration through phases 8B - 12		late 6 cent.	
	8A				
	8B			early 7 cent.	
	9A	round-cornered building erected			
	9B				
	10	major alteration and partial replacement of rectilinear building)mid- to)late 7 cent.	
	11				
	12	round-cornered building demolished rectilinear buildings partly abandoned		end 7 cent.	
	13				
	13	rest of site abandoned			
<i>post-Aksumite</i>					
	14	cultivation		from 8 cent.	

Fig. 332 Summary of the D site sequence.

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specialised practices as part of a wider distribution network for animal products, suggesting that this part of the site was primarily engaged in some other activity. Significantly, this latter pattern is one that is also represented at the broadly contemporary K site within the main Aksum built-up area, where specialised craft-work is attested.

Archaeobotanical research has revealed a wealth of information about plants present at D site, most of which were presumably exploited by the inhabitants. The range of varieties has been surveyed above: cultivated and wild species are both represented. Among the former, cereals and oil-yielding plants predominate, including both indigenous species and others introduced from elsewhere. Sorghum and finger millet, two cereals which originated in neighbouring but significantly lower regions, were both rare. That cereals were processed at D site is suggested by the presence of grindstones and confirmed by the fact that grains were accompanied by chaff, rachis and other waste-components removed during processing. (Impressions of chaff were also noted on pottery.) The obsidian artefacts named Likanos flakes were probably set in straight handles for use as harvesting knives.

Buildings at Late Aksumite D site, with the exception of the enigmatic phase-7A elite structure, were constructed of field stones, sometimes roughly shaped, set in mud mortar. In contrast to earlier and/or higher-status buildings, heavy timber seems rarely to have been employed in the walls although lighter wooden components may have been used for roofing the small rooms. Open courtyards seem to have been used as extensions to living and working space. Excavation was not on a scale sufficient to indicate overall subdivision of space and the extent to which the settlement may have been divided into compounds.

Domestic activities in addition to those enumerated above suggest that the site served a residential function. Lighting was available from lamps of pottery, glass and stone. The range of pottery indicates storage, presumably of comestibles, as well as cooking and eating. More specialised activity is suggested by rare pottery filters.

Despite the seemingly mundane activities carried out at D site, its inhabitants clearly maintained a reasonable degree of material prosperity, as is indicated by the range of artefacts outlined above. More fragmentary items are also suggestive: two tiny pieces of gold foil were recovered, and one of gilded copper alloy. Ivory was also present; the few poorly preserved items at D site may have been worked there (as the presence of Guditi scrapers might suggest) rather than being finished possessions of the inhabitants. The range, quality and quantity of both metal objects and glassware were much restricted in comparison with the

élite burials of earlier times. Coinage was evidently in regular use at D site, six silver and twenty copper coins being recovered from Late Aksumite contexts. It is, however, not easy to differentiate between material which reflects the personal prosperity of the site's inhabitants rather than the range and nature of the work in which they were engaged; nor do we know whether, in Aksumite terms, this was a significant distinction.

No human skeletal remains were recovered from the Late Aksumite occupation at D site. Disposal of the dead evidently took place at some unknown location elsewhere. Burial places at ancient Aksum appear to have been separate from residential areas and segregated by status, but the only non-élite cemetery known, at the Guditi Stelae Field, was probably out of use by Late Aksumite times (cf. Chapter 8, above). Commoner graves of this period have yet to be located and investigated. No attempt has been made to ascertain whether Aksum's present-day Muslim burial ground, which lies at the foot of Beta Giyorgis to the west of D site, was used for interments in earlier times.

The inhabitants of D site owned and used items and materials brought to Aksum from elsewhere. Pottery provides the best, but not the only, examples. The presence of amphorae from the eastern Mediterranean and the northern Red Sea areas does not necessarily mean that the imported contents of these vessels were consumed at the site: the vessels may have been emptied elsewhere and brought to D site to be recycled for domestic purposes. Other imported pottery, rare bowls of African Red Slip ware from North Africa and glazed vessels from Mesopotamia, are more likely to have been in primary use at D site. The engraved stone seal illustrated in Figs 309g and 310b also probably originated in the general area of the eastern Mediterranean.

Commodities also came to D site from other areas of the Aksumite realm itself. Fine purple-painted pottery was probably brought from eastern Tigray and similar sources are also suggested for certain other pottery vessels. Obsidian appears to have been brought from some distance and was carefully employed so as to maximise production of the lithic artefacts for which it was the preferred material. The possibility that unprocessed cotton was brought from elsewhere (as is the case today) rather than grown in the immediate vicinity of Aksum has been noted above.

Finally, it is useful to consider the chronology of the Late-Aksumite occupation of D site and the evidence for its demise. Although its stratigraphic and structural sequence is complex, radiocarbon determinations combine with the evidence of coins and other artefacts (Fig. 332) to show that its overall duration was little more than two hundred years, centred on

D Site at Kidane Mehret

the sixth and seventh centuries. Its end appears to have been sudden and can be dated with some precision. Use of, and alterations to, the site and its buildings seem to have continued even through the final stage of occupation: phases 12 and 13, dated to the early eighth century AD. Abandonment seems not to have been accompanied by destruction. The associated coinage is significant. The final issues of the Aksumite series, as presented by Munro-Hay and Juel-Jensen (1995), bear the names of rulers in the following order: Ioel, Hataz, Gersem and, finally, Armah. As indicated above, eight coins of Ioel were recovered from Late Aksumite contexts at D site, ten of Hataz and two of Gersem. The coinage of Armah was represented only by a single

example from the unstratified topsoil. Copper coins of Armah are, however, among the commonest issues of the Aksumite series, although they have been found comparatively rarely at Aksum itself. Allowing for some time-lag between issue and loss, it seems reasonable to conclude that D site, or at least those parts of it that have been investigated archaeologically, was abandoned some time before the issue of coinage came to an end, perhaps around the beginning of Armah's reign. The implications of this suggestion are further considered elsewhere (pp. 485-6, below). No evidence has been encountered for subsequent settlement of the site, which has been terraced and cultivated for an unknown period.

THE K SITE IN MALEKE AKSUM

SUMMARY: Within the main built-up area of ancient Aksum, exploratory excavation of a site retaining no traces of monumental architecture revealed a long succession of middle-rank occupation by people who were engaged in a variety of craft activities. The material culture and economic evidence is contrasted with those recovered from the broadly contemporary Late Aksumite component at D site.

EXCAVATION AND STRATIGRAPHY (Michael Harlow and Jacke Phillips)

With the kind permission of Ato Hailu Gezehegn, Michael Harlow supervised exploratory excavations in 1996 on a site within the built-up area of Maleke Aksum, at the foot of Beta Giyorgis hill and some 600 m west of Maryam Tsion cathedral (Fig. 333; see also the map at Fig. 7, above). The site, designated K, was chosen in the expectation that it would illustrate Aksumite life in a non-prestige urban setting and provide a comparison with the D site on the periphery of the town. It comprises a large garden of some 1500 sq. m surrounding Ato Hailu's residence and enclosed by a substantial stone wall, the whole sloping gently down to the south. An area some 30 m from east to west by 70 m from north to south (Fig. 334) was cleared and surface artefacts collected within a series of 5-m grid squares. The pottery, examined by Tsehay Eshetie, totalled 96 kg and proved to be predominantly hillwash, concentrated in the northeastern area. The diagnostic

sherds were mostly Aksumite in character, with some of later date and about 15% apparently earlier. The diverse nature of this material and the manner of its deposition have to be borne in mind when interpreting the excavated deposits.

A total of four trenches was excavated, evenly spaced over the cleared area. All were initially 2 m square, three being subsequently extended to permit examination of features encountered. The extensions were initially given separate trench designations; for simplicity these were subsequently (as here) amalgamated. The excavations were essentially exploratory and direct stratigraphic links between them could not be established. Radiocarbon dating has yielded results of limited value, other than for the earliest phase investigated, so pottery and coin evidence must provide the basis for the chronological framework.

Trench K1

The northeastern trench, 2 by 2 m, revealed topsoil over hillwash to a depth of about 0.4 m. Below layers of silty clay and charcoal a large clay feature, probably



Fig. 333 View over K site from the slope of Beta Giyorgis.

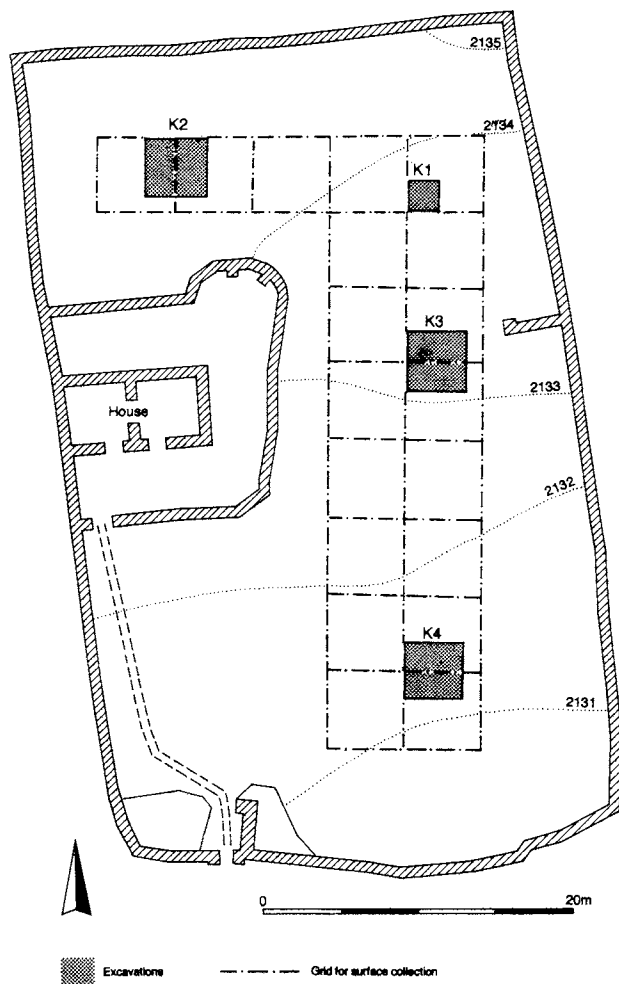


Fig. 334 Plan of K site, showing collection grid and excavation trenches.

hardened by heat, occupied the northwestern part of the trench at an average depth of 0.8 m, bounded on the east by a large rock and resting on others at some 1.6 m below the surface. No regular structure could be discerned apart from a hard reddish exterior about 0.6 m wide and a softer, darker interior below a hard red baked top lined with white. The artefacts within this feature included decorated sherds of Classical Aksumite type, amphora fragments and one piece of African Red Slip ware. The feature probably dates no earlier than the sixth century and, since it rested on rocks forming the foot of Beta Giyorgis, it is highly improbable that earlier occupation had occurred in that particular place. Deposits to the east and south of this feature, as well as overlying it, contained both Aksumite and recent artefacts.

Phases recognised in the K1 trench were:

- i - the clay feature (perhaps sixth century)
- ii - accumulated deposits (final and post-Aksumite)
- iii - subsoil and hillwash
- iv - modern topsoil.

The K2 trenches

The northwestern trench, designated K2, was extended to cover a total area of 16 sq. m. The upper 0.2 m yielded abundant artefacts including pottery, glass, metal and slag; this material may only be dated to the long but ill-defined post-Aksumite period continuing into recent times. Below this, in the northwest corner of the excavation, a complex of ash and charcoal layers interleaved with baked red clay was partly excavated, extending from 0.3 to 0.9 m below the ground surface. In its lower part was a baked clay hearth some 0.5 m in diameter with a softer interior of ash and charcoal. This complex might have been associated with a manufacturing activity but the materials which were found in it consisted of pot, bone and brick with one engraved glass fragment. Although smaller and at a higher level, it resembled the hard clay feature in trench K1, described above.

More convincing evidence for industrial activity was provided by a large layered midden incorporating vitrified debris, rising 1.6 m from a base 1.9 m below the modern surface (Fig. 335a). It contained a

K Site in Maleke Aksum

wide variety of pottery fragments and domestic refuse mixed with waste products apparently derived from the manufacture of artefacts in a variety of materials including glass, metal, ivory and horn. Vitrified potsherds included some from small deep crucible-like cups. These and the plant remains all point to a multi-purpose, largely domestic midden that accumulated over a period of time. Use of the midden may have been prolonged, and a coin of Hataz suggests that this period included the late sixth century. On its south side the midden abutted mixed material of Late Aksumite date: a high proportion of bone and pottery and more horn, glass and vitrified crucible fragments. Two samples of plant material from the midden were submitted for radiocarbon dating (cf. Appendix VI) with conflicting results: 1665 bp \pm 45 on charcoal (OxA-8339) and 1055 bp \pm 50 on emmer wheat grains

(OxA-8289). It is unlikely that the midden continued in use for some 500 years: the emmer may be intrusive, while the charcoal may reflect the use of mature wood as fuel.

The other main feature in these trenches was a wall, faced on both sides and some 0.8 m wide, aligned roughly north-south, close to the eastern side of the excavation. The wall survived to a height of 1.1 m and was exposed for a distance of 3.5 m although clearly extending further to the north. Its rough foundation was exposed in a limited area to the southwest at 2.0 m depth, with a typical Aksumite ledge at 1.8 m. A further wall aligned east-west and bonded at a right angle to the eastern face of the north-south wall in the southeast corner of the excavation suggested that the interior of the structure bounded by these walls lay to the east, the waste midden thus being on

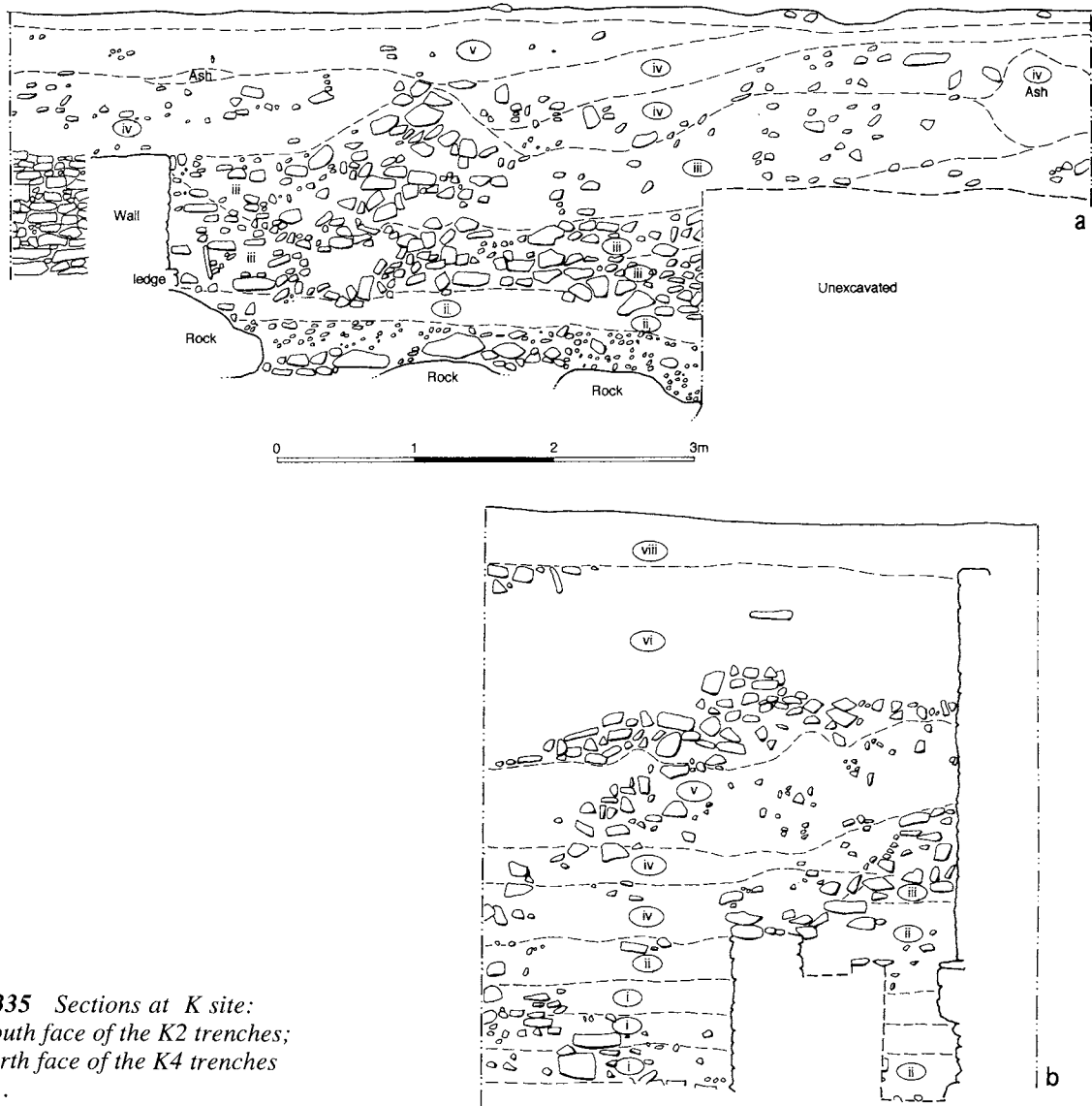


Fig. 335 Sections at K site:
a - south face of the K2 trenches;
b - north face of the K4 trenches
 (part).

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the outside. The rubble from the destroyed upper courses of these walls comprised a layer about 1 m thick to the west of the north-south wall. The pottery which it contained was predominantly Late Aksumite with some earlier material.

The earliest phase of occupation in the area exposed by this trench was investigated only in a small area near the southwestern corner. Just below the wall foundation at about 2.0 m depth was a layer of medium red-brown silty clay, 0.2 m thick and rich in pottery and bone, predating or broadly contemporary with the erection of the walls. Below it lay a dense layer of small stone rubble between very large boulders which seem to represent local bedrock. The deposits within this rubble were very dense and contained abundant pottery of Classical Aksumite and Late Aksumite type, suggesting a date around the fifth and sixth centuries.

Six phases may be discerned in the K2 trenches:

- i - the earliest remains from the deep sounding (fifth/sixth century)
- ii - the occupation of the building and deposition of the adjacent waste midden
- iii - destruction (possibly early seventh century)
- iv - levels with continuing industrial activity
- v - subsoil and hillwash
- vi - modern topsoil.

The K3 trenches

In mid-slope, trench K3 eventually covered a total area of 16 sq. m. It was positioned 5 m south of K1 over the reported site of a circular stone house pulled down in 1937 which had belonged to the present owner's father. Substantial remains of this house were unearthed (Figs 336a, 337), including a section of the external wall, an internal descending staircase with five steps and its flanking internal wall and doorway, part of the floor and the bases of two probable internal walls. Grindstones, a pump filter, an umbrella frame, iron plough links and other modern metal objects and some large potsherds found on the steps and floor level of the house clearly belonged to the period of its occupation. A plan of a similar house was recorded in 1906 by the Deutsche Aksum-Expedition (Fig. 336b; Littmann *et al.* 1913, III: figs 23, 118); indeed, such houses were common in Aksum at that time (D.W. Phillipson 1997: 5-10) and occasional examples still survive.

Below were the remains of two successive significantly earlier buildings, lying on a different alignment and exposed only in limited areas. The later of these buildings was represented by two walls: one extending from north to south near the west side of the excavation and a second, bonded at a right angle to its

east side, cut by the stairway wall of the round house. Rubble from the destruction of this earlier building filled the areas enclosed by its walls to a depth of some 1.2 m below the ground surface; pottery and coins of Hataz suggest that demolition took place around the beginning of the seventh century. Below the rubble, rough stone flooring was preserved at the same level as the foundations of the walls. Deposits below the paving contained two further coins of Hataz.

Beneath the remains of this Aksumite building and separated from its walls by a rubble layer were still earlier walls on a similar alignment. With one butted exception, their angles were bonded. The presence of later structures prevented preparation of a detailed plan. Likewise, it was not possible to excavate their foundations although a typical Aksumite ledge was revealed at 1.8 m depth. The fill between these early walls contained pottery suggesting a sixth-century date.

In summary, the K3 trenches revealed five phases:

- i - the earliest building (probably sixth century, with possible earlier material below)
- ii - the second building (probably late sixth or early seventh century)
- iii - the third building (nineteenth/twentieth century)
- iv - subsoil
- v - modern topsoil.

The K4 trenches

The lowest excavation, 21 m south of K3, measured 4 by 4 m and revealed a remarkable series of stone walls preserved to a height of some 4 m and perhaps representing a two-storey building (Figs 338). Six phases of occupation were recognised. The earliest preceded the erection of the walls and has yielded two virtually identical radiocarbon dates (Appendix VI): one on barley seed of 1585 bp ± 50 (OXA-8288) and one on charcoal of 1590 bp ± 50 (OxA-8338). The building seems to have been erected in the late fifth century, to have been altered on at least two occasions separated by intense burning, and abandoned in the early seventh century. The principal wall extended from east to west across the trench and contained two blocked doorways. There were two north-south walls, that on the east being bonded to the north face of the first wall, that on the west being butted. Artefacts associated with the occupation included pottery, beads and copper alloy cosmetic instruments, with sixth-century coins of Ioel and Wazena.

The most recent phase was represented by the cultivated topsoil, c. 0.2 m in depth, containing modern artefacts mixed with abraded older material. Below this was an ashy patch and a pit cut into the rubble and wall beneath.

K Site in Maleke Aksum

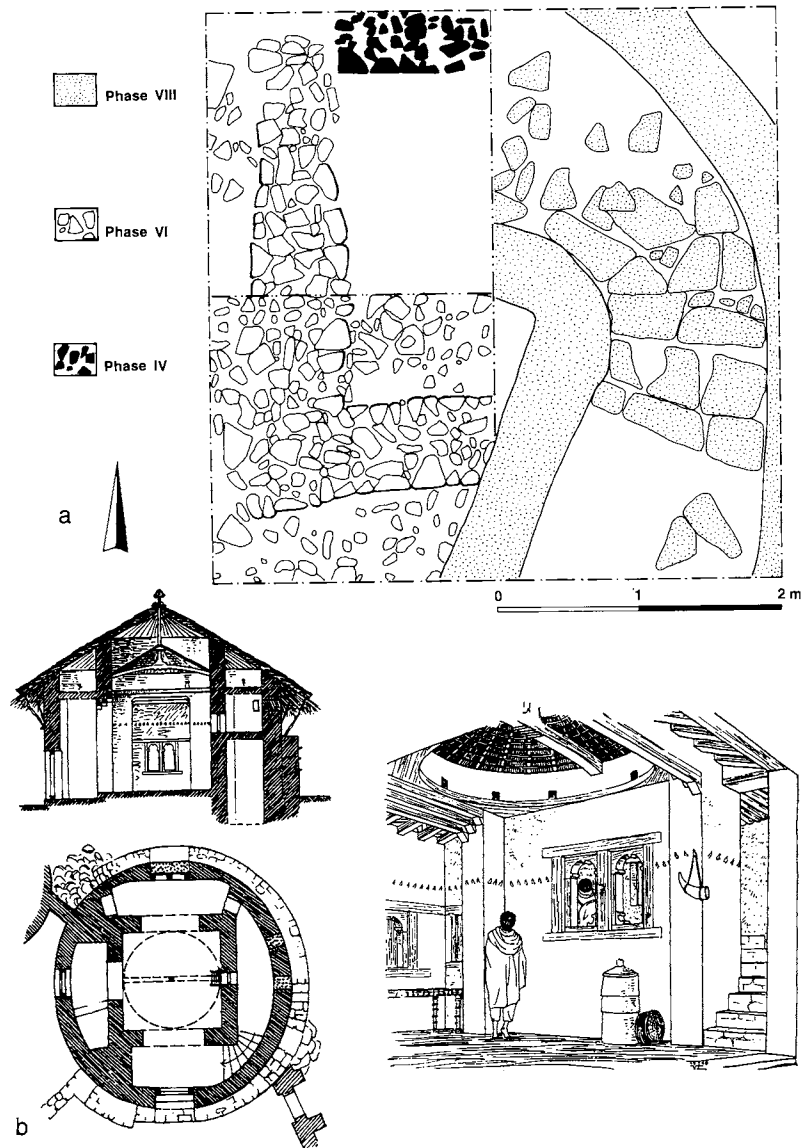


Fig. 336 Plan of the foundations of a round house exposed in the K3 trenches, with drawings of a similar house recorded by the Deutsche Aksum-Expedition in 1906.

Three walls were preserved: Wall 1, extending from east to west across the centre of the excavated area, had two blocked apertures, perhaps doorways, separated from each other by a stretch of wall that had been built from a lower level. Wall 2 ran north to south along the east edge of the excavation, bonded with the north side of Wall 1. Wall 3, parallel to Wall 2, had a similar blocked doorway near the centre of its exposed section and butted against the south side of Wall 1.

The walls were surrounded by a very thick and unstable rubble layer, which caused considerable problems in excavation (Fig. 335b). The rubble appeared to derive from the destroyed upper levels of the walls, suggesting that the building may have had at least two storeys. Artefacts recovered from the rubble were characteristic of hillwash but included a high

proportion of Aksumite material, including two undecipherable coins. Artefacts found north of Wall 1 included a number of copper alloy cosmetic instruments and some beads, with mixed but predominantly Late Aksumite pottery. To the south, the rubble layer was thicker, suggesting that the ground level may have been lower on that side and that the two doorways had been blocked before the rubble accumulated; the artefacts were of similar date and included a sixth-century coin of Ioel.

As excavation progressed, the top of a fourth wall was revealed in the northwest corner of the trench, aligned north-south but separated from Wall 1 by an unblocked doorway. The building of Wall 4 from about 2.6 m below the ground surface, like the blocking of doorways in Walls 1 and 3, is attributed to a period of reconstruction. Some mixed silty and

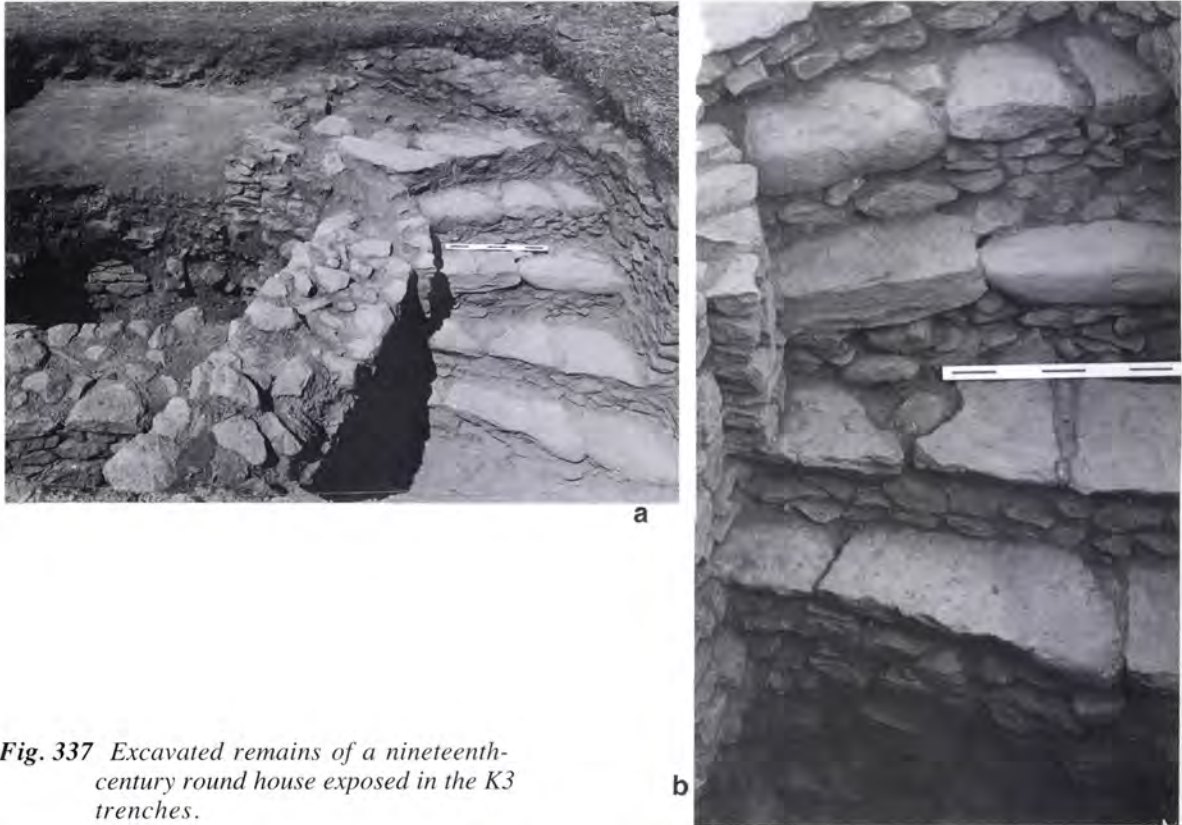


Fig. 337 Excavated remains of a nineteenth-century round house exposed in the K3 trenches.

smaller rubble deposits were also associated with this phase.

Immediately below was a banded series of burned layers, the topmost one being markedly thicker and blacker than the others, extending right across the northern half of the excavation and traceable also on the south side of Wall 1, where they lay at an angle against the south face of the wall, again suggesting an originally lower ground level on that side at a time when at least the easternmost doorway in Wall 1 was unblocked. Drains in the wall also indicated that this was probably the exterior of the building. Finds from these burned layers suggested a Late Aksumite date and included several metal objects with coins of Wazena, Ioel and an earlier anonymous issue.

Before the intense fire represented by these deposits, a series of modifications had been made to the original building, including construction of a stone bench-like feature with a rounded south end some 0.3 m deep against Wall 2. It had three rough shallow stone steps leading up to it from the west and the west edge of the westernmost step formed the top of a further and clearly earlier north-south wall which was butted against Wall 1 and extended northwards beyond the excavated area. The foot of this wall was not reached. Wall 3 also dated from this phase.

At a depth of 3.4 m was some rough paving to the south of Wall 1; the walls themselves had

ledges at this level below which the building was rougher, perhaps representing foundations which were traced to a further depth of 0.8 m. Two phases were recognised in these deepest deposits, marked by Late Aksumite artefacts but including several potsherds of Classical Aksumite character. The stratigraphy of these steeply inclined deposits was not easy to follow and it is possible that inadvertent mixture took place during excavation. It is likely that there was a distinct late Classical Aksumite horizon predating the walls. Unfortunately time did not permit further excavation in the restricted areas that were exposed *c.* 4.2 m below the modern surface.

The phases in the K4 trenches may be summarised as follows:

- i - below the main wall ledges (probably late fifth or early sixth century)
- ii - occupation above the wall ledges (perhaps early sixth century)
- iii - modifications (early/mid-sixth century)
- iv - conflagration (mid/late sixth century);
- v - reconstruction and decline: smaller rubble (late sixth century)
- vi - destruction: larger rubble (perhaps early seventh century)
- vii - late pit and fireplace (probably associated with the nineteenth-century house)
- viii - cultivated topsoil.

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a



c



b

Fig. 338 Walls exposed in the K4 trenches.

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CORRELATION

The phases recognised stratigraphically in each of the four K-site trenches are summarised in Fig. 339, which also presents a consolidated chronology,

grouped in Late Aksumite (phases I to VI) and post-Aksumite / mixed (phases VII to IX) periods for the site as a whole. It is this consolidated system which has been employed in the discussions which follow.

Century AD	K1		K2		K3		K4		K-site phases	
5							i	K4(9)-(11) K6(7), (8) K7(8)	I	LATE AKSUMITE
							ii	K4(8) K5(10)(12)(13) K6(6) K7(7)	II	
6							iii	K5(7), (5)	III	
	i	K1(8), (9)	i	K9(7), (8)	i	K3(12)-(14) K11(8) K13(9), (10), (12)	iv	K4(6) K5(6), (11) K6(5) K7(6)	IV	
	ii	K1(7)	ii	K2(3), (6), (8) K8(3), (6) K10(8), (9)			v	K4(5) K5(5) K6(3), (4) K7(4), (5)	V	
7			iii	K2(5), (7) K8(8) K9(6) K10(6), (7)	ii	K3(7)-(11) K13(7), (8), (11)	vi	K4(2) K5(2) K6(2) K7(2)	VI	
7-18	iii	K1(5), (6)	iv	K2(4) K8(4), (5) K9(4), (5) K10(4), (5)					VII	
19-20	iv	K1(2)-(4)	v	K2(2) K8(2) K9(2)-(3) K10(2), (3)	iii	K3(2)-(6) K11(2)-(7) K12(2)-(4) K13(2)-(6)	vii	K4(3) K5(3), (4)	VIII	
modern	v	K1(1)	vi	K2(1) K8(1) K9(1) K10(1)	iv	K3(1) K11(1) K12(1) K13(1)	viii	K4(1) K5(1) K6(1) K7(1)	IX	MIXED / POST-AKSUMITE

Fig. 339 Correlation of phases at K site.

ARTEFACTS

Most of the K-site artefacts, especially the pottery, was worn and abraded, being probably derived from Beta Giyorgis hillwash. *In situ* deposition was evidenced in very few contexts other than the lowest levels of trench K4, which produced no coins but two virtually identical radiocarbon dates in the late fifth century. The following account is largely restricted to material from contexts attributed to Late Aksumite phases I to VI; specimens from later contexts are noted only when they proved to be of particular interest.

Pottery and clay objects (Jacke Phillips)

In this account definitions of vessel forms and types follow those employed in the chapters devoted to pottery from the Tomb of the Brick Arches and D site, since the K-site sequence bridges the two and partly overlaps the latter. Emphasis is here placed on material not represented at D site, but with comparison and reference to similar but more complete material found there. Pottery excavated at K site totalled over 620 kg; a further 96 kg was collected from the surface.

Basket- and mat-impressed sherds were not recorded in detail at K site, but were noted in virtually all phases. At least two open bowls are impressed on the exterior by an open riddle or sieve. A closed vessel from phase II has an impression on the exterior of its bottom of a coiled open basket (cf. the example from D site illustrated in Fig. 288a).

Beakers

The beakers include several examples from phases I and II with Classical Aksumite moulded decoration of types [1] and [2b].⁴⁷ One has a wide ledge handle instead of the usual vertical strap form. These beakers (e.g. Fig. 340a) are less well made than those from the Tomb of the Brick Arches, with careless decoration and mottled surface indicative of uncontrolled firing. Plain specimens are later, phase IV, with the exception of a miniature from phase I.

Bowls

Ledge-rim bowls: These bowls follow the tradition represented at the Tomb of the Brick Arches and D site. They generally have a deep open form with a rim of medium (13 to 23 mm) width, and a brown to yellowish-red slipped surface. The upper face of the rim is often embellished with designs such as edge grooves (Fig. 340d), grooves beside a discontinuous

⁴⁷ For Classical Aksumite decoration types, as indicated in square brackets, see Appendix II.

applied snake-like motif with punctated ridge, the snake motif alone, and red-painted features such as bands on rim-edges sometimes delineating a thick wavy or angular band (Fig. 340e). A variation employs an incised chevron, the inner part only of the rim being painted red. Rim-edge scalloping with the grooves is also known. The applied snake motif seems to have developed from a small closely spaced design with definite terminal embellishment (Fig. 340b) to a larger version coarsely applied (Fig. 340c) and, eventually, a simple form without terminal embellishment. The painted version likewise shows progressive degeneration (Fig. 340g). Both developments can be traced stratigraphically through the sequence, the painted design appearing earlier than the applied form.

Rolled rim bowls: Few examples were recovered, being similar to those from D site (p. 315, above). An example from phase III has a burnt exterior, suggesting use for cooking.

Bowls with strongly exterior-thickened overhanging rim: This form was recovered in small quantities throughout the K-site sequence. Also recovered at D site (p. 315, above), it may represent a precursor to the shallow form discussed below.

Deep to medium open bowls: Few of these bowls were recovered, generally large and round-bottomed with a plain rim (Fig. 340h). Decoration is restricted to the use of slip and burnish. A thick-walled bowl, 230 mm in diameter with roughly incised rim groove and fire-marks on the interior bottom, was recovered in phase VI. Another is thinner, brown-slipped and burnished, being 300 mm in diameter. A thick-walled ring-footed bowl from phase I is self-slipped on the interior and beneath the foot (Fig. 340i). A deep bowl with burnished red slip and a post-firing incised cross below the exterior rim may be a precursor of the semiglobular form common at D site.

Tapering straight-walled shallow bowls: Few deep bowls of this profile were recovered, the one inventoried example being 320 mm in rim diameter with a horizontally pattern-burnished interior; it is from phase V. A number of shallow forms occur in phases I and II, often with a red-painted band on the interior of the rim (Fig. 340f). A thick-walled bowl has its flattened rim slipped and adorned with applied buttons bearing an incised cross.

Semi-globular bowls: These bowls were recovered throughout the sequence, ranging between 70 and 270 mm in rim diameter. They are usually well-made, red-to-brown or orange-slipped and burnished. The former often have one or two grooves around the exterior rim. The latter usually show a red-painted rim band and are occasionally further painted, as with a trefoil cross (Fig. 341a). One has a moulded ridge around the interior bottom. A small number of semi-globular bowls display a post-firing incised cross.

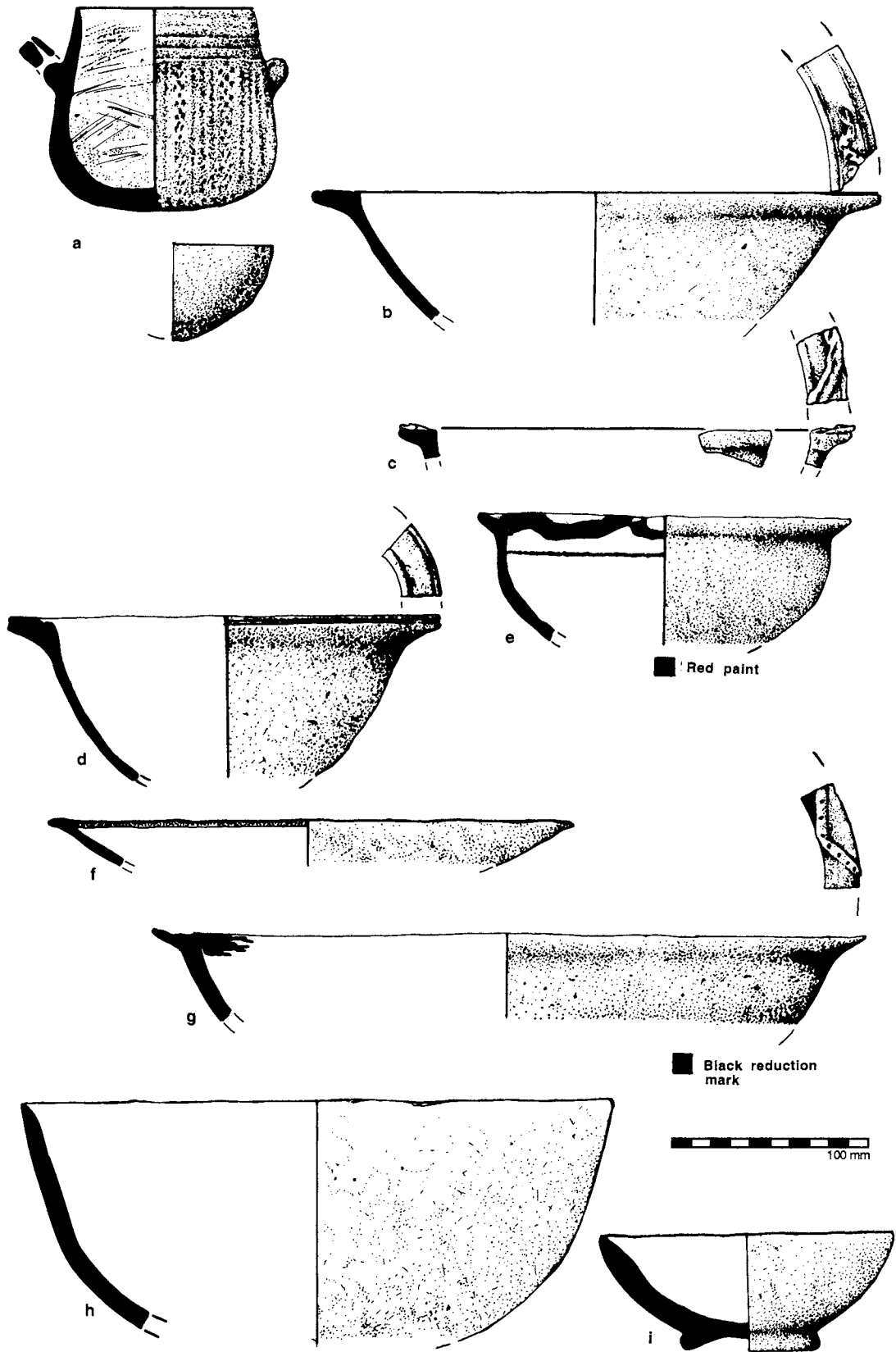


Fig. 340 Pottery beaker and bowls from K site.

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Shallow bowls: Certain shallow bowls encountered in phases III and IV display features such as a smoothed interior, overhanging rim and rough exterior which suggest some affinity with the *metad* used today for cooking *enjera*. More characteristic *metad* rims were recovered in the recent levels.

Cups

A few vessels, nearly as tall as their rim diameter and capable of being held in one hand, are regarded as cups rather than bowls. Two, from phases IV and V, have straight out-tapering walls and rounded rim; one of them (Fig. 341b) has its flat base preserved.

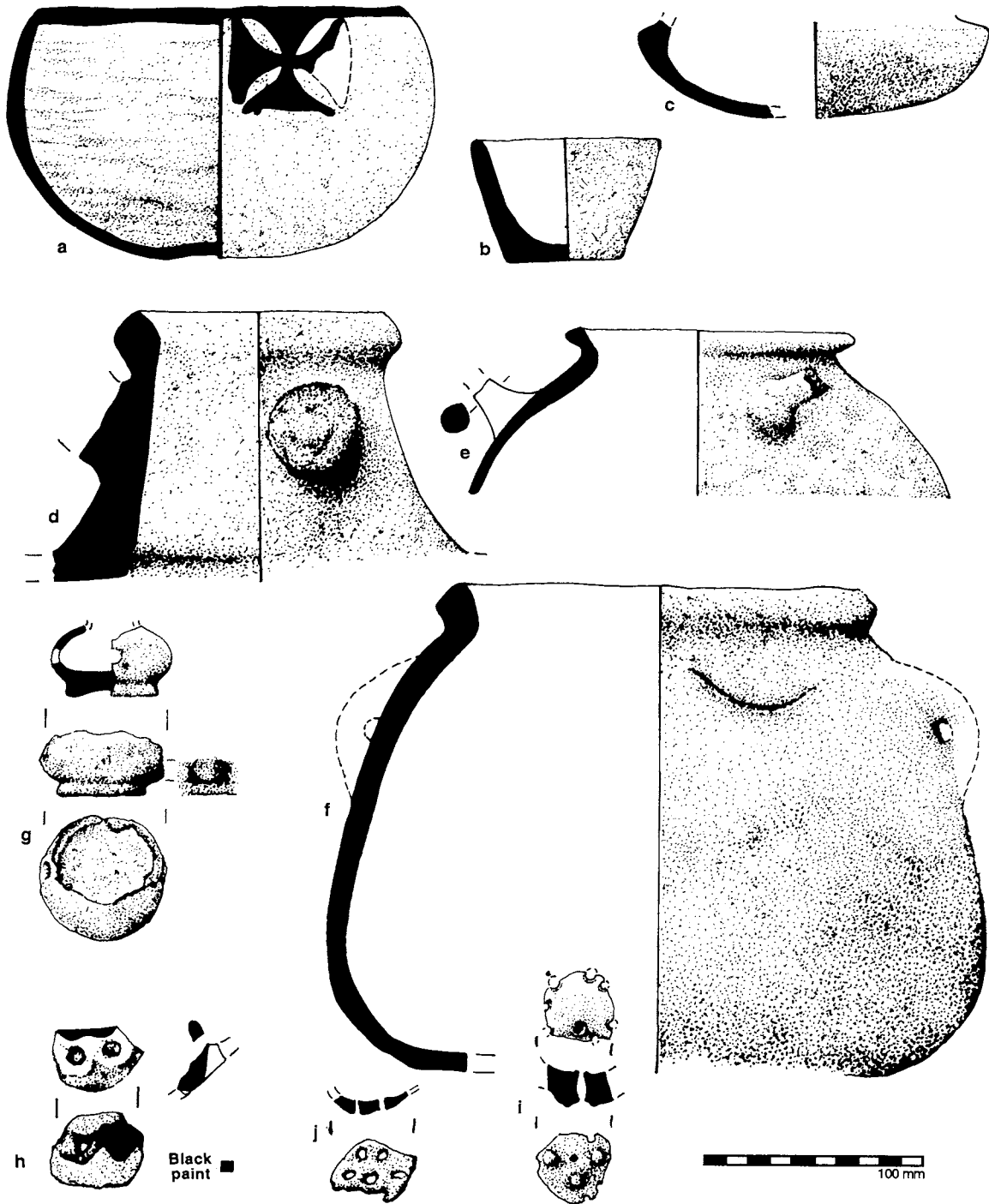


Fig. 341 Pottery bowl, cup, pot, jar, cooking vessels, lamps and filters from K site.

Basins

As at D site, this term is here applied to thick-walled bowl forms more than 400 mm in rim diameter.

Basins with deeply incised or impressed interior: These, recovered throughout the K-site sequence, are a continuation of the type found in the Tomb of the Brick Arches. In contrast to examples from the latter site and the Mausoleum, individual lines of the herringbone pattern are shorter and thinner, and the basin shape seems to be shallower.

Smooth-walled basins: A variety of such basins was found, one example from phase V being 420 mm in diameter, shallow with a rough surface.

Pots

Surprisingly few pots were recognised at K site other than from sherds having a battered rim or closed vessel profile. Since few sherds from footrings or flat bases were noted, it may be assumed that most pots had round bottoms. Rims are mostly of the plain cylindrical, tapering, exterior-thickened or ledge forms noted at D site. Examples with a rebated profile (Fig. 341c) occur throughout the sequence, all with burnished red slip (2.5YR 4/6). The body is low and wide, with a wide rebate and presumably upright neck. Only one example, from phase I or II, is sufficiently well preserved for reconstruction of the lower body, while one from phase II preserves the stub of a vertical coil handle at the rebate.

A well preserved vessel (Fig. 342a) from phase VI in the K3 trenches has a near-globular body with angled shoulder and upright cylindrical collar. The exaggerated vertical strap handle, with incised edges and finger-depressed turn, is pierced vertically. Some features suggest connections with Late Aksumite material, but the incised and infilled cross design with punctated corners, the handle shape and unique decoration above may indicate a more recent date.

Jars

Jars, like pots, are difficult to isolate amongst the K-site material other than from convex body sherds, few jar-rims being identified. Although no bases can be linked with the rim and neck fragments, it is assumed that most jars were round-bottomed.

Ledge-rim globular jars: A few recognisable rims of this form, probably residual, were recovered in phases IV and VI.

Jars with in-tapering necks: Fragments of what are probably large thick-walled jars with inward-tapering necks and two vertical thick oval pulled strap handles (Fig. 341d) occur throughout the sequence, mostly worn and abraded. They include neck and rim, body, and handle sherds. The handles, from upper neck to upper shoulder, characteristically have a groove

along the exterior. The vessels cannot be reconstructed, but it is assumed that some were ring-based, as thick ring-bases of about 140 mm diameter occur in the same fabric in phase IV.

Handled jars: The neck and handles of a jar 310 mm in rim diameter (Fig. 342b) were recovered in phase VI of the K3 trenches. It has a bulging cylindrical neck, slightly flaring rim and a strap handle, with incised cross-hatching around the rim, finger depressions at the handle turn and top, and a punctated applied boss on either side of the neck/handle junction. It combines Late Aksumite features with others suggesting more recent manufacture. A further large jar with a tall cylindrical neck, globular body and single strap handle (Fig. 346) was recovered almost intact from the floor of the phase-VIII round house in the K3 trenches. Similar neck fragments were recovered from the remains of a broadly contemporary context adjacent to the Mausoleum (p. 211, above). The vessel strongly resembles those used today from the preparation of the fermented honey drink, *tej*.

Storage pots

The fragmentation of most sherds is not conducive to reconstruction of large vessels, and storage pots are not easy to recognise in these circumstances.

Near-cylindrical storage pots: No tall forms like those from D site were recognised, although a large vessel from phase II, with slightly convex near-cylindrical body and ledge rim, may be of this type.

Shouldered storage pots: Shouldered storage pots were also recovered, all in a fabric which was also employed for braziers and the large jars with in-tapering necks noted above. Indeed, it is possible that the ring-foot bases may be from this type of vessel. One example from phase IV, self-slipped on the exterior, has a high sloping shoulder with an applied ridge bearing a grooved line suggestive of a rope-pattern, and a convergent rim thickened on the exterior. The rim diameter is about 200 mm, much smaller than the examples at D site (cf. Fig. 279e, above).

Cooking vessels

At least one and possibly two types of cooking pot were recovered, the chief difference being handle form. The definite example (Fig. 341f), from phase IV, is strongly burned on the exterior. It has a flattened rounded bottom, sloping shoulder and exteriorly thickened slightly out-turned warped collar rim about 190 mm in diameter, with two vertical probably coil handles (missing) on the shoulder. The other type, of which one (Fig. 341e) preserves signs of exposure to fire, is similar in general shape but has thinner walls, two horizontal coil handles on the shoulder, and a smaller rim diameter between 140 and 160 mm.

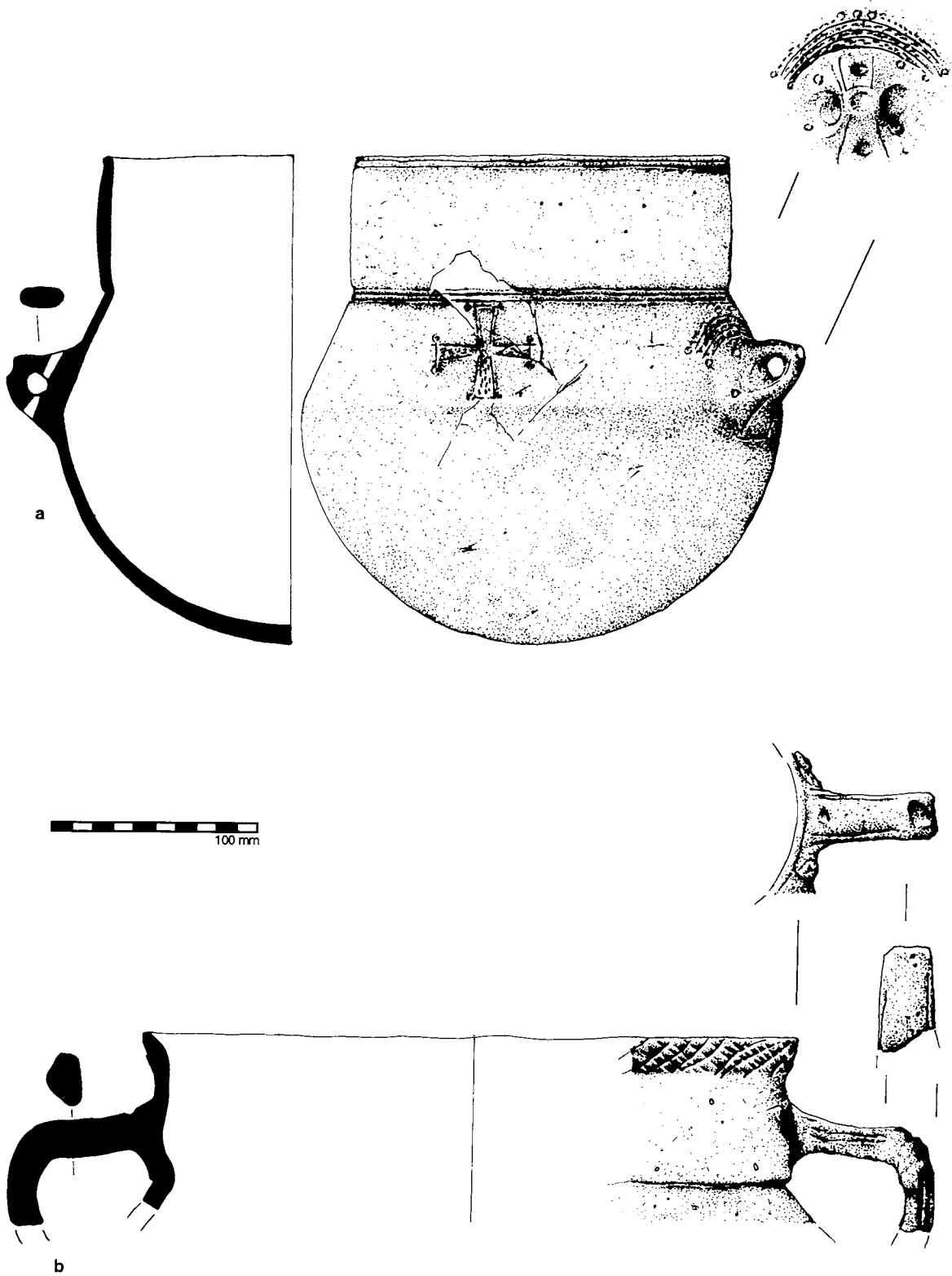


Fig. 342 Pottery jar and pot from K site.

Vessels of this second type were found as early as phase I.

Braziers

No restorable brazier was recovered at K site, although several sherds were found. Four fragments, from contexts well distributed through the sequence, are attributed to braziers of round high-wall type, suggesting that this form was in use from at least the fifth century. Two further fragments, from phases IV and VI, are attributed to deep straight-walled braziers such as that from the Tomb of the Brick Arches (cf. Fig. 55, above).

Lamps

As elsewhere at Aksum, lamps include both purpose-made examples and sherds or vessels that were re-used or converted; the latter being recognised by a concentration of oily black residue or burn marks at specific points on the rim.

Purpose-made lamps: Purpose-made pottery lamps were found redeposited in phases IV and VI.⁴⁸ As at D site, the earliest examples are open shallow ovals in form. One, from phase IV, has a rounded rim, smoothed and burnished on all surfaces, whilst another from the same phase is crudely made with rougher but slipped and burnished surfaces, nearly upright walls, a flat bottom and slightly pinched spout. A rim fragment, also from this phase, probably comes from a purpose-made lamp, or one converted from a bowl; the section is strongly tapered to the rim. Closed forms, not found at D site, occur only in the later levels. From phase VI came a semi-globular form (Fig. 341h) with rounded rim having two wick holes leading to a single extended spout below, and also a ring-footed form (Fig. 341g) with small hole-mouth rim having a lug or vertical loop handle on one side and an 8-mm pre-firing wick-hole opposite.

Lamps converted from other vessels: Broken and residual sherds were converted into lamps from the earliest levels excavated. At K site, unlike D site, they appear earlier than any purpose-made lamps. Most re-used sherds are from ring-foot bowls, the foot being reversed and the shallow underfoot used as the container, although some are open forms that may originally have served as bowls. Such converted lamps occur in phases I, V and VI.

Lids

The few possible lids (or shallow trays) are all fragmentary, chiefly from the phase-V midden. The flat top of another example, from the topsoil, with a flat base rounding to vertical walls, bears the impression of tightly coiled basketry.

⁴⁸ Lamps of stone, copper alloy and glass are discussed separately.

Ladles

Fragments of at least five ladles were found, one in trench K4 within the phase-III bench, and others in deposits of phases IV and V. All have a characteristic large straight strap handle attached to an open body just below the rim.

Filter vessels

A filter fragment from phase I (Fig. 341i) retaining eight holes comes from a closed vessel, perhaps a censor. It is 7.5 mm thick, embellished with three small exterior bosses apparently alternating with the 3.9-mm holes; its exterior bears yellow ochre paint applied over a white undercoat.

The filter insert of a closed vessel neck (Fig. 341j) was recovered in phase II. No further fragments of the vessel were found, but the insert suggests an internal neck diameter of about 40 mm. It may have fitted the neck of a small vessel or the shoulder spout of a larger one. The holes are 4.9 mm across, arranged in a circle of six around the central seventh.

Imported vessels

Imported ceramics are less common and more restricted in type than at D site.

Amphorae: Fragments of amphorae, easily recognisable by their wheel-manufacture and distinctive fabric, were recovered throughout the excavated levels, with the exception of phase I. It would, however, be premature to argue that phase II marks the beginning of these vessels' importation. As at D site, most sherds were recovered singly, often worn and in clearly secondary contexts. The five inventoried specimens are of the same general fifth-to-seventh-century type as the D-site sherds, with strongly ribbed body, tall neck with sloping shoulder, two vertical sloping handles joining upper neck to shoulder, and interior rim inset. Differences can be noted, however, in that the rim inset is not as pronounced and occasionally absent, the handles being less sloping. One amphora (Fig. 343a) from phase IV could be reconstructed and, although missing the shoulder and base, illustrates these features which may suggest a date earlier than that of the D-site amphorae (see Appendix III). Only two fragments of the unribbed variety were found, in topsoil and in phase VI. The K-site amphorae add little to what is already known of these vessels at Aksum, except archaeological confirmation that they may have been present as early as the late fifth century.

African Red Slip (ARS) ware: Seven sherds of ARS ware bowls were recovered from secondary contexts in phases IV to VI and the surface, including two ledge-rim bowls similar to those from D site and the Mausoleum. The illustrated specimen (Fig. 343g) is a shallow open bowl with plain tapering rim, similar to

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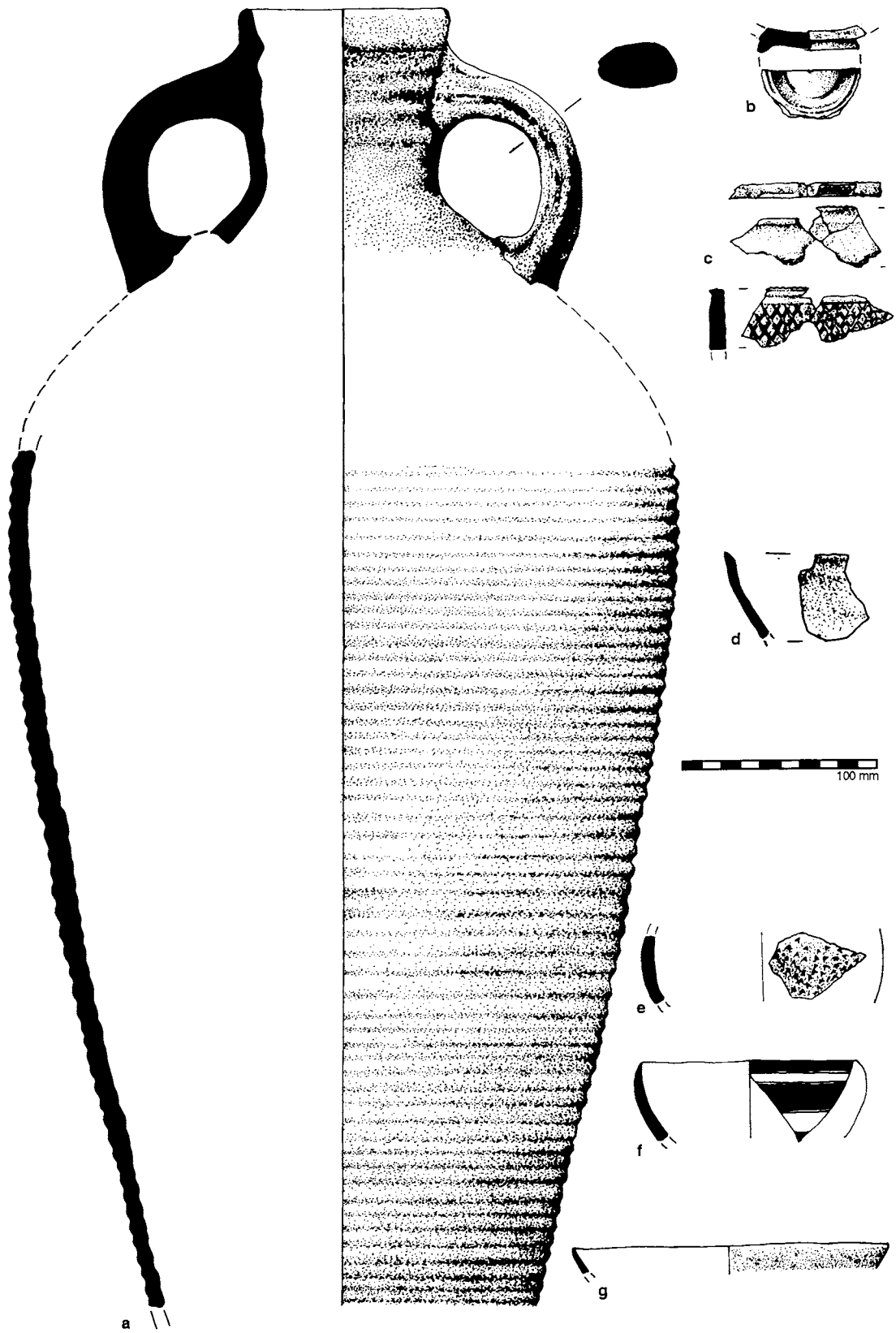


Fig. 343 Amphora, African Red Slip bowl, Sassanian and other imported pottery from K-site.

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one recovered during investigation of the Stelae Park shaft tombs (Munro-Hay 1989: 315). It is difficult to generalise on the small quantity of this material at K site, other than to observe that it does not occur in contexts prior to the mid-sixth century. The K-site sherds are nonetheless possibly earlier than those from D site.

Sassanian blue-green glazed ware: In contrast to the D-site material (p. 326, above), most of the sherds are from shallow open bowls (Fig. 343d) with tapering rims slightly flattened on the interior. At least fourteen bowls are represented, glazed on all surfaces, ranging from 140 to 200 mm in rim diameter, and from 4.4 to 6.2 mm in thickness. All were recovered in phases IV to VI of the K4 trenches, suggesting that such bowls may not have been available in Aksum prior to the mid-sixth century. Their concentration in a particular area of K site also suggests a distribution limited to a single building. Other glazed sherds, presumably derived from the Beta Giyorgis slope, were recovered from the surface and other hillwash contexts.

Hand-made imported sherd: A body sherd (Fig. 343e) from a closed vessel of fine dark grey ware from phase I is covered with triangular punctates. It is



Fig. 344 Porcelain from K site.

reminiscent of a specimen from a phase-I deposit in the Mausoleum (Fig. 170e, above) with which it may share a southerly origin.

Purple-painted Aksumite (PPA) ware: Only three sherds of PPA ware were recovered at K site, all of the same common form and decoration: an open bowl with tapering rim and horizontal painted bands with incised guide-lines (Fig. 343f). They occur only in the upper occupation levels of phases V and VI. The origin of PPA ware has been discussed above (p. 326).

Porcelain: A rim sherd from a porcelain bowl from phase VII has iron-ochre painted geometric decoration (Fig. 344). It is a Chinese deep open bowl, not earlier than the eighteenth century, of a type and quality exported abroad in the Far East and eastern Africa and elsewhere, but not into Europe.⁴⁹ Another fragment from the rim of a similar bowl was recovered on the surface, and a sherd abraded to a discoid shape is noted below. In contrast with contemporaneous contexts in the Mausoleum trenches (p. 211), only one fragment of a porcelain coffee cup was recovered at K site, from the surface.

Residual material

Some sherds from the lower levels at K site and from the later hillwash layers appear, from their form and decoration, to be residual from earlier periods. The possibility cannot be ruled out that unexcavated lower levels may contain earlier material. The residual material is described in terms of the pottery sequence summarised on pp. 453-8, below.

Pre-Aksumite: The few sherds recovered include filter vessel body fragments recovered from contexts of phases V and VI, a bowl with wavy combed decoration from phase I, and a body fragment from phase V of what was probably an open vessel of black-topped red ware with incised dropped triangles between horizontal infill lines (Fig. 345a). This last type is extremely rare at Aksum, but similar to those from Yeha tomb 12 (Fattovich 1980: 39-41, pls xxi.6, xxiii.3, xxv.5) and Matara (*ibid.*: pl. xxxiv.1). Pre-Aksumite occupation is not suggested for K site, and the sherds were probably washed down from Beta Giyorgis during Late Aksumite times.

Proto-Aksumite and Early Aksumite: A significant quantity of definitely Proto-Aksumite and Early Aksumite sherds was recovered in the lower levels investigated, and suggest that older unexcavated deposits may be of this date. Recovered were an open bowl fragment (Fig. 345b) with large flat-strap vertical handle and pattern-burnished exterior, and other

⁴⁹ Ms Jessica Harrison-Hall, Department of Oriental Antiquities, British Museum, kindly provided this information, based on a drawing and colour slide, and a fragment of the sherd itself.

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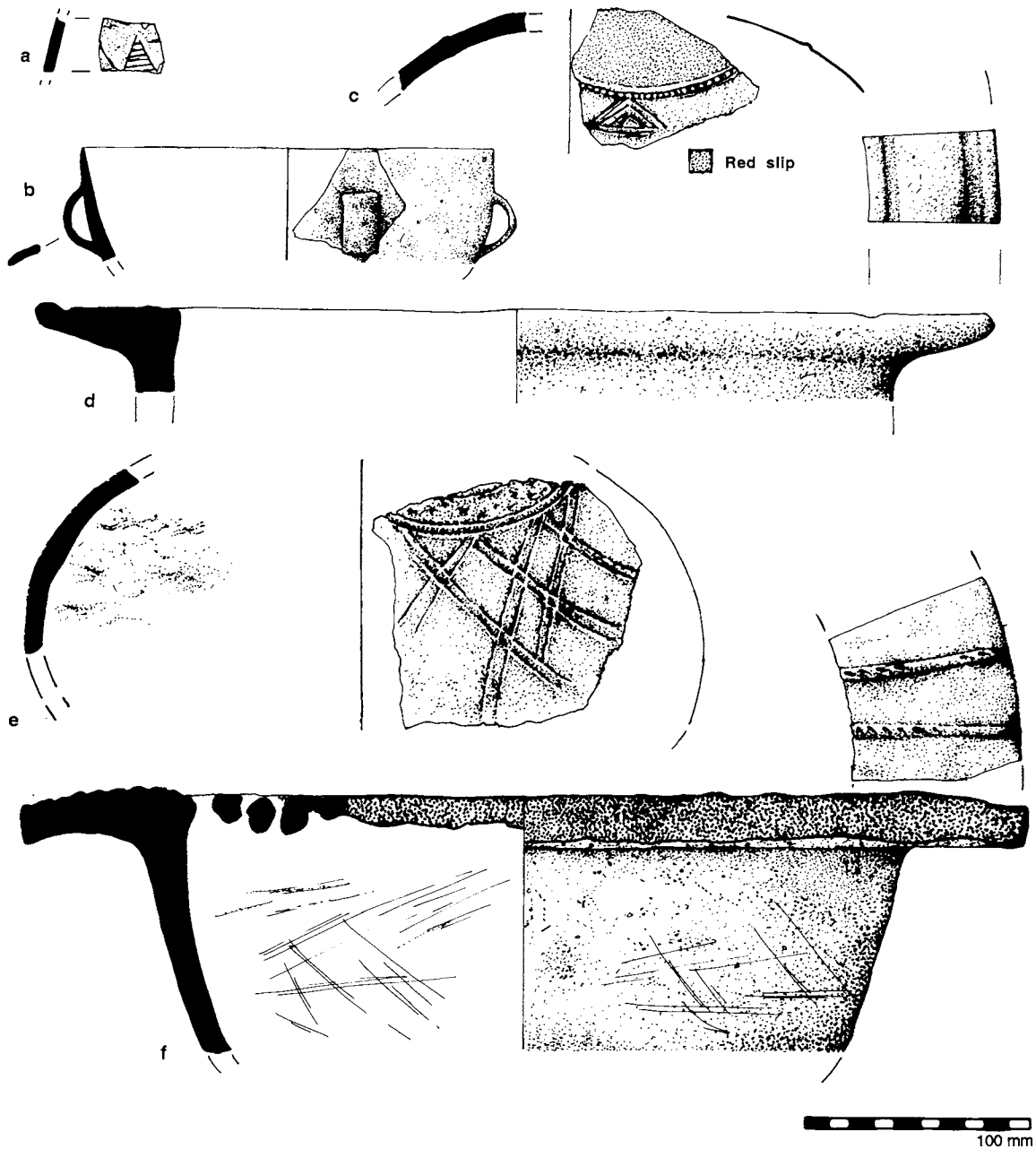


Fig. 345 Residual pottery recovered from K site.

plain burnished examples with horizontal appliqué diagonally ticked near mid-body (phases II to VI), both with characteristic lipped rim. Similar applied decoration occurs on both open and closed vessels, principally in phases IV to VI. A shallow bowl with large flat-strap handle indicative of Early Aksumite date was also recovered in phase VI, and similar handles for closed vessels in phases IV and V. Several broad ledge-rim basins with interior lip were recovered throughout the sequence. The majority have a wide groove near

the inner and outer edge of the rim top (Fig. 345d). One (Fig. 345f) is embellished with radiating pairs of diagonally ticked applied ridges, the entire rim top, inner lip and outer edge being red-painted, and the exterior body rough-wiped. It was recovered in phase V in a clearly residual context. A splaying ring-foot base from phase II may belong with it. The shoulder sherd of a closed vessel (Fig. 345c) from phase VI, with a single parallel at D site, has a fine slashed ridge delimiting a weak red-slipped (10R 4/4) upper shoulder

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from the remaining body and an unusual pendant triangle incised below. Its fabric and surface finish are similar to those of Proto-Aksumite material, but the decoration is somewhat different (C. Perlingieri *pers. comm.* 1998).

Classical Aksumite: A shallow open bowl with tapering rim and corrugated exterior [type 1] and a rebated vessel rim with only horizontal chevron and OWP bands without corrugation are exceptionally fine. Open bowl body fragments with interior raised moulded decoration including a tapering rim and body [type 2], a ring-foot with bordered chevron medallion and a round-bottomed form with bordered OWP medallion may be earlier. All these specimens come from

phases I to II. Almost certainly made earlier, however, are two jar sherds recovered from phases IV and V, one with incised diagonal crosses of double lines embellishing the body below horizontal shoulder patterns (Fig. 345e), and the other alternating vertical corrugation and similar crossed lines, similar to patterns on the earliest tripod vessels (Munro-Hay 1989: 281, figs 16.296-7). A number of sherds with Classical Aksumite decoration preserve white bands of highlighting, as noted in the Tomb of the Brick Arches.

Overview

In comparison with D site, K site yielded far more vessels fired under poor or uncontrolled conditions and

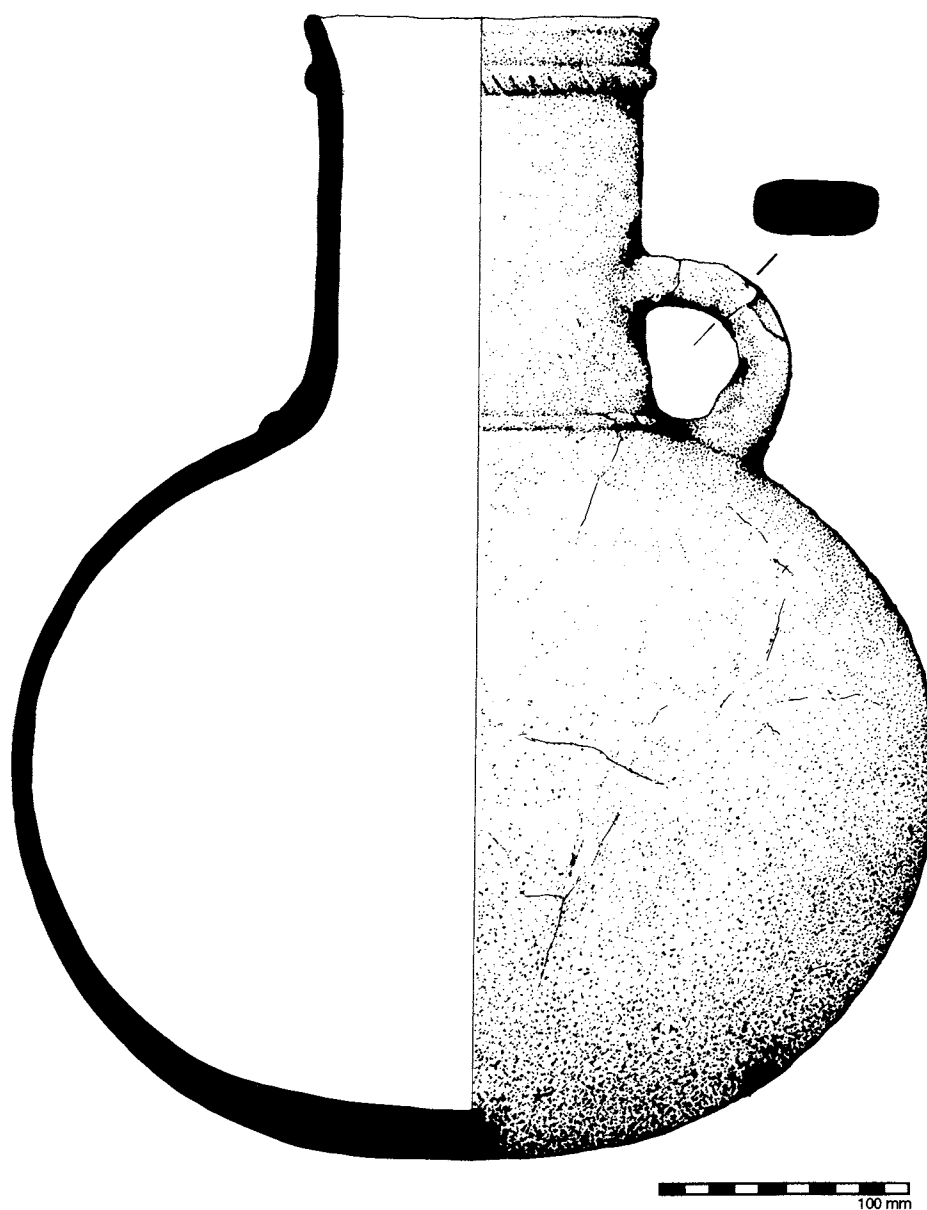


Fig. 346 Recent pottery jar from K site.

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bearing somewhat careless decoration which may be considered transitional between the Classical and Late Aksumite styles. At D site the only sherds of such vessels were probably residual, being associated with later material; but in the earlier phases of the K4 trenches they were apparently deposited *in situ*, at a period prior to the earliest Late Aksumite occupation of D site, perhaps late in the fifth century AD.

Little demonstrably post-Aksumite or recent pottery was recovered at K site, which is surprising since the area has clearly been in continuous occupation for at least a century. It is noteworthy in this connection how little typological and technological change has been discerned in the pottery between the eighth and eighteenth centuries. Such clearly recent pottery as was found mostly came from the K3 trenches where it was associated with the circular house described above. The presence of similar pottery in the phase-VI levels underlying the house is an indication either of the deep disturbance created by its construction, or of the extension of phase VI long into post-Aksumite times. The recent sherds are generally of the same types as were found in the upper levels of trenches outside the Mausoleum (pp. 207-11, above); they are not discussed in detail here.

Other clay objects

The few clay objects recovered at K site are analogous to those found at D site and outside the Mausoleum.

Discs: At least 37 deliberately abraded and roughly circular sherds were recovered throughout the sequence. One, found on the recent house floor in the K3 trenches, was made from a sherd of imported porcelain, and another (Fig. 347a) was abraded around a stamped cross which had embellished the original vessel. No pierced spindle whorls were recovered at K site.

Cone: Only one example was present (Fig. 347b), in phase IV. Its profile is concave and, unlike cones elsewhere at Aksum, it has a flat base and the hole is abortive, suggesting that it may have been intended for a different purpose than those from D site. Its place in the sequence suggests that the tall concave shape may have preceded that with a squat convex profile, and that the base profile developed from flat to concave.

Figurines: Four figurine fragments were noted, two (*e.g.* Fig. 347c, from the topsoil) human or animal foot and lower leg fragments, one (Fig. 347d) a small zoomorphic torso and leg, and the last (Fig. 347e) probably the head of a bird or long-necked animal. The foot and leg illustrated has a tapering foot, and the surface of the leg is impressed with a diamond pattern similar to, but not the same as, that on the blue-green glazed bowl (Fig. 347c). The other, from phase VI, has a splaying flat foot of quite different type. The head, with a punctate eye, tapers to a long nose. The

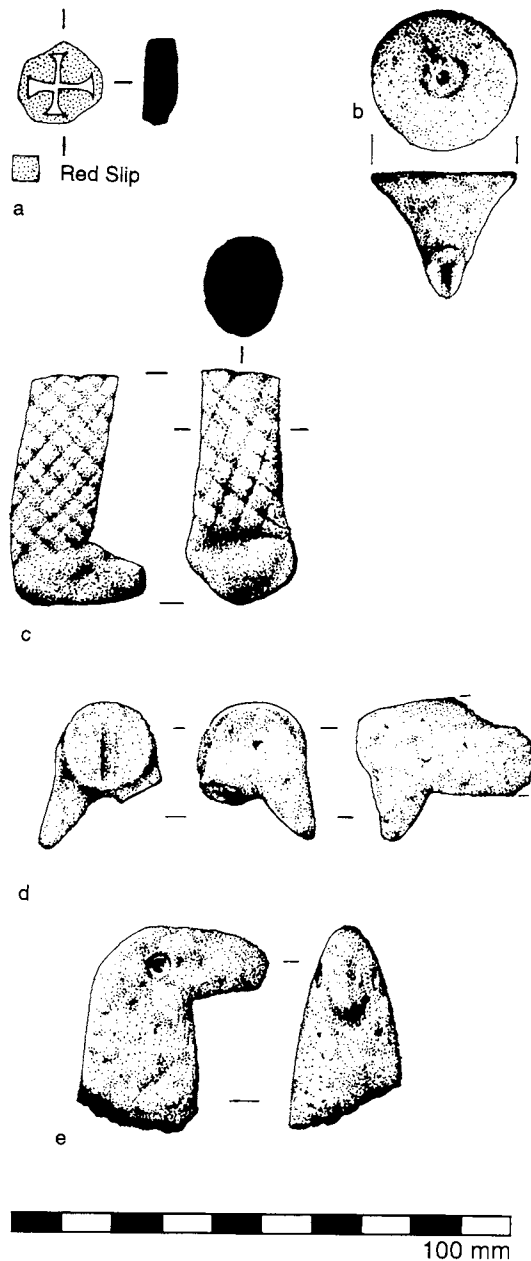


Fig. 347 Clay objects from K site.

torso was drilled vertically at the centre and displays tapering stubby legs. These were recovered respectively in phases IV and I, suggesting dates not later than the mid-sixth century.

Other objects: A circular clay object with concave ends and side profile, possibly an ear-stud, was recovered from phase IV. It measures 27 mm in diameter and 20 mm in height, one end being incised with a cross and bordering circle. Possible ear-studs of different type were recorded at D site (Fig. 2901) and the Mausoleum area (Fig. 188e).

Glass and beads (Michael Harlow)

GLASS

The fragments of glass recovered from the K-site excavations total 255, including numerous fragments less than 10 mm in size that were recovered from archaeological samples; they are summarised in Fig. 348. Less than a dozen are more than 40 mm in maximum dimension. Most are body fragments which rarely permit reconstruction of the forms of the vessels from which they came. Four are from bases, nine from rims, two each from handles, neck and shoulder. Two bangles, two droplets, and two rod fragments complete the list. No complete or reconstructable vessels were present.

It is interesting to note:

- the relatively large number of fragments (108) in phases IV and V;
- the occurrence of lamp fragments in phases III, IV and V;
- the occurrence of unshaped raw glass in phase II, glass rod in VI and droplets in VI and VII, suggesting some form of glass working during Late Aksumite times;
- the wide range of forms, types and colours of the glass in phases VIII and IX, confirming the mixed nature of these recent deposits.

The range of colours is similar to that from D site, with a preponderance of yellowish green, colourless, and colourless with a yellowish or greenish tinge particularly in phases IV and V. Turquoise glass

does not appear in any quantity before phase VI, but sixteen cobalt blue fragments were recovered from phases IV and V. Two fragments of burgundy red were found in phase I but the only other examples are in modern mixed contexts. Other dark colours are represented in early contexts only by purple/black bangle fragments. Fig. 348 summarises the occurrence of colours by phase.

The few recognisable forms are as follows:

Ring-based plate or bowl: This short section of ring-base in translucent yellowish green glass comes from a phase-I context and could have been part of a bowl or plate (Fig. 349a). It appears similar to a fragment illustrated by Munro-Hay (1989: 205, fig 157).

Lamps: Some of the most interesting specimens are fragments of glass lamps. A phase-III context yielded two body fragments of translucent pale yellowish green glass decorated with marvered blobs and bars of medium cobalt blue (Figs 350a, b). These fragments also preserve lightly engraved narrow horizontal bands above and below the three blobs which were themselves elongated into a 'bean'-like shape and grouped as though they were part of a double row. Another small fragment of similar blob-decorated glass came from a nearby context of phase IV. Similar examples from the Stelae Park are described by Munro-Hay (1989: 200, figs 14. 121-5, citing parallels from other sites in northern Ethiopia, from Kish and from Nubia). Harden (1969: 75, pl. x.a) notes a fourth-century AD 'upturned cone' lamp from Karanis of similar glass and decoration. A further example which is attributed to the 'fifth or perhaps sixth century' in 'Egypt or the Near East' has been illustrated by Tatton-Brown (in Tait 1991: pl. 127) who also describes (*ibid.*: 100)

Phase	red	cobalt blue	blue	colourless	yellow-tinged colourless	green-tinged colourless	green	turquoise	green/yellow	white	other	Total
I	-	-	-	1	-	-	3	-	1	2	2	9
II	1	-	-	1	1	1	-	-	2	-	-	6
III	-	1	-	1	-	-	1	-	2	-	-	5
IV	1	10	-	4	-	17	4	1	10	-	-	47
V	1	6	5	8	5	5	3	1	20	4	3	61
VI	1	1	1	4	-	-	1	14	2	-	2	26
VII	1	-	-	-	-	-	-	-	4	-	3	8
VIII	1	11	5	11	-	-	38	5	10	1	2	84
IX	-	1	-	2	-	-	2	3	-	-	1	9

Fig. 348 Summary of glass from K site.

K Site in Maleke Aksum

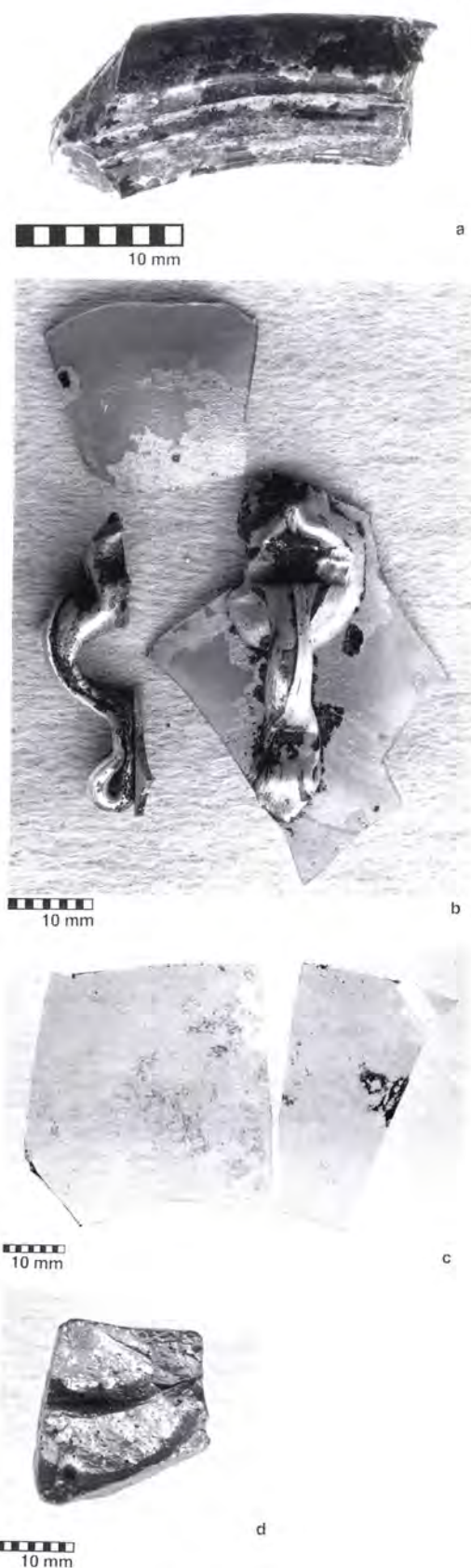


Fig. 349 Glass from K site.

glass lamps from Early Byzantine sites around the eastern Mediterranean, including some with small handles so that they could be hung on chains from the ceiling.

A further group of glass lamp fragments came from phase IV (Figs 349b, 350c, d), consisting of thin (0.8 mm) body fragments of colourless glass with a greenish tinge and two loop-handles applied to the exterior, probably for suspending the lamp. The lamp appears to have been globular with a broad flaring rim above the handles and a carination between the lower body and the base. This form of lamp seems to belong to the group of globular hanging lamps with little handles described as type IXb by Morrison (Munro-Hay 1989: 200, figs 14.127-36), except that the rims are much broader. Similar broad rims occur on ninth/tenth-century Persian hanging lamps which anticipate the great enamelled and gold-painted mosque lamps of Syria and Egypt in the Mamluk period (Tait 1991: 122, fig. 154).

Other lamps are represented by two rim fragments of the narrow everted-rim variety, one of lemon yellow and the other yellowish green glass, from a phase-VII context; two rim fragments of thicker (3 mm) and less pronounced form in bright green and yellowish green glass from phase V; and body fragments of thin yellowish green glass with two parallel engraved bands from phase IV.

Bowls: One rim fragment of medium yellowish green glass and an accompanying body fragment from phase VI seem to come from a fairly steep-sided globular-bodied bowl. The rim is narrow but sharply everted and the glass is too thick and darkly coloured for it to be a lamp (Fig. 350e). Although it can be assigned to category IIIc 'bowls with lip-edge rims' in Morrison's classification (Munro-Hay 1989: 189), there is only one possible parallel (*ibid.*: fig. 14.58) despite the 'moulded pinched ribs' on the body of the published vessel. Fig. 350f shows a body fragment of cased glass from phase VII, seemingly from a bowl. The inside of the vessel is of colourless glass with a yellowish green tinge, the outside a thinner layer of translucent brownish red glass. The outer layer has been crudely cut away in a very rough undecipherable design so that the colourless glass shows through; a cameo-cutting technique was probably used. No similar example is known from Aksum but Price and Cottam (1998: 30) report that cased glass of this kind, although rare in Britain, was manufactured elsewhere in the fourth century. Von Saldern (1991: 118) notes Near Eastern deep-relief geometric glass-cutting in the fourth and fifth centuries. A fragment of cased glass similar to that from the Tomb of the Brick Arches and the Mausoleum, of cobalt blue over opaque white glass, was recovered from a late context of phase VIII.

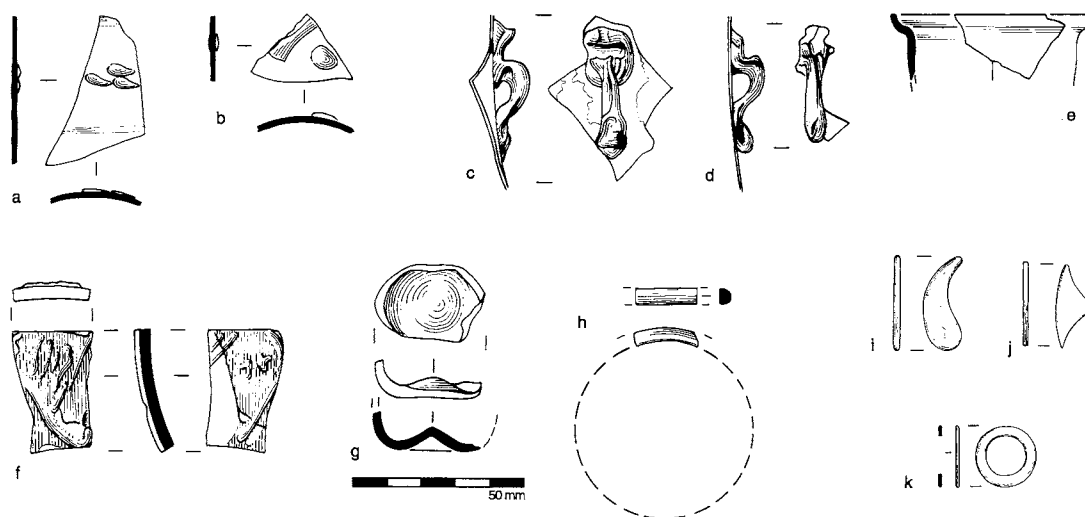


Fig. 350 Glass from K site.

Phial: A concave base-fragment from phase VII is of pale brownish red, or pink glass, c. 25 mm in diameter, retaining part of the vessel side (Fig. 350g). As the glass is relatively thick (3 mm) it seems likely to have been a part of a phial rather than a beaker (cf. type VIII of Munro-Hay 1989: 195, figs 14.111-2).

Bangle: A bangle fragment from phase V (Fig. 350h), of wound dark brownish black glass, has a semi-circular 5 by 4 mm cross-section, flat on the inside; its original inner diameter was about 54 mm. This type of bangle has been noted on several sites at Aksum (type XIb of Munro-Hay 1989: 207, figs 14.194-5).

Miscellaneous fragments: Two fragments of uncertain use are illustrated in Figs 350j, k. The first, of dark cobalt blue opaque glass from phase V, is 1.0 mm thick, flat, triangular, with a convex base 25 mm long and concave sides. Unlike the cold-clipped inlay from the Mausoleum, it had been cut to shape while hot. It might be a waster from a sheet of glass after discs had been cut. The second, from a modern context, is a broad flat disc of translucent dark burgundy red glass 18.5 mm in diameter with a large central hole; it could have been used as a pendant or some other form of decoration. Two body fragments of curved colourless glass with a turquoise tinge are noteworthy in view of their unusual exterior decoration: part of the surface was stippled with tiny fragments of the same glass which seemed to have been rolled onto it when it was fairly cool so that they did not melt into it but remained protruding (Fig. 349c). These fragments might derive from a globular lamp, but they were found in a mixed modern context and their age is uncertain.

Unshaped raw glass

Some unshaped fragments are of particular interest as they suggest that glass may have been worked in the vicinity of K site. Figs 349d and 350i illustrate a small lump of opaque red raw glass from phase II and a flattened droplet of similarly coloured glass from phase VI. The latter could have been formed by dropping heated glass onto a flat smooth surface. Two small fragments of glass rod add to the evidence of glass working. One, from phase VI, is of translucent cobalt blue glass 3.5 mm in diameter. The other, from phase VIII, is of light green translucent glass.

BEADS

A total of 43 beads was excavated at K site: 32 of glass, 10 of stone and 1 of clay. They occur throughout the sequence but the largest groups are from phases V and VI, the glass mainly from trench K4 and the stone from the K2 midden.

Glass beads

The colours of the glass beads are summarised by phase in Fig. 351, but their number is so small that it is not possible to discern any significant trends. The largest group is opaque or translucent turquoise in phases IV, V and VI; the blue and cobalt blue beads tend to be earlier and the red varieties later. Two beads with red over white and red over green come from phases VII and VIII respectively.

Spheres: The nine spherical beads came from phases IV to VIII. Three are illustrated. Fig. 352a is in opaque mid-red glass with black lengthwise stripes, from phase VI; and Fig. 352b, in opaque mid-turquoise glass, is from phase VI. Fig. 352c shows fragments of an unusual hollow bead with a green core covered with

K Site in Maleke Aksum

Phase	cobalt blue T	blue T	colourless O	green O	turquoise O	turquoise T	red O	white O	other glass	stone	clay	Total
I	-	-	-	-	-	-	1	-	-	-	-	1
II	2	1	-	-	-	2	-	-	-	-	-	5
III	-	-	-	-	-	-	-	-	-	1	-	1
IV	-	-	-	1	1	1	1	-	-	-	-	4
V	1	2	-	-	2	4	-	-	-	5	-	14
VI	-	-	1	1	2	1	2	-	-	2	1	10
VII	-	-	-	-	-	-	-	-	1	-	-	1
VIII	-	-	-	-	-	1	1	1	1	1	-	5
IX	-	1	-	-	-	-	-	-	-	1	-	2

Fig. 351 Summary of beads from K site. (O = opaque, T = translucent)

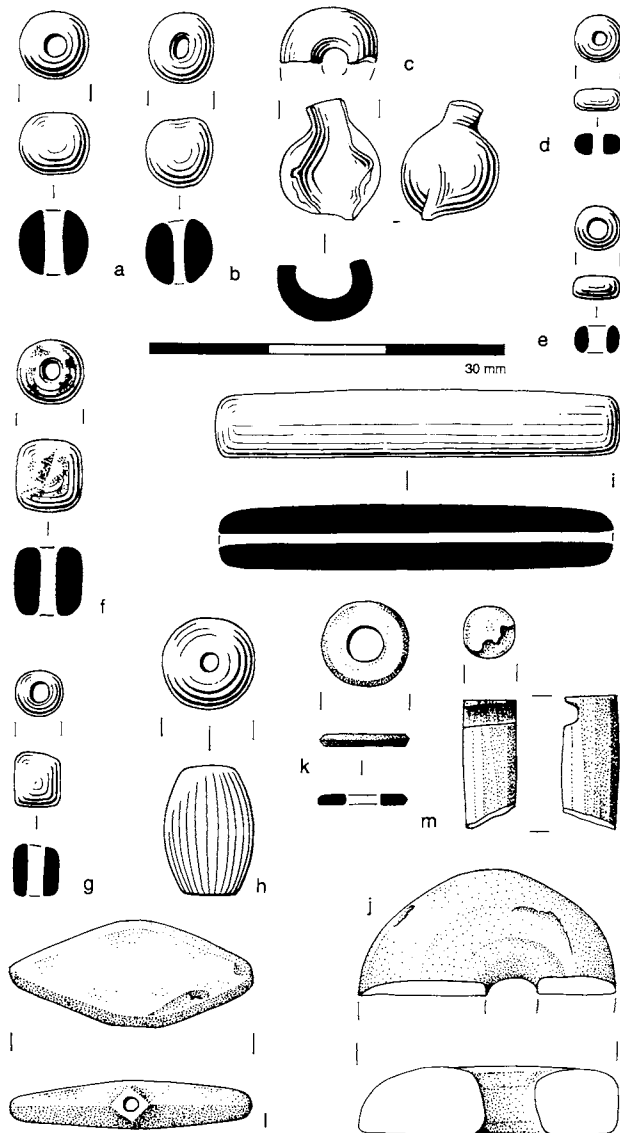


Fig. 352 Beads from K site.

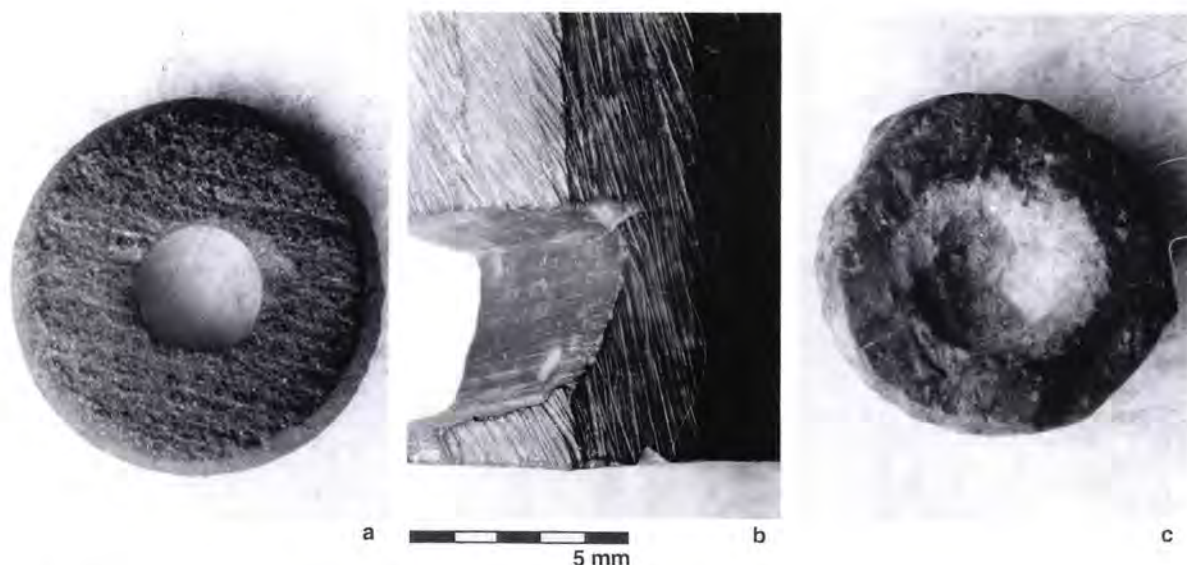


Fig. 353 Beads from K site, illustrating methods of manufacture.

translucent red glass and a protruding collar at one end, from phase VII.

Oblates: There are seven oblates: short elliptical forms with circular cross-sections, all from phases II, IV and V. Those shown in Figs 352d, e are in pale turquoise glass from phases IV and V.

Barrels: The five barrel beads comprise three from phase V and one each from phases I, IV and VIII. Two are illustrated: Fig. 352f is in dark turquoise glass from phase V, and Fig. 352g is in opaque dark red glass from phase IV.

Rings: Four ring beads were recovered: two from phase V contexts are translucent mid-blue, one from phase VIII is flat with a double-chamfered circumference in opaque burgundy red, while one in translucent dark blue glass comes from a modern context.

Discs: There are two disc beads, both in dark turquoise glass, from phases II and VI.

Cones: Two cone-shaped beads came from the same phase-II context, in mid-blue and translucent cobalt blue glass.

Bicone: A long rounded bicone of opaque mid-red glass comes from phase VI (Fig. 352h).

Cylinder: The single long cylinder bead is illustrated in Fig. 352i. It is 34 mm long, of clear glass with a greenish tinge, and comes from phase VI.

Stone beads

The ten stone beads comprise two in carnelian, one each in metamorphosed sandstone, limestone, basalt and haematite, with four of unidentified stone. There are three discs, two oblates, and one each of cone, sphere, barrel, cube and flat diamond. Seven of the

stone beads come from phases V and VI. Two disc beads are illustrated: one of metamorphosed yellowish brown sandstone from phase VI (Fig. 352j) and the other, much smaller and slimmer, of black basalt from phase V (Figs 352k, 353a). One of the carnelian beads is illustrated in Fig. 352l: it is a diamond-shaped flat bead perforated through the narrower width of the diamond and has bevelled edges. It comes from the recent phase IX. The other carnelian bead, from phase VIII, has a barrel shape and a deeper red colour.

Three of the stone beads show signs of their method of manufacture. A thick faceted bar from phase VI, 32 mm long, of dark bluish black stone with a saw cut at one end is probably a blank for the production of stone beads (Figs 352m, 353b). An unperforated cuboid piece of haematite from phase V may be another blank. A partly bored oblate in blackish brown stone from phase V is also illustrated in Fig. 353c.

Clay bead

The single clay disc bead came from phase VI.

Metal (D.W.P.)

Coins

A total of fourteen identifiable coins and three probable ones was recovered during the K-site excavations. Full details and selected illustrations are provided in Appendix V. Their stratigraphic occurrence at K site is summarised here, inventory numbers being cited for ease of cross-reference.

K Site in Maleke Aksum

No coins were recovered from deposits of phases I to III. Phase IV yielded five specimens: type 76 [Anon. AE2] (1 - K/103\); type 118 [Wazena AE1] (2 - K/64\, K/118\); type 134 [Ioel AE3] (1 - K/107\); and illegible (1 - K/117\). From phase V came four coins: type 134 [Ioel AE3] (1 - K/143\); type 137 [Hataz AR1] (1 - K/157\); type 141 [Hataz AE2] (2 - K/163\, K/171\). The four coins from phase VI deposits comprised: type 137 [Hataz AR1] (3 - K/22\, K/40\, K/49\); and illegible (1 - K/62\). Phase VII yielded a single coin (K/21\), presumably redeposited, of type 76 [Anon. AE 2]. The three coins redeposited in phase VIII comprised: type 148 [Gersem AE1] (1 - K/46\), type 153 [Armah AE1a] (1 - K/68\); and illegible (1 - (K/52\).

Silver

Three items of very debased silver were recovered from Late Aksumite contexts. An ingot (Fig. 354a) from phase I is 30 mm long and weighs 6.7 g. Part of a finger-ring (Fig. 354d) from phase IV, 15.5 mm in diameter and 5 by 1 mm in cross-section, is decorated on its outer face with a series of oval depressions. Also from phase IV came a 40-mm length of twisted square-sectioned wire (Fig. 354b).

Lead

Post-Aksumite levels yielded a plain lead seal (Fig. 354c), 19 mm in diameter.

Copper alloy

The K-site material, like that from elsewhere at

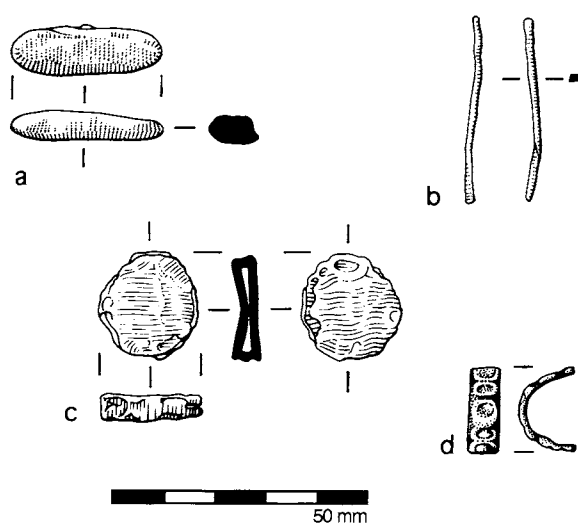


Fig. 354 Silver and lead artefacts from K site.

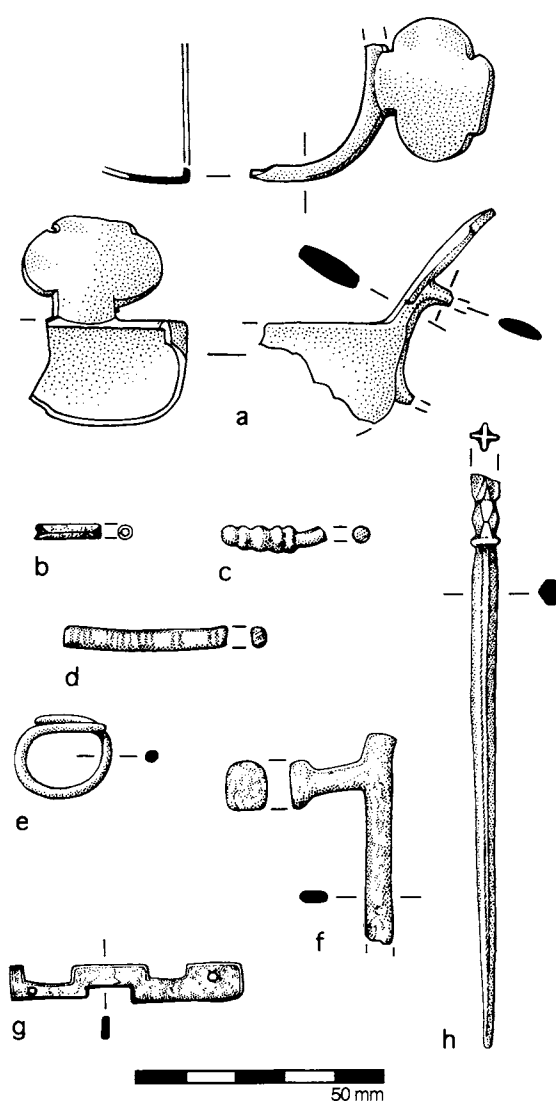


Fig. 355 Copper alloy artefacts from K site.

Aksum, has not been subject to metallurgical analysis and all copper or copper alloy artefacts are described together under this heading. Late Aksumite material was as follows:

Lamp: A fragment of an elaborate lamp from phase V (Fig. 355a) is made of sheet metal 1.5 to 2.0 mm thick. It comprises part of a bowl with a flat-top rim and a foliate projection at 45 degrees preserving the stumps of a vertical strap handle behind.

Ring: A ring (Fig. 355e) from phase V consists of a 19 by 16 mm loop of oval-section wire.

Pins or applicators: Two pin-like objects from phase V may have served a cosmetic function. One (Fig. 355h) is square in cross-section, the head demarcated by a collar and bearing opposed v-shaped cuts

producing a cruciform plan. Another (Fig. 355c) preserves a rounded beaded head on part of an oval-sectioned shaft; it was recovered next to the decorated bar illustrated in Fig. 355d.

Miscellaneous: A piece of thin sheeting (Fig. 355b) from phase IV had been carefully bent to form a hollow tube 13 mm long and 3.9 mm in maximum diameter. An object from phase V (Fig. 355f) is of uncertain function, perhaps some form of fastener. It is a bar 42 mm long, of rectangular cross-section, with a right-angled branch terminating in a flat head resembling that of a nail. Equally enigmatic is the piece from phase IV illustrated in Fig. 355g: a 56-mm length of copper alloy strip carefully cut to a stepped shape and pierced in two places, perhaps some form of decorative attachment. Other less distinctive artefacts comprise fragments of sheet metal from phase II; two discs, two shanks, a nail, some sheet fragments and a narrow perforated decorated strip from phase IV; a thin groove-decorated bar and some sheeting from phase V.

Items from post-Aksumite contexts included a nail retaining traces of gilding on the head.

Iron

Knives: The two specimens, from phases II (Fig. 356c) and VI (Fig. 356d), are both of the usual Aksumite type with a triangular-sectioned blade and a tang.

Hammerhead: A hammerhead from phase III (Fig. 356a) is of particular interest as representing a type of tool not noted elsewhere during the 1993-7 Aksum excavations, although a hammer of quite different type, with integral iron handle, was recovered in 1974 from the Tomb of the Brick Arches (Munro-Hay 1989: fig. 15.141). The K-site specimen is a double-ended hammerhead, slightly curved, 153 mm long, 59 mm wide and 38 mm thick, with a shaft hole 21 mm in diameter. Its flat ends, one 34 mm square and the 22 by



Fig. 357 Metal-working debris from K site.

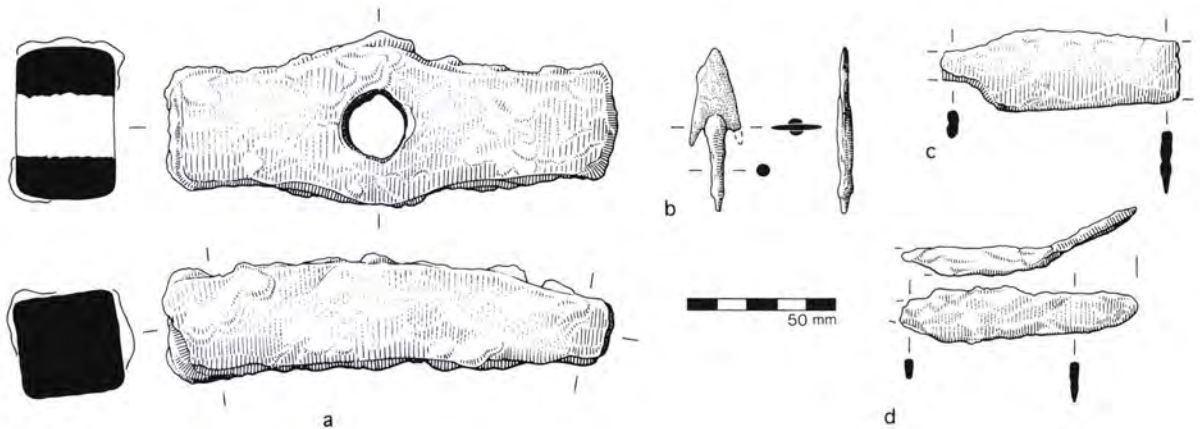


Fig. 356 Iron artefacts from K site.

K Site in Maleke Aksum

33 mm, show no signs of heavy use. The specimen's weight was unfortunately not recorded.

Arrowhead: An arrowhead from phase VI (Fig. 356b) has a triangular barbed blade of copper alloy set in rounded iron tang. Its overall length is 56 mm.

Miscellaneous: The remaining iron specimens from Late Aksumite contexts comprise a bar from phase IV and miscellaneous fragments from phases III, IV and V.

Metal working

The phase-V midden in the K2 trenches contained slag and crucible fragments (Fig. 357) indicative of metal working. Samples examined by Ann Feuerbach are identified as copper or copper alloys, but no detailed analysis has been undertaken.

Recent metalwork

A quantity of recent material recovered in contexts of phases VIII and IX, mostly from the round house in the K3 trenches, included remains of an umbrella and a pump-filter, as well as hinges and cartridge cases, and is not described in detail.

Ivory, horn, bone and shell

(D.W.P.)

Ivory and horn

A rectangular plaque of elephant ivory (Fig. 358a) from phase IV measures 68 by 36 mm and is 5 mm in average thickness, with shallow carving on one smoothed side comprising a ladder border, the space thus enclosed being divided by a groove down the centre into two squares, each with a faint lotus-like design. The back of the plaque retains clear tooling marks which are discussed and illustrated elsewhere (p. 463 and Fig. 408b, below). There are no signs of the plaque having been attached to another object. It is not possible to propose parallels for this plaque, nor to suggest its possible function.

Fragments of two lathe-turned objects, perhaps rims or walls of cylindrical boxes resembling but not identical to those from the Tomb of the Brick Arches, were recovered from phases V (bone, Fig. 358b) and VII (horn, Fig. 358c). They are respectively 40 and 70 mm in diameter.

Phase V also yielded a similar object (Fig. 358d), interpreted as part of a horn bracelet, 67 mm in diameter. Further evidence for the use of a lathe at K site is provided by two ivory offcuts from phase V (Fig. 358e), further discussed below (pp. 460-1, 468 and Fig. 403).

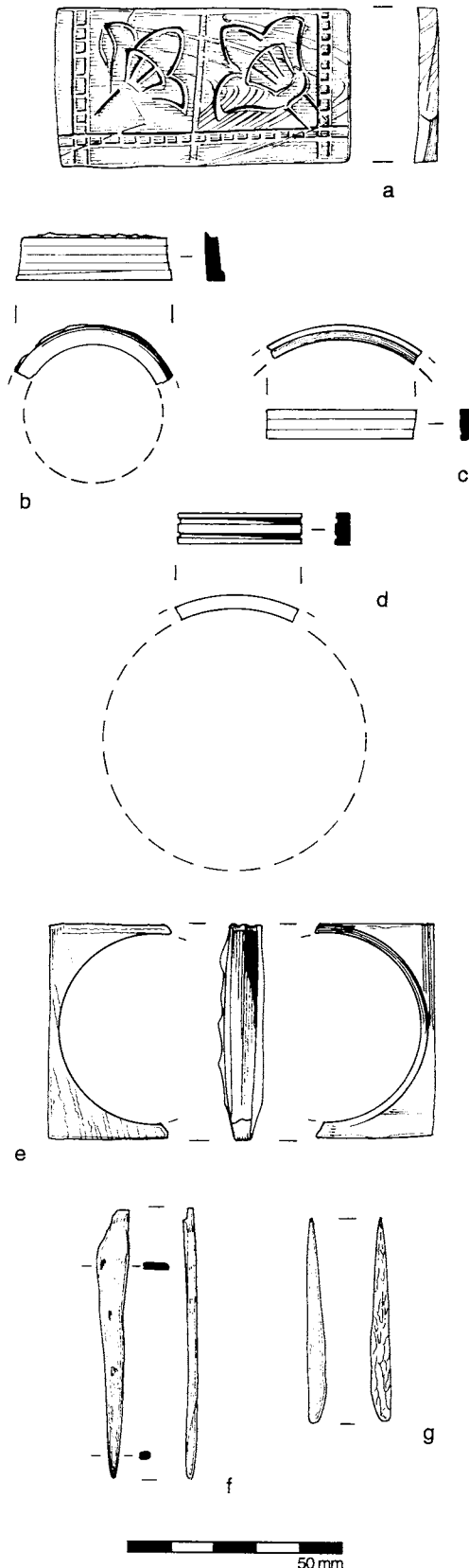


Fig. 358 Artefacts from K site in ivory, horn and bone. Design on a is faint.

Bone

Bone points were recovered from phases III (Fig. 358f) and V (Fig. 358g), Both are virtually intact, respectively 63 and 49 mm long. They are each informally made on a splinter or rib or longbone, with a point at one end bearing use-polish.

Shell

Particular interest attaches to two perforated cowrie shells from phases I and IV since they are, so far as the writer is aware, the only such objects yet discovered in contexts of demonstrable Aksumite age. The later specimen retains traces of red paint. Cowries were not infrequently recovered from recent contexts adjacent to the Mausoleum, and two further examples came from recent levels at K site.

Stone and brick

(D.W.P.)

A complete lamp (Fig. 359a) from phase V, finely pecked from syenite to the shape of an open bowl, measures 80 by 50 mm by 41 mm high. Its sides, tapering to the base, bear neat parallel rings and the lip has a single depression or spout. There are traces of a black stain on the interior.

A rectangular piece of fine-grained pumice (Fig. 359b) from phase II measures 61 by 47 by 22 mm, smoothed on all surfaces. Such stones are now used for fine leatherwork and preparation of vellum.

A plaque of grey-black chlorite schist (Fig. 359c) from phase IV is slightly abraded on the front, rough on the back, with smooth sides. It is 45 mm square and 12 mm thick.

A piece of fine-grained sandstone (Fig. 359d) from phase I is interpreted as a whetstone, 37 by 17 by 8 mm.

Grindstones were also recovered but not recorded in detail. In general terms, the collection is analogous to that from D site (pp. 346-8, above).

An unusual asymmetric brick fragment (Fig. 359e) from the K2 midden bears rough cross-hatching on one surface and seems to have been roughly smoothed on the others. Jacke Phillips notes that it may have been used as a smoothing or polishing device in some industrial or craft activity and may have been intentionally shaped to facilitate use in the right hand; two worn spots suggest positions for the thumb and forefinger. The cross-hatching was incised after firing, perhaps in order to improve grip.

Lithics

(Laurel Phillipson)

As at D site, it was not possible to achieve complete recovery of the chipped stone artefacts present in the excavated deposits. More than half of all the small worked stone (146 out of 234 pieces) recovered, including tools, cores and debitage, was recovered from

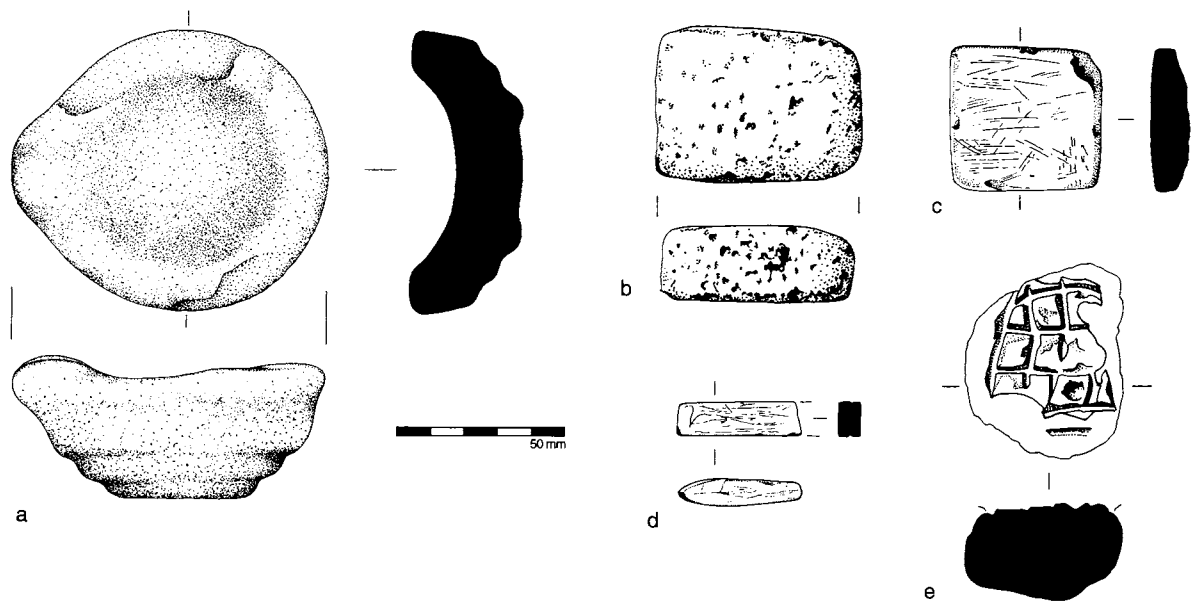


Fig. 359 Artefacts from K site in stone and brick.

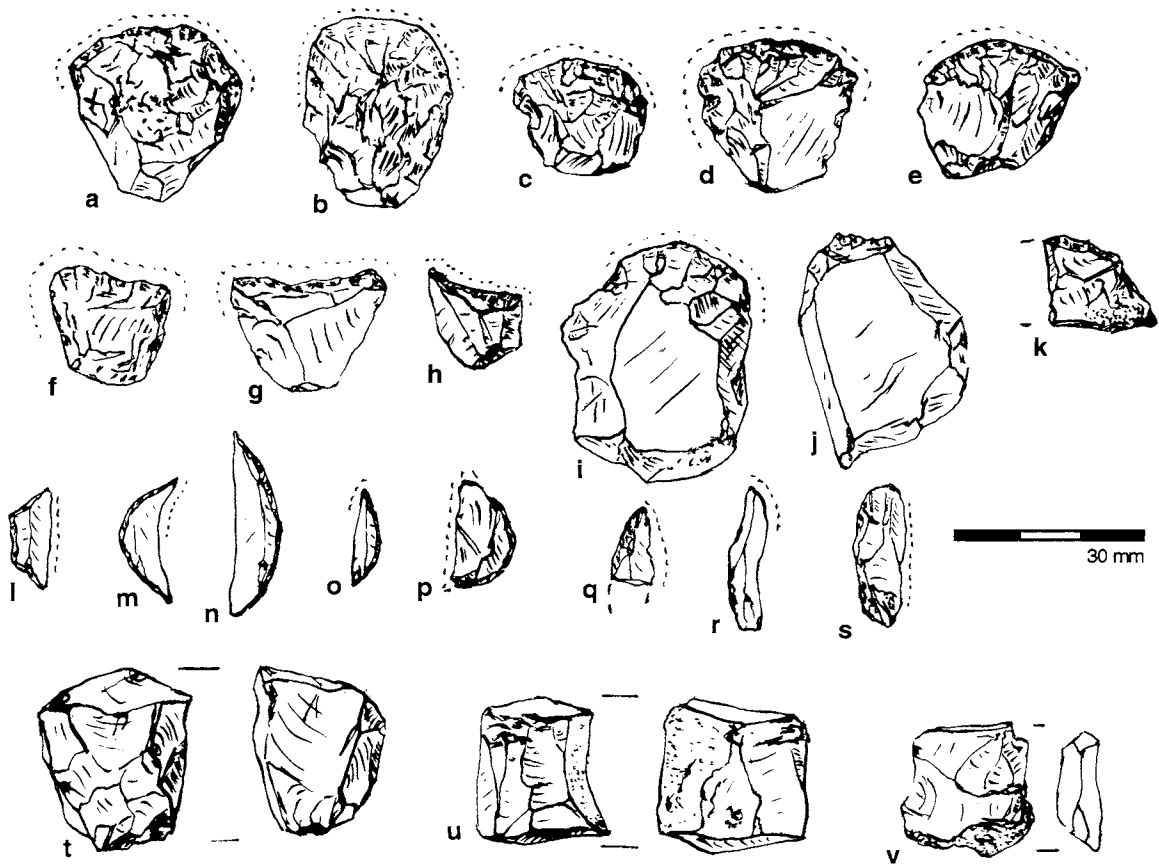


Fig. 361 K-site excavated lithics (dashed lines indicate areas of heavy utilisation and microscarring): **a-d** - Gudit scrapers (chert, **a** is burnt, **b** very heavily utilized); **e** - Gudit scraper (chalcedony); **f** - concave scraper (chert); **g** - concave scraper (chalcedony); **h** - concave scraper (obsidian); **i** - convex flake scraper (chert); **j** - denticulate flake scraper (chert); **k** - flake scraper fragment (chalcedony); **l** - uniaxially trimmed trapezoid (chalcedony); **m** - crescent bifacially trimmed at tip (chalcedony); **n** - crescent bifacially trimmed at tip (chert); **o, p** - uniaxially trimmed crescents (chalcedony, **p** is very heavily utilised); **q** - bifacially trimmed crescent tip (chalcedony, very heavily utilised); **r, s** - minimally backed bladelets (chalcedony); **t** - multiplatform core (chalcedony); **u** - bipolar core (chalcedony); **v** - exhausted core (chalcedony).

Aksumite deposits, and it was from these samples that almost all pieces smaller than 3 mm were recovered.

The very low percentage of cores from Late Aksumite contexts at least suggests that while lithic tools were used at this site, they may not have been produced here. This tentative conclusion does not seem to be well supported by the proportion of 87% flake fragments, chips and chunks relative to all lithic elements from the phase. It is further complicated by the very casual nature of cores in the Aksumite lithic assemblages, which makes it difficult to distinguish some cores and core fragments from more random chips and shatter chunks. The total absence from this site of Likanos flakes, which were abundant at D site and which are the most obviously agricultural of the lithic tools, accords well with the evidence of other artefact classes and features, that this was primarily an

urban industrial, rather than a suburban agricultural settlement. The presence of a variety of backed microliths and microlithic fragments suggests that various activities took place here in addition to the possibly commercial employment of Gudit scrapers for wood and ivory working. Evidence for the use of Gudit scrapers is discussed on pp. 437-9.

The Late Aksumite lithics from K site (Figs 361, 362) show many similarities and apparent identities of tool types with the D-site material; tool frequencies and use of raw materials are, however, markedly different. While the presence of obsidian Likanos flakes only at D site seems to indicate a major economic differentiation, the use of fine cherts and chalcedonies rather than obsidian for the production of backed microliths at K site suggests that some additional factor of cultural differentiation was present.



Fig. 362 *The range of scraper types recovered from K-site deposits.*

Whatever the cause of this differentiation, it seems to have been deliberately maintained since fine cherts and chalcedonies and glassy obsidian were available to the inhabitants of both sites.

Observations on the probable use of the various classes of microliths, especially the crescents and their broken tips, at D-site (pp. 359-60) probably also apply to tools from this site which, being of harder cherts and chalcedonies, exhibit less of the fine use-wear traces observed on the obsidian artefacts. Some of the most convincing evidence for the use of Gudit scrapers in the preliminary stages of ivory working comes from ivory turning waste scraps recovered from this site (cf. p. 461, below).

HUMAN SKELETAL REMAINS *(Helen Cook)*

K site yielded 27 fragments of human bone, the majority from Late Aksumite contexts. An ash level attributed to phase II yielded an almost complete foetal skeleton, to which a couple of bones recovered from a nearby phase-IV ashy area also belong. Isolated fragments of human bone were found in fill or floor

deposits of phases I and II. Adult bones were recovered from a pile of stone and ash attributed to phase VII.

The foetus: Fig. 363a shows a 11.9-mm-long groove on the distal portion of the posterior of a foetal right humerus. The edges of this compound fracture are rounded but there is limited evidence of bone remodelling. There is no bridging callus and no sign of infection. Another shorter channel on the left fibula is 6.1 mm long, on the posterior/lateral portion of the mid-shaft. This groove has not been remodelled and the damage probably occurred post-mortem. On the right ischium there are some possible cut marks. These do not appear recent and exhibit no evidence of remodelling. As with the gouge on the tibia, these marks probably occurred after death. However, it is impossible to say whether they were caused by accident or in the performance of a burial ritual.

Adult bones: These come from a skull with prominent brow-ridge and large mastoid process, indicating a full-grown male. The moderate pitting around the external auditory meatus and mastoid process indicates advanced age (W.Bass 1995). Four cut marks on the left side of the frontal bone above the temporal line run from anterior to posterior. There is no sign of remodelling and these may have been made some time



Fig. 363 K-site human remains.

after death. The anterior of the frontal bone and the nasal bone are pitted. There are partially remodelled lesions on the cerebral surface of this frontal bone, mainly on the left side. The left parietal bone also has lesions on both the cranial and cerebral surfaces. Some of the edges of these lesions were smooth and some were rounded (Fig. 363b). Moderate pitting occurs over most of the parietal cranial surface. A depression in the centre of the forehead, without any associated stress fractures may be the remains of a depression fracture or a healed bone gumma resulting from a syphilitic infection (Brothwell 1981: 134-8). It is almost impossible definitively to diagnose such pathologies from isolated bone fragments.

ARCHAEOBOTANY (Sheila Boardman)

Forty-three soil samples were collected from the four excavation areas at K site (Fig. 364). The methodology employed is described in Appendix VII. Of the 33 samples which produced charred plant material, ten came from a single feature, the midden in K2.

K1

One phase-IV sample produced some *Eragrostis* grains, but none that could be positively identified as

teff (*Eragrostis tef*). There were a few grains of barley (*Hordeum* sp.), wheat (*Triticum* sp.), grains and chaff of emmer wheat (*Triticum dicoccon*), a few lentils (*Lens culinaris*) and some smaller seeds. The restricted nature of the excavation precluded identification of the nature of the fill so the possible origins of the plant remains are difficult to assess. The crops represented are all known from other Late Aksumite deposits, as at D site (pp. 365-8, above).

Two further samples from K1 produced charred seeds. These came from mixed (phase VII) or recent (phase VIII) contexts. They contained grains of finger millet (*Eleusine coracana*), probable teff (*Eragrostis* cf. *tef*), linseed (*Linum usitatissimum*), fruit stone fragments of Sudan teak (*Cordia africana*), plus other nut shell or fruit stone fragments and many seeds of wild plants. *Brassica*/Brassicaceae seeds probably include the cultivated species, Abyssinian mustard/rape/cabbage (*Brassica carinata*) and black mustard (*Brassica nigra*). Many of the seeds were poorly preserved, however, and a limited range of seed reference material was available in Addis Ababa to aid determination of the full range of *Brassica* species.

K2

Most of the samples collected in these trenches came from the phase-V midden, grouped into lower, middle and upper layers. The lower layers of the midden were

K Site in Maleke Aksum

	Phases			
	I-II	IV-VI	VII	VIII-IX
CEREALS				
Oat (<i>Avena</i> sp.)	26	27	-	1
Finger millet (<i>Eleusine coracana</i>)	-	-	6	36
Teff (<i>Eragrostis tef</i>)	32	10	-	65
? teff (<i>E. cf. tef</i>)	32	206	64	34
Barley (<i>Hordeum</i> sp.)	51	80	-	4
Emmer (<i>Triticum dicoccum</i>)	4	27	-	-
Breadwheat (<i>Triticum aestivum</i>)	1	3	-	-
Wheat (<i>Triticum</i> sp.)	3	10	-	2
indeterminate	37	49	1	5
LEGUMES				
Chickpea (<i>Cicer arietinum</i>)	-	1	-	6
Grass pea (<i>Lathyrus sativus</i>)	2	7	-	4
Lentil (<i>Lens culinaris</i>)	3	6	-	2
Pea (<i>Pisum</i> sp.)	-	-	-	1
Vicia	-	5	-	4
OIL & FIBRE CROPS				
Noog (<i>Guizotia abyssinica</i>)	-	-	-	6
Flax (<i>Linum usitatissimum</i>)	51	5	4	2
Cotton (<i>Gossypium</i> sp.)	7	10	-	1
OTHER CROPS				
Cress (<i>Lepidum sativum</i>)	65	1	-	-
Grape (<i>Vitis vinifera</i>)	1	-	-	-
WILD SEEDS & FRUITS				
Brassicaceae	77	26	190	4
Caryophyllaceae	-	1	-	-
Chenopodiaceae/Amaranthaceae	34	7	134	3
Compositae	32	-	64	2
<i>Cordia africana</i>	-	-	2	-
Cyperaceae	1	1	-	-
Fabaceae	-	6	-	5
<i>Galium</i> sp.	1	4	-	2
Labiatae	1	-	64	-
Malvaceae	1	10	-	1
<i>Menticago</i> sp.	-	-	-	1
<i>Plantago</i> sp.	-	-	-	35
Poaceae	687	1049	326	178
Rubiaceae	-	16	-	-
<i>Rumex</i> sp.	1	-	-	1
Solanaceae	3	2	42	1
Umbelliferae	1	-	-	1
indeterminate	475	140	153	55
Total quantifiable remains	1629	1709	1050	462
Total contexts sampled	3	13	1	10

Fig. 364
Archaeobotanical
materials identified at K
site.

sampled in the northeast and northwest areas. Samples from the former area contained two *Eragrostis* seeds, hulled barley and some seeds of (mostly unidentifiable) wild plants. In contrast, samples from the northwest area produced grains of oat (*Avena* sp.), teff (*Eragrostis tef*) and probable teff (*E. cf. tef*), barley,

bread wheat (*Triticum aestivum*), a legume (*Viciae* undiff.), and seeds/fruits of a range of wild plants. The middle part of the midden in the same area again produced a mixture of cultivated and wild plants, although oat was absent and there was only one possible teff grain. Wheat here included grains and glume-bases of

Archaeology at Aksum

emmer, and the legumes included grass pea (*Lathyrus sativus*) and lentil. There was one seed of linseed. Samples from the upper part of the midden were less informative, dominated by wild grasses (Poaceae), with a few grains of oat, barley, wheat (including emmer), a legume (Viciae undiff.) and linseed.

The plant remains and the other finds from the various midden layers do not point to clearly marked episodes of particular types of dumping activity, although contexts (3) and (6) were distinct dumping episodes, separated by context (4). The plant remains present in both of these contexts probably represent debris from several small-scale grain-cleaning and cooking operations.

The other K2 deposits which contained charred plant remains are assigned to the recent phases VIII and IX. Cultivated plants were represented only by a single grain of wheat.

K3

A phase-VI deposit yielded a largely intact pottery vessel (Fig. 343a), the soil within which produced four seeds, all of wild plants; they probably derive from the surrounding soil and are unrelated to the use of the vessel. The other deposits sampled relate to the phase-VIII round house: finger millet, barley, wheat, chickpea (*Cicer arietinum*), grass pea, lentil, pea (*Pisum* sp.), cotton (*Gossypium* sp.), noog (*Guizotia abyssinica*) and linseed being represented. These crops are all grown in the immediate vicinity today.

K4

Well stratified deposits of phases I to VI, comprising floor and floor make-up layers, burnt and ashy deposits, and rubble layers, produced some of the richest archaeobotanical samples at K site. Virtually all the cultigens mentioned previously are represented, including oat, teff, barley, emmer wheat, bread wheat, chickpea, grass pea, lentil, cotton and linseed. Finger millet, noog and pea are absent, as they are from other Late Aksumite contexts at K site. Two samples produced seeds of cress (*Lepidium sativum*) and one produced a single grape (*Vitis vinifera*) pip. The many Brassicaceae seeds in some samples may include further cultivated or collected plants (see above). There were also many seeds or fruits from the Chenopodiaceae, Compositae and Poaceae families although, in the absence of determinations to genus or species, it is impossible to speculate whether they originated as collected plants, weeds of cultivation, or incidental inclusions in the deposits.

Wood

Wood fragments were identified by Rowena Gale including *Acokanthera*, *Ficus*, *Acacia abyssinica* and

Juniperus, with less certain *Albizia*, *Maesa*, *Olea* and *Rhus*.

Summary

The plant remains from Late Aksumite contexts at K site, taken together, confirm the general features illustrated by the more comprehensive material from D site. Much of the material from post-Aksumite and mixed contexts is probably derived from comparatively recent activity and is concordant with traditional practice at the present time.

ARCHAEOZOOLOGY

(Chester R. Cain)

Only 9537 fragments, perhaps just over half of the total of faunal remains from K site, could be analysed within the time available. They comprised hand-collected samples from unmixed Late Aksumite levels of the K2 and K4 trenches, no material being analysed from K1 or K3. The faunal material for analysis was divided as follows: phases I to III from K4, phases IV to VI from both K4 and K2. As at D site, analysis of activities within individual structures or levels was not attempted. The recording and analytical methods are explained in Appendix VIII.

Species representation

Domestic stock (cattle, sheep and goat) accounted for 90% of identifiable specimens (Fig. 365). As at D site, cattle was the most common species. Both sheep and goat were identified according to Boesneck's (1969) criteria but, with only eight examples, discussion of relative representation is not feasible. The remaining 10% comprised mostly domestic species: dog, cat and chicken, with some wild bovids, non-galliform bird, rodent and fish. A single proximal metatarsal (from the K2 assemblage attributed to phases IV to VI) resembles that of a domestic pig but could represent a wild suid. Both hippopotamus and elephant were represented by fragments of ivory. K site displays higher taxonomic diversity than D site, especially when Late Aksumite D22 is excluded. The apparent higher frequency of chicken, cat and rodent may reflect a relatively high human population density in this part of Aksum during the later first millennium AD. Shell, other than the cowries noted above (p. 408), was not identified.

Body part representation

5833 specimens from the K site assemblage, or 61.1%, were minimally identified to body part, as summarised in Figs 366 and 367. For the reasons that have been set out above (p. 370), comparison with

K Site in Maleke Aksum

	Trench K4 Phases I-III	Trench K4 Phases IV-VI	Trench K2 Phases IV-VI	Total
<i>Bos</i> /cf. <i>Bos</i>	92	97	193	382
Caprine/ <i>Ovis</i> / <i>Capra</i>	28	6	12	46
<i>Equus</i> sp./cf. <i>Equus</i>	-	1	-	1
Suid/cf. <i>Sus scrofa</i>	-	-	1	1
<i>Canis familiaris</i> /Canid	1	10	1	12
<i>Felis</i> sp./Felid	2	5	-	7
Rodent	2	3	-	5
Alcelaphinae	-	-	1	1
cf. Hippotraginae	3	-	-	3
<i>Loxodonta afr.</i> /cf. <i>Lox</i>	-	1	3	4
<i>Gallus gallus</i> /cf. <i>Gallus</i>	2	3	6	11
Other birds/cf. <i>Aves</i>	1	4	-	5
Fish	-	-	1	1
Not identified	3182	2757	3119	9058
Total	3313	2887	3337	9537

Fig. 365 Faunal taxa (NISP) from K-site contexts. Specimens from flotation samples are excluded.

Element	Trench K4 Phases I-III	Trench K4 Phases IV-VI	Trench K2 Phases IV-VI
Metacarpal	1.5%	5.0%	5.5%
Metatarsal	3.3%	5.3%	6.6%
Astragalus	0.9%	1.3%	1.1%
Calcaneum	0.6%	1.3%	1.8%
Femur	7.3%	4.3%	3.3%
Tibia	4.0%	2.0%	3.7%
Humerus	3.0%	5.6%	4.4%
Radius	1.2%	1.3%	4.2%
Ulna	0.6%	1.0%	1.5%
Scapula	3.0%	4.3%	3.9%
Pelvis	2.4%	2.6%	3.5%
Vertebral	29.2%	14.2%	27.8%
Rib	30.1%	14.2%	16.4%
Cranial	0.6%	3.0%	0.2%
Mandibular/Maxillar	-	2.3%	1.5%
Mandibular	1.5%	2.3%	2.0%
Teeth	10.6%	29.8%	12.7%
	N = 329	N = 302	N = 457

Fig. 366 Body-part representation by selected skeletal element (NISP) for size-class III ungulates in K-site contexts.

Archaeology at Aksum

Zones	Trench K4 Phases I-III	Trench K4 Phases IV-VI	Trench K2 Phases IV-VI
Cranial	12.3%	29.5%	15.0%
Axial	54.9%	27.9%	45.3%
Fore limb	4.1%	6.3%	8.8%
Hind limb	10.8%	5.0%	6.5%
Distal limb	17.9%	31.3%	24.4%
	N = 390	N = 383	N = 525

Fig. 367 Body-part representation by zone (NISP) for size-class III ungulates in K-site contexts.

other assemblages is limited to those recovered at Aksum by similar methods. Body-part representation at K site is roughly similar to that from Late Aksumite D22. In view of the limited time-range of the material analysed, discussion of change in animal exploitation practices is not practicable. Variation between various areas of Aksum is, however, significant.

All contexts at K are characterised by inflated representation of rib and vertebral fragments, the latter

being particularly remarkable when compared with the results from D site (Fig. 325). This pattern is suggestive of a locality where a limited set of animal segments of low-to-moderate utility (Binford 1978; Speth 1983) was being distributed through indirect channels (Zeder 1988: 13).

Age

At K site, almost no cattle seem to have been slaughtered before 18 months (Fig. 368). Some animals were slaughtered before 42 months. In K2, the largest proportion of animals were slaughtered after 48 months. In both K4 contexts, large numbers of cattle seem to have been slaughtered both before and after 48 months.

Modification

Further studies will be necessary to explore this issue (Behrensmeier *et al.* 1986; Blumenschine and Marean 1993; Brain 1981; Bunn 1983; Fisher 1995; Lyman 1994; Potts and Shipman 1981; Marshall 1990; Shipman *et al.* 1984). Burning was not a common feature, being restricted to just over 10% of the identifiable elements from K site.

Frequency of cut marks on maximally identifiable elements is quite consistent among contexts

Probable age of fusion	Element	Trench K4, Phase I-III		Trench K4, Phase IV-VI		Trench K2, Phase IV-VI	
		Fused	Unfused	Fused	Unfused	Fused	Unfused
c. 7 - 18 months	Humerus dist.	3	-	7	-	3	-
	Radius prox.	-	-	1	-	3	-
	First, second phalanges	13	-	30	-	27	-
c. 24 - 36 months	Metacarpal dist.	-	-	6	2	5	-
	Metatarsal dist.	4	1	6	1	6	3
	Tibia dist.	1	-	1	1	1	-
c. 36 - 42 months	Calcaneum	1	-	-	1	1	-
c. 42 - 48 months	Humerus prox.	1	1	1	1	-	-
	Radius dist.	1	-	-	1	7	-
	Ulna	-	-	-	-	1	1
	Femur prox.	2	6	1	3	1	-
	Femur dist.	6	1	1	-	1	-
	Tibia prox.	3	4	-	2	1	5
Number of elements with recordable fusion status		48		66		66	

Fig. 368 Age of elements (NISP) in K-site contexts.

K Site in Maleke Aksum

Zones	Trench K4 Phases I-III	Trench K4 Phases IV-VI	Trench K2 Phases IV-VI
Cranial	2	-	3
Axial	14	9	14
Fore limb	3	3	4
Hind limb	2	1	2
Distal limb	6	6	7
Totals	27	19	30

Fig. 369 Occurrence of cutmarks on fully identifiable faunal elements from K-site contexts.

(Fig. 369). The percentage of elements with cut marks is low (4.6%), and is consistent with other assemblages from East Africa (Bunn and Kroll 1986; Marshall 1990).

Rodent and carnivore gnawing were both observed in most contexts at K site, being present on less than 1% of fragments overall.

Both measures of fragmentation used in this analysis (average maximum dimension and average circumference per skeletal part) indicated that fragmentation was consistent between contexts. However, recovery bias would probably have masked high fragmentation if it did exist.

SUMMARY OF RESULTS

The K-site faunal assemblages are generally similar to each other in many respects. The patterns seen here are relatively unlike those from D site, except for the Late Aksumite material from D22. I believe that the relative similarity between the K units and Late Aksumite D22 indicates that analogous activities were associated with these Late Aksumite structures. There seems to have been a degree of economic specialisation at K site extending beyond the subsistence level. This hypothesis is based on the higher species diversity, increased appearance of younger (so-called prime-aged) animals and patterned body-part representation.

K site, with its central location within ancient Aksum, may have been somewhat removed from animal production and dependent on some form of animal-product distribution system (*e.g.* Zeder 1988; but see Glass 1991). Domestic species were presumably the main source of animal products at K site; and the rarity of wild animals suggests that they were not regularly acquired either for food or for other uses such as hides.

It is likely that distribution of animal products, specifically meat attached to bone, at K site was through multiple pathways. For example, domestic bovinds and wild animals may have been transported from the hinterland, while chickens (and, conceivably,

pigs) may have been raised in the restricted space available. Cattle and caprines, however, seem to have been the focus of animal resources for the inhabitants of K site.

OVERVIEW (*D.W.P.*)

The excavations at K site, limited to a single season, were essentially exploratory. It did not prove possible to link the stratigraphy in the four trenches, correlation being achieved solely through establishing broad contemporaneity of phases, as indicated above in Fig. 339. Erosion and deposition of hillwash are both indicated and render the archaeology more difficult to interpret. The two northerly excavations, closest to the foot of Beta Giyorgis, reached the base of their artefact-bearing deposits, but K3 and K4, further to the south, did not. K3 penetrated a level probably dating to the late fifth or early sixth century; K4 was excavated to a depth of 4.2 m where fifth-century deposits were encountered, but whatever lies beneath remains unknown. The known occupation of K site thus extends back to the fifth century, although there are indications of earlier material there and/or in the vicinity (Fig. 370). The principal use of the site appears to have ceased around the beginning of the seventh century, perhaps somewhat prior to the abandonment of D site. This principal use of K site is all regarded as belonging to the Late Aksumite period, although it should be emphasised that it began somewhat (perhaps half a century) earlier than the Late Aksumite occupation of D site. Although some activity may have taken place in the vicinity during the long intervening period, no further building seems to have occurred prior to the nineteenth century when the round house investigated in the K3 trenches was erected.

The lower levels at K site thus intervene between, on the one hand, the period marked by the Tomb of the Brick Arches and the Mausoleum and, on the other, the first Late Aksumite occupation at D site. Comparisons with the latter are readily made; those with the former are hindered both by the presence of a significant chronological gap and by the differences in function and status, the earlier sites being élite funerary monuments while K site evidently served residential and manufacturing functions for a middle-rank population. The distinction between D and K sites in terms of socio-economic criteria was, essentially, that the former occupied a position peripheral to the main built area with inhabitants largely engaged in the production and processing of food, whereas the latter was located centrally and more industrial craft-work was undertaken there.

Archaeology at Aksum

Approximate date (century AD)	Developments at K site
?	Possible early activity in the vicinity
?	Occupation represented by lowest levels, not investigated
c. late 5 - end 6	Late Aksumite stone buildings and industrial / craft activity
early 7	Abandonment
7 - 18	Little discernible activity
19	Round house built
early 20 (1937)	Round house demolished

Fig. 370 K-site sequence.

Faunal analysis confirms that the inhabitants of K site obtained much of their meat through a specialised market economy, as is to be expected in a location where herding would have been impracticable. Chickens, however, were probably kept at the site itself. Plant foods, presumably brought from elsewhere, were processed on-site; it is not unreasonable to suggest that this may have been mainly women's work, the men being engaged in the craft activities noted below. That harvesting was not a primary occupation of the inhabitants of K site is confirmed by the total absence of the specialised Likanos flakes. Domestic activities, notably cooking, are indicated. Lamps of pottery, metal and glass were in use.

Craft activities attested at K site included the working of copper and its alloys, and of glass, ivory, horn and bone. Flaked stone tools, although used at the site, may not have been made there. The evidence largely comprises waste materials from the midden encountered in the K2 trenches; excavations were not on

a sufficient scale, and/or were not appropriately located, to demonstrate the nature or precise location of the workshops. Smelting areas were not demonstrated and may have been located elsewhere; casting, involving the use of crucibles for copper and/or copper alloys, was undertaken at or near K site, as was the working of glass. A lathe was employed for the working of ivory, horn and bone which may have been prepared on-site, perhaps through the use of Gudit scrapers.

The general socio-economic position of K site's inhabitants seems to have been comparable with those described above for D site; the arguments do not require repetition. The presence of cowrie shells in stratified Late Aksumite contexts is, however, unparalleled and noteworthy. The possible presence of domestic pig is of interest, albeit in a context where some degree of disturbance is indicated: formally avoided by Ethiopian Christians, it was not represented in the larger and broadly contemporary Late Aksumite faunal assemblage from D site.

OTHER SITES AND MONUMENTS

This chapter includes short notes of minor sites at Aksum that were examined in the course of the 1993-7 Project, with summary illustrated accounts of certain previously investigated tombs to which comparative reference is made in Chapter 15

P, H and X sites (D.W.P.)

During the 1994 and 1995 field seasons, at the request of the relevant authorities, small-scale test excavations were conducted at three locations within Aksum town in order to ascertain whether or not archaeological features were present such as might be damaged by future development work. The locations concerned are shown on Fig. 7, above.

P site

In 1994, the ecclesiastical authorities requested investigation of a site (designated P) immediately east of the Mai Hejja stream, below the Yeha Hotel. The site was regularly used on the occasions of visits to Aksum by His Holiness the Patriarch. Proposals to build there were, however, resisted by the planning authorities because of the sensitive position of the site in close proximity to the largest stelae. The area, a plan of which is provided in Fig. 371, is roughly triangular in shape, bounded on the east by the access drive of the Yeha Hotel, on the northwest by the road to Mai Shum, and on the southeast by houses. The western half of the site has a generally flat earth surface, while on the east rock slopes up to a height some 12 m above the level ground.

Archaeological work was supervised by Jenny Jones. A careful search revealed no surface features of archaeological interest. Five test excavations, each 1.0 m square, were made within the area of the proposed building. They were located in areas considered most likely to retain significant depths of deposit. All were excavated to bedrock, which was reached at a maximum depth of 1.15 m. The deposits consisted entirely of hill-wash, with very small numbers of abraded Aksumite potsherds mixed with modern material, all clearly derived from the slopes above. There was no *in situ* archaeological material of any kind.

A further trench, 2.0 m square, was excavated on the line indicated for the approach road to the

proposed building. Here, the deposits were much deeper; in fact a nearby well is said to have been dug to a depth of more than 20 m. The excavation was taken to a depth of 1.65 m, being well in excess of that likely to be disturbed through road construction. Here, again, the deposits proved to be hill-wash and virtually sterile archaeologically. It is reasonable to assume that the underlying deposits are fluvial in origin.

As a result of these investigations, the Project was able to report that the proposed building site is of no archaeological significance.

H and X sites

In 1995 two sites were investigated under Niall Finneran's supervision at the request of the municipal authorities. One site (designated H) was a small walled garden and courtyard to the east of the Health Centre and virtually opposite the Ghenet Hotel. The area measured approximately 20 by 30 m, but the presence of large piles of aggregate and hard-core delivered in advance of construction work meant that only a much smaller area could be tested archaeologically. The sampling took the form of three 1.0-m square test pits arranged along the central axis of the site. Natural subsoil was encountered immediately below the yard make-up, and none of the excavations revealed features of archaeological significance. The few artefacts recovered were all of recent origin and were not retained. It was concluded that, despite its central position, the site contained no archaeological material that would be threatened by development.

The second site (designated X) was a walled garden located immediately north of the main Adwa road some 70 m east of the Ezana Garden and 30 m south of the Tomb of Bazen. Five 1.0-m square trenches were laid out in an L-shaped configuration in order to sample all available areas while avoiding the central well. (The well is 25 m deep; its excavator

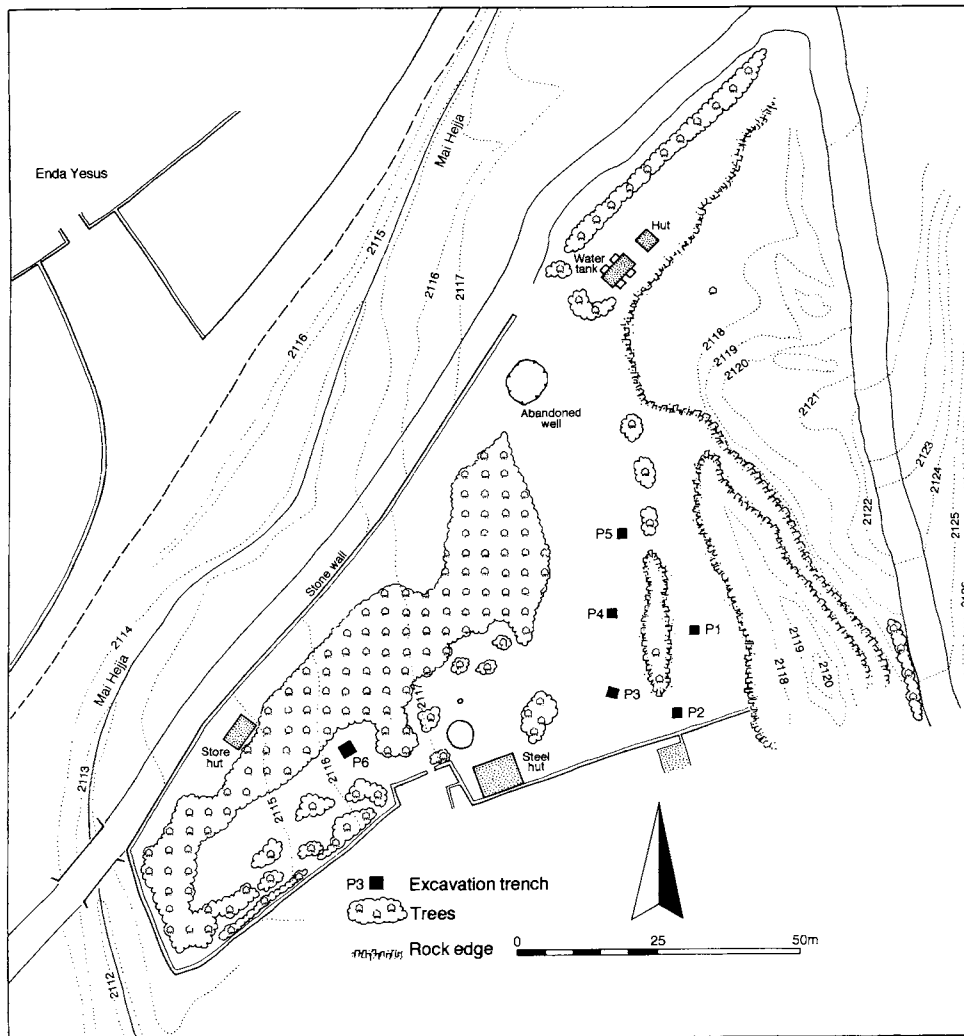


Fig. 371
Plan of P site.

reported that nothing of archaeological relevance had been recognised during his work.) There were no surface indications of archaeological material, the local absence of which was confirmed by the excavations, all of which encountered bedrock at an average depth of

0.5 m. The overlying deposits mainly comprised modern rubble. It seems likely that, notwithstanding the proximity of rock-cut tombs, any archaeological deposits which may have been present in this area have been eroded by run-off of water from Mai Qoho.

L site (Tekle Hagos and D.W.P.)

In 1997, local residents drew Project members' attention to a dressed stone partly visible in rubble in the bed of the Mai Lahlaha stream immediately adjacent to the Tomb of Etiopis (see map above, Fig. 7), where the stream is crossed by a track leading westwards from Aksum town to fields at the foot of the southern slopes of Beta Giyorgis (Fig. 372a). It was stated that the stone had been more fully exposed some years ago when the track was improved, and that it had been seen to bear an inscription. Since the area appeared exposed

to disturbance both by erosion and by intensified use and possible further improvement of the track, a brief investigation was conducted under the supervision of Tekle Hagos.

Work was restricted to removing rubble so as to expose the whole of the stone's upper surface and to permit examination of its underside. The stone was found to be a rectangular slab of dressed syenite, 2.03 m in overall length, 0.56 m in width and 0.18 m thick (Fig. 372b). One end had been dressed square, the other

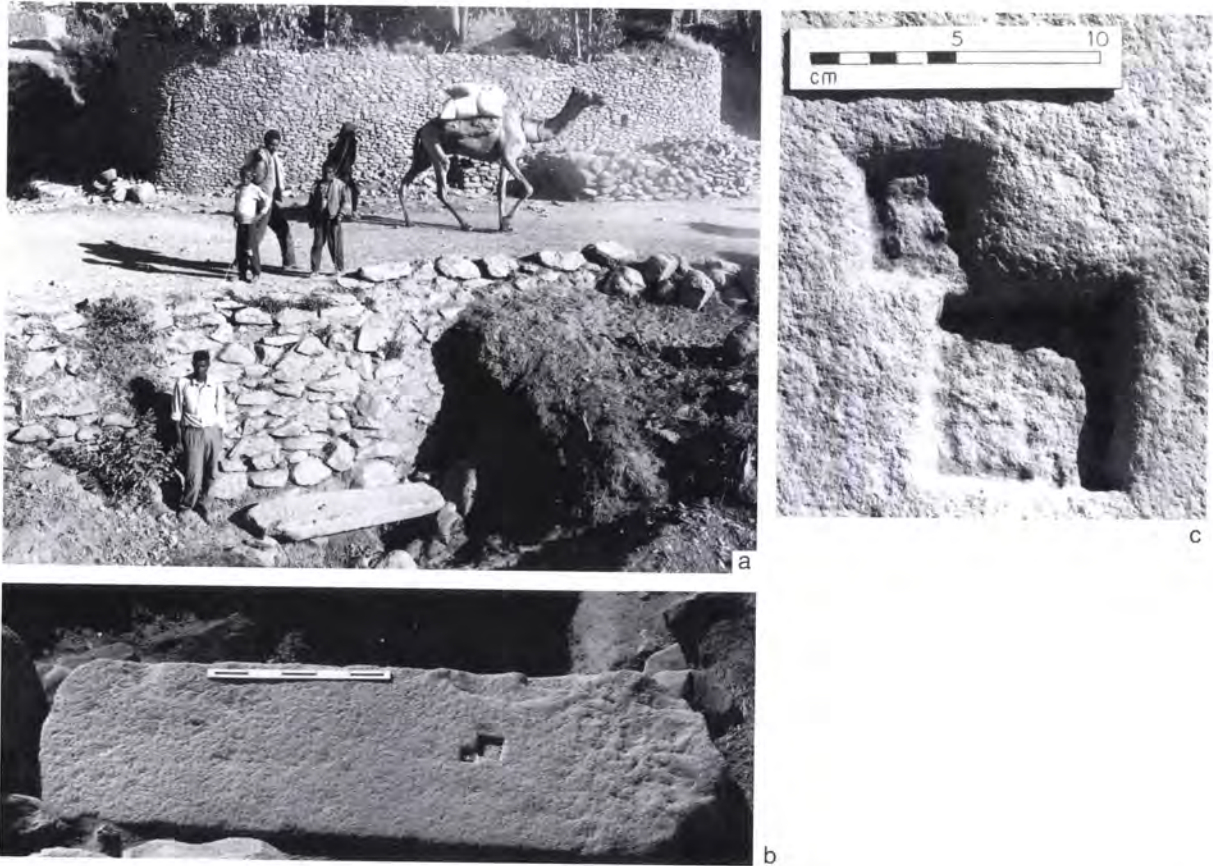


Fig. 372 L site: a - general view from the south; b - the dressed stone as exposed, 0.5-m scale; c - detail of carving.

was less carefully trimmed and retained a pointed shape from its original quarrying. Near the mid-line of its upper surface, approximately 0.73 m from the pointed end, two carefully carved square indents were exposed (Fig. 372c). This carving, of unknown significance or purpose, covers an area some 100 mm square and is the only embellishment visible on the otherwise plain dressed upper or lower surfaces of the stone. The only suggestion that may be offered as to the original function of the stone is that it may have been set upright with its pointed, less carefully dressed, end in the ground. There is no reason to suppose that its original location was particularly close to its 1997 position:

extensive erosion has clearly taken place in the vicinity and immediately upstream on the west bank of the Mai Lahlaha at the Aksumite structure noted as 'Ruin D' by the Deutsche Aksum-Expedition (Littmann *et al.* 1913, II: 122-4; D.W.Phillipson 1997: 122), while stone may have been brought from elsewhere in order to stabilise the trackway.

During clearance work a single Aksumite coin was recovered (Appendix V). Its fifth-century date is of no relevance to that of the carved stone. After recording, it was decided that the stone was not of sufficient importance to merit removal; it was therefore recovered with rubble for protection.

Mestaha Werki (Laurel Phillipson)

The monument known as Mestaha Werki (= place where gold is spread out) is well known locally but, so far as the writer is aware, only a very brief notice of it has so far appeared in print (Anfray 1965: 4 and pl.

1b). It is located on a low spur at the southwestern foot of Beta Giyorgis at a height of 2135 m, overlooking the valley which separates Beta Giyorgis from Gobedra hill (see map, Fig. 383, below). The area

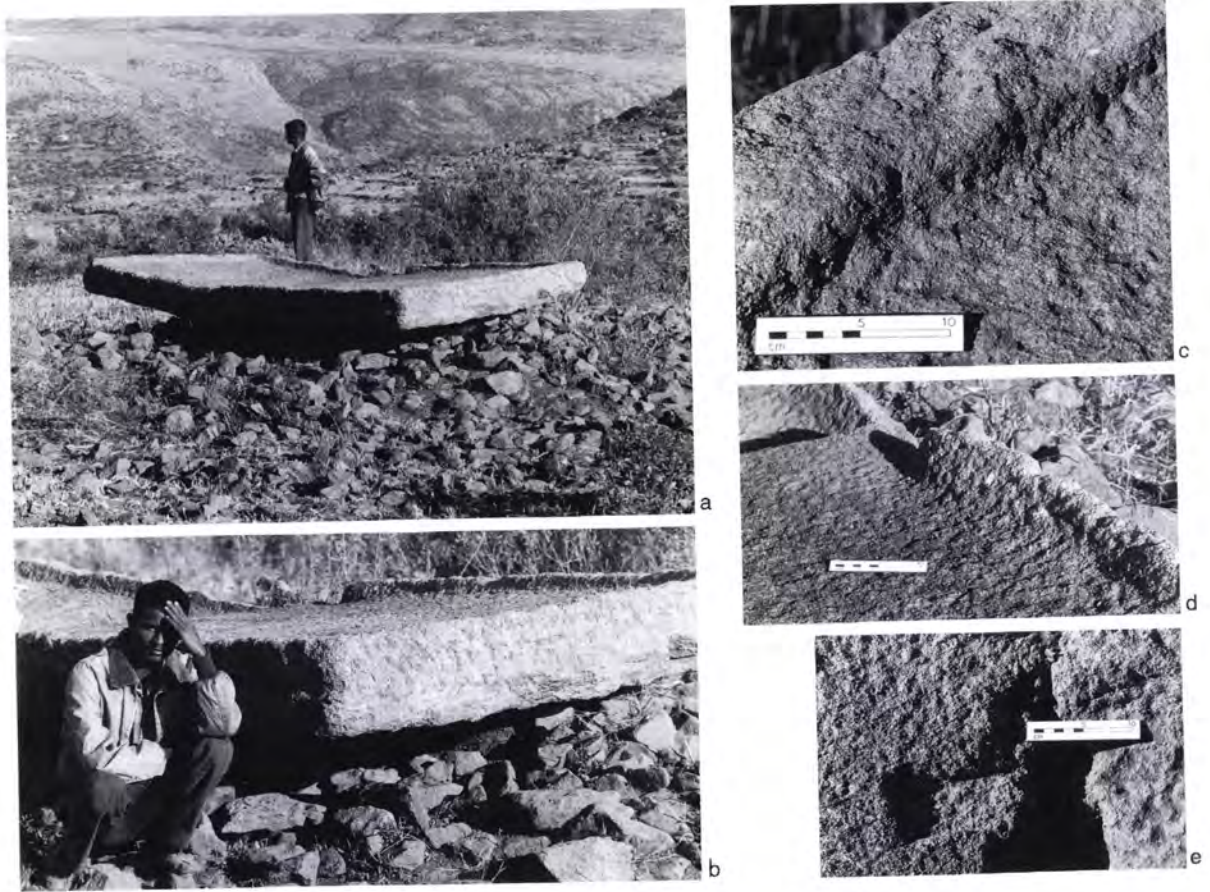


Fig. 373 Mestaha Werki.

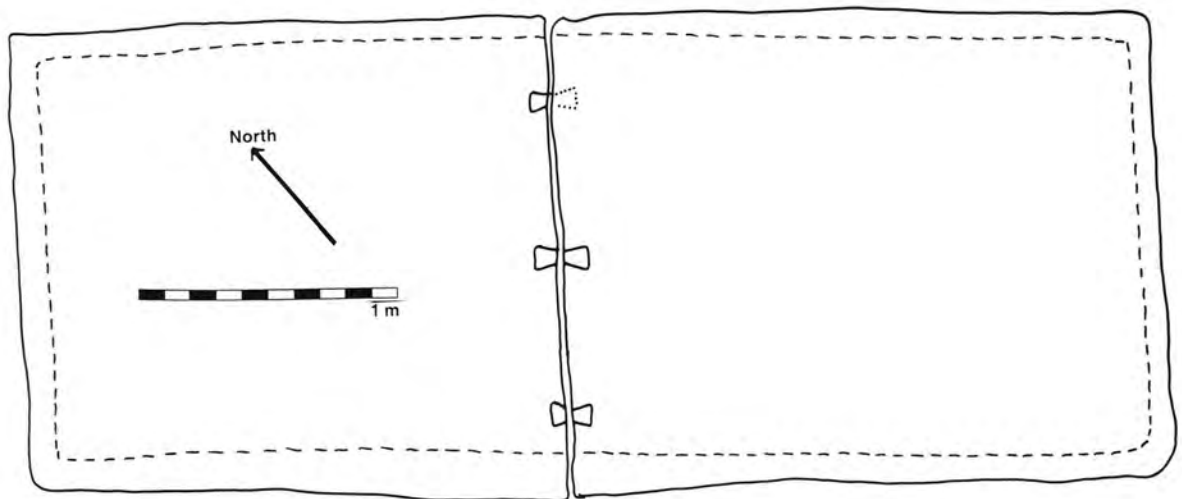


Fig. 374 Sketch plan of Mestaha Werki.

Other Sites and Monuments

surrounding the monument is currently under cultivation.

Mestaha Werki (Figs. 373, 374) is a rectangular slab of coarse gritty sandstone breccia. It is 4.44 m in overall length by between 1.69 and 1.86 m wide. Its thickness at the edges varies between 0.21 and 0.36 m. It now rests in an approximately horizontal position on a pedestal of earth some 0.8 m high, the terrain immediately surrounding it having been lowered through cultivation and erosion. It has been carefully chiselled and punch-dressed on the edges and upper surface; the underside appears to have been chiselled only. The upper surface is slightly concave and surrounded by a raised rim all around its periphery. Either the slab was constructed from two pieces of stone or, at some time in the past, it was broken into two approximately equal halves. The two pieces had been joined by

inserting three metal butterfly clamps; the clamps have now disappeared but the shallow holes in which they were set are clearly visible. These clamps are distinct from the angled variety used at the Tomb of the False Door (Fig. 230e, below) and at Nefas Mawcha. The southern piece is now displaced upwards by 0.13 m at its east end. No other archaeological traces of ancient activity were noted in the immediate vicinity.

While there is no archaeological evidence as to the possible function of this isolated monument, local traditions relate that the Ark of the Covenant was rested there when being brought to Aksum. It is located very close to an old route into Aksum which is followed by tracks originating in both Wuchate Golo and Adi Tsehafi (see map at Fig. 2, above); traditions state that the Virgin Mary travelled to Aksum along this route.

Inscriptions and engravings at Adi Tsehafi *(Laurel Phillipson)*

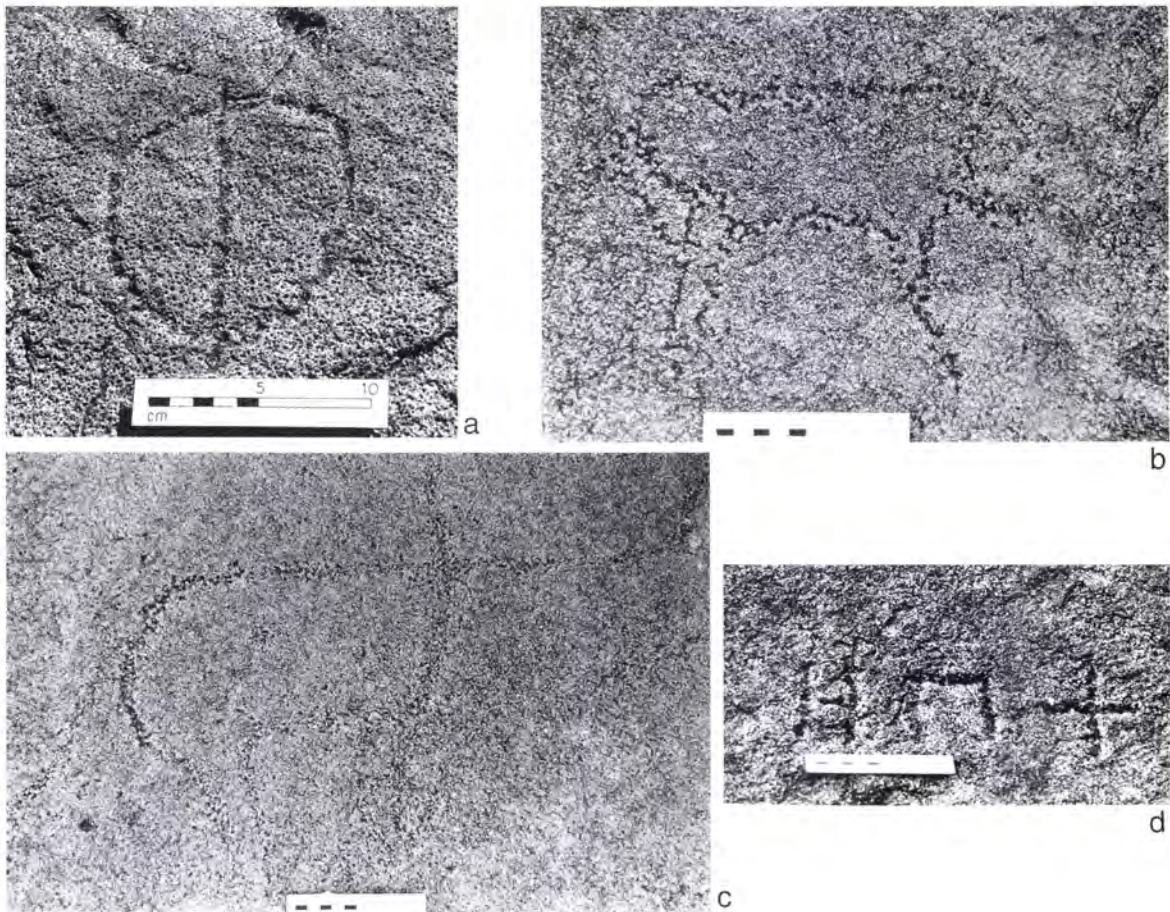


Fig. 375 Engravings and inscriptions at Adi Tsehafi.

Archaeology at Aksum

A very brief visit to the quarry area at Adi Tsehafi (pp. 243-5, above) permitted a number of pecked rock engravings to be located and recorded (Figs 375, 376). The inscriptions are on rock surfaces within the quarried area on either side of the Mai Goda river, downstream of the principal crossing of the route from Aksum to Adi Tsehafi. Those that were recorded comprise repeats of the same three Ethiopic letters (= ZBT) which are most probably to be associated with quarrying and interpreted as marks of ownership.

There are in addition two animal figures, probably representing cattle, depicted on an exposed rock on the eastern bank immediately adjacent to and

overlooking the presumably Aksumite levelled incline leading to the crossing (p. 243, above). They represent an art form that is known from other sites in both Tigray and Eritrea (Cervicek 1976; Jousaume 1981) but which has so far received little academic attention, probably being linked stylistically with a late stage in the local rock-painting sequence (Agazi 1997; Calegari 1999).

The condition of these engravings and their exposed position suggest an age little or no greater than that of the nearby inscriptions. There is no evidence that the association of the two sets of glyphs is other than coincidental.

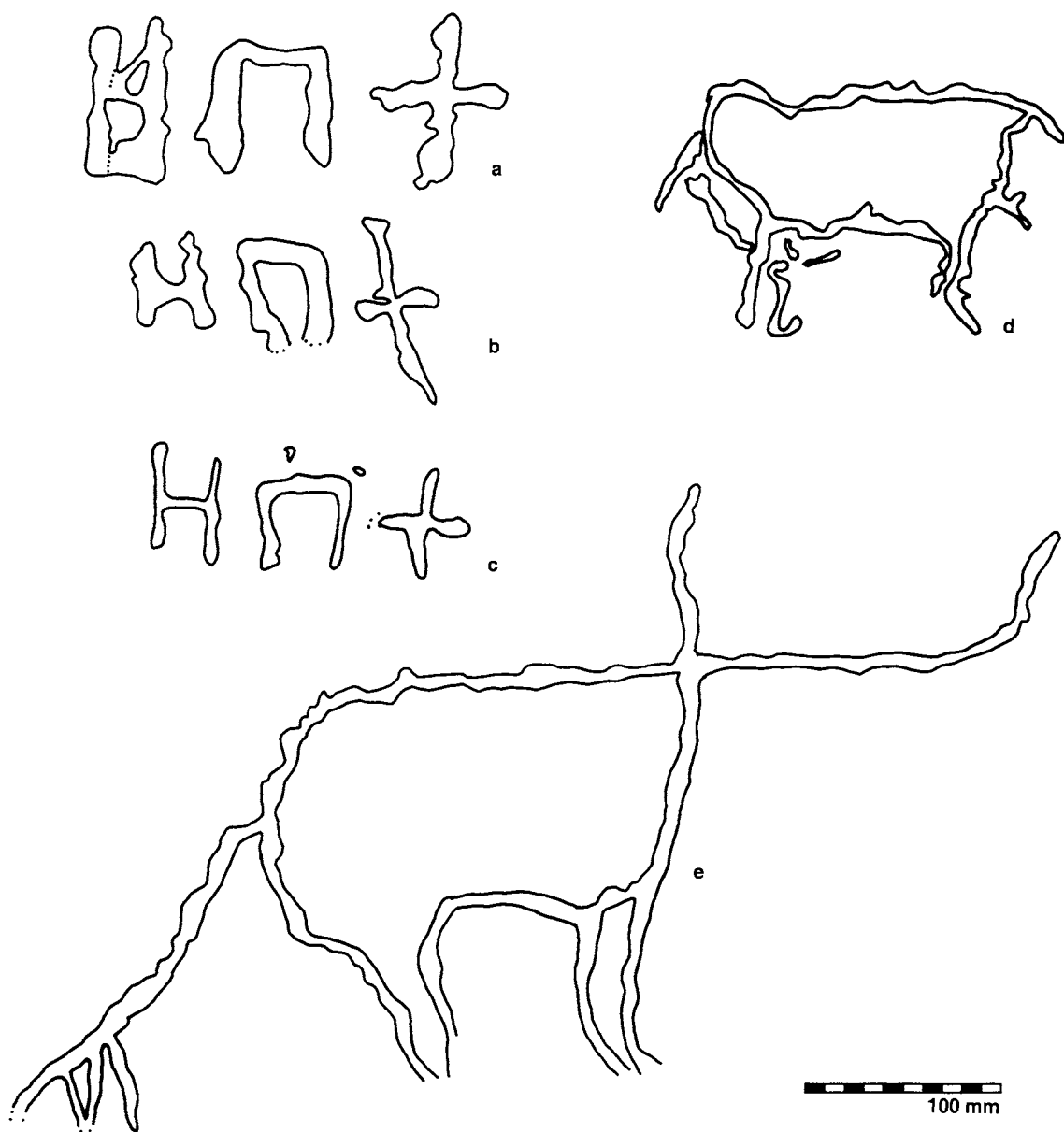


Fig. 376 Engravings and inscriptions at Adi Tsehafi.

The Tomb of Bazen, the Tomb of the False Door and the Tombs of Kaleb and Gabra Maskal

(D.W.P.)

Four monumental tombs in and close to Aksum provide useful comparisons with the Tomb of the Brick Arches. Although they were not primary foci of research, the 1993-7 Project undertook detailed survey and photography of their extant remains which have not in all cases been published comprehensively by

which will be used in the concluding syntheses (Chapter 15).

The Tomb of Bazen

Close to what was probably the eastern edge of ancient Aksum, at the southwesternmost foot of Mai Qoho

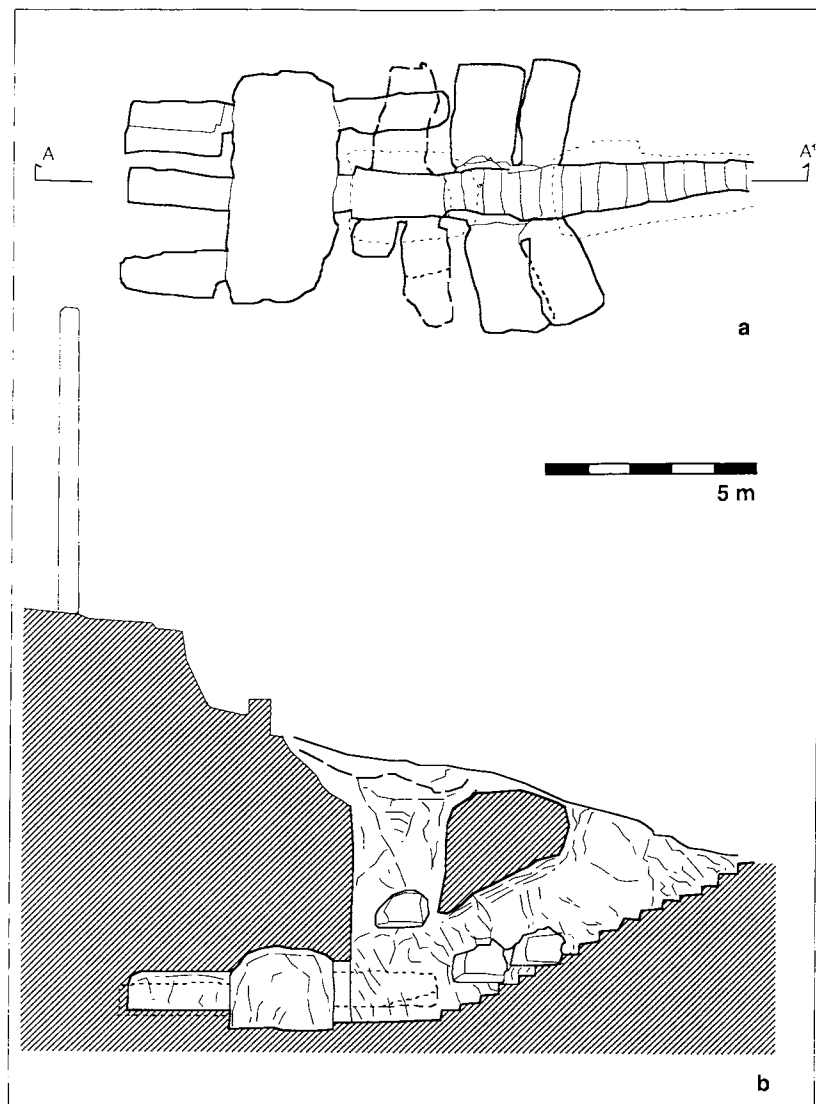


Fig. 377 Plan and section of the 'Tomb of Bazen'.

previous investigators. The results are summarised here⁵⁰ as a basis for comparison and to present data

⁵⁰ By kind permission of British Museum Press, this section is based on material already published (D.W. Phillipson 1998).

hill, a small group of stelae was recorded by the Deutsche Aksum-Expedition and some earlier writers (Valentia 1809, III: map at p. 82; Littmann *et al.* 1913, II: 33, fig. 5; D.W. Phillipson 1997: 60-1). Today, only one stela survives: a roughly dressed



a



b



c



d

Fig. 378 The 'Tomb of Bazen': a - the foot of the adit, showing roughly carved loculi in the adit wall and the entrance to the transverse chamber; b - the entrance to the transverse chamber; c - a view up the adit from the transverse chamber; d - inside the transverse chamber, showing loculi. Scales: 0.5 m.

Other Sites and Monuments

example some 6.5 m high which still stands upright, despite its hillslope location, through having been erected in a rock-cut socket. Although no definite relationship can be demonstrated, this stela may have been intended to mark the position of the subterranean tomb known today as the Tomb of Bazen, which lies some 10 m to its south, cut into the soft rock at the foot of the hill (Fig. 377). Bazen is recorded in traditional king-lists as ruler of Aksum at the time of the birth of Christ (Belaynesh *et al.* 1975), but it should not be assumed that the popular attribution has any chronological significance. Nearby is a rock-cut rectangular pit with probable burial loculi in its sides, some of them unfinished (D.W. Phillipson 1997: fig. 279). There are also a number of shaft-tombs and other surface indications which, coupled with the records that further stelae were formerly present, suggest that this burial area may have been quite extensive (cf. Littmann *et al.* 1913, II: fig. 5).

The Tomb of Bazen was located and cleared by J. Doresse in 1954.⁵¹ Only an exceedingly cursory account of the work has been published (Kebbede and Leclant 1955), but it appears that the tomb was virtually empty - presumably following ancient robbing - and that no dating evidence was recovered. The tomb is approached by a rock-cut adit, 9.5 m long, with sixteen steps (Figs 378a, c). This opens through a round-topped doorway (Figs 378a-c) to a transverse room 7.5 to 8.5 m below the steeply-sloping surface (Fig. 378d). A total of four burial loculi lead off this room; seven additional loculi leading off the adit itself are generally smaller and less regular in shape. There are indications that the tomb may originally have been reached by means of a vertical shaft, the stepped adit being a secondary feature.

The Tomb of the False Door

At the western extremity of the main stela area, some 65 m west of the Mausoleum, is the so far unique structure known as the Tomb of the False Door (Chittick 1974; Munro-Hay 1989: 104-13). It was discovered in 1972, when erosion in what was then a road revealed the top of a carved stone slab, and was completely excavated under Neville Chittick's direction in the following two years. It was found to have been completely robbed in antiquity, then filled and eventually buried by natural silt and hillwash. Observations on the stone-dressing displayed at this monument have been presented above (p. 259).

In order to prepare the site, either because it lay beyond the area previously terraced or because it was recognised that the made-up ground provided an inadequate foundation for such a massive construction, a large pit was dug deep into the natural clay. Into this

⁵¹ M. Doresse has most kindly provided the writer (*in litt.*) with details of his investigation.

pit a huge stone slab was placed horizontally; it was subsequently covered and can now be seen in only a few places, but it must measure at least 7 by 5 m. On this slab was built the tomb's substructure, comprising an antechamber and inner chamber, both surrounded on three sides by a passage (for a plan and reconstruction, see Munro-Hay 1989: 116-20, 165-6). The basic similarity of the substructure plan to that of Nefas Mawcha is noteworthy. Similar metal clamps were also used in the construction of the two monuments; the Tomb of the False Door is the only place at Aksum where such a clamp has been preserved *in situ* (Fig. 230e, above). The inner chambers and the passage were reached by separate stairs; there was originally no intercommunication between them. The roof of these structures was roughly level with the ancient ground surface; above it was erected a squat structure some 12 m square and 2.8 m high, probably flat-roofed (cf. D.W. Phillipson 1998: fig. 48). A slab carved with a false door virtually identical to those on the stelae was set vertically in the middle of its south wall directly above the stairs leading into the tomb. In front of this was a paved courtyard, the two stairs each covered with a massive capstone. The large blocks of which the entire structure was built (*e.g.* Fig. 379a) were especially carefully dressed and fitted on the surfaces that would have been visible, those comprising the substructure being exceptionally massive.

At some time after its construction, the substructure was entered by robbers. The capstone covering the stair leading into the tomb itself was broken up and removed, but attempts to deal similarly with its neighbour failed and the passage was entered by breaking through the thick stone wall from the antechamber. The inner tomb chamber itself was entered and the single stone sarcophagus which it contained was severely mutilated (Fig. 379b). Although Chittick's excavators recovered no trace of the original contents, these must have been (or at least believed to be) of great value, to judge from the lengths to which the robbers went in order to gain access.

The thoroughness of the robbing makes it difficult to ascertain the date of the tomb's construction. There is some evidence, however, for attributing it to the late fourth or early fifth century AD (Munro-Hay 1989: 157).

The Tombs of Kaleb and Gabra Maskal

Two further monumental tombs are located side by side beneath a shared superstructure about 2 km north of Aksum town. The site (Figs 7 and 236, above), on a saddle between two low hills, offers spectacular views southwards over Aksum to the fertile plains beyond, northwards towards the Mareb valley and what is now Eritrea, and eastwards to the mountains around

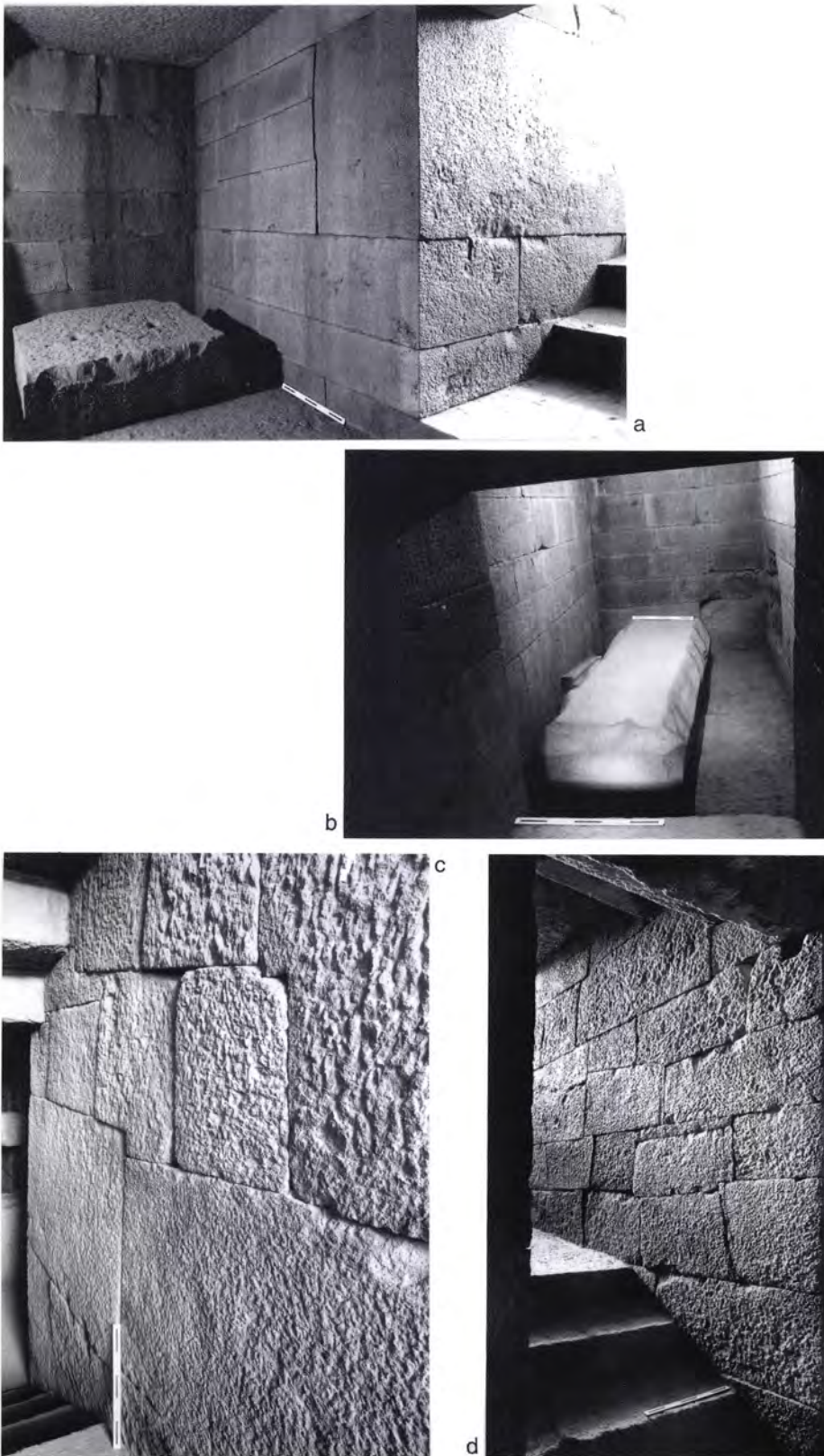


Fig. 379 *The Tomb of the False Door: a - the east end of the antechamber at the foot of the stepped adit; b - the remains of the sarcophagus in the central burial chamber, seen from the antechamber looking north. The Tomb of Kaleb: c - the foot of the adit, north wall from above; d - the foot of the adit, south wall from below. Scales: 0.5 m.*

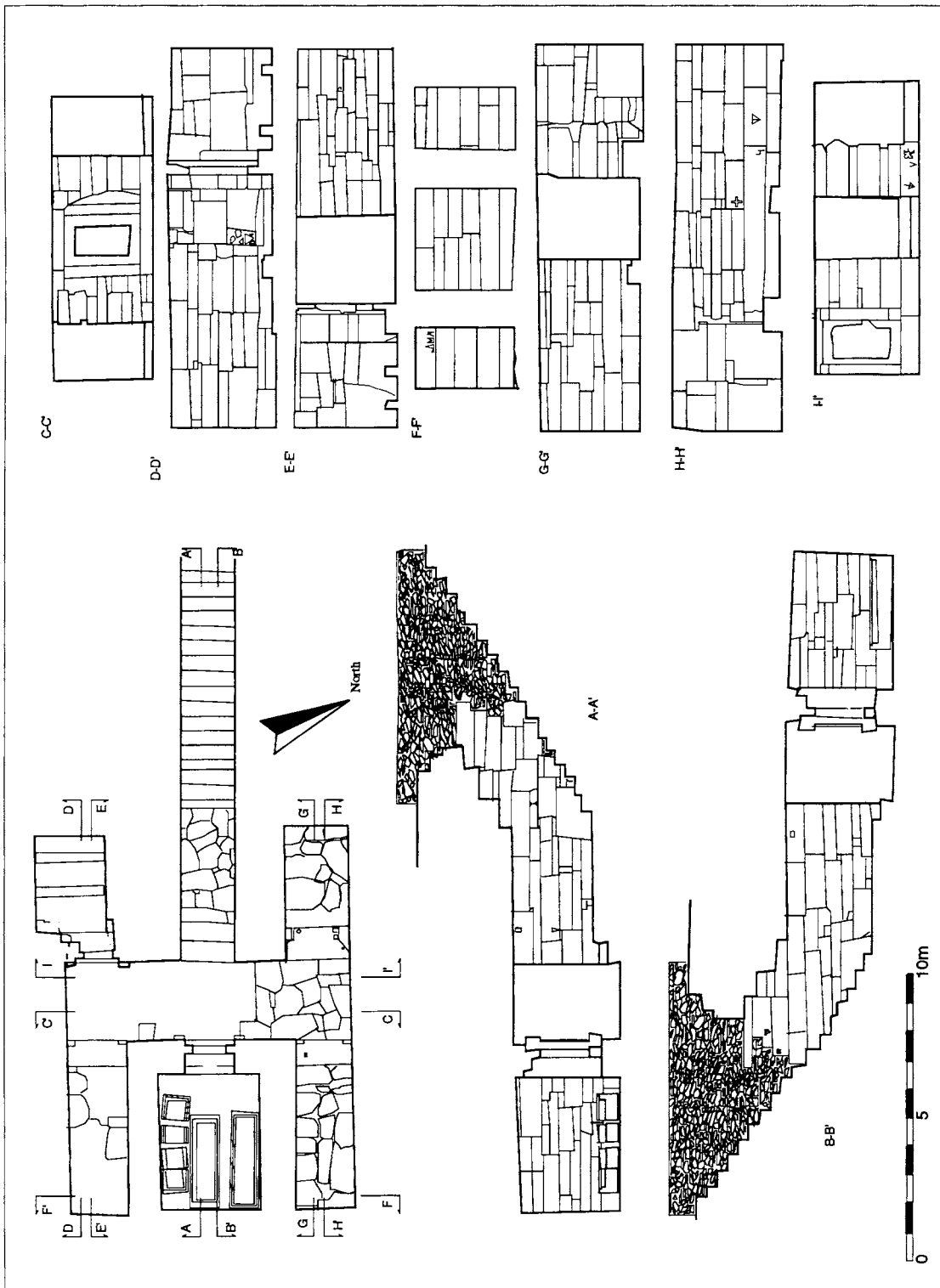


Fig. 380 Plan and sections of the Tombs of Kaleb and Gabra Maskal.

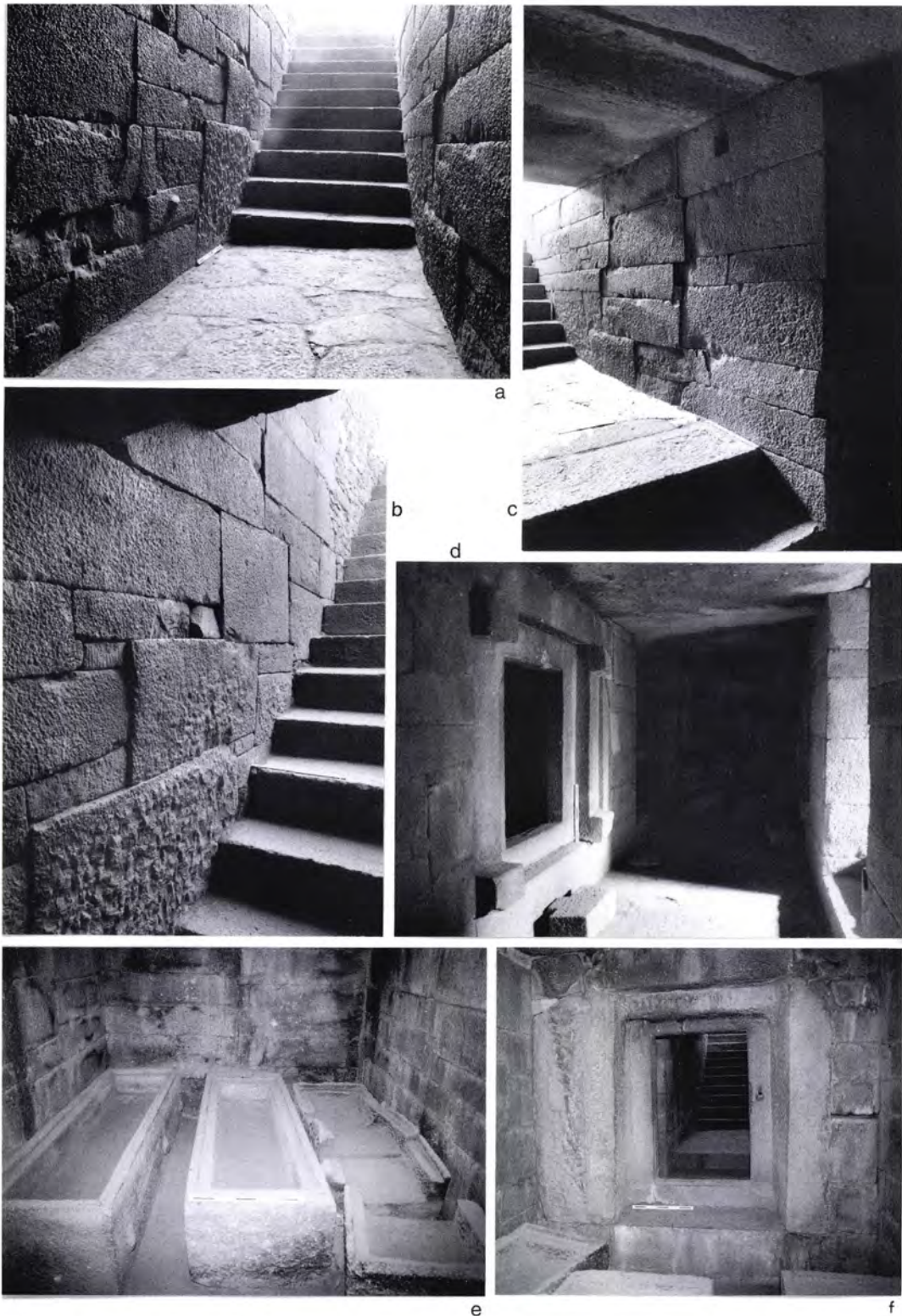


Fig. 382 *Lithics from various excavated sites and surface collections: a - Guditi scraper from the Stela 2 excavation, discarded in a freshly retouched state (chalcedony); b - Guditi scraper from Surface Collection K (chert); c,d - microlithic scrapers from Surface Collection L (chert); e - microlithic scraper from Surface Collection N (chert); f - trimmed tabular object from Surface Collection N (slate); g - Guditi scraper from the Adi Tsehafi quarry area (chert); h-k - steep convex flake scrapers from the south foot of Gobedra Hill (chert).*

Other Sites and Monuments

Adwa. There is evidence for other Aksumite tombs, and for domestic occupation, in the immediate vicinity (Munro-Hay 1989: 42-7). The two tombs are basically similar, although differing in detail (Fig. 380). Each is approached by a separate stepped adit, fully roofed, constructed of huge, carefully dressed syenite blocks of irregular shape, each individually worked to fit its desired place. The northern tomb, traditionally attributed to king Kaleb (Fig. 379c, d), comprises a longitudinal chamber from which three rooms open eastwards. That to the south, attributed to Gabra Maskal, is more complex and better preserved (Figs 380, 381); in plan, but not in construction, it shows strong similarity with the Tomb of Bazen described above. There is a similar longitudinal chamber and three rooms to the east, that in the centre retaining three sarcophagi (Fig. 381e). There are also two rooms extending westwards, on either side of the entrance stair. Three of the five rooms are entered through portals cut in vertical monolithic slabs. That leading to the room with the sarcophagi is particularly fine and well preserved (Figs 381d, f), closely resembling the portals of the Mausoleum and the false doors of the stelae.

The superstructure (D.W. Phillipson 1994a: fig. 27, 1997: 73-88) comprises a central raised courtyard reached from the west by a flight of six steps, 12 m wide. This court links two wings, one erected over and aligned on each of the underground tombs. The two wings are not absolutely identical; it is possible that they were separate structures subsequently linked by construction of the central raised courtyard. The

superstructure itself has never been subjected to thorough archaeological investigation, but has been disfigured by inaccurate restoration. Anfray (1990) has suggested that it may post-date the tombs.

Kaleb was king of Aksum in the early sixth century, being known both from the coinage and from documentary sources. Gabra Maskal is traditionally recalled as his successor, but no coins bear his name.

The two tombs have been open since at least the sixteenth century, when they were described by Father Francisco Alvares (Beckingham and Huntingford 1961: 158-9). Ethiopian sources indicate that the tombs' existence was remembered locally in earlier times (Conti Rossini 1910), so it is not to be expected that contents would have survived such as might provide an indication of their age. The only primary evidence for the date of these tombs consists of numerous informal low-relief carvings on their interior walls, including several crosses (Bernard *et al.* 1991). These are clearly of Christian type and date, being closely paralleled on Aksumite coins, and there is no reason such as differential patination to suggest that the carvings significantly post-date the construction of the tombs. The superstructure shows ecclesiastical features that are likewise suggestive of a Christian date (cf. Buxton 1971: fig. 36). None of this evidence is conclusive, however, although it combines to suggest that the traditional attribution of these tombs to a ruler known to have lived in the early sixth century, and to his successor, is not seriously misleading.

SURFACE COLLECTIONS OF AKSUMITE LITHIC INDUSTRIES

(Laurel Phillipson)

Intensive survey was made of the area within about a 5-km radius of Aksum, omitting only the top and upper slopes of Beta Giyorgis, with a selective survey of areas within a 10-km radius (Fig. 11, above). The

surveys had three principal aims: to establish a comprehensive regional lithic sequence, to gain a preliminary understanding of settlement patterns in the Aksum vicinity and to locate areas in which intensive

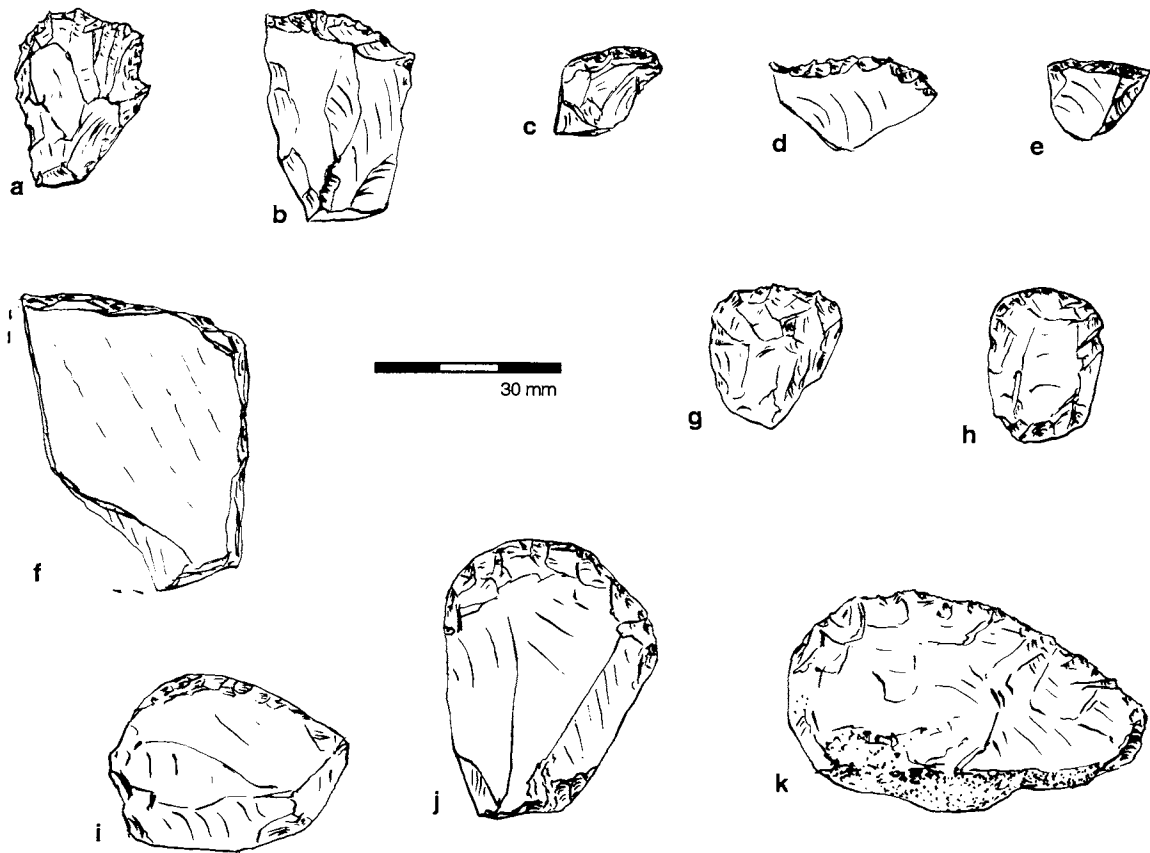


Fig. 382 Lithics from various excavated sites and surface collections: **a** - Guditi scraper from the Stela 2 excavation, discarded in a freshly retouched state (chalcedony); **b** - Guditi scraper from Surface Collection K (chert); **c,d** - microlithic scrapers from Surface Collection L (chert); **e** - microlithic scraper from Surface Collection N (chert); **f** - trimmed tabular object from Surface Collection N (slate); **g** - Guditi scraper from the Adi Tsehafi quarry area (chert); **h-k** - steep convex flake scrapers from the south foot of Gobedra Hill (chert).

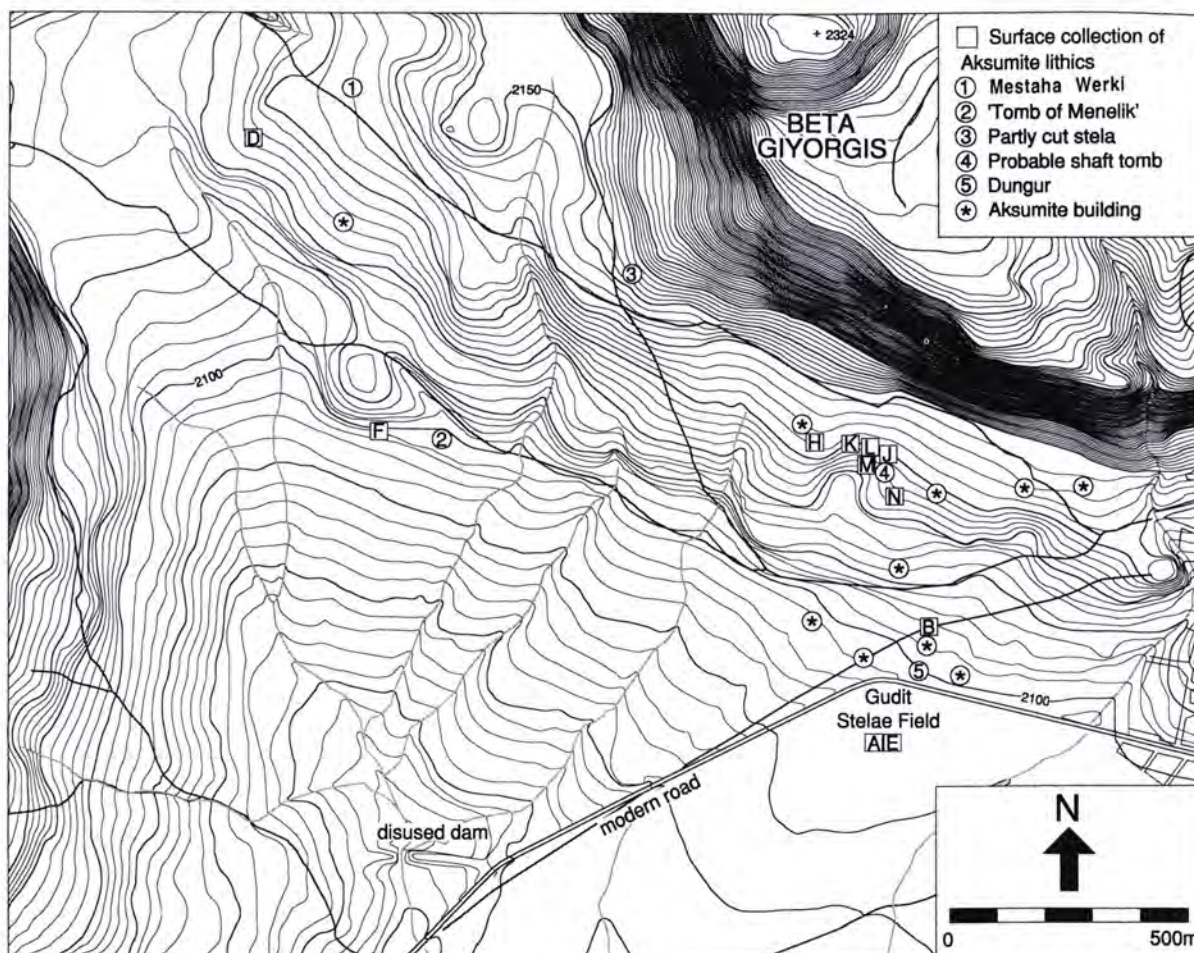


Fig. 383 Map of the area west of Aksum, showing locations of Surface Collections and other Aksumite features.

surface collection would contribute to an understanding of Aksumite stone-tool production and use. These aims were largely met.

Surface collections were not made in all areas where significant or interesting lithic occurrences were noted and, before describing the collections which were made, note should be taken of the more important of the uncollected sites. On both banks of the Mai Goda river near Adi Tsehafi the presence of occasional chert flakes and tools (Fig. 382g) including a few Gudit scrapers (see below) was noted. Small discrete patches of Aksumite potsherds and lithic artefacts on the south flank of Gobedra Hill and on the west flank of Beta Giyorgis mark individual dwelling sites. Densely distributed Aksumite remains including many lithic artefacts to the southwest of the modern town of Aksum, especially on the north side of the Mai Ayne spring, probably indicate the presence of stratified deposits which would merit excavation. Only a few artefacts were collected here. Further afield, at the village and

shallow convex scraper	1
shallow denticulate scraper	3
Gudit scraper	109
irregular Gudit scraper	1
multi-platform core	6
radial core	2
parallel flake	9
rejuvenating flake	14
cortex / irregular / indeterminate flake	67
chip / chunk / flake fragment	138
Total	350

Fig. 384 Surface collections A and E from the Gudit Stelae Field.

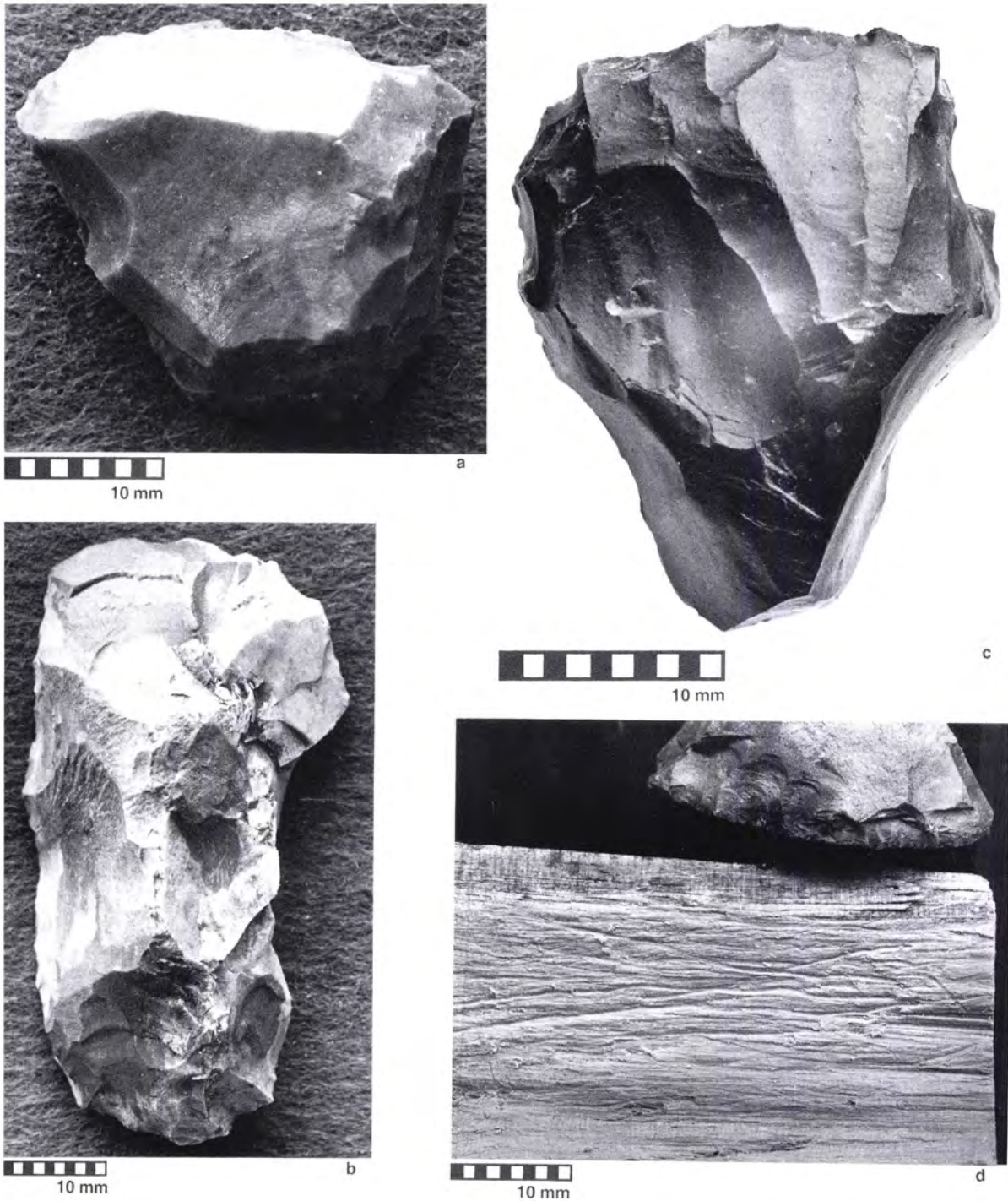


Fig. 385 Gudit scrapers: **a** - a 'typical' Gudit scraper; **b** - a Gudit scraper at an early stage in the sequence of use and resharpening; **c** - an apparently pristine Gudit scraper in black chert (shown also in Fig. 382a), note the sharpness of the scraper teeth; **d** - a Gudit scraper used to scrape or plane Eucalyptus wood, compare the tooling marks with those on Figs 315 and 408b.

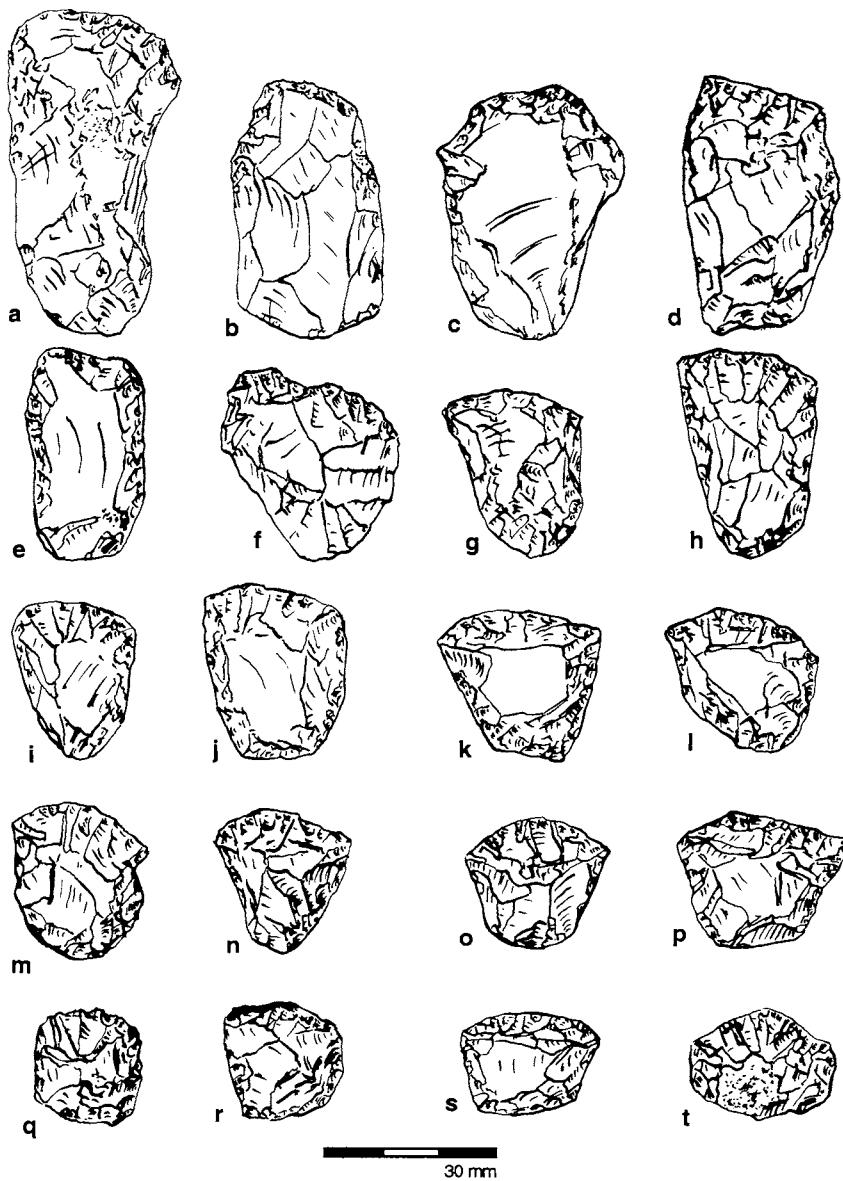


Fig. 386 Gudit scrapers from Surface Collection A.

church of Enda Yesus, about 1.5 km east of the new airport on the north side of the road to Adwa, abundant Late Stone Age or Aksumite lithics were noted with little associated pottery. The preponderant raw material there was blue-grey or brick-red chert, in contrast with the yellow-brown variety common closer to Aksum. Radial cores with maximum diameters of up to 60 mm, convex scrapers on thick flakes and unretouched mudstone flakes were noted, but no Gudit scrapers (see below). It is possible that this material was broadly contemporaneous with the lithics found nearer to Aksum, but of a somewhat different tradition or variant. At Da'erika village and near Libanos church, respectively about 10 km and 20 km southwest of Aksum, numerous yellow-brown chert artefacts were

noted in association with Classical or Late Aksumite potsherds. Most abundant among the lithic tools here were semi-circular steep convex scrapers apparently identical to those manufactured near Aksum, as described below.

Surface collections were made mainly to the west of Aksum (Fig. 383) at locations chosen to sample three distinct types of site: a workshop area where only Gudit scrapers were used and resharpened but not manufactured, a second workshop area at which only steep convex scrapers were produced but not used, and areas where a variety of lithic artefacts including scrapers had been used and discarded but not produced.⁵²

⁵² This chapter is concerned with surface collections of Aksumite lithic material. Prehistoric material is discussed in Chapter 2, above.

Surface Collections of Aksumite Lithic Industries

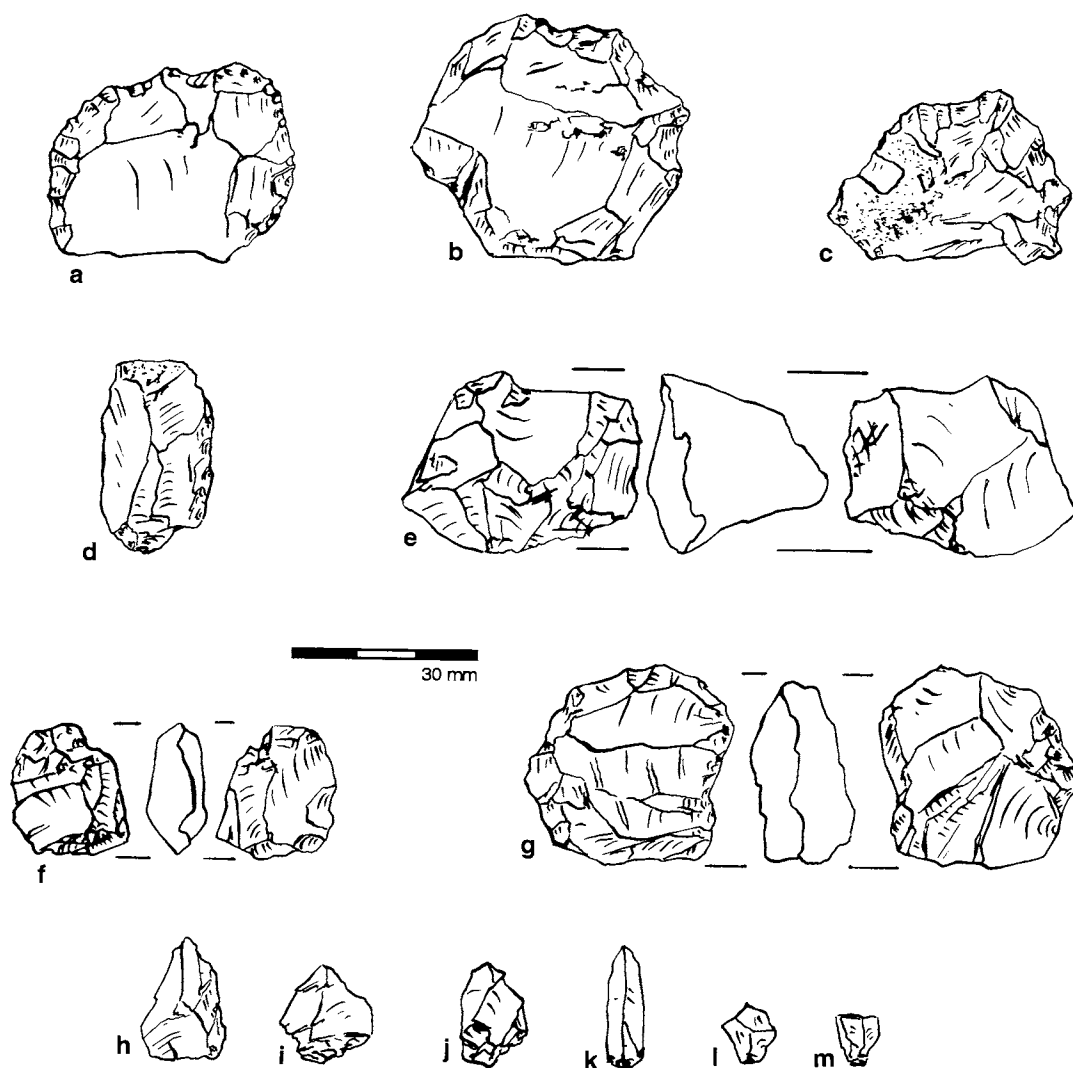


Fig. 387 Miscellaneous scrapers and cores from Surface Collection A: **a-c** - denticulate scrapers; **d** - sidescraper; **e-g** - cores; **h-m** - resharpening/trimming flakes.

Gudit scrapers

Two adjacent surface collections made in the northern portion of the Gudit Stelae Field (Surface Collections A and E) encompassed a combined total of 153 sq. m within which all lithic artefacts were collected, Aksumite pottery was noted but not collected, and no other artefacts were found. As a detailed description of this collection has been published elsewhere (L. Phillipson 2000a) it will only be summarised here (Figs 385-7). In total it comprised 350 mostly chert artefacts, of which 109 were Gudit scrapers, while more than 200 comprised the minor flakes and fragments which resulted from the resharpening of these scrapers.

Gudit scrapers are a highly characteristic type of endscraper usually made on a stout flake of triangular cross section with dorsal scars tending to originate from a central ridge or keel. This type of flake is often

termed 'core rejuvenating', but is in fact easily and rapidly produced from any approximately cuboidal casual or multi-platform core. Previous researchers (D.W. Phillipson 1977; see also Puglisi 1946) have informally defined Gudit scrapers by their plan which is generally splayed or fan shaped, wider at the distal than the proximal end, with an asymmetrically convex curve to the working edge, and a slight spur or pronounced corner at one end of the distal edge, most often the left (Figs 384a, b). In fact, such strictly morphological criteria cause some problems as they define only one stage in the use-life of Gudit scrapers. These began as steep convex endscrapers on stout flakes or blades (Figs 384b, 386a-d), assumed their characteristic shape as a result of intensive use and repeated resharpening, and were eventually discarded when too short to be effective (Figs 386q-t). Some of

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the smallest examples had by this stage acquired a concave scraper edge. The splayed plan shape and spurred corner are a not uncommon incidental result of the resharpening of small endscrapers and as such can

be duplicated in lithic assemblages from totally unrelated sites and periods (Morrow 1997). What does seem to be unique to the Gudit scrapers is their high degree of uniformity, which suggests that their plan



Fig. 388 The chert block from Surface Collection D.



a



b



c

Fig. 389 Dorsal and ventral views of steep convex scrapers; note the regularity of curvature of the scraper edges and the shallowness of the final trimming scars.

Surface Collections of Aksumite Lithic Industries

	<u>Collection J</u>				<u>Collection K</u>		<u>Collection L</u>	
	obsidian	chert	quartz	mudstone	chert	quartz	chert	quartz
shallow convex scraper	-	1	-	-	-	-	-	-
shallow denticulate scraper	-	-	-	-	-	-	4	-
steep convex scraper, well finished	-	45	1	-	11	-	8	-
steep convex scraper, less well finished	-	64	1	-	12	-	8	-
steep convex scraper, unfinished	-	26	-	-	6	-	4	-
steep convex scraper, broken	-	34	-	-	9	-	7	-
irregular Gudit scraper	-	1	-	-	1	-	-	-
microlithic convex scraper	-	1	-	-	-	-	1	-
triangular backed microlith	-	-	-	-	1	-	-	-
utilised crystal	-	-	-	-	-	1	-	1
overstruck flake	-	50	-	-	7	-	9	-
radial core	-	-	-	-	2	-	1	-
casual/multi-platform core	-	52	1	-	6	-	1	-
parallel flake	-	33	-	-	7	-	21	-
radial flake	-	23	-	-	1	-	-	-
rejuvenating flake	-	25	-	-	2	-	2	-
cortex/irregular/indeterminate flake	-	663	-	-	28	-	96	-
flake <12 mm max. dimension	-	179	-	-	2	-	36	-
chip/chunk/flake fragment	5	1851	76	1	105	5	1232	2
Totals	5	3048	79	1	200	6	1430	3
		3133			206		1433	

Fig. 390 Surface Collections J, K and L: lithic artefacts.

shape was not obtained accidentally, but deliberately produced. Even more significant is the nature of their minor resharpening scars. The individual scars are relatively deep and are spaced so as to give a minutely crenellated or denticulate edge. Replication experiments suggest that this type of edge was obtained by retouch with a narrow metal tool such as the edge of a knife blade, using firm pressure or indirect percussion.

Extensive replication experiments detailed elsewhere (L.Phillipson 2000b) have shown that Gudit scrapers are effective and efficient tools for planing and shaping wood and soft stone. Planing marks made by the use of Gudit scrapers match similar marks found

on steatite seals and on worked ivory recovered from Late Aksumite deposits at the D and K sites. From the evidence of these experiments it is concluded that Gudit scrapers were probably used in the shaping of wood, ivory and soft stone (Fig. 384d). Other experiments demonstrated that the minutely denticulated scraper edges made them not only inefficient for scraping damp, fresh hide, as the scraper edge rapidly became clogged with fleshy particles, but also ineffective in dressing dried skins, which they tended to scratch and cut (Fig. 384c).

The concentration of Gudit scrapers to the virtual exclusion of other tool types in the vicinity of

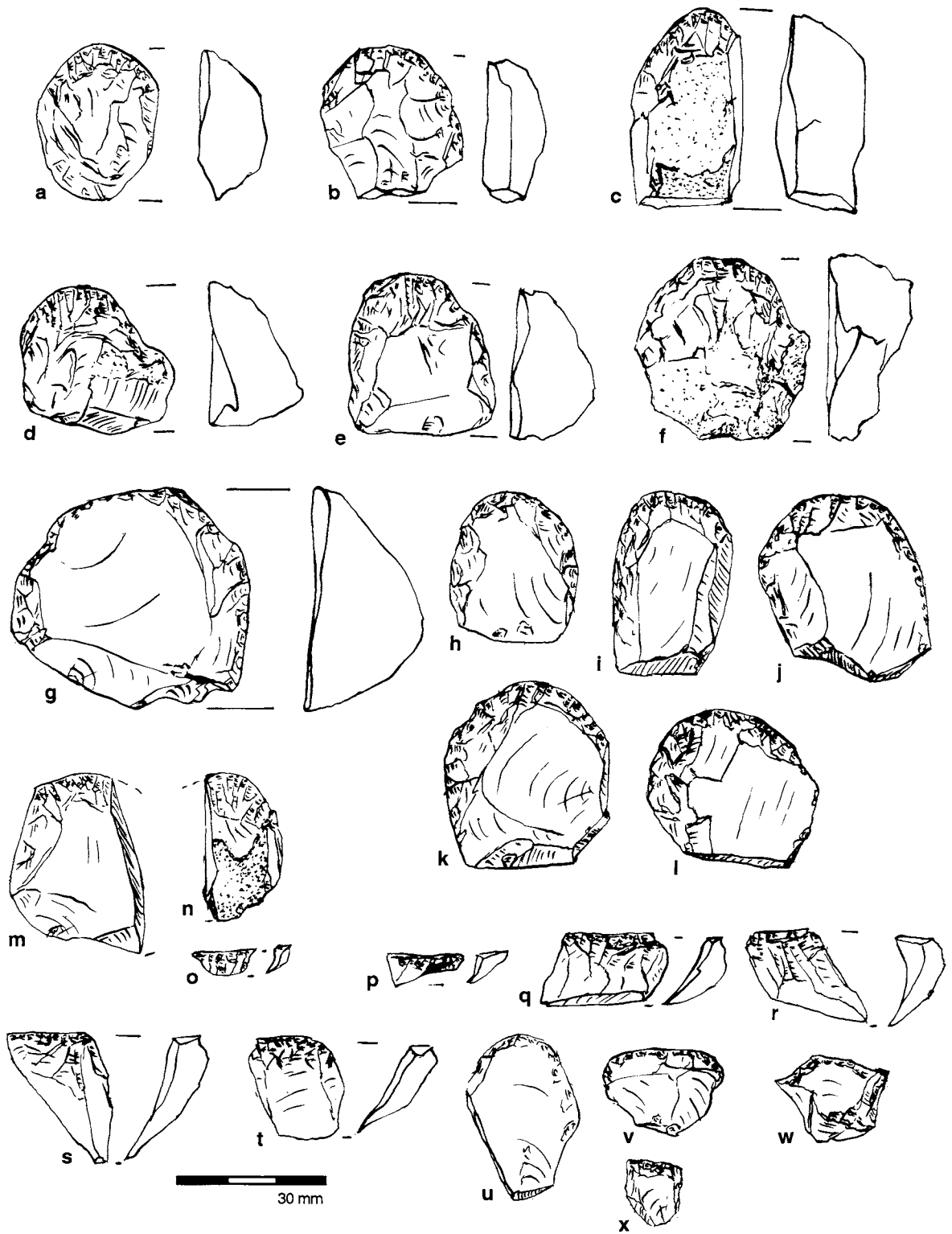


Fig. 391 Artefacts from Surface Collection J: **a-g** - steep convex scrapers on chunks (chert); **h-l** - steep convex scrapers on flakes (chert); **m,n** - broken steep convex scrapers (chert); **o-t** - overstruck flakes (chert); **u** - shallow convex scraper (chalcedony); **v** - shallow convex scraper (chert); **w** - Gudit scraper (quartzite); **x** - microlithic scraper (chalcedony).

Surface Collections of Aksumite Lithic Industries

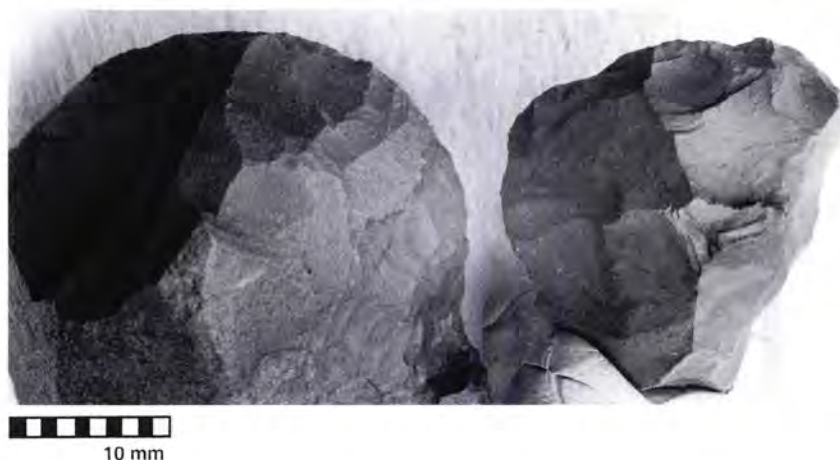


Fig. 392 A steep convex scraper (left) and a heavily worn Gudit scraper compared. See also Figs. 316, 389 for utilised steep convex scrapers.

the Gudit Stelae Field seems to be indicative of a specialist workshop, while their presence at dispersed sites elsewhere in the general area suggests that they were not exclusively a specialist's tool.

Relative dating evidence indicates that these scrapers belong to rather late phases in the Aksumite

sequence. They were certainly in use during Late Aksumite times: deposits of this period at D and K sites yielded both Gudit scrapers and ivory artefacts showing traces of their use. They did not occur in Pre-Aksumite levels at D site and were markedly absent from deposits at the Gudit Stelae Field contemporary with that

	<u>Collection B</u>		<u>Collection C</u>		<u>Collection D</u>
	chert	quartz	chert	obsidian	chert
shallow notched scraper	1	-	-	-	-
shallow nosed scraper			1	-	-
shallow denticulate scraper	1	-	-	-	-
shallow convex scraper	-	-	2	-	-
steep convex scraper	2	-	6	-	-
irregular Gudit scraper	-	-	5	-	-
<hr/>					
?imported raw material	-	-	-	-	1
<hr/>					
opposed-platform core	-	-	2	-	-
multi-platform core	8	1	3	-	-
radial core	3	-	5	-	-
<hr/>					
parallel flake	-	-	2	5	-
radial flake	-	-	7	-	-
cortex / irregular / indeterminate flake	-	-	6	3	-
chip / chunk / flake fragment	-	-	34	12	-
all flake fragments	19	-	-	-	-
<hr/>					
Totals	34	1	73	20	1
	<hr/>		<hr/>		<hr/>
	35		93		1

Fig. 393 Surface Collections, B, C and D: lithic artefacts.

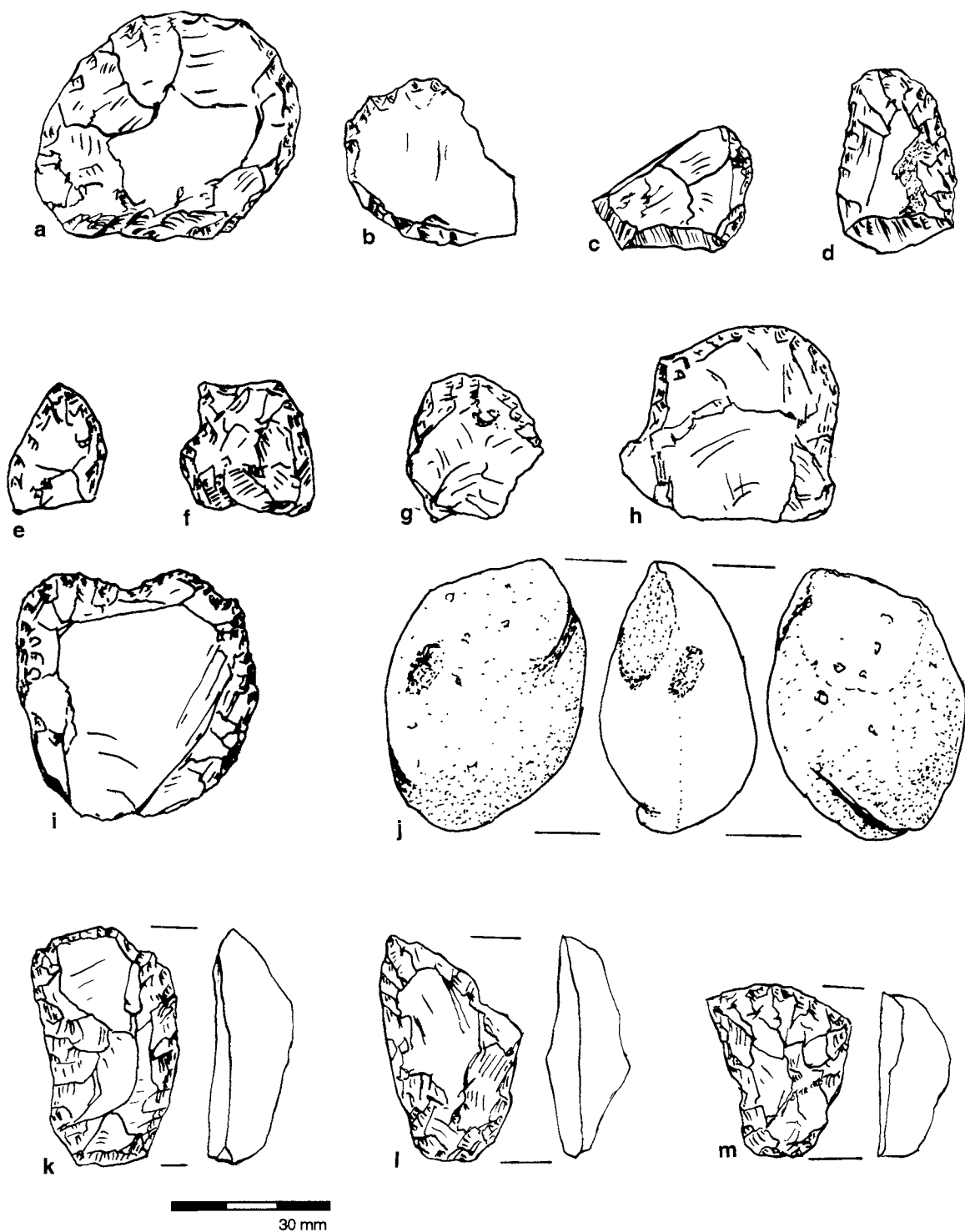


Fig. 394 Artefacts from Surface Collections B and C and from the area of the Guditi Stelae Field: **a** - steep convex scraper, B (chert); **b-d** - miscellaneous scrapers, B (chert); **e, f** - Guditi scrapers, C (chert); **g-i** - Guditi scrapers, C (chalcedony); **j** - pebble with worn grooves and flat areas, C (quartz); **k-m** - large Guditi scrapers with narrowed butts, area of the Guditi Stelae Field (chert).

Surface Collections of Aksumite Lithic Industries

	<u>Collection G</u>			<u>Collection N</u>		
	chert	quartz	obsidian	chert	quartz	other
shallow denticulate scraper	1	-	-	1	-	-
steep convex scraper	7	-	-	4	-	-
Gudit scraper	3	-	-	-	-	-
irregular Gudit scraper	-	-	-	1	-	-
rectangular trimmed slate utilised crystal	-	-	-	-	-	1
single-platform core	1	-	-	-	-	-
opposed-platform core	3	1	-	1	-	-
multi-platform core	2	1	-	2	-	-
rejuvenating flake	7	-	-	-	-	-
cortex / irregular / inderterminate flake	3	-	-	17	-	-
chip / chunk / flake fragment	2	1	1	626	3	-
Totals	29	3	1	652	4	1
		33			657	

Fig. 395 *Surface Collections G and N: lithic artefacts.*

area's use as a cemetery: it seems likely that use of the site for workshop purposes did not take place until long after it had ceased to be used as a place of interment (Chapter 8, above). Pottery from surface collections containing Gudit scrapers is of Classical or Late Aksumite, but not Early Aksumite, type. The only evidence that Gudit scrapers may have been used prior to the fifth or sixth century AD consists of ivory from the Tomb of the Brick Arches which bears tool marks indicative of shaping by means of a lithic tool with denticulations resembling those characteristic of Gudit scrapers.

A wedge-shaped block of fine-quality yellow chert (122 by 70 by 103 mm) with a few flakes removed from one battered edge (Fig. 388) was collected from a small, presumably residential, site on a knoll on the western flank of Beta Giyorgis (Surface Collection D: Fig. 383, above). Associated remains at this site included minor portions of largely undressed walling and paving, Aksumite potsherds and a few chipped

stone artefacts; it was reported that Aksumite coins have been recovered here in the past. The block appeared to match in colour, degree of silicification and uniformity much of the chert used to produce Gudit scrapers. Such chert is abundant to the north of Beta Giyorgis, but that available closer to the Gudit Stelae Field is generally of a browner colour and less uniform quality. The block may have been procured and transported for the purpose of stone tool production.

Steep convex scrapers

Three neighbouring Surface Collections, J, K and L, together encompassed 67 sq. m of a circumscribed area dominated by another highly uniform tool type: a steep edged, semi-circular convex scraper made on thick flakes or tabular chunks (Figs 389a-c). Of 4772 lithic artefacts collected here, 302 were intact or broken scrapers (including overstruck flakes) of this type, all but two of them being made of a variable brown to yellow chert which outcrops abundantly not more than

Archaeology at Aksum

	obsidian	chert	quartz	mudstone	basalt	carnelian	other
shallow concave scraper	-	2	-	-	-	-	-
shallow nosed scraper	-	1	-	-	-	-	-
shallow denticulate scraper	-	3	-	-	-	-	-
shallow convex scraper	-	11	-	-	-	-	-
steep concave scraper	-	1	-	-	-	-	-
steep denticulate scraper	-	1	-	-	-	-	-
steep convex scraper	-	17	-	-	-	-	-
Gudit scraper	-	2	-	-	-	-	-
irregular Gudit scraper	-	8	-	-	-	-	-
tabular scraper	-	2	-	-	-	-	-
tabular trimmed slate	-	-	-	-	-	-	2
<hr/>							
crescent, complete	-	1	-	-	-	-	-
crescent, broken	-	1	-	-	-	-	-
crescent tip	-	1	-	-	-	-	-
trapezoid	-	1	-	-	-	-	-
backed bladelet	-	3	-	-	-	-	-
<hr/>							
pounder/hammerstone	-	-	2	-	-	-	-
pounder/rubber, marble	-	-	-	-	-	-	1
vellum-burnisher	-	-	1	-	-	-	-
spherical bead	-	-	-	-	-	4	-
utilised crystal	-	-	4	-	-	-	-
<hr/>							
opposed-platform core	-	12	-	-	-	-	-
multiplatform core	-	14	1	-	-	-	-
exhausted core	1	21	1	-	-	-	-
radial core	-	21	-	-	-	-	-
casual core	-	6	-	-	-	-	-
<hr/>							
parallel flake	2	29	1	-	-	-	-
radial flake	-	13	-	-	1	-	1
rejuvenating flake		21	-	-	-	-	-
cortex/irregular/ indeterminate flake	3	124	-	-	-	-	1
chip/chunk flake fragment	4	962	58	2	-	-	10
<hr/>							
Totals	10	1278	68	2	1	4	15

1378

NON-LITHIC ARTEFACTS

Glass:

- 1 fragment cobalt blue ?bowl rim, 15.4 x 12.3 x 2.8 mm
- 1 fragment cobalt blue with marvered flute decoration, 8.9 x 7.1 x 2.9 mm
- 1 fragment transparent intense red, 5.2 x 4.3 x 4.2 mm
- 2 pieces modern bottle glass utilised as scrapers, maximum dimensions 30.0 and 25.1 mm
- 1 cobalt blue oblate collared bead, 5.3 mm diameter
- 1 fragment opaque red wound bead, c. 7.1 x 5.6 mm

Metal:

- 1 folded copper/copper alloy strip, c. 57 x 2.8 x 1.0 mm
- 5 iron fragments, maximum dimensions 9.3 – 15.1 mm
- 1 iron wire, 100 mm long, 0.2 mm diameter
- 1 iron bullet, 20.1 mm long, 6.3 mm diameter
- 1 cartridge cap

Brick:

- 1 Aksumite brick fragment, 55 mm thick

Fig. 396 Surface Collection H: lithic and non-lithic artefacts.

Surface Collections of Aksumite Lithic Industries

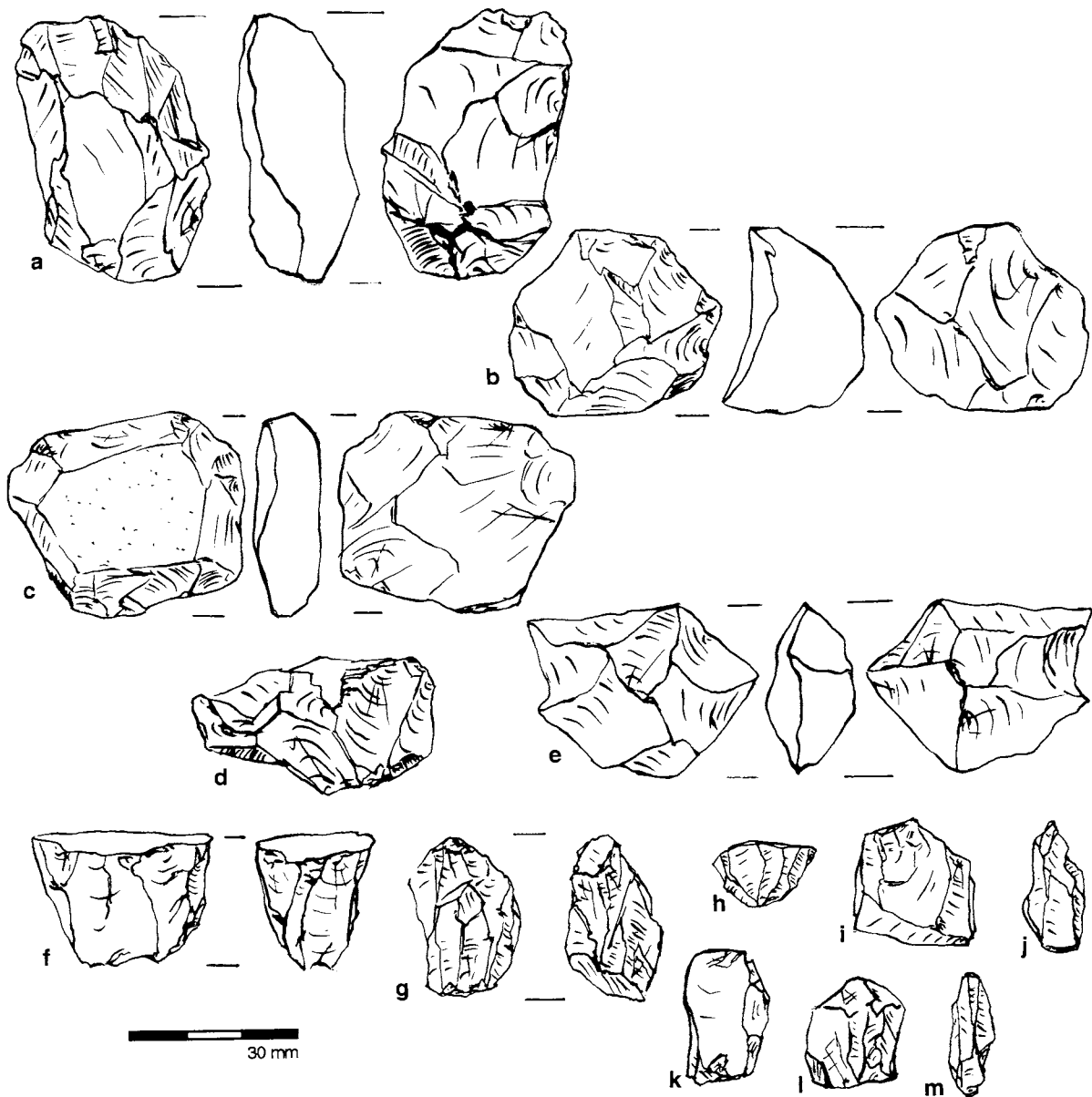


Fig. 397 Cores from Surface Collection H: **a-c** - radial (chert); **d** - multiplatform (chalcedony); **e** - multiplatform (chert); **f** - bipolar (chert); **g** - bipolar (chalcedony); **h-j** - exhausted (chalcedony); **k** - exhausted (chert), **l** - exhausted (quartz crystal); **m** - exhausted (obsidian).

a few hundred metres below the area where the artefacts were collected (Figs 390, 391). Included among the steep convex scrapers are a minority with well finished edges; most had less well finished or irregular edges, had been abandoned in an unfinished state, or were broken before they had been completed. As evidenced by the presence of numerous cores and large amounts of manufacturing debris, this would seem to have been a factory site for the production of a single standardised tool type, most well finished specimens of which had been removed from the site for use elsewhere.

Both the initial striking of the cores to produce the flat chunks and flakes which were used indiscriminately for scraper production and their subsequent trimming appear to have been accomplished by direct percussion with the same broad or blunt hard hammer. The absence of hammerstones in association with this manufacturing debris suggests that a metal tool, perhaps a bar, was employed for this purpose. Heavy bashing would have been used to shatter the chert blocks or cores into chunks and fragments from which suitable scraper blanks could be selected. Lighter

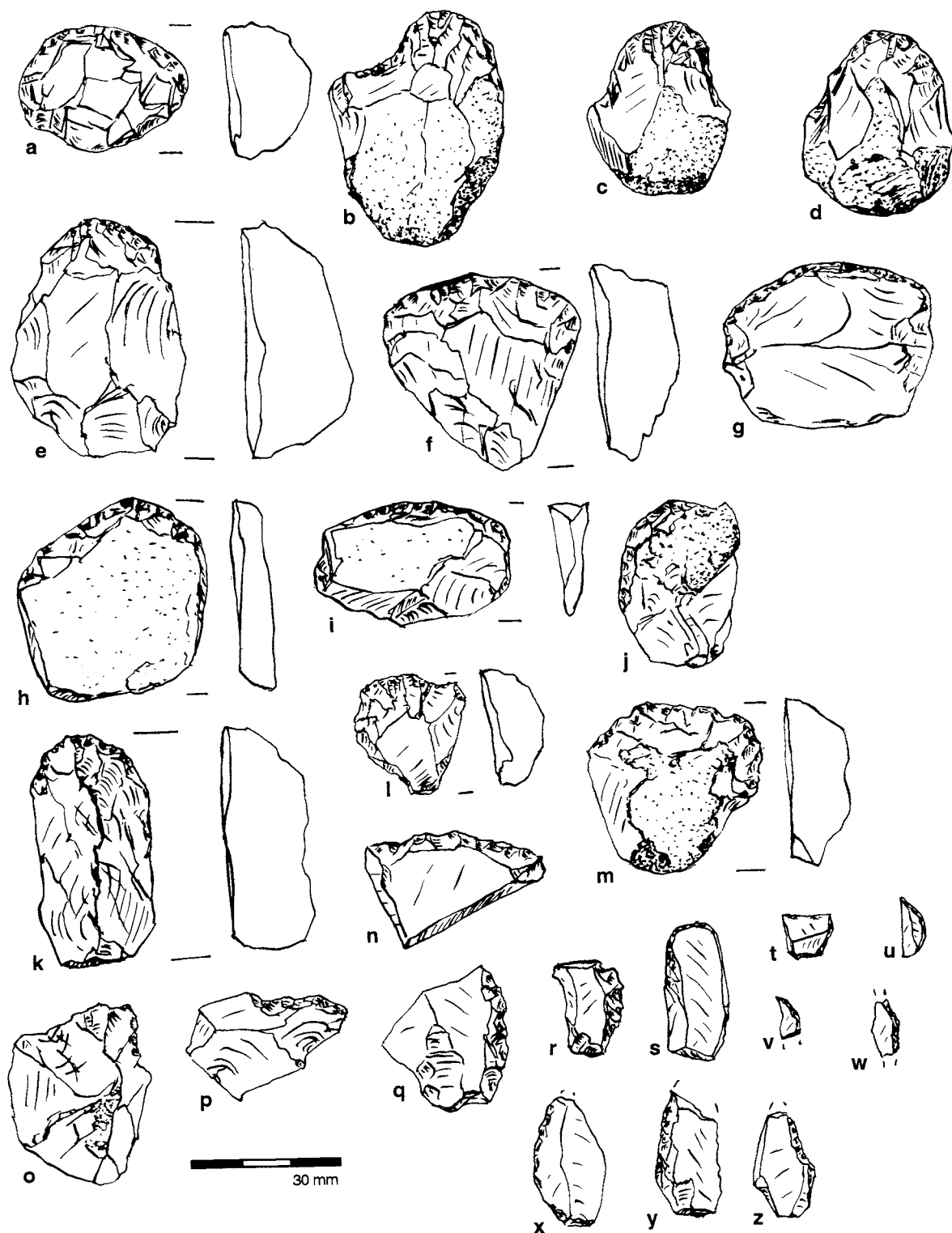


Fig. 398 Tools from Surface Collection H: **a-j** - steep convex scrapers (chert); **k** - Gudit scraper at an early stage of use (chert); **l** - Gudit scraper (chalcedony); **m** - Gudit scraper (chert); **n, o, q** - denticulate scrapers (chalcedony); **p** - denticulate scraper (chert); **r, s** - microlithic scrapers (chert); **t** - unilaterally backed trapezoid (chalcedony); **u** - bifacially backed crescent (chalcedony); **v** - bifacially backed crescent tip (chalcedony); **w** - unilaterally backed microlith fragment (chert); **x-z** - minimally backed bladelets (chalcedony).

Surface Collections of Aksumite Lithic Industries

tapping with the same tool would have produced the slightly irregular convex scraper edge with a bevelled profile of about 60 to 75 degrees, as found on many unfinished examples. A final stage of yet lighter re-touch with the same tool would have produced the doubly bevelled profile with an edge angle of about 90 degrees, characteristic of finished specimens. The final retouch scars were shallow and overlapping to give a smoothly curved edge with much less bite than that of the Gudit scrapers.

On fairly frequent occasions, the edge being trimmed was struck too forcefully, causing a portion of the already trimmed convex edge to be inadvertently removed (Figs 391o-t). The presence of these rather numerous overstruck flakes suggests not so much an absence of skill in scraper manufacture - the finished examples are well made and highly standardised in size and shape - as the lack of value of the raw material *per se* and the probability that the scrapers were being produced in haste, perhaps by people working under some form of duress. It may be conjectured that we have here an example of the products of forced or slave labour at work.

The edges of the steep convex scrapers are unlike those of the Gudit scrapers, bearing more numerous, shallower, overlapping trimming scars (Fig. 392). In plan shape, the scrapers are broader and of even curvature, approximating to an arc of a circle, without any corner or spur. In edge texture and profile, though not necessarily in plan shape, these scrapers resemble those contemporary and recent lithic hide scrapers from southern Ethiopia which I have been able to examine by courtesy of Ms (now Dr) K. Weedman. Experimental use of these steep convex scrapers has demonstrated that they are effective and efficient for defleshing fresh, wet hide and particularly so for preparing dried skins. They are not, however, useful for working wood as they tend to skim over its surface without biting into it. Dating evidence for these tools, as for the Gudit scrapers, consists of their occasional presence in Late Aksumite excavated deposits and their association in surface assemblages with potsherds of Classical Aksumite and/or Late Aksumite affinity.

Other assemblages

The final group of surface collections, from apparent occupation areas, encompasses a greater variety of tool types than do any of the collections considered so far (Figs 393-8). Taken together they provide a fuller picture of Aksumite lithic tool types than can be obtained from any one site alone. On the lower terrace levels on the southwest and west flank of Beta Giyorgis, above an almost continuous band of chert outcrop, almost

every prominent rock outcrop and hillock has on its eastern or uphill side a small level area cleared of other rock on which varying amounts of small lithic tools may be found, sometimes with associated Aksumite pottery and in several instances with traces of minor ancient walls of undressed stone. Surface Collection H comes from the largest and densest of these occurrences. These sites become smaller and more widely separated as one proceeds northwards in a clockwise direction around the foot of Beta Giyorgis, but merge into an almost continuous distribution of artefactual material as one proceeds in the opposite direction towards Dungur and the western outskirts of Aksum town. In some areas, as around Surface Collections J, K and L, apparently domestic assemblages of varied lithic tool types give place to restricted scraper-production sites or, as in Collection N, a preponderance of lithic artefacts is replaced by a greater proportion of potsherds.

Surface Collection C was made over an area of 100 sq. m at D site on the same terrace as trench D23; Collection G was made near Mai Ayne; Collections B, D, H and N are from sites in the area to the north and west of Dungur as shown in Fig. 383, above. Surface Collection N was made over an area of 12 sq. m, within which all lithic artefacts were collected. Collection B covered 100 sq. m; Collections D and G were selective, comprising only a few diagnostic pieces from their respective areas.

The largest of the surface collections, Collection H, comprised all artefactual material from an area of 675 sq. m on the north side of a prominent rock outcrop known as Sheik Akwash, near the remains of a moderately large Aksumite undressed stone-walled building complex (Figs 396-8). Associated potsherds were identified by Jacke Phillips as of Classical to Late Aksumite types; most are of coarse utility wares although pieces from the building site itself were of finer wares. Fragments of iron, copper, ancient glass, and glass and stone beads were also present.

As may be seen from Fig. 396, Surface Collection H uniquely comprises examples of most of the scraper, backed microlith and other stone tool- and core-types which have been recovered in less variety from other sites in the Aksum area. Technologically and morphologically this assemblage may be homogeneous and there is no reason to doubt its contemporaneity with the mainly fifth-century pottery found associated with it and with Surface Collections B and G. Conditions of preservation, smaller sample-sizes and especially a strong tendency to site-specific industrial specialisation may be invoked to explain the reduced variety of lithic types at most other sites.

SYNTHESES

Lithic industries

(Laurel Phillipson)

Raw materials

Aksumite use of stone encompassed a wide variety of purposes and dressing techniques and a correspondingly wide variety of types of stone. Syenite, coarse and fine sandstones, basalt and marble were used in architectural and monumental constructions at Aksum and the same materials were also used for such larger artefacts as mortars, stone bowls and grindstones. Smaller carved artefacts including lamps, seals and beads were made of schist, hornfels or marble. There is no conclusive evidence that the numerous spherical carnelian beads recovered from several contexts were locally produced, although small amounts of gem-quality carnelian are found locally along with a wide variety of colours and qualities of siliceous rocks. The numerous flaked stone tools, which comprise a significant component of the total Aksumite industrial assemblage, were made primarily of microcrystalline and amorphous silicates or of glassy obsidian. Less frequently, small transparent crystalline quartz cores were struck to produce minute flakes and individual quartz crystals were occasionally used as engraving tools. Although the chipped stone artefacts were sorted for study purposes and tabulated according to their raw materials, these clearly intergrade into one another and there are many examples of flakes, cores and tools with two or three apparently different materials (such as transparent quartz and opaque chalcedony) on the same piece and no change in artefact scar-pattern across the change in material type. In general, the yellow and red cherts and most of the opaque chalcedonies are tabular and unbanded or have flat, horizontal banding. Translucent and some opaque chalcedonies, crystal quartz and some quartzites are nodular, derived from the abundant geodes which erode out from the extensive basalt deposits capping the adjacent hills. Some quartzite is metamorphic in origin and this grades into the silicified sandstones and mudstones often used in the production of earlier artefacts of Middle Stone Age type.

Opaque chert is found in and interlayered with the beds of compacted diatomites which are exposed on the flank of Beta Giyorgis just above the Tomb of Menelik. Most of the exposed chert has disintegrated

to an angular detritus or decayed to a white/ grey clay which is currently mined to provide a plaster for house walls. Similar beds outcrop at a low level on Gobedra and, presumably, other surrounding hills. In places, these outcrops contain solid chert of more-or-less homogeneous quality and smaller amounts of very fine chalcedony. Near the Tomb of Menelik and the areas of Surface Collections H, J, K, L, M, and N, yellow brown chert of rather unhomogeneous quality is abundant. Lumps of a more homogeneous quality of ochre-yellow chert were noted to have eroded out on the valley floor north of Beta Giyorgis, and between it and Adi Tsehafi. This particular chert was evidently a preferred material for Guditi scrapers; the even more abundant less homogeneous yellow-brown chert was almost the only material used for the mass-produced steep convex scrapers. Chert also occurs locally in a less frequently utilised blue-grey colour and in shades of red or brown, sometimes mottled or banded; it can be obtained more easily and in larger pieces than the other silicates.

Opaque chalcedonies also occur in the same formations as the tabular cherts, but are less abundant. They are mainly dark red to red-brown, sometimes finely banded with olive green and/or yellow, and they also occur in dark or pale grey, pale green, yellow and white. The red chalcedony has sometimes been referred to as jasper and the banded forms as agates. A milky or semi-translucent form has sometimes been referred to as opal. White chalcedony in small pieces may be confused visually with feldspar or quartzite, which are also present locally, neither being so satisfactory for tool production. In fact, the colour of the chalcedony has little bearing on its flaking properties and seems to have been disregarded by Aksumite tool manufacturers. Chalcedony was mainly used for very small scrapers and for some microliths.

Translucent, colourless chalcedony, sometimes with very fine white banding, occurs mainly in geodes together with and sometimes grading into crystalline quartz. It is only obtainable in small pieces and seems to have been a preferred material for the production of some of the tiniest backed microliths.

Archaeology at Aksum

Quartz and quartzite occur as transparent crystals in geodes, and as opaque white quartzite together with chalcedony in geodes and in vein deposits. It also occurs as metaquartzites which grade into highly silicified sandstones. When struck, it produces many chips and chunks and was little used for Aksumite tool production. Although employed in earlier lithic industries, the silicified sandstones and mudstones were likewise little used in Aksumite times.

Glassy obsidian was used for a variety of microlithic tools excavated from D site although none was found in surface occurrences at that site owing to its fragility and the speed with which it is destroyed by exposure. It was also found as a rare component of several of the surface collections made on the western side of Aksum. It appears only to have been used for the production of quite small tools and the several cores which have been recovered seem to have been worked down to the production of bladelets only a few millimetres long. This suggests that the material was considered as particularly valuable, and perhaps that it was brought from some distance. No nearby source for glassy obsidian was located.

Some lithic artefacts, notably those of the finer grades of chalcedony, crystalline quartz and obsidian show clear evidence of minutely damaged edges (Fig. 399) resulting from their use as tools for cutting, engraving and other functions, as discussed and illustrated elsewhere (L. Phillipson 2000a, b).

Comparisons

The lithic materials recovered from D and K sites appear to bear sufficient resemblance to those from the upper levels of Gobedra Rockshelter (D.W. Phillipson 1977) in tool types, in variety and in raw material to suggest cultural continuity.⁵³

In comparing the Aksumite lithic artefacts from the surface collections with those excavated at D and K sites (pp. 352-63 and 409-11, above), variations in the numbers of tool types represented in each location seem particularly significant. The quantities of lithic artefacts recovered during excavation were biased to a greater or lesser extent, as noted above. This bias is obviated by considering the ratio of the number of discrete tool types to the total number of tools recovered for each unit. Ignoring the very small sample from post-Aksumite or mixed horizons at D site, this ratio gives a value of 0.50 to 0.25 as characteristic of lithic assemblages from Aksumite residential sites in our area (Fig. 400).

⁵³ Radiocarbon dates for Gobedra strata IIa and IIb are respectively 2806 bp ± 53 (BM-1153 on bone collagen) and 6825 bp ± 165 (GX-4680 on bone apatite). Broadly similar assemblages from Anqer Bahti and Bahti Nebait are noted above in Chapter 2.

When applied to the surface collections, this ratio becomes particularly useful as it provides a clear distinction between Collections H and N, presumed occupation sites at which sundry specialised tools were used for various purposes, and the remaining surface collections which appear to have been single-purpose industrial sites. Surface Collections J, K and L, at which it is suggested that steep convex scrapers were mass-produced for use elsewhere, have ratios of tool types relative to all tools between 0.095 and 0.018. The corresponding ratio for the Surface Collection from the Gudit Stelae Field, A plus E, is 0.026. Although this figure is in the same range as that of the scraper-production sites, it has been demonstrated that these collections represent a workshop at which Gudit scrapers were used and resharpened, but at which few if any were manufactured.

An index of the number of tool types relative to the quantity of all artefacts seems to distinguish between sites at which tools were manufactured and those at which they were used but not produced. This measure, however, is likely to have been somewhat distorted by accidents of preservation and collection. For reasons noted above, assemblages from D and K sites are almost certainly deficient in the proportions of small flakes and debitage recovered. In Surface Collections A, E, H, J, K and L care was exercised to collect all exposed lithic artefacts with maximum dimensions of 2 mm or greater and a significant amount of material with smaller maximum dimensions was also collected.

Another significant point of comparison is in the presence of obsidian, which is abundant at D site (especially in the Pre-Aksumite levels) and moderately frequent at K site. Its minor presence in the exposed surface deposits of Collections H and J suggests that it may originally have been somewhat more abundant at these locations, but not as dominant as at D site. The unique presence of Likanos flakes and the low proportion of steep scrapers of either type are further distinguishing characteristics of the D-site assemblages. The high to moderate proportions of backed microliths which characterise the excavated assemblages and that from Surface Collection H suggest a cultural continuity between this material and the similar, but earlier, microlithic assemblages excavated from the upper levels of Gobedra Rockshelter.

Post-Aksumite material occurs at K and D sites only in mixed superficial deposits which may well contain older as well as younger artefacts. The higher proportions of cores and of steep scrapers in these post-Aksumite or mixed deposits will have resulted in part or largely from the weathering of surface material and the processes of redeposition resulting in the attrition of some of the smaller and more

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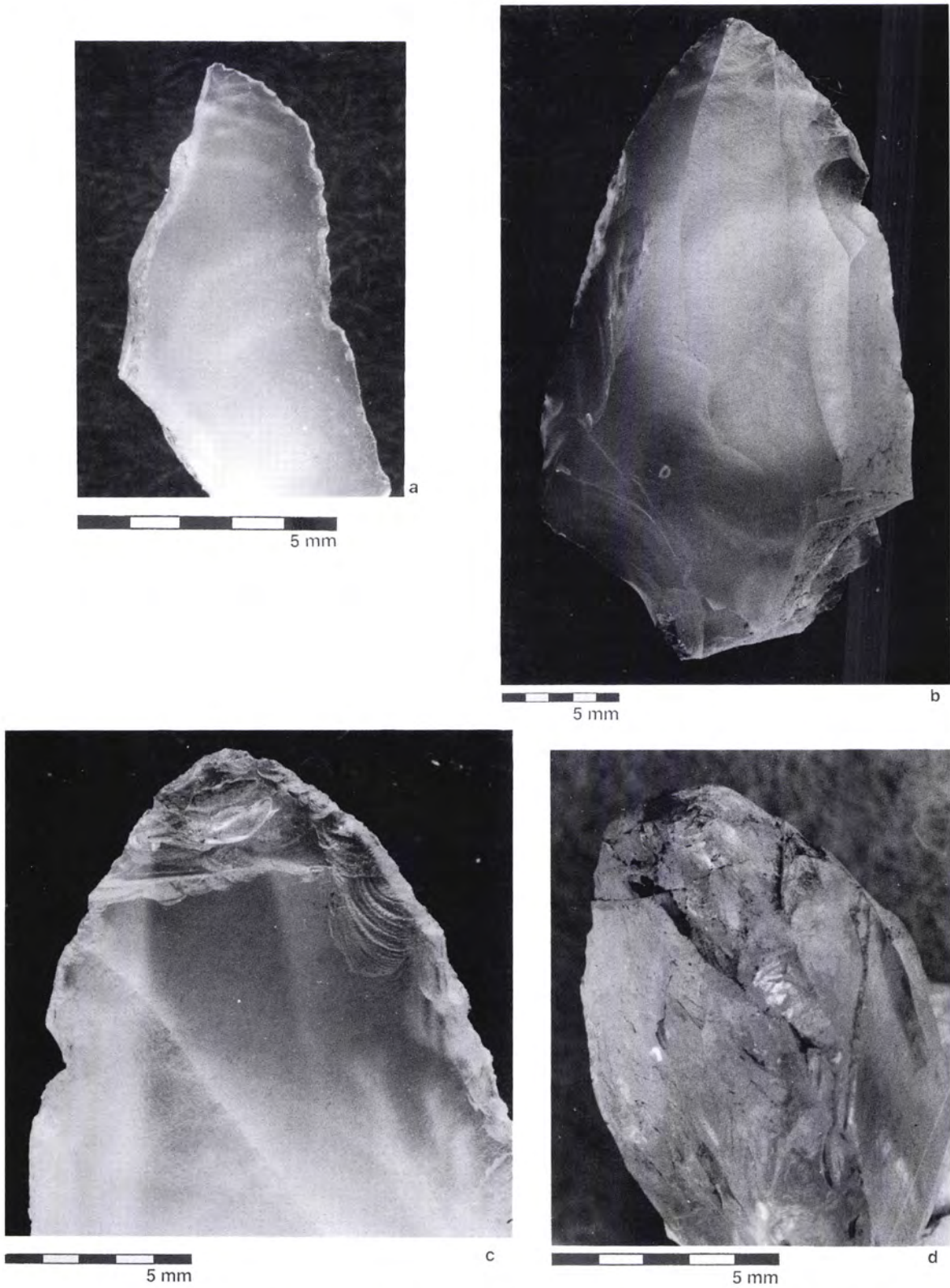


Fig. 399 Examples of wear and use-damage on lithic artefacts: **a** - chalcidony crescent, note the heavily worn tip and portion of the sharp edge; **b, c** - a unique chalcidony point with possible impact-damage at the tip on the ventral surface, from Baahiti Nebait; **d** - worn tip of a utilised quartz crystal.

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	Pre-Aksumite	Late Aksumite	Mixed / later	Late Aksumite	Mixed / later	<u>Surface Collections</u>					
						A & E	H	J	K	L	N
N artefacts	82	653	41	140	95	350	1378	3133	206	1433	657
N tools	23	51	3	13	6	114	69	224	47	42	8
N tool types	9	13	3	6	3	3	18	4	4	4	4
% obsidian	77	48	51	16	12	-	<1	<1	-	-	-
% chert/chalcedony	11	43	37	81	84	100	93	97	97	>99	>99
% steep scrapers ¹ / tools	13	14	33	38	67	96	42	100	96	64	62
% shallow scrapers / tools	13	6	33	38	67	4	30	-	-	10	13
% Likanos flakes / tools	30	22	-	-	-	-	-	-	-	-	-
% Gudit scrapers ² / tools	-	4	-	23	67	96	14	<1	2	-	13
% backed microliths / tools	43	68	33	54	17	-	10	-	2	-	-
% tools / artefacts	28	8	7	9	6	33	5	7	23	2	1
% cores / artefacts	7	3	12	<1	8	2	6	2	4	<1	<1
% debitage / artefacts	65	89	80	90	85	65	89	91	73	96	99
tool types: all artefacts	.110	.020	.073	.043	.031	.009	.013	.001	.019	.003	.006
tool types: all tools	.391	.254	1.00	.461	.500	.026	.260	.018	.085	.095	.500

¹ Overstruck flakes are counted as tools, but not as a distinct tool type, being parts of steep convex scrapers.

² Includes irregular Gudit scrapers.

³ At the present time children open the locally abundant geodes and offer them for sale to visitors. Debitage may thus be over-represented in Surface Collection H; the ratios of debitage to artefacts and of tools, cores and tool types may all be affected by this factor.

Fig. 400 Comparisons between Aksumite lithic assemblages.

fragile components of these assemblages. These processes will have affected the surface collections in a similar way.

The absence of Gudit scrapers from Pre-Aksumite deposits at D site, their presence in Late Aksumite deposits at both the D and K sites and their presence in association with Classical Aksumite potsherds in the surface collections provides the best dating evidence we yet have for them. It may also be observed that the use of part of the Gudit Stelae Field as a workshop site must have postdated its active use as a burial place. No Gudit scrapers or other lithic artefacts

were recorded as recovered from the fillings of the second- to third-century graves and burial shafts. The uses to which Gudit scrapers were put, working wood, ivory and perhaps soft stone, certainly occurred in earlier times, but may then have been done largely with metal tools or with other forms of denticulate scrapers. The apparently abrupt appearance of numerous Gudit scrapers may thus represent a period when the use of metal tools was no longer economic for some preliminary stages in the production of carved objects. This could have resulted from an increased demand for carved wood and ivory outstripping the production of

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metal tools; it may also reflect a decline in iron production resulting from centuries of progressive deforestation and consequent lack of charcoal for smelting, perhaps coupled with the depletion of local iron ore resources. If it can be demonstrated by future research that the mass production of steep convex scrapers for hide working had a concurrent and equally abrupt inception, the temporal replacement of metal by stone tools for these industrial processes would be even more convincingly demonstrated. The very localised production of large numbers of steep convex scrapers indicates a sophisticated economic system for their production, distribution and use; evidence for the local concentration of use of the Gudit scrapers is taken as a further demonstration of craft specialisation.

Discussion

While such differences as have been noted between ceramic wares and most other artefacts from D site and similar items from other contexts can be attributed to differences in time and in status, a different picture emerges with respect to the small lithic elements. Those from K site, from the various surface collections and from the upper levels of Gobedra Rockshelter seem to be part of a single industrial tradition with respect to raw materials, specific tool types and flaking techniques. Those from D site, both Pre-Aksumite and Late Aksumite, are equally related in specific tool types and in flaking techniques, but differ in the high frequency of obsidian and in the presence of one implement type, the Likanos flake, not found elsewhere. The occasional recovery of obsidian flakes and fragments from other Aksumite contexts and of Gudit and convex scrapers from D site is an indication that the several assemblages belong to a single general technological complex. However, the fact that a variety of tools was made of presumably imported obsidian indicates the presence of something more than the kind of narrow industrial specialisation demonstrated with

respect to the Gudit and steep convex scrapers (pp. 437-47). The possibility may be entertained that this differentiation of the lithic assemblages reflects a cultural as well as a spatial separation of D site and its inhabitants from the main Aksum settlements.

As none of the excavations was planned or conducted with the aim of establishing dated typological sequences for the lithic components of Aksumite material culture, nor for the detailed correlation of lithic and ceramic sequences, little can be said in these regards. The establishment of such correlations will, it is hoped, be a priority for future researchers. It is, however, possible to use the available evidence of site distribution in conjunction with that of crafts techniques and processes to postulate an economic history for Aksum and its immediate environs, a history which may help to focus the aims and objectives of future research.

Taken as a whole, Aksumite production and use of lithic artefacts was abundant and varied. Some of their chipped stone tools, most notably the Gudit and steep convex scrapers, seem to have been produced, distributed and used as part of a sophisticated economic system, certainly involving a notable degree of craft specialisation and possibly the use of compelled labour. Other stone tools may have been used for more casual, domestic purposes including the shaping of small wooden objects and the manufacture of clothing. Puglisi (1946) and subsequent researchers have tended to consider these Gudit scrapers as isolated, enigmatic elements within an otherwise metal-using material culture. It is now possible to recognise them for what they are: parts of a significant lithic component of the total Aksumite material assemblage. As discussed in Chapter 15, the lithic tools provide evidence of local cultural continuity from Pre-Aksumite into Aksumite times, and their Late Aksumite reflorescence may reflect significant environmental change.

Overview of pottery development

(Jacke Phillips)

The earliest pottery recovered at Aksum, in the lower levels of D site, follows a long sequence of development within northeast Africa and the Horn, which can be seen through the Neolithic and Kerma cultures in the Nile Valley, the Gash cultures in the eastern Atbai and that represented at Agordat in Eritrea (cf. Fattovich 1988). In the immediate Aksum region, earlier material is best known at Gobedra Rockshelter (D.W. Phillipson 1977), where a development from generally coarse to finely-made wares is indicated. No comment

is offered here as to the relationship between this earlier material and the pottery described below.

The 1993-7 excavations have not revealed a complete succession of ceramic development; the available assemblages are summarised in Fig. 401. There are significant chronological lacunae, and understanding is further complicated by the fact that the material comes from contexts, both burials and habitation sites, of varied socio-economic status. The stratified habitation sequences at D and K sites are marred by

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mixture with redeposited sherds of various ages. The following summary attempts to piece together a composite sequence with the addition of data from the 1972-4 excavations⁵⁴ and from published accounts of earlier research.

All Aksumite vessels are hand-made; no evidence exists for use of the potter's wheel at Aksum, and the few wheel-made vessels encountered in Aksumite-period contexts all appear to have been imported from elsewhere, chiefly the Mediterranean world. The classification of ceramic groups presented here forms a chronological sequence of ten numbered phases, based on changing trends in vessel form and decoration:

Pre-Aksumite

1) Pre-Aksumite I pottery occurs in the phase-I levels at D site, mainly in trench D22.

2) Pre-Aksumite II pottery occurs at D site in contexts attributed to phases 2 and 3 in trenches D13, D19, D22 and D23.

The two Pre-Aksumite stages recognised at D site represent a period of unknown duration between the eighth and the fifth centuries BC. The quality of manufacture and firing is testimony to the high level of Pre-Aksumite ceramic technology achieved in the Aksum region. Although its earlier development cannot yet be directly traced in this region, it seems probable that a long tradition of expert potting preceded the material found here. Pre-Aksumite ceramics in both fine and coarse clays emphasise functionality and are characterised by simple elegant profiles. Often surface-slipped, they are well fired and the sparse decoration is incised or applied.

Two basic fabrics are characteristic of this Pre-Aksumite pottery. Many vessels were deliberately fired as 'black-topped red ware' (BTRW), a widespread technique employed for millennia in many parts of northeastern Africa, the surface colour extending throughout the vessel wall. The fabric itself ranges from very coarse to very fine, differentiated almost entirely by the quantity and size of white quartzite inclusions, and often has a smoothed surface. There is no correlation between section thickness and coarseness. Most open bowls are made of this fabric, as are Pre-Aksumite I storage pots. The other basic fabric is a uniform coarse brown with a rough surface, of which all lids, filter vessels, basket-impressed bowls, pots with combed decoration and Pre-Aksumite II storage

pots were made. Bowls with ticked rims are mostly brown although the occasional BTRW bowl is also decorated in this manner.

The surfaces of many BTRW vessels retain evidence of having been red-slipped or red-washed, presumably to smooth rough surfaces although some fine fabrics were also treated in this way. It is difficult to determine the extent and frequency of this feature, as the surface has often been lost by wear or erosion, and does not in any case seem to adhere well; but it seems that at least the majority of the BTRW wares were slipped or washed before firing. Occasionally, a subsequent slip or wash seems to have been applied with the intent of obscuring the reduced black to produce the appearance of a uniform colour. Slip has not been preserved on the coarse, more uniform brown wares.

Decoration is limited and sparse; indeed, the period is characterised by a general emphasis on quality of form, fabric and firing technology rather than on surface embellishment. This contrasts with the wider range of decoration found at Matara and other eastern sites (Anfray 1966). Vessels have a simple elegance that suggests practical functionality, suggesting that the tiny coil handles on many of the bowls (Fig. 265f), pots (Fig. 266c) and jars (Fig. 267a) were also probably functional. Such decoration as exists is located near or on the rim of open forms such as bowls and lids, but on the larger pots and storage vessels it enhances the shoulder instead. This chiefly comprises multiple incised or combed bands, often in combinations of straight and wavy or zig-zag lines. Punctated, possibly rouletted, bands also occur on the shoulders of open vessels, as do applied bosses, buttons, ridges and more elaborate raised designs including occasional recognisable Sabaeen letters. Pattern burnishing is sometimes preserved.

The repertoire of Pre-Aksumite pottery forms at D site is quite restricted, in contrast with that found at religious and burial sites such as Hawelti and the Yeha tombs (Fattovich 1976, 1978, 1980; de Contenson 1963). Bowls and storage pots are common, with less numerous lids, smaller pots and occasionally jars, all of which are to be expected at a habitation site. Vessel sections are regular, thickening towards the bottom, with rounded or tapering rims. Handles are typically coil-made and round in section, with the occasional flat ledge handle. Most vessels have rounded bottoms, although one Yeha-type jar has a ringfoot and one possible tripod leg suggests that other base forms also existed. Extremely few Pre-Aksumite habitation sites have been excavated,⁵⁵ and D site at Aksum provides a much extended repertoire of forms.

⁵⁴ A number of duplications and typographical errors have in the course of this research been noted in the published descriptions of artefacts from the 1972-4 excavations (in Munro-Hay 1989). An annotated copy may be consulted in the Project Archive, together with a concordance of illustrations, excavation inventory, and context references, as well as a catalogue of those artefacts that were housed at the Aksum Museum in 1993-4.

⁵⁵ As at Grat Be'al Guebri in Yeha, and also at Matara where complete vessel profiles are limited to small open shapes (Anfray 1966; Fattovich 1978).

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Phase	Designation	Example cited	Date
1	Pre-Aksumite I	D site phase 1) within period) 8 - 5 centuries) BC
2	Pre-Aksumite II	D site phases 2 - 3) BC
3	Proto-Aksumite	Beta Giyorgis	late last mill. BC
4	Early Aksumite I	Da'erika	1 - 2 centuries AD
5	Early Aksumite II	Tomb GTII, Guditi Stelae Field	?3 century AD
6	Classical Aksumite I	Primary deposits in Mausoleum and East Tomb	mid-4 century AD
7	Classical Aksumite II	Tomb of the Brick Arches	late 4 century AD
8	Late Aksumite I	K site phases I - III	end 5 century AD
9	Late Aksumite II	D site phases 4 - 7, K site phase IV	early 6 century AD
10	Late Aksumite III	D site phases 8 - 13, K site phases V - VI	mid-6 - 7 century AD
	post-Aksumite		from 8 century AD

Fig. 401 Summary of the Aksum pottery sequence.

Proto-Aksumite

3) The repertoire of Proto-Aksumite pottery is currently known from a burial at OAZ I and elsewhere on Beta Giyorgis as published by Perlingieri (in Bard *et al.* 1997: 390, fig. 5), with other contemporary material briefly described (*ibid.*: 395-6, fig. 11), dating to the last three centuries BC. No Proto-Aksumite levels were excavated in 1993-7 by the Project here described, although some residual sherds were recovered in secondary contexts (*e.g.* Fig. 345b) at D and K sites.

Early Aksumite

4) Four vessels⁵⁶ from Da'erika appear to bridge the gap between the Beta Giyorgis Proto-Aksumite material and the pottery from tomb GT II (see below) They are here considered to derive from an Early Aksumite tomb group, perhaps dating from the first or second century AD (Fig. 402).

5) The material from tomb GT II, in the Guditi Stelae Field, published in Munro-Hay (1989), probably dates to the third century AD or thereabouts, and presents

⁵⁶ This material, recovered from a site c. 10 km southwest of Aksum, was examined in 1997 by courtesy of Ato Fisseha Zibelo of the Tigray Culture Bureau, Aksum office.

the earliest manifestation of the Classical Aksumite decorative repertoire.

The account here offered is based exclusively on material from apparent burial contexts. The transition from Proto-Aksumite to Early Aksumite seems to have been a gradual development, marked initially only by slight changes in form. The small samples of residual sherds at D and K sites, with the groups from Da'erika and GT II, do not permit a full evaluation.

The chief visual development at the beginning of the Early Aksumite is the neck, which becomes cylindrical in shape with a slight flare. Thus, jars with a cylindrical neck but having other Proto-Aksumite elements may be considered as transitional or even to date from the beginning of the Early Aksumite stage. In D-site residual contexts, jars with a wide cylindrical neck (Fig. 287e) and pots with cylindrical collar (Fig. 287b) all have a squat globular body and rounded bottom. The horizontal applied ridge, still often but not always diagonally slashed, occurs on bowls and jars. Walls continue to be thin and the fabric, still orange in colour, is obscured by the well preserved dark red burnished slip. The flat loop handle becomes thicker in section with a smaller loop, now



Fig. 402 Artefacts from Da'erika.

pierced at the top by a small hole. The coil handle reappears as a horizontal feature, with drag-punctated embellishment to facilitate adherence to the body wall.

The funerary pottery from GT II represents a major stylistic development: body surface decoration is now more extensive and the vessel shapes far more varied, including beakers, bowls, jars and other closed vessels, wide-mouth pots, an animal model basin (Munro-Hay 1989: fig. 16.189), tripod basket-handled bowl (*ibid.*: fig. 16.148) spouted jar (*ibid.*: fig. 16.304) and bird-shaped vessel (*ibid.*: fig. 16.302), many of which appear here for the first time in a datable context. Earlier features, such as the large flat strap loop handle and slashed horizontal ridge (*ibid.*: figs 16.73, 275-7, 280), are retained. New features, such as the combination of alternating horizontal coil and flat strap loop handles on the same pot (*ibid.*: figs 16.243, 279), interior moulding (*ibid.*: figs 16.112, 113), pedestal bases (*ibid.*: figs 16.150, 152), angular concave lids (*ibid.*: figs 16.318, 319) and coil handle extensions (*ibid.*: figs 16.125, 148, 150, 152, 173) appear for the first time. Jars have a typically broad cylindrical neck which remains unembellished even when the body surface is decorated. They are more evenly fired and more finely decorated than those discussed above, often with incised decoration on the body surface and handles. GT II ceramics have already progressed beyond the simple plainness of transitional Early Aksumite vessels, with the additional embellishment of vertical corrugation on the body sometimes terminated with horizontal 'Ovoid Walk Punctate' (OWP). Possible foreign influences become apparent in certain forms at this period, as in the GT II group, Roman contacts being suggested by the development of everted and ledge rims on bowls, and by elaborations suggestive of metalwork on features such as handles.

Classical Aksumite

6) The material from primary contexts in the Mausoleum and East Tomb (pp. 194-7, 220, above) probably dates from the mid-fourth century and is certainly later than that from GT II. It is considered Classical Aksumite, but earlier in date than that from the Tomb of the Brick Arches; chronologically and typologically it falls between the larger assemblages from GT II and the Tomb of the Brick Arches.

7) Pottery from the Tomb of the Brick Arches is here regarded as the type-group for the Classical Aksumite style, dated to the late fourth century AD (pp. 55-77, above and Appendix II below).

The principal assemblages are derived from élite funerary contexts, and it is not possible to estimate the extent to which they may represent a specialised aspect of the pottery tradition (cf. pp. 130-1, above). Consideration of the sequence as a whole provides some indication of increasing decorative elaboration and stylistic development within the Classical Aksumite period. By the time of the Mausoleum and East Tomb, this decorative style had been elaborated considerably beyond the stage represented at GT II, with vertical OWP patterns and other variations including horizontal neck corrugation and multiple incised horizontal shoulder bands on jars. Human-headed jars, not found in GT II (Munro-Hay 1989: 278), make their appearance at this time, as does rim dentilation on everted-rim bowls. Vessels with plain unelaborated surfaces appear alongside, with well-burnished red slip on all visible surfaces and occasionally painted after firing (although both are rarely preserved). The fabric continues to range from coarse to fine with varying quantity of inclusions, and from hard to crumbly; normally it is pink and even light red in colour, although some orange wares continue throughout. This is Wilding's (in Munro-Hay 1989: 236-90)

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'Red Aksumite' ware, actually a varied selection of fabrics chiefly distinguished by the two main factors of temper and solidity.

Comparison between the contents of these tombs also indicates some development in form and shape. The body profile generally becomes more angular, especially in bowls and beakers. Vertical strap handles on all vessels shrink in scale and are often reduced to a solid squared-off lug. Jar necks generally become taller and narrower, from 'broad' in GT II to 'medium' and 'narrow' (to use Wilding's terminology) in the Tomb of the Brick Arches. Everted and even broad ledge handles become more common, and appear on smaller bowl forms with further applied embellishment in the form of birds and discontinuous scalloping in groups of four around the rim. Pedestal bases are now sometimes fenestrated.

Late Aksumite

8) Material from the earliest levels of K site (phases I to III), tentatively dated to the end of the fifth century or the beginning of the sixth, may be considered transitional between Classical and Late Aksumite. Comparable material occurs in residual contexts at D site.

9) Material from phases 4 to 7B of D site is dated between the end of the fifth and the early sixth centuries, prior to the construction of building 10. At K site, the contemporaneous occupation is attributed to phase IV.

10) This pottery is known from D site phases 8A (marked by the initial construction of building 10) to 13, as well as from phases V and VI at K site. Chronologically, it represents the time between the mid-sixth century and end of the seventh.

Late Aksumite pottery is currently known from habitation sites rather than from funerary contexts; furthermore, that studied here was associated with a much lower level in the socio-economic hierarchy than the Classical Aksumite material considered above. Much of the D- and K-site pottery having Classical Aksumite decoration is crudely made and poorly fired, with roughly executed patterns that mark the latest development of the style, most noticeable in the phases I to III at K site.

Most Late Aksumite pottery exhibits declining technological capability, and vessel firing appears less controlled than before, with an increased tendency towards the use of reduction firing which maintains or raises the temperature without increasing consumption of fuel; flash (or reduction) marks are common. Body walls and handles generally become thicker and fabrics coarser, presumably to help maintain vessel strength. As these vessels were not placed in a tomb, it is possible that they were manufactured differently for actual use by the living. Surface-decorated vessels, such as the complete K-site beaker (Fig. 340a) are

more resilient to decay or breakage than those from the tombs. Their surface slip is better preserved although distinctly varying in colour from yellow to brown even on the same vessel.

Concurrent with this decline in quality is a developing taste for deeper plain bowls with everted and ledge rims, clearly influenced by the imported Roman bowls of African Red Slip ware (ARS), as well as incurving rounded or tapering rims that herald the later semi-globular bowl form. Many have simple painted designs, usually red rim bands, or small appliqué on the upper rim ledge; these are clearly a development from the more elaborate extravagances in the Tomb of the Brick Arches but now include the occasional Christian cross in a variety of forms. Fabrics and surface slip become more orange in colour, the latter noticeably so, and vessels were fired after painted decoration had been applied. It is at this time that Wilding's 'Brown Aksumite' ware (Munro-Hay 1989: 290-301) begins to appear; the term is applied to a disparate collection of vessel forms and decorative schemes sharing a generally yellowish to brown fabric and surface slip colour. In comparison with the earlier 'Red Aksumite' ware, typology and manufacture are significantly more diverse.

This period witnessed such a profusion of different shapes, styles and fabrics that it is difficult to discern any trend to their appearance or decline at the sites investigated, especially when the depositional circumstances at D site and the eroded nature of much K-site material is taken into account. Nonetheless, it seems that several different influences were at work during this period, probably the result of increasing awareness of, and exposure to, the outside world. Ledge- and everted-rim bowls which, it was argued above, may originally have been inspired by imported Roman ARS vessels, developed into characteristic Aksumite types with a variety of rim embellishments.⁵⁷

The main difference between Late Aksumite phases 9 and 10 is the increasing presence of Wilding's 'Black Aksumite' wares (Munro-Hay 1989: 301-11), which may be the result of different preferences or social status at the sites investigated; so far as can be determined, there is no abrupt change but merely a gradual reduction in quantity (but not disappearance) of the 'Brown Aksumite' wares. The technological decline noted above continued. Increased surface burnishing, especially on vessels requiring impermeability, suggests that unburnished surfaces were a deliberate choice, as on the deeply incised basins (Fig. 274),

⁵⁷ Neither the ribbed Mediterranean amphorae (Figs 283a, c, 343a) nor the thin-walled glazed bowls (Figs 283f, 343d) seem to have had any direct influence on Aksumite potting during this period, although the former were clearly imported in some quantity and presumably reused in Aksum once their contents had been consumed.

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rough bowl (Fig. 273i) and pot (Fig. 275a) and the selectively burnished pots (Figs 276c, 277b). Decoration is usually incised and punctated, and comparatively spare and slapdash, although some vessels are highly decorated with coloured slip accents. The most obvious holdover from Classical Aksumite design is the use of vertical corrugation lightly gouged on semi-globular bowls (Fig. 273e), and possibly the moulded interior bowl designs (Fig. 273b), both employing Christian cross symbolism.

Some well made, thin-walled vessels in fine fabrics fired at high temperatures continue at D site, but are limited and may either be survivals from earlier times, perhaps from the élite structure, or have been imported from the eastern part of the Aksumite Empire where similar vessels occur in greater quantity. An extensive petrological study of the fabrics would help to evaluate the latter possibility.

Large decorated pots provide a good example of variety within a single overall type. Those illustrated here (Figs 275-7) exhibit a wide range of forms, decorative styles, fabrics and surface and handle treatments, showing no particularly logical development and found throughout the majority of defined phases. Some features continue from the Classical Aksumite phase, as discussed by Wilding (Munro-Hay 1989: 290-1, *passim*), but these elements are simplified and are seen mostly in the finer vessels.

Post-Aksumite

Pottery later than that from Late Aksumite D site is found in phase II of the Mausoleum fill and phase 3 of its external deposits; this corresponds generally with Wilding's 'Grey and Black Aksumite' (Munro-Hay

1989: 301-11). Beyond initial recording, it was not studied during the 1993-7 research described here, but cf. Wilding (in Munro-Hay 1989) and Perlingieri (Bard *et al.* 1997: fig. 11). A number of vessels illustrated by Wilding (in Munro-Hay 1989), now held in the museum at Aksum, are cruder than the published drawings indicate, displaying a wide variety of technological capability but linked by their reduced firing technique and black colour.

A note on sources of potter's clay at Aksum

Modern potters in the Aksum area exploit two principal sources of clay; the next nearest source is stated to be some 25 km distant. One of the Aksum clay-sources lies a short distance to the north of D site, to the east of the road to Enda Kaleb, at a place called Addi Guatia. The other Aksum source is at Maekenu elementary school, to the west of the road from Aksum to Adi Tsehafi. Clays from these two sources are quite distinct, and modern potters exploit them in different ways according to their specific properties. Clay from the Maekenu source is used exclusively for making jars, and two types of clay from Addi Guatia are mixed for making cooking bowls; these two vessel-types are virtually the only ones produced in the immediate area today. Another clay source, reported during survey but not used today, lies close to the Mai Rubba, north of Kubie Hill (cf. Fig. 11, above); it is stated to contain distinctive mica particles akin to those observed in many excavated assemblages, especially the brown Pre-Aksumite wares. Detailed petrographic analysis is required to ascertain the extent to which these sources were used in ancient times.

Glass and beads

(Michael Harlow)

Glass

The research here described provides an opportunity to compare assemblages of glass from different dates and associations. Once demonstrably modern material is discounted, over half (1445 fragments) comes from an élite funerary deposit of the late fourth century in the Tomb of the Brick Arches, which was also the only site in which reconstructable forms, apart from solid objects such as bangles or ear-studs, were found. A smaller group (528 fragments) of analogous and slightly earlier date comes from phase I in the Mausoleum. Later phases in and around the Mausoleum, much disturbed, yielded much smaller assemblages of various, often uncertain, dates and associations. Most of the material from D and K sites is, by contrast,

associated with habitation and production at a lower level of the socio-economic hierarchy and dates between the late fifth (at K site) and the early eighth centuries. The period between the late fourth century and the late fifth appears not to be represented in the samples here studied.

There are a number of contrasts between the collections. So far as colour is concerned, both the Mausoleum phase-I material and that from the Tomb of the Brick Arches are predominantly blue or cobalt blue, often in association with colourless yellow-tinged glass, much of it probably derived from the disintegration of cased vessels. The Tomb of the Brick Arches also contained a considerable amount of burgundy red glass, both opaque and translucent. The D

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and K sites on the other hand produced mainly colourless glass tinged with green or yellow and some turquoise, with yellow green becoming more frequent in the later phases at K site; a large collection of pale brown glass fragments was also present in phase 6 of trench D19. Strong colours in translucent glass are characteristic of Romano-British glass assemblages of the first and second centuries AD, with yellow green continuing until the third quarter of the third century. Colourless and turquoise glass are associated with the third century and green-tinged colourless and pale green glass with the fourth century (Price and Cottam 1998: 15-16). Strong colours are known to have persisted for a longer time in the eastern Mediterranean area; and Aksum seems to have followed this trend.

The range of forms and decoration found in these sites is not as wide as that reported from the 1973-4 excavations, probably due to the smaller number and time-range of the sites concerned. Again, there is a marked contrast between the earlier elite burial sites on the one hand and the later domestic occupation on the other. The Mausoleum is the main source of small geometric cold-chipped inlay which was also present in the hoard of cuprous scrap from the Tomb of the Brick Arches but does not occur at the later sites. Cobalt blue and colourless cased glass is a particular feature of both the early assemblages, not altogether absent from K site.

The Tomb of the Brick Arches contained the most striking forms in the shape of the large opaque red goblet (Figs 58b, 60a, above), the fluted blue handled tankard (Fig. 58a), the mysterious burgundy red sphere (Figs 59d, 60b) and, if they are indeed glass, the large turquoise leaf-shaped inlay pieces (Fig. 59b). It may be that some or all of these were prized pieces obtained from outside the Aksumite Empire, as almost certainly was the engraved shallow bowl of pale green glass (Munro-Hay 1989: fig. 14.71; Fig. 61a, above). The origins of these striking forms are of particular interest as evidence of Aksum's contacts with other regions at or just before the time of the tomb's use. It is difficult to find convincing parallels in the main publications on Late Roman glass or on known contemporary glass-producing sites in the Near East such as Jalame in Palestine (Weinberg 1988) where nothing similar is recorded. Morrison (in Munro-Hay 1989: 189) has pointed out some similarities between the large red goblet and two even larger examples from Tomb WT8, dated to the second or third century AD, at the Meroitic site of Sedeinga in northern Sudan (Leclant 1973). The Sedeinga goblets are of translucent blue glass richly decorated with polychrome paint and gilding. They carry a Greek inscription and scenes of Egyptian gods and their bases are quite different from that of the Aksum goblet. A

cup from Sedeinga has a base similar to that of the Aksumite goblet but is of translucent colourless glass decorated with an incised geometric pattern. A smaller parallel-sided flute in the Corning Museum, dated to the third or fourth century (Whitehouse 1997: 89), is of clear green-tinged glass, 147 mm high, again with a base different from that of the Aksum example. Cool (1996) sets out arguments that the Sedeinga glass vessels may have been produced at Meroe, rather than at Alexandria or elsewhere in the Near East. These arguments could equally be applied to Aksum where, however, no conclusive evidence of glass making, as opposed to glass working, has yet come to light. Thus, despite the differences between the Aksum goblet and the Sedeinga flutes, a Meroitic or Aksumite origin for the former is a distinct possibility.

When considering the cobalt blue tankard and particularly the large thin-walled sphere of burgundy coloured glass, the lack of parallels is even more striking. The base of the tankard is very similar to that on the red goblet, suggesting a common origin, but the sphere seems to be unique. It is considered that most of the pottery from this tomb was made for funerary purposes; and the same may well be true of the striking glass forms. Analyses of samples taken from these vessels and of other glass and bead fragments from Aksum is currently being undertaken at the Corning Museum (Brill 1999): the results may throw more light on the origins of Aksum glass.

The K and D sites continued the Aksum tradition of pale green goblets decorated with looped trails, as best represented in the GTII tomb (Munro-Hay 1989: pl. 14.1). They also yielded various beaker, flask and cup fragments in fine thin glass. Both sites contained fragments of lamps in colourless and tinged colourless glass and of very dark bangles. K site also yielded fragments with recognisable late Roman decorative features such as cobalt blue blobs and bars on colourless green-tinged glass (cf. Whitehouse 1997: 213-19), hexagonal moulded net patterns and engraved and incised designs.

There was tantalising evidence at K site of glass working in the form of small lumps of raw glass and glass rod but no moils or other waste products characteristic of glass blowing. The raw glass may have been used for making glass beads rather than vessels. Some vitrified crucible and tuyere fragments seem, however, to have been associated with working metal rather than glass (p. 407, above).

Beads

Like the glass, the bead assemblages studied in 1993-7 fall into two principal groups. A total of 1163 beads was excavated from the Tomb of the Brick Arches and from phase I in the Mausoleum, representing elite

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funerary deposits of the fourth century AD. D and K sites are associated with occupation and production at a lower level of the socio-economic hierarchy and date between the late fifth and the early eighth centuries. In addition, there is a small group of specimens recovered from Pre-Aksumite horizons at D site; these probably date between the eighth and the fourth centuries BC, although admixture with later material cannot be precluded. Post-Aksumite and mixed contexts at the Mausoleum, D and K sites include material as late as the nineteenth and twentieth centuries as well as some which is clearly derived from earlier deposits.

The small group from Pre-Aksumite contexts at D site is the only assemblage in which stone specimens outnumber those of glass. Carnelian, however, seems to have continued in use until later times.

The predominant glass bead colours from the Tomb of the Brick Arches are opaque red and red striped (346 beads), opaque and translucent turquoise (271) and green (315), cobalt blue and blue (48) and yellow beads (51). The much smaller numbers from the primary deposits in the Mausoleum show a similar predominance of turquoise (7) and blue/cobalt blue (9) but only 3 green and 1 red. It is possible that the red example was intrusive from higher levels in the same trench (MG 80), where contexts of phases II and III yielded 208 red opaque drawn beads (Fig. 193a, above). The 23 colourless glass beads from the Tomb of the Brick Arches have no parallels in the Mausoleum nor, with one D-site exception, in later periods.

During the Late Aksumite period at D site blue/cobalt blue and turquoise again predominate, followed by green, red and yellow. K site shows a similar pattern. There was thus little change in colour-preference between the fourth-century deposits and those of Late Aksumite date.

Far fewer glass beads were recovered from post-Aksumite and mixed horizons. Those from the Mausoleum trenches were mainly blue, cobalt blue and turquoise. Those from the D site were turquoise

or blue only. The K site beads were again mainly turquoise but included a few red, and red over white or green cores in the latest phases.

More change is apparent in the shapes of beads. Dominant in the fourth-century deposits are characteristic biconical hexagonally faceted beads (*e.g.* Figs 64a-e, above), followed closely at the Tomb of the Brick Arches by drawn beads of a standard barrel shape with rounded corners and then by other barrel shapes. Oblate beads, perhaps significantly, were absent from these fourth-century funerary contexts. The origin for these drawn beads requires further investigation, but one contender is northern India (*cf.* Stern 1991: pl. xxxviii). The gold-in-glass beads from the Tomb of the Brick Arches are of typical Roman type. Products of the Near East and Nile Valley seem to have been more numerous at Aksum in later periods.

In Late Aksumite times oblates are the most common at both K and D sites, followed by small often irregular drawn beads and barrels. In the Post-Aksumite/mixed material small drawn beads continue to be the most numerous, while recent blue ring beads of the kind still used for decorating baby carriers are also fairly common. It seems that the spherical beads with contrasting coloured glass around a coloured core are likewise recent.

These Aksumite sites demonstrate again how difficult it is to assign most beads to particular periods or places of origin. Important exceptions are the biconical hexagonally faceted beads, the gold-in-glass beads and possibly the relatively large opaque red beads from the Mausoleum. One or two elaborate recent beads, such as the large black oblate with contrasting marbled spots from Mausoleum phase 5 in which may be of Roman, perhaps Syrian origin, are also more readily identifiable. Other beads may have been manufactured locally in Late Aksumite times if not before: evidence for the working of glass has been noted above, while the production of stone beads is indicated by bars, cubes and partially bored beads.

Ivory-working techniques

(*Laurel Phillipson*)

Unambiguous literary evidence (*e.g.* Casson 1989: 53; Wolska-Conus 1968-73) indicates that ivory was a valued export from parts of ancient northeastern Africa including especially Aksum, but says nothing about the forms in which the ivory was exported, whether as whole tusks or as finished artefacts. As will be detailed below, material of fourth- to seventh-century date recovered in the course of the present research demonstrates not only that ivory was present in considerable

quantities, but also that it was shaped, turned, carved and employed with such skill and for such a variety of purposes as to indicate that its use was part of a long-standing and accomplished tradition.

Two scraps of lathe-turned waste from K site attest to local ivory working in the sixth century, to the use of an efficient lathe and fine iron or steel blades as well as to the presence, most probably, of skilled specialist turners (Fig. 403). The ivory is

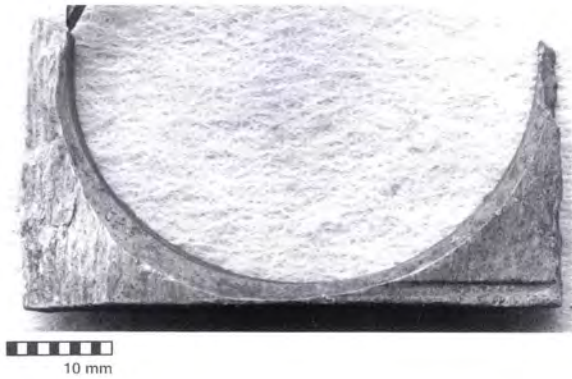


Fig. 403 Waste scrap from a lathe-turned disc or ring, K site.

sharply cut and the scraps are the smallest which could remain from the cutting of circular discs or rings from square plaques. Numerous ivory scraps and very small pieces with tooling marks, but unrecognisable as to

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their original objects or functions, were recovered from both K and Late Aksumite D sites. These attest to the working and/or use of ivory in a variety of industrial and domestic contexts. Several of these scraps have a flat surface of shallow, approximately parallel, but slightly irregular scratches or planing marks, some of which could have been produced by the use of Gudit scrapers, such as are abundant in Aksumite surface occurrences and also in excavated contexts at K and Late Aksumite D sites. Other ivory pieces appear to have been scraped or planed smooth with the use of a narrow metal tool.

In every instance decoration on the carved and turned pieces is in low relief on flat surfaces; the styles are consistent with, but not identical to those found on the major stone monuments and on the painted pottery. The single figurine recovered, a standing female with a possibly foreign hairstyle and not much clothing, does not appear to have been envisaged by its creator as a three-dimensional shape, but as a low-relief front with rounded corners and edges



Fig. 404 The figurine from the Tomb of the Brick Arches (see also Fig. 105): not a true carving in the round, but two low reliefs conjoined.



Fig. 405 Details of the carved ivory panels from the Tomb of the Brick Arches: *a* - vine motif; *b,c* - African-style faces carved in low relief.

conjoined to a similar low-relief back (Fig. 404). While the vine motif on the furniture panels from the Tomb of the Brick Arches (Fig. 405a) has numerous Alexandrian (Kitzinger 1938; Buckton 1994: 65), Byzantine (Harrison 1989) and South Arabian (Serjeant 1976: pls 10, 121; Béal 1991) parallels, it is also found on the base of Stela 1 and in other Aksumite contexts, the animal faces on these same panels have a distinctly African, as opposed to European or

Asian, appearance, as is indicated in the illustrations above (Figs 405b, c).

Proof of the abundance of Aksumite ivory working is shown not only by the quantity and quality of ivory fragments recovered from the several contexts, but also by its use for such relatively commonplace items as a roughly shaped faceted handle, perhaps of a fly whisk or knife (Figs 406a, b), from Late Aksumite D site and a lightly ornamented rectangular plaque,

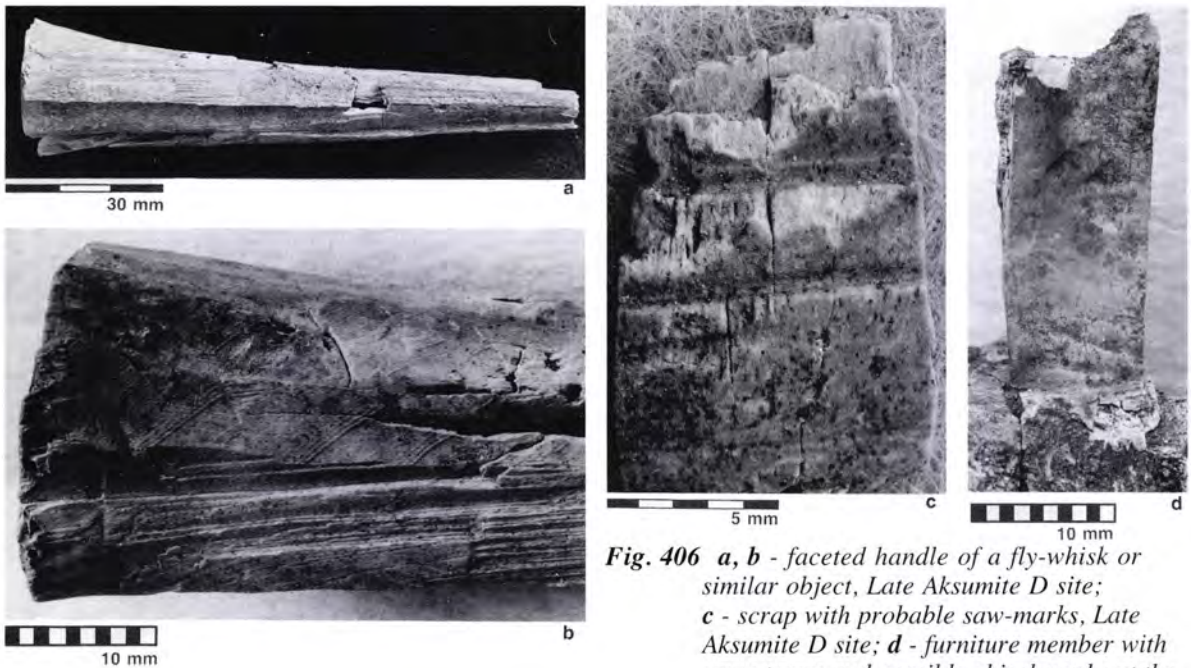


Fig. 406 *a, b* - faceted handle of a fly-whisk or similar object, Late Aksumite D site; *c* - scrap with probable saw-marks, Late Aksumite D site; *d* - furniture member with sawn tenon and possible chisel marks at the base of the tenon, Tomb of the Brick Arches.

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perhaps a gaming piece, from K site (p. 407, above). Evidence of the local abundance of ivory may be inferred from its use to provide the major tenoned members of jointed furniture, by the obviously well practised skill with which it was carved and shaped, and by the fact that such major pieces as the elaborately carved furniture panels and whatever object had incorporated the numerous square plaques with concentric turned circles and brass studs had not been removed

from the Tomb of the Brick Arches when it was robbed. The fact that much finely carved ivory remained in the Tomb of the Brick Arches after its partial robbing also attests to the abundance of the Aksumite ivory industry. While finely carved pieces were worthy of use as prestige grave furnishings, the tomb-robbers evidently did not consider them worth removing. If the turned plaques with metal studs had covered a box or coffer, it would seem that the contents had been

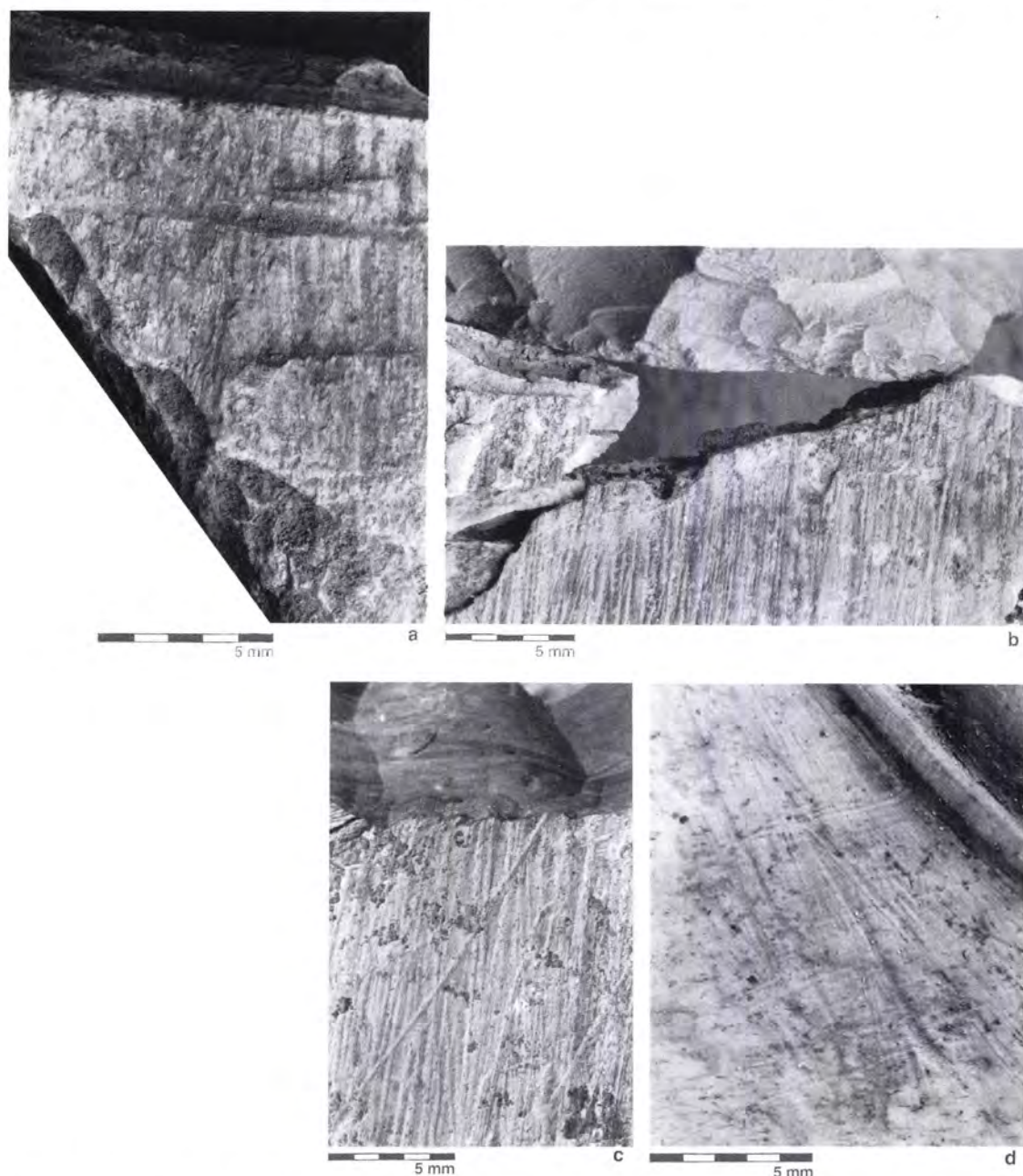


Fig. 407 *a* - waste scrap from K site with the diagonal edge cut by a chisel or shallow gouge used vertically, giving a characteristic scalloped edge; *b*, *c* - pieces of worked ivory from the Tomb of the Brick Arches with Guditi scrapers juxtaposed to show the compatibility of their edges with the marks on the ivory; *d* - irregular planing marks, partially effaced, on the corner of a turned plaque from the Tomb of the Brick Arches.

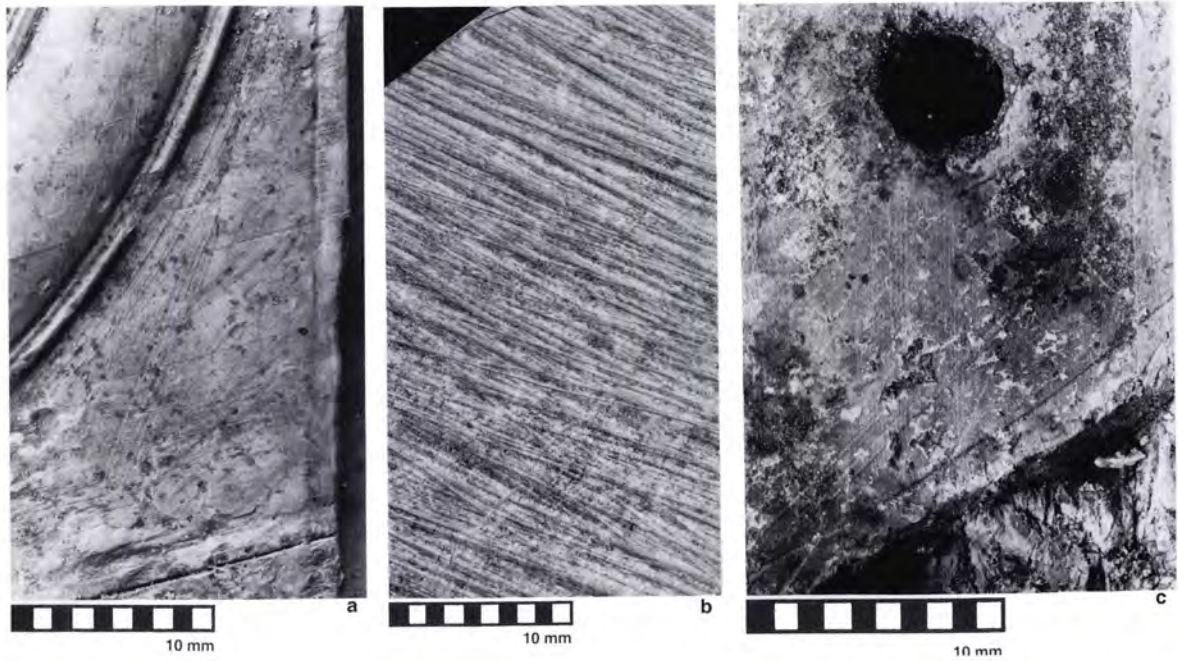


Fig. 408 *a* - turned plaque from the Tomb of the Brick Arches exhibiting sharply cut metal planing marks overlying fainter, less regular planing marks, note also the marking-out line along the right edge and its slight scalloping; *b* - reverse of a rectangular plaque from K site with pronounced planing marks, probably from a Guditi scraper (the obverse of this piece is shown in Fig. 358a); *c* - the undecorated central portion of one of the figured panels from the Tomb of the Brick Arches, the edge marked out by an engraved line which was not perfectly followed in the carving.

robbed, but the box itself smashed and abandoned. While much skill and effort went into the working of the ivory, its value as reusable material was evidently less than that of whatever other fine materials had been removed from the tomb in antiquity.

A wide range of tools and techniques may be recognised as having been applied to the working of the ivory artefacts:

Sawing was used for the initial cutting out of basic shapes. At times this must have been somewhat hasty

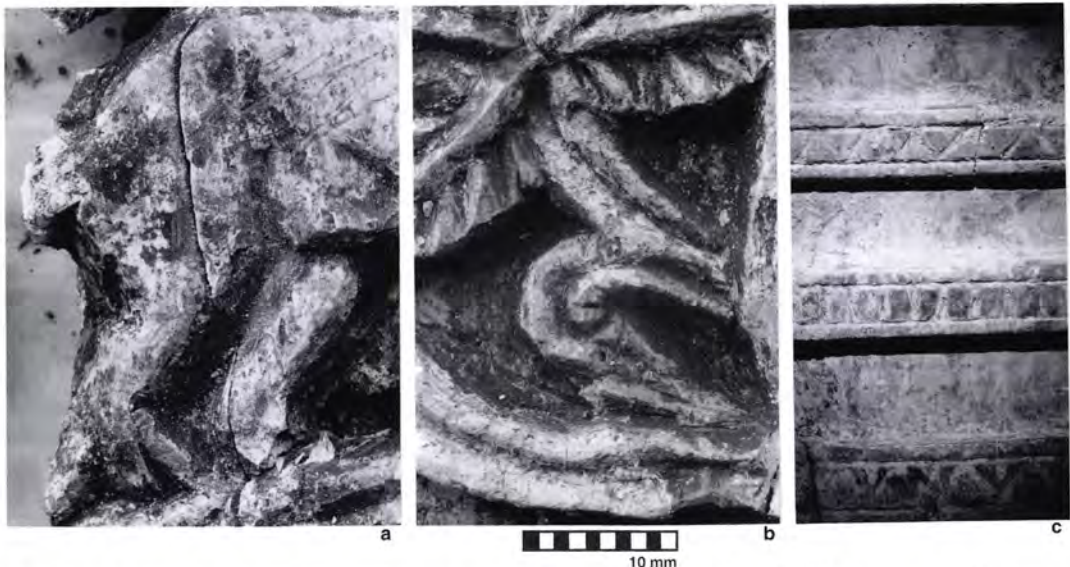


Fig. 409 *a, b* - details of carving on the figured panels from the Tomb of the Brick Arches; *c* - knife-carved decoration on the raised bands of a turned cylindrical box from the Tomb of the Brick Arches.

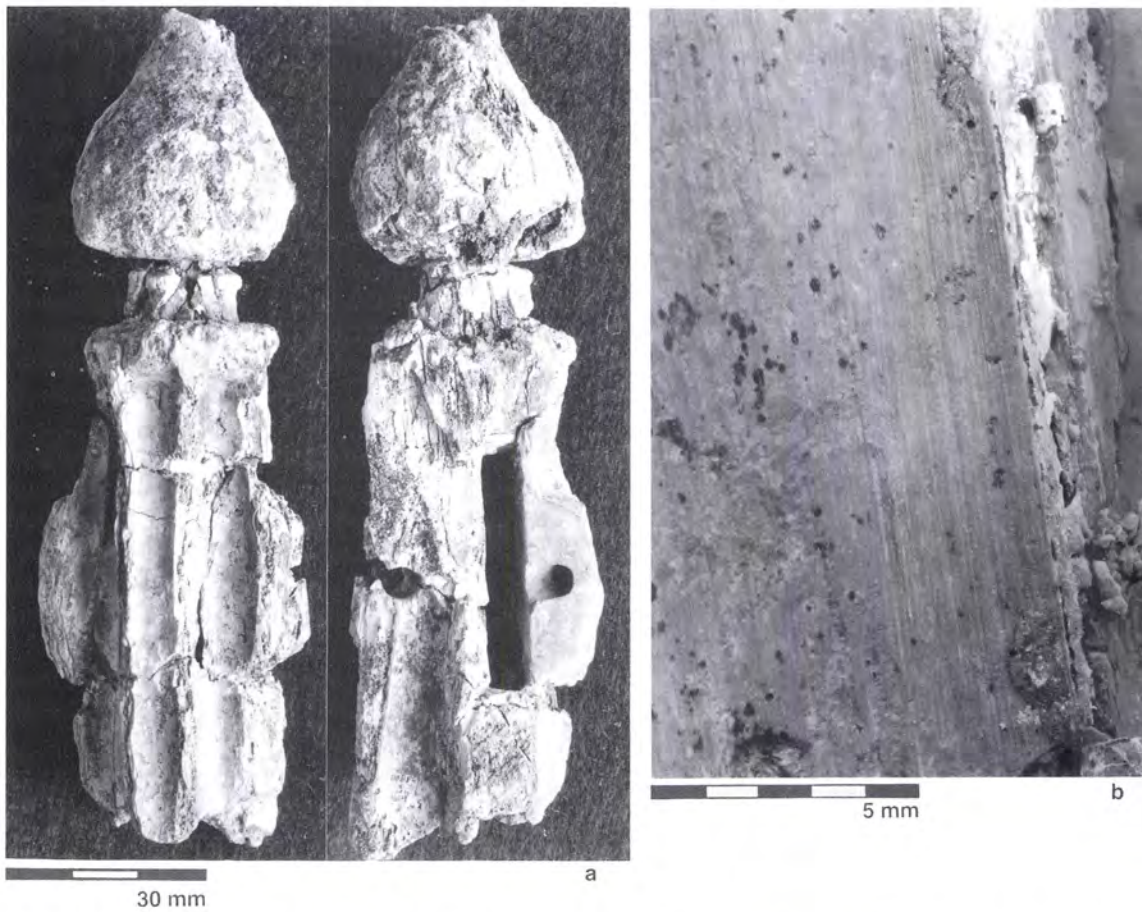


Fig. 410 Turned furniture finial from the Tomb of the Brick Arches (see also Figs 99, 100g): **a** - general view, showing carved fluted decoration, sawn mortice and drilled peg holes; **b** - striations of polishing inside the fluting.

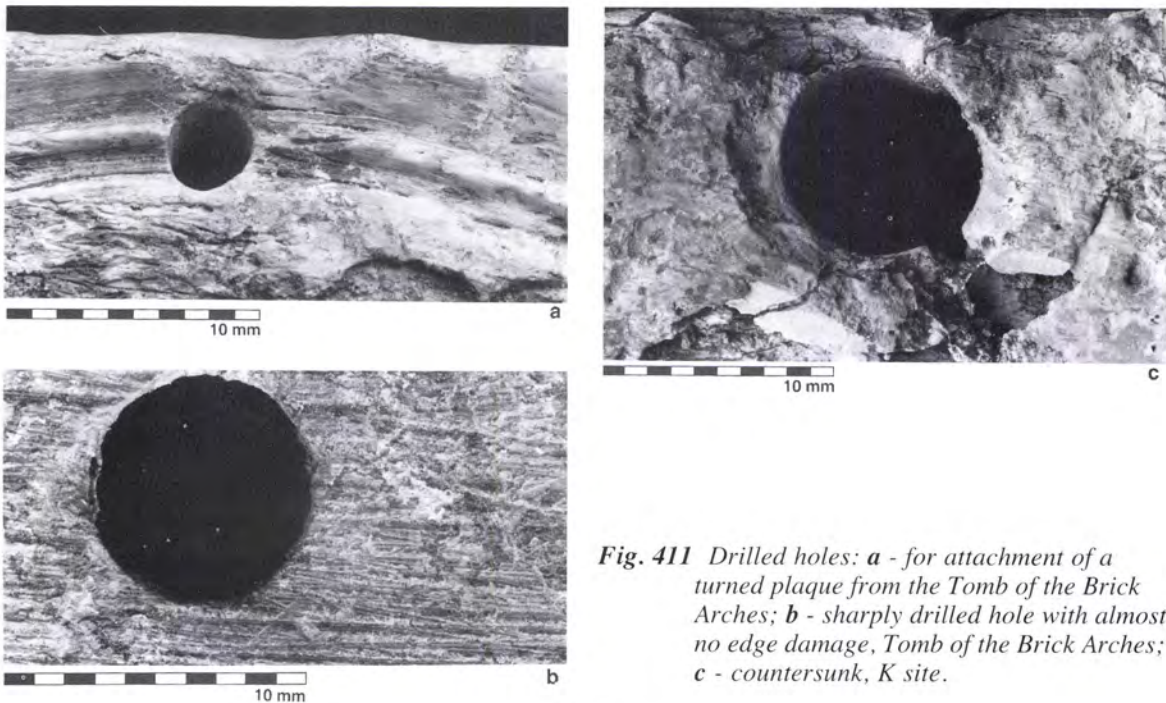


Fig. 411 Drilled holes: **a** - for attachment of a turned plaque from the Tomb of the Brick Arches; **b** - sharply drilled hole with almost no edge damage, Tomb of the Brick Arches; **c** - countersunk, K site.



Fig. 412 Scrap or trial piece from K site.

or crude as stepped saw chattering marks have been noted on some pieces. Fine, careful sawing was used elsewhere (Figs 406c, d).

Chiselling marks were noted trimming some edges, including those of the square plaques with concentric turned decoration, discussed below (Fig. 407a).

Planing to provide a flat, regular surface for further decoration or carving was done mainly with a narrow metal blade on pieces recovered from the Tomb of the Brick Arches including the two carved furniture panels and the square turned plaques. The same task was most probably accomplished with the use of chert Guditi scrapers on the lathe scraps and rectangular gaming piece from K site and on some scraps and pieces from D site; a similar scraper was used on some pieces from the Tomb of the Brick Arches (Figs 407b, c, 408a, b).



Fig. 413 Lathe-turned objects from the Tomb of the Brick Arches: **a** - copper alloy stud with central dimple, at the centre of an ivory plaque; **b** - the dimpled central peg on the lid of a cylindrical box; **c** - the dimpled central peg on a turned plaque without a metal stud; **d** - turning on this copper alloy stud is eccentric to the stud's margins, but concentric with that on the surrounding ivory.

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Marking out on the carved furniture panels and the square plaques was done with a knife point, sharp stylus or similar tool. Quartz crystals, of which a few specimens with utilised tips were recovered from several contexts, might have served a similar purpose (Fig. 408c).

Carving of the furniture panels (Fig. 97, above) was apparently done with a small, sharp knife or similar tool. Veiners, gouges and chisels do not appear to have been used in this work (Figs 409a, b; see also Fig. 98, above). Decoration on the external raised bands of a cylindrical box is knife-incised (Fig. 409c). The faceted handle from Late Aksumite D site was probably knife-carved, but may have been sawn to its elongated pyramidal shape (Figs 406a, b, above). **Fluting**: the deep, uniform flutes on the mortise-and-tenon furniture members were probably cut with a U-shaped or semi-circular gouge or fluter (Fig. 410a).

Polishing was restricted to the inside, concave surfaces of the fluted mortise-and-tenon pieces. Faint, shallow parallel scratches suggest that a fine abrasive powder was used for this purpose (Fig. 410b). Carving marks may have been effaced from the female figurine

recovered in the Tomb of the Brick Arches (Fig. 404, above) by similar polishing, but there was no specific evidence of this. None of the other ivory artefacts evidenced similar polishing traces, though such were observed on some marble and carved steatite artefacts.

Drilling of the carved furniture panels and the square turned plaques, presumably to allow for their attachment to wooden frames or bases, took place after the carved or turned decoration had been completed (Fig. 411a). In every instance the drilled holes are sharply cut with little or no chattering or incidental damage to their edges (Figs 411b, c). Unlike the stone beads, which tend to have conical or biconical drilled perforations, those on the ivories are perfectly cylindrical; some are countersunk. A small ivory scrap, possibly a trial piece or an uncompleted annular bead, recovered from K site, shows clearly that a centring hole and two perfectly concentric engraved lines were produced simultaneously to equal depths (Fig. 412). Most probably a compass drill was used for this purpose. The narrowness of the engraved lines indicates that very fine points, whether of stone or metal, were used for this work.

Turning of some of the ivory artefacts, whether for initial shaping or subsequent decoration, may have been done with a compass drill, but the sizes and elaboration of most pieces make it most probable that a well balanced lathe capable of cutting both internal and external surfaces, as for the several cylindrical boxes and their concavo-convex lids, was used. The external horizontal bands on one such box are well turned, but finished with rather less expertly executed incised line decoration (Fig. 409c, above). The lids and inserted bases of these boxes were turned separately.

Central to the turned bases, the interiors of the box lids and the copper or copper alloy studs on the square turned plaques are small dimpled hemispherical bosses which were evidently associated with a lathe centring or attachment device (Fig. 413a). Close examination of the dimples on the metal studs shows that a small amount of material was displaced, not punched out or shaved away. A few of the turned ivory plaques had not been supplied with metal studs; instead of a central dimpled boss, these had a slightly larger integral cylindrical peg (Figs 413b, c). It is possible that the plaques with the central pegs or false studs were uncompleted. Turning was executed from the periphery of each piece towards the centre, gradually reducing the central unturned portion to a small diameter which, on such items as the bases and lids of cylindrical boxes, was then further reduced to a minimal dimpled boss. There was no need for the final stage of reduction of the central pegs on the ivory plaques as they were destined to be removed completely to allow for the insertion of metal studs.



Fig. 414 A turned plaque from the Tomb of the Brick Arches: the fine quality of the turning contrasts with the less refined cutting of the plaque margins.

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Ornamental rings on the metal studs seem to have been engraved by turning after the latter were inserted into the ivory, as they are concentric with the rings on the plaques, but not always perfectly so with the margins of the studs (Fig. 413d). This turning of ivory and metal together on the same artefact would seem to demonstrate the availability of good quality tools including a well balanced and evenly powered lathe and masterly craftsmanship, an impression which is substantiated by the cleanly turned lines and evenly curved ridges on most of these plaques. A few examples, however, show more hesitant workmanship; stray cut marks and scratches on these pieces demonstrate that a very narrow tool or point was used to shape both the ivory and the metal.

Engraved lines paralleling the straight edges of several turned plaques suggest that their finished sizes were marked out at an early stage, but that the final smoothing of the corners of the obverse face and trimming to size was done after the turning had been completed. The trimming of some edges is slightly

irregular, done with a chisel or shallow gouge perpendicularly to the plaque's face, leaving a slightly ragged edge which was probably obscured by whatever method was used for their mounting. The difference in quality between the careful turning and the hasty trimming of edges suggests that the person responsible for using the plaques to embellish some item of furniture, perhaps a wooden box or chest, was not the same as the person or people responsible for shaping the ivory (Fig. 414). This is further evidence of the extent of Aksumite craft specialisation. The two lathe-turned scraps from K site, on the other hand, were very neatly sawn to square shapes before the largest possible circles were cut from them (Fig. 403, above).

While all the turned plaques from the Tomb of the Brick Arches are all of the same size and general pattern, they are not exact duplicates of one another as to the size, spacing or even the number of their rings. The design, as with many other aspects of Aksumite art and architecture, was a matter of the craftsman's judgment rather than exact measurement.

Archaeobotany

(Sheila Boardman and D.W.P.)

There are a number of characteristics common to the archaeobotanical samples from Aksum which greatly limit our ability to reconstruct both details of local crop-processing activities and crop-husbandry practices more generally. Today, most of the crops represented are grown and processed separately, whereas the archaeobotanical samples generally produced admixtures of these. From the contexts sampled and the other material present, we can often say with some degree of confidence that much of the mixing probably took place post-depositionally, once the plant material had become charred and buried. There is no evidence of mixed crops and/or crop-processing debris being stored, for example, for use as animal fodder, or traded in this form, at Aksum. Meanwhile, crop processing by-products, such as rachis internodes, awns and straw of cereals, and the culms, pods and capsules of other cultivated plants, were rare in these samples or absent altogether. This may be due to a number of factors (*e.g.* no local processing of crops, or preservation biases), some of which are discussed further below. Thirdly, the very broad identifications currently used for the wild plants mean that we have very limited morphological and ecological information from which to reconstruct local crop-processing activities, or to form hypotheses which relate to particular crop-husbandry practices, the soils cultivated, times of planting, use of irrigation *etc.* In any case, very detailed

ecological information is simply unavailable for many Ethiopian species and genera at present. All these factors inhibit the extent to which conventional palaeoethnobotanical models (Hillman 1981, 1984; Jones 1984, 1987) can be applied to the Aksum data; and the extent to which more locally developed models (d'Andrea *et al.* 1997, 1999; Butler *et al.* 1999) will be useful in future. Despite these problems, the results here presented provide a valuable insight on Pre-Aksumite and Late Aksumite agriculture, supplementing and amplifying the data recently outlined by Bard *et al.* (2000) for the intervening periods.

Taxa identified from the charred plant remains

Nomenclature follows S. Phillips (1995) for cereals and Hedburg and Edwards (1989) for legumes.

Crops of Near Eastern origin include the cereals: bread wheat (*Triticum aestivum*), emmer wheat (*T. dicoccon*), hulled barley (*Hordeum vulgare* s.l. - all probably two row barley, also called *Hordeum distichon*) and oat (*Avena* sp); the legumes: chick pea (*Cicer arietinum*) common pea (*Pisum sativum*) grass pea (*Lathyrus sativus*), fava bean (*Vicia faba*) and lentil (*Lens culinaris*); and the oil/fibre crop linseed or flax (*Linum usitatissimum*). Identification of these species was generally straightforward, preservation permitting.

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Ethiopian and African crops include the cereals: finger millet (*Eleusine coracana*), sorghum (*Sorghum bicolor*) and teff (*Eragrostis tef*). *Sorghum bicolor* here refers to all cultivated sorghums (*i.e.* Bicolor, Guinea, Caudatum, Durra and Durra-Bicolor), although Bicolor is the most likely race at Aksum (S. Phillips 1995). The other taxa in this group are the important Ethiopian oil crop niger or noog (*Guizotia abyssinica*), and the fibre crop cotton (*Gossypium* sp.). It is possible that the latter includes both the indigenous species *G. arboreum* and *G. herbaceum* which survive in Ethiopia today. Clearly, the recovery at D site of two finger millet grains which, although not directly dated, are probably Late Aksumite does not prove that this crop was definitely grown and used. The very few finds of finger millet, and other African crops (*e.g.* sorghum) at Aksum, are discussed further below.

Other useful plants comprise additional crops such as grape (*Vitis vinifera*), gourd (*Lagenaria* sp.), cress (*Lepidium sativum*), and possibly some brassicas (*e.g.* *B. carinata*, *B. nigra* var. *abyssinica*); also wild plants which are of economic importance today, or were so in the recent past (*e.g.* *Rhamnus prunoides*). Wild plants can, for the most part, be identified only to family, subfamily or genus level. Almost no previous work on material of this type has been undertaken in Ethiopia, and identifications are at present limited by the very patchy nature of the seed/fruit reference material available within herbarium collections, which necessarily contain predominantly flowering and fruiting specimens. It is therefore likely that some cultivated species and a number of other useful plants have been overlooked in the present study.

There are single finds of Sudan teak fruit stones in D site phases 7 and 12, and in a very late deposit at K site. Many of the indeterminate fruit stone fragments throughout the deposits at these sites may also be from this species. The Sudan teak tree (*Cordia africana*, Amharic *wanza*, Tigrinya *auhi*) is still common around Aksum today, the fruits being sold in the market. In addition to edible fruits, with very sweet pulp (used as a general sweetener), Sudan teak has a range of medicinal properties and its wood is highly valued for use in buildings and furniture (Jansen 1981: 177). The remains of edible wild plants appear to be rare in these deposits, but this may largely reflect the limited identifications carried out on the smaller seeds and fruits.

The wild plants incorporate a number of possible weeds of cultivation, but of which crops, we cannot tell. The wild plants also include *Lepidium* sp., perhaps indicating cress (*Lepidium sativum*), isolated seeds of which are present at D site from phase 9 onwards, and in Aksumite contexts at K site. Cress is

still widely grown in Ethiopia as a medicinal and culinary plant. Before the introduction of New World spices its seeds were widely used as the main flavouring in *wat* sauces, although the wealthy preferred to use black pepper (*Piper nigrum*), imported from Arabia and further afield (S. Edwards *pers. comm.*).

Changes through the sequence

The earliest period for which a comprehensive archaeobotanical picture has been obtained is that of the Pre-Aksumite occupation at D site, dated between the eighth and fifth centuries BC. The samples here are comparatively small and, as explained above (pp. 363-5), some may be contaminated with more recent material. Crops firmly attested at this time are hulled barley, emmer, linseed, a pea and oat (although this last may have been a weed). Less certain are teff, noog and lentil, while the presence of cotton at this early date may be regarded as unlikely (cf. Vogelsang-Eastwood 2000: 268).

Virtually no archaeobotanical materials dating between the Pre-Aksumite and Late Aksumite periods were investigated by the Project here described. The presence of sorghum in the Classical Aksumite Tomb of the Brick Arches is, however, noteworthy.

The Late Aksumite occupation at D site has yielded a more comprehensive archaeobotanical assemblage (pp. 365-8, above), dated to the sixth and seventh centuries AD. The picture from Late Aksumite D site is effectively duplicated by the smaller assemblage from the broadly contemporary occupation of K site (pp. 412-4, above). Crops grown in Pre-Aksumite times continued, with teff, noog and cotton now definitely represented. Bread wheat, faba bean, grass pea, chick pea, cress, gourd and grape make their appearance, along with rare examples of finger millet and sorghum. The scarcity of these last two cereals is interesting in view of their present popularity, finger millet being the preferred base for making beer; both are crops of African origin which originated in regions of lower altitude to the south and southwest of the Tigray highlands. If these crops were indeed rare in Late Aksumite times, and their under-representation not due to sampling, there could be an indication that contacts with more low-lying inland areas were not developed until more recent times. Seeds of finger millet from Gobedra Rockshelter have been directly dated to the tenth or eleventh centuries AD (D.W. Phillipson 1977, 1993a).

Apart from the sorghum and finger millet, there is remarkable continuity between the range of crops cultivated by Late Aksumite farmers and that favoured today. A sample of crop remains from the Stela-2 site, probably dating from the nineteenth century, is noted above (p. 156). The extent to which this

Archaeology at Aksum

range originated in Pre-Aksumite times remains uncertain. Pre-Aksumite barley and emmer (both cereals of Near Eastern origin) are definitely indicated, but there is some uncertainty whether the Ethiopian teff and noog are also represented. It would certainly be premature to suggest, on the basis of the evidence here presented, that in the Aksum region cultivation of

crops originating in the Near East predated that of indigenous varieties.

The impression gained of Pre-Aksumite and Aksumite agriculture, as in other cultural areas, is one of continuity, not only through the period of over a millennium illustrated by the research here described, but with present-day traditional practices also.

Distribution of Aksumite materials and settlement

(Laurel Phillipson)

Consideration of surface sites and lithic occurrences in relation to the local topography is essential for a fuller understanding of their significance and temporal relationships. It is also crucial to any elucidation of the cultural history of Aksum. The town is backed on its northeast by Mai Qoho and on its northwest by Beta Giyorgis; between them lies the seemingly fertile and well watered Mai Hejja valley. To the west of Beta Giyorgis and separated from it by a much broader, drier valley is Gobedra Hill, with Gobedera village on its southern flank and the major Aksumite settlement of Wuchate Golo (de Contenson 1961) on its north-eastern flank. Extending to the south and west of Aksum is the broad, undulating Hatsebo plain, sloping down to the southwest, whose agricultural potential is chiefly limited by the availability of water. The valley between Gobedra and Beta Giyorgis is divided transversely by a low watershed just south of Wuchate Golo. To the north of this watershed, the land drains into Mai Rubba, a locally important tributary of Mareb, which flows first eastwards and then north-eastwards into a steep sided valley close to Adi Tsehafi, where Aksumite activity is also attested.

Late or post-Aksumite soil erosion has, with a few exceptions, removed all archaeological material from the valley bottoms north and west of Beta Giyorgis and north and east of Gobedra, leaving them ringed on the surrounding hill flanks or lower slopes by Aksumite sites of major significance. Listing them in a clockwise direction, these include the monumental stone quarries, slipways and associated remains on Gobedra, the Aksumite settlement of Wuchate Golo, and an uninvestigated occurrence of Aksumite bricks and dressed stones in a field on the south flank of Melatta Hill. Aksumite remains in the now much eroded and impoverished valley of Mai Goda include major stone quarries and engravings near Adi Tsehafi (pp. 243-5, 423-4), the site of the once important church of Saint George after which Beta Giyorgis is presumably named and from which Aksumite ivory and metal artefacts are said by a local informant to have been re-

covered, occasional scatters of Aksumite potsherds and lithics, and outcrops of copper ore, of fine quality ochre-yellow tabular chert such as was preferred for the production of Gudit scrapers, and good sources of sandstone or gritstone breccia, of marble and of limestone. The local name for the valley area to the north of Beta Giyorgis, Baahti Hatsine (= metal cave), is said not to refer to a particular hole or cave, but to the area in general. Possibly it pertains to an earlier period of ore extraction and metal working in an area which now has a treeless, denuded and much eroded landscape. Near Adi Tsehafi, the Mai Goda (= danger water) is said to be safe to drink and to wade across, but treating it with disrespect may cause serious illness or death.

Except for the isolated monument known as Mestaha Werki (pp. 421-3, above), the valley area between Gobedra and Beta Giyorgis is devoid of Aksumite remains as it has been eroded below what must have been the Aksumite land surface. The route along which stelae and quarried stones were dragged, rolled or otherwise transported from the Gobedra quarries to Aksum would have crossed this valley somewhere south of the present watershed, reaching the flank of Beta Giyorgis close to the Tomb of Menelik, which lies at about the apparent altitude of the valley floor in Aksumite times (Fig. 383, above). At a slightly higher level than this site on the flanks of Beta Giyorgis are numerous Aksumite remains, including small level areas of Aksumite land surface and a possible ancient path or roadway which tends towards Mestaha Werki and beyond in a northerly direction. The location of Mestaha Werki and, at Surface Collection D, of a block of 'imported' chert suggests that this may have been a major route along which blocks of gritstone and other materials were transported to Aksum. Tradition emphasises its importance; it is said to be that whereby the Ark of the Covenant was brought to Aksum, and also that along which on a later occasion the Virgin Mary travelled to Aksum.

From the west, encircling Beta Giyorgis in a counter-clockwise direction there are: two stelae built

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into a modern field boundary about 0.5 km northwest of Baahti Nebait, suggestive evidence that parts of the path around this side of Beta Giyorgis are ancient and may once have been cobbled or roughly paved, and the remains of several isolated Aksumite building sites with undressed stone walls, potsherds, chipped stone tools, etc. and from which Aksumite coins and beads have been removed. A rockshelter near Dungur, devoid of archaeological deposits, is said to have been the dwelling place of Abba Salama (Frumentius, first Bishop of Ethiopia). On its wall and on a boulder in front of it are pecked engravings of Aksumite crosses in two styles. Closer to Aksum are the dense surface occurrences of lithic and ceramic artefacts which are represented by Surface Collections H to N (Figs 395-8). Close to Surface Collection H and evidently part of the same site complex is the ruin of an Aksumite building which is threatened by recent developments to the town water supply. To the south and east towards Dungur, the Gudit Stelae Field and the modern urban fringe, Aksumite remains are almost continuous.

It would seem that on the west flank of Beta Giyorgis were located several moderately wealthy, stone walled farmsteads, country villas or similar residences. Closer to Aksum and within a few hundred metres of outcrops of the necessary raw materials are areas where steep convex chert scrapers were mass-produced, interspersed with other areas yielding a variety of stone tools, Classical and Late Aksumite potsherds, beads, glass and metal fragments. These apparently agricultural and industrial peri-urban settlements gradually give way to the suburban and urban buildings of Aksum itself. Individual Aksumite farmsteads or residential sites on the south flank of Gobedra were marked only by small amounts of ceramic and lithic material, had no evidence of stone walls, and were more closely spaced than those in analogous positions on Beta Giyorgis.

On the wide Hatsebo plain southwest of Aksum town there are no monumental or architectural remains visible beyond those at Dungur and the Gudit Stelae Field. Extending from the area of the present (1997) airport as far as the spring of Mai Ayne there is, however, a large area over which vast quantities of potsherds, mainly of Classical and Late Aksumite types, scrapers and related Aksumite lithics, and occasional fragments of glass and other Aksumite materials are distributed in variable densities. In some places potsherds predominate, in other places lithic artefacts do so; elsewhere are areas where modern ploughing has brought little or no Aksumite material to the surface. It may be surmised with a reasonable degree of confidence that this large and densely populated area was home to the labourers, artisans and farmers whose work supported the monumental constructions and other achievements of the Aksumite civilisation in its capital metropolis.

In contrast with its southern and western fringes, where dense urban constructions such as those uncovered in the K-site excavations, gradually give way to more dispersed suburban, industrial and agricultural developments, Aksum is sharply restricted on its northern and eastern boundaries by the abrupt slopes of Beta Giyorgis and Mai Qoho and the steep rise between them to the Mai Shum reservoir. Thus, although D site is located at about the same distance to the north of Aksum as are Dungur and the loci of the surface collections to the west, it seems to have been a distinct settlement, rather than a continuation of Aksum suburbs or ribbon development. Situated above Aksum's great reservoir, its water sources would have been as distinct from those of central Aksum as were its agricultural fields, which occupied the valley between Mai Qoho and Beta Giyorgis and are marked by numerous scatters of Aksumite potsherds and lithics.

CONCLUDING DISCUSSION

(D.W.P.)

The research here described permits a far more comprehensive understanding of ancient Aksum than was previously possible. It complements and amplifies the work of others, past and present, but serves also to emphasise the areas that remain to be investigated. Many earlier researchers concentrated their attention on the foreign connections, luxury accoutrements and monumental architecture of the Aksumite élite. Now, we are able to view ancient Aksum as a functioning society both in the context of its African homeland and as part of the changing wider world of the first millennium AD. This chapter makes no attempt to provide an overall synthesis, but is restricted to commenting on matters directly illustrated by the research described in previous chapters.

Aksum's location in a fertile part of the Ethiopian highlands, closer to their western edge - where the land begins its irregular descent to the arid plains of Sudan - than to the Red Sea escarpment, stimulates enquiry about the economic basis of its undoubted prosperity. The region today is intensively cultivated to yield a variety of crops including both Near Eastern and indigenous Ethiopian species (Simoons 1960; Huffnagel 1961). It is now possible to argue that this situation has prevailed, with changing emphases, since at least the early centuries of the last millennium BC. Our very imperfect knowledge of the prehistory of Ethiopian farming (D.W. Phillipson 1993a; Barnett 1999; Bard *et al.* 2000) strongly suggests that these practices have a local antiquity far greater than that illustrated by the Project here described or by current research at Beta Giyorgis.

The benefits of crop-cultivation are not, of course, limited to the supply of food. Textiles, cordage and stimulants may also be obtained in this manner. Domestic animals likewise provide not only food but also traction and transport, hides for clothing, ropes and vellum, as well as a medium for tribute, exchange and trade (cf. Bagnall 1985).

Raw materials that would have been readily available in the region include building stone and timber for construction as well as for fuel. Quarries have been investigated; few woods have been precisely identified although *Acacia*, *Cordia*, *Juniperus* and *Olea* are now known to have been available. Sources of metals seem in some cases to have been less immediately local but were nonetheless readily accessible.

Few reliable data are available concerning the sources of metals available to the Aksumite population. The geology of Aksum's immediate vicinity is discussed by Getaneh and Russo (1994, 1997). Manzo (1999) has published an outline account, relating primarily to earlier periods. More detailed surveys of mineral occurrences in northern Ethiopia are provided by Jelenc (1966) and Morton (1978), but emphasise those suitable for modern exploitation. Iron and copper (cf. p. 470, above) occur at several locations in Tigray and Eritrea, tin and silver are present albeit more restricted. Gold has been reported from several locations (*e.g.* Bent 1893). Zinc is more problematic: it was not used as a distinct metal in ancient times being incorporated with copper during the smelting process in order to make brass (Craddock 1995).

Ivory was worked at Aksum and also exported in, presumably, its raw state; much of it may have been obtained in regions to the west of Aksum although there are also contemporary references to the presence of elephant herds in the immediate vicinity. Manzo (1996, 1999) provides a useful summary of these and later records of the presence of elephants in the region.

An aspect of ancient Aksumite material culture that has previously received remarkably little attention is the flaked stone industry which continued in use throughout the period covered by the research here described (see also Usai 1997). Obsidian (Zarins 1996) was widely used and clearly valued: it must have been widely traded from its limited areas of occurrence around Adulis, the Dahlac Islands and elsewhere. Sources closer to Aksum are known, but remain incompletely surveyed.

Unusual though it may seem that such artefacts should have been made and used by a society which possessed a complex and sophisticated metal-working technology, the prevalence of Aksumite lithic industries has now been clearly demonstrated (L. Phillipson 2000a, b, in press; pp. 449-53, above; for analogous phenomena in other parts of the world, see Ford *et al.* 1984; Young and Humphrey 1999). This stone-tool technology is undoubtedly descended from that which had prevailed in the region for several millennia previously, as illustrated at Gobedra Rockshelter (D.W. Phillipson 1977) and from the excavations at Anqqr Baahti and Baahti Nebait (pp. 23-6, above).

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Date	Period	Attestation (this work)	Attestation (other)
8-4 cent. BC	Pre-Aksumite	D site phases 1-3	Beta Giyorgis
3-1 cent. BC	Proto-Aksumite		Beta Giyorgis
1-3 cent. AD	Early Aksumite		Beta Giyorgis first occupation of present town site, <i>e.g.</i> Stelae Park, Cathedral area GTII tomb
4 cent. AD	Classical Aksumite	Stela 3 Stela 2 Stela 1, Mausoleum Tomb of the Brick Arches	Nefas Mawcha First Cathedral
5 cent. AD			Tomb of the False Door Dungur, Ta'akha Maryam <i>etc.</i>
6-7 cent. AD	Late Aksumite	K site, D site phases 4-13	Tombs of Kaleb & Gabra Maskal
after 8 cent. AD	post-Aksumite	Decline	

Fig. 415 Summary of the archaeological sequence at Aksum.

The archaeological sequence revealed by the excavations here described is summarised in Fig. 415. It is now appropriate to evaluate certain aspects of this sequence in greater detail.

The 'Pre-Aksumite' period

Consideration of Aksumite origins has in the past concentrated on evidence for the rise of political complexity in the highlands of what now comprise Eritrea and northern Ethiopia (*e.g.* Munro-Hay 1993; Fattovich 1997a, b). Particular attention has been paid to indications that, around or shortly before the middle of the last millennium BC, the region attracted contact with what is now Yemen, across the Red Sea. Features which made their first appearance on the African side at this time include monumental stone architecture and sculpture, as well as writing, all of which have a demonstrably greater antiquity in Yemen (Seipel 1998). The language of these inscriptions is South Semitic; modern Amharic and Tigrinya belong to this family and are written in scripts of South Arabian derivation (Greenberg 1963; Daniels and Bright 1996). Religious artefacts from Pre-Aksumite sites

show similar connections. These features have been recognised at a number of excavations in highland Tigray (de Contenson 1981), notably Yeha and Melazzo (Anfray 1972b, 1990; de Contenson 1962, 1963). Closer to Aksum, they are represented at Seglamien (Ricci and Fattovich 1987). The nature of their remains renders these sites readily visible, and it is only recently that their peasant counterparts and contemporaries have been recognised at Beta Giyorgis (Fattovich *et al.* 2000).

It is, however, the Pre-Aksumite component in the lower levels at D site (Chapter 10, above) that now provides the most informative example of a peasant settlement of this period. Here, between the eighth and the fifth centuries BC, was a stone-built complex of angular rooms and courtyards, the farming economy being remarkably similar to that employed by the rural population of the area in recent times. Cattle were the principal livestock species; cultivated crops included wheat, barley and, perhaps, the local cereal teff. Material culture included rare cuprous artefacts but no iron, abundant hand-made pottery including large storage vessels, microlithic artefacts, stone

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beads and pendants but, apparently, few if any imported items.

This settlement and its material culture provides an interesting contrast with the evidence from contemporary élite sites such as Yeha. The pottery at Pre-Aksumite D site, while displaying some parallels with that from Yeha (Fattovich 1976, 1978), includes many types that are markedly distinct, indicative of the sites' contrasting status and function. Other traits, including many metal artefact types, monumental architecture, figurative stone carving and writing, that are characteristic of Yeha, are not represented at Pre-Aksumite D site. An analogous phenomenon has been known previously from the Asmara vicinity (Tringali 1979, 1981; Munro-Hay and Tringali 1993). The foreign element that has hitherto been emphasised in accounts of this period is thus much less pronounced.

It is now appropriate to consider whether settlements such as Pre-Aksumite D site possessed features derived from trans-Red Sea contacts or whether their antecedents were largely or exclusively local. Although further excavation of analogous sites will be required before these questions can be answered authoritatively, it is clear that substantial revision is needed to our understanding of the nature of the contacts which took place between the highlands that are now divided between Yemen and Ethiopia. The view conventionally held in the past, which now requires reconsideration, has been that the monumental Tigray sites were occupied by colonisers from Yemen who settled in circumscribed areas of exceptional fertility and established a polity named - in the unvocalised inscriptions - D'MT, the subjects of which included the indigenous peasantry (Munro-Hay 1993). The name 'Ethio-Sabaeen' by which this period is often designated (*e.g.* Fattovich 1990; Fattovich *et al.* 2000) gives inappropriate emphasis to the overseas contacts now seen as localised and restricted to certain élite sectors of the region's population. Likewise, the term 'Pre-Aksumite' does not reflect the cultural diversity now recognised, and places inappropriate emphasis on later developments. A revision of the terminology is clearly required.

Aksumite beginnings and political history

The archaeology of northern Ethiopia during the so-called Proto-Aksumite period of the last three centuries BC remains poorly known, other than from the recent investigations of Fattovich and Bard at Beta Giyorgis (Fattovich *et al.* 2000). The Aksumite civilisation which arose around the beginning of the Christian era clearly (as will be further discussed below) displays both indigenous and allochthonous elements, although its formative processes remain very poorly understood. Within the relevant area, virtually no archaeological sites other than Beta Giyorgis have been published

which clearly date to the last few centuries BC or the first century AD (Anfray 1990). There is no indication of human settlement at the actual site of Aksum itself until the first century AD, which is also the date of the *Periplus of the Erythraean Sea*, a trader's handbook to the Red Sea and India Ocean coastlands (Casson 1989), which refers to the port of Adulis near modern Massawa in Eritrea and also to 'the Aksumite metropolis'.

It has long been known that Aksum was the capital or principal metropolis of a major polity which arose during the early centuries AD in the highlands of northern Ethiopia and southern Eritrea. It need not be assumed that the capital was always at the same site: traditions that it moved from elsewhere in the vicinity to the present Aksum around the beginning of the Christian era receive some support from recent archaeological investigations (Fattovich *et al.* 2000). By the third century, Aksum was the political centre of a powerful centralised kingdom (Anfray 1981; Kobishchanov 1981; Taklasedik 1981), controller of abundant resources, ruler of extensive territories, trading widely and, by *c.* AD 270, issuing its own coinage which circulated both locally and internationally. During this time, Aksum rapidly established itself in nominal control of extensive territory and thereby acquired very substantial human and material resources. These lands appear to have comprised much of the modern Eritrea apart from the extreme north and west, as well as the greater part of what is now Tigray region in Ethiopia; their southerly extent remains poorly understood. Summaries of Aksumite political history are provided by Munro-Hay (1991) and D.W. Phillipson (1998). Study of Aksumite coinage, which bears the names of successive rulers, permits an ordering of the various issues and of the rulers named in their inscriptions. It is not easy, however, to correlate the names on the resultant 'king-list' with those preserved in traditional sources, the only undoubted links being provided by kings Ezana in the mid-fourth century and Kaleb early in the sixth. At times, Aksumite political authority extended eastwards across the Red Sea to the Yemeni highlands and, less certainly, westwards as far as the Nile valley. Whether, as has often been suggested (Burstein 1981), Aksum conquered Meroe in the fourth century, there can be little doubt that it was the rise of Aksum which led to the economic decline of its Nilotic neighbour.

Religion

Study of Aksumite coinage (see, especially, Hahn 1999 and Juel-Jensen 1998) provides a clear indication of the adoption of Christianity at Aksum during the reign of Ezana, an event which is recorded also in surviving Aksumite stone inscriptions, in the writings of Graeco-Roman historians and in Ethiopian historical

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tradition. Prior to this event, which probably took place around AD 340, the Aksumite rulers adhered to the polytheistic practices of earlier centuries which had much in common with those prevailing in South Arabia (Ryckmans 1988), reflected in the use of the crescent-and-disc symbol on the earliest Aksumite coins. This symbol was replaced, during the reign of Ezana, by the Christian cross. The cross was subsequently accorded greater prominence in coinage design, sometimes accompanied by an inscription indicating the gradual adoption of the new religion through the Aksumite countryside (D.W. Phillipson 1998: 113, in press).

The adoption of Christianity exerted a powerful influence over the subsequent history of Aksum, which came to be regarded by Roman and Byzantine emperors as a potential ally both in doctrinal controversies and in political manoeuvres. Much of the Ethiopian and Eritrean highlands has remained a staunchly Christian area ever since; and the Ethiopian Orthodox Tewahedo Church traces its origin to Aksum, which remains to this day a place of unparalleled sanctity. The Cathedral of Maryam Tsion at Aksum was first built in ancient times: there is controversy whether this took place during the reign of Ezana or, rather later, during that of Kaleb (Heldman 1995). It took the form of a five-aisled basilica which survived, doubtless modified, until the sixteenth century; the huge plinth on which it stood may still be seen. During the one hundred and fifty years following Ezana's conversion, Christianity seems to have been gradually adopted by increasing numbers of Aksumites. Tradition (cf. Sergew 1972: 115-21) recalls the arrival of ecclesiastics early in the sixth century, probably from Syria, who introduced monasticism and founded religious establishments in many outlying areas (D.W. Phillipson in press). Increased contact with Syria at this time is also indicated both archaeologically and linguistically (Conti Rossini 1928; Monneret de Villard 1937; Ullendorff 1968; McCullough 1982; Marrassini 1990).

Socio-economic differentiation

There is good archaeological evidence at Aksum for a substantial population enjoying a high level of material prosperity. Differentiation in this prosperity is apparent between sites and is reflected in the architecture and, as discussed below, in the burials.

At and around Aksum, as at Matara and elsewhere, are remains of stone buildings with a tall central structure surrounded by an extensive walled court and ranges of rooms (cf. Buxton 1970; Buxton and Matthews 1974; Anfray 1990). In the older literature, these buildings are often referred to as 'palaces', but the less committal 'élite structures' is a preferable designation. The largest and most elaborate of these

structures was that in western Aksum known as Ta'akha Maryam (Littmann *et al.* 1913, II: 112-21; D.W. Phillipson 1997: 103-20). The one example discovered by the Project here described, at D site, was not comprehensively investigated; it was probably erected during the sixth century AD, which is in broad agreement with such dating evidence as is available for other buildings of this type; we do not know whether similar structures were used in earlier times. In no case, unfortunately, has archaeological evidence been reported which would permit a confident assessment of the precise purposes to which these structures were put. They may, however, be contrasted with other buildings such as are represented in later phases at D site: domestic residences erected on a smaller scale using only undressed stone with or without supporting timbers, which are associated with farming pursuits and/or small-scale craft industry. It seems likely that the actual dwellings of the lowest strata in Aksumite society have not yet been unearthed; they are, however, probably represented by clay models of small thatched houses, as well as by artefact-scatters concentrated on the west and southwest sides of Aksum. It is clear that access to imported goods was by no means restricted to the highest ranks of society.

A very remarkable feature of Aksum, apparently shared by other Aksumite settlements irrespective of size or rank (*e.g.* Anfray 1967, 1990) is the absence of walls to demarcate or defend the built area. Such walls have long been a regular feature of urban settlements in most parts of the world (Southall 1999; see also Fletcher 1986), including Africa (Fletcher 1993; Connah 2000). It has been argued (D.W. Phillipson 2000) that the absence of walls makes use of the term 'city' with reference to ancient Aksum potentially misleading, and that the ancient term 'metropolis' is more appropriate.

Burials

Use of upright stones as grave-markers has been widespread through much of northeastern Africa for several thousands of years. Aksumite sites illustrate one specialised local manifestation of this tradition. The custom of erecting stelae was followed at several levels of Aksumite society, the elaborate (probably royal) examples in the central stelae area being contrasted with shaft or simple pit-graves marked with plain or undressed smaller stelae. The abundant evidence for socio-economic stratification provided by the surviving architecture is paralleled by the burial arrangements. The finest funerary monuments utilised the same materials and stone-dressing techniques as were employed for Aksumite élite structures. There is corresponding variation in the quantity and elaboration of the associated grave goods. By about the second century AD, burials were accompanied by grave goods of

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varying richness, some of great abundance, which indicates unequal access to resources.

The burials described and noted in the present work, despite their narrow chronological range, are extremely diverse. In the Gudit Stelae Field, use of which seems to have centred on the second and third centuries AD, simple pit graves marked by small plain or undressed stelae were accompanied by very few artefacts (Chapter 8, above). The GT II tomb, incompletely investigated in the same area during 1974 (Munro-Hay 1989: 143-6), comprised more than one earth-cut chamber (perhaps originally two tombs) containing abundant pottery, glassware and iron tools suggestive of farming and carpentry, as well as weapons. The burials in the Gudit Stelae Field thus seem to represent a range in the middle-to-lower ranks of the socio-economic hierarchy.

The later burials that were investigated clearly belonged to the Aksumite élite; most were located in or immediately adjacent to the central area, now the Stelae Park, which appears to have been the royal burial ground. At first sight, even these tombs present a bewildering diversity including multi-chambered subterranean examples reached by vertical shafts (Munro-Hay 1989: 78-94) or stepped adits (pp. 31-5, 425-7, above), elaborate built structures such as the Mausoleum (pp. 165-79), subsequently covered and intended to be marked by a huge stela, chambers of uncertain arrangement beneath the mighty capstone of Nefas Mawcha (Munro-Hay 1989: 116-20, 165-6; D.W. Phillipson 1997: 67-71, 189-90, 1998: 101-2), and the more compact Tomb of the False Door (p. 427) with its squat superstructure. With the partial exception of the Tomb of the Brick Arches, all had been severely robbed in antiquity and their interpretation is thus impeded; some attempt at synthesis may nonetheless be made.

Vertical shafts leading to one or more underground burial chambers are known from several areas. At Aksum, they may be seen in the vicinity of the Tomb of Bazen, beneath the Church of the Four Animals, beside the Tomb of the False Door and near the Tombs of Kaleb and Gabra Maskal; they have also been reported from several other locations including Beta Giyorgis. The so-called catacombs beneath the Stelae Park (Munro-Hay 1989: 78-86) should probably be regarded as belonging to this type of tomb. Although dating evidence is sparse, it seems probable that at least some of these tombs date from the fifth or sixth centuries or later; the varying care and resources devoted to their construction may reflect their use for the interment of individuals extending over a range of socio-economic importance. They are clearly derived from the very similar tombs used at Yeha from Pre-Aksumite times (Anfray 1972b). The tombs approached by a stepped adit may be an elaboration of this

type, a view which is considerably strengthened by the recognition of two cases, noted below, where a shaft tomb appears to have been modified by the construction of an adit.

In Aksum, the only tomb with a stepped adit for which secure dating evidence is available is the fourth-century Tomb of the Brick Arches, discussed in Chapter 4. No such evidence for the analogous Tomb of Bazen (pp. 425-7, above) has been recorded, while the sixth-century date proposed for the Tombs of Kaleb and Gabra Maskal (pp. 427-31) is not wholly secure. A tomb of this general type on Beta Giyorgis (Fattovich and Bard 1995, 1997; Fattovich *et al.* 2000) is dated to the Early Aksumite period. These tombs show very considerable variation both in layout and in construction. Although the Tomb of Bazen is entirely rock-cut and the Tomb of Gabra Maskal wholly built, their general plans are remarkably similar. It would almost certainly be misleading to propose a chronological sequence for these tombs based either on lay-out or on construction technique. The Tombs of Kaleb and Gabra Maskal stand out from the others as the only ones wholly of dressed stone construction, for the quality of workmanship displayed, and for their apparently Late Aksumite date. The early Beta Giyorgis example, on the other hand, shows signs of having been converted from one or two shaft tombs (Fattovich *et al.* 2000). It is possible to place a similar interpretation on the configuration of the Tomb of Bazen (pp. 425-7). The Tomb of the Brick Arches had been used for the interment of three or four individuals, each probably in a separate chamber. In the Tomb of Gabra Maskal, three stone sarcophagi are present in one of the five chambers. The largely unrobbed Tomb of the Brick Arches contained very rich grave goods, perhaps of slightly less opulence than those indicated by the robbed traces in the Mausoleum.

The Stelae Park

The most famous monuments which have survived from ancient Aksum are the huge monolithic stelae, carved in representations of multi-storeyed buildings; one, which still stands, is 23 m high and weighs approximately 160 tonnes. Another, which probably fell and broke while being erected, would have been 30 m high and over 500 tonnes in weight: it may be the largest single monolith which people anywhere have ever attempted to erect (D.W. Phillipson 1998: fig. 37). These stelae were quarried about 4 km away from the site where they were erected: their extraction, carving, transport and erection would have required enormous investment of labour (cf. pp. 247-54, above).

The general configuration of the Stelae Park has been described above in Chapter 3. Here, it is intended to offer a synthesis of the work undertaken there by the 1993-7 Project in so far as it has permitted a

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better understanding of the area during Aksumite times. No features were investigated to which there is any reason to attribute a date before the beginning of the fourth century AD. No revisions are therefore offered to the picture obtained during Chittick's excavations (Munro-Hay 1989) of the earliest phases of activity in the area which now forms the Stelae Park.

Stelae 1, 2 and 3 were originally intended to stand in line, facing in the same southward direction over Aksum. An artist's reconstruction of this intention is reproduced as Fig. 416. It must be emphasised that this drawing represents an intention, rather than a prospect which ever really existed: Stela 2 probably stood for several centuries, Stela 3 is still erect, but Stela 1 was probably never successfully set up. These three largest stelae were not equidistant, and increased in size and elaboration from east to west. The eastern Stela 3 and the central Stela 2 differed only slightly in height and weight but the western Stela 1 was one-and-a-half times the height and almost three times the weight of the others. If we assume that the eastern tomb associated with Stela 1 was the same size as the Mausoleum on its west, we have a precise explanation for the distance separating Stelae 1 and 2. Stratigraphy noted during excavation on the Stela-2 site (p. 152,

above) indicated the possible presence of what might be the eastern extremity of this eastern tomb, post-dating the Stela-2 substructure.

The most probable explanation of all these observations, taken together, is that Stelae 3, 2 and 1 were erected in that chronological order. This would imply the existence of three royal grave-complexes, similar but progressively more grandiose. The most recent, dating to the fourth century AD (see discussion on pp. 220-3, above), was not successfully completed, its stela collapsing whilst being erected at what was probably a near-final stage in the overall construction process. The consternation, not to mention injuries or deaths, which accompanied this catastrophe may readily be imagined.

The view of the Stela-1 complex obtained in 1974 has been confirmed and amplified. It is clear that this was a funerary complex without parallel at Aksum for its scale, complexity and magnificence. Stela 1 itself, which was more than three times as massive as any other Aksumite stela, almost certainly fell and broke while the attempt was being made to erect it, before the associated funerary complex was fully complete; on falling, Stela 1 also destroyed the monument known as Nefas Mawcha (pp. 480-1),

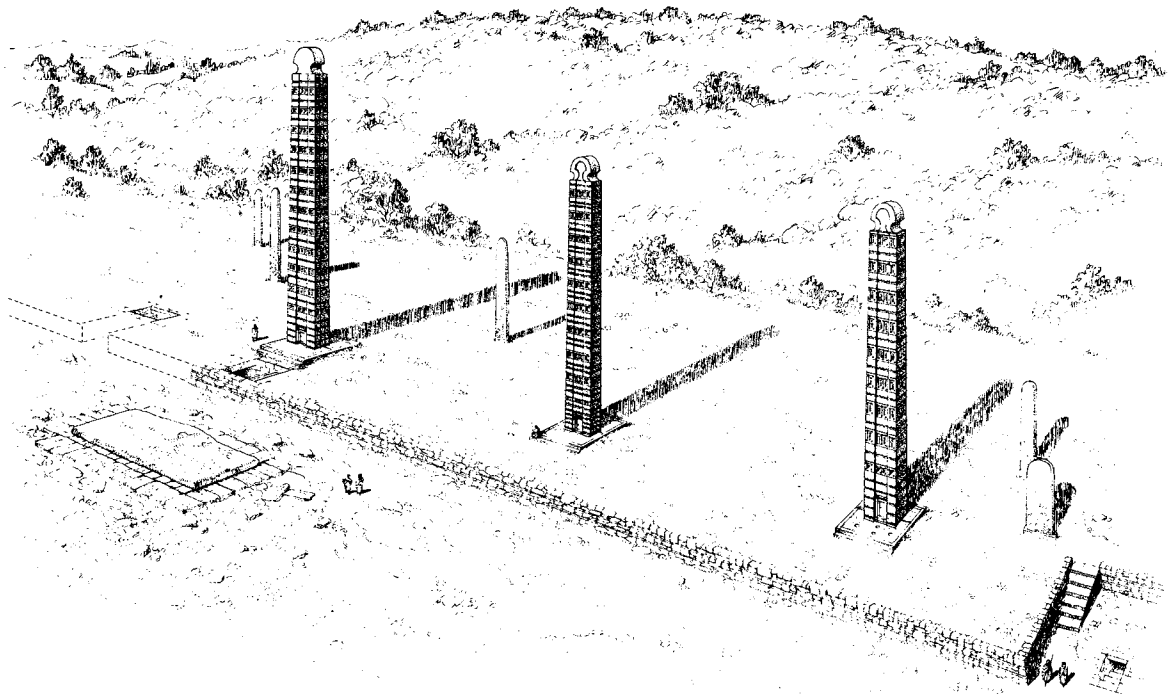


Fig. 416 A reconstruction of the intended appearance of the central stelae area at the end of the fourth century, had Stela 1 (left) been successfully erected. Note, at bottom right, the stairs shown in Fig. 417, and the adit leading to the Tomb of the Brick Arches. The open area over the Mausoleum's east portal must have been filled before erection of Stela 1 was attempted.

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likewise apparently unfinished. Excavation on the site where Stela 2 formerly stood also revealed the remains of massive associated structures, the funerary nature of which - although highly probable - cannot yet be conclusively demonstrated. Excavations in the immediate vicinity of the still-erect Stela 3 are not practicable. The 1993-7 research provides additional support for the now widely accepted view that many stelae were grave-markers. By far the largest and most elaborate are the six storeyed stelae and it would be a reasonable inference that these mark the graves of those Aksumites who wielded the greatest power and influence and who had access to the most abundant resources. The most likely contenders for this position are the kings.

The sequence here proposed carries the implication that westward development came to a sudden halt when Stela 1 collapsed, and it obviates any suggestion that the use of the area for the erection of stelae continued after the collapse, with no attempt being made to remove the debris. It would also explain the apparent abandonment of the much smaller Stela 8 which lies incompletely dressed to the north of the Mausoleum's western entrance, no attempt apparently ever having been made to finish or erect it (D.W. Philpson 1994a: fig. 4).

It remains to consider the absolute date at which these developments took place. The archaeological evidence is not as conclusive as one would wish, largely because of the very extensive robbing and other disturbance to which the area has been repeatedly subjected. Most of the primary deposit had, for example, been removed from the Mausoleum. Two radiocarbon dates indicate, however, that construction and primary use of the Mausoleum probably took place within the period covered by the late third century AD and the first half of the fourth (p. 223, above). This is not contradicted by such evidence as has been derived from the artefacts associated with primary use of the Mausoleum and East Tomb nor from those (not yet studied in detail) apparently contemporary with the erection of Stela 2.

It is both remarkable and unfortunate that none of the Aksum stelae or associated monuments bears any inscription which might indicate the ruler or other individual in whose name they were erected. (Fragments of an inscribed brass rondel which may have been intended to adorn the apex of a stela were recovered from the Tomb of the Brick Arches, as noted on pp. 97-100, above.) This lack is all the more remarkable in view of the evidence from stone inscriptions and from coinage that Aksum was, from at least the third century, a literate society some of whose members were familiar with the Ge'ez and Greek languages and with Ethiopic, South Arabian and Greek scripts. The only inscription so far found on any of

these monuments is the single letter carved on one of the roof slabs of the Mausoleum: although Roger Schneider (Appendix IX) is unable to propose a meaning for this glyph, he does suggest that its form precludes a date later than the reign of Ezana in the mid-fourth century AD.

In the absence of purely archaeological evidence, it is necessary to rely on circumstantial inference and historical arguments in the attempt to obtain a more precise estimate for the date of the Stela-1 complex than the broad chronological bracket indicated by the radiocarbon analyses. The epigraphic argument summarised above suggests that the second half of the fourth century may be excluded from consideration, leaving a period of approximately one hundred years, between the mid-third century AD and the mid-fourth. This is the period which saw Aksum's prime florescence and effort to integrate itself with the international economy, as is reflected in the issue of its first coinage. As a result, by the early fourth century if not before, the polity had emerged from its previous obscurity and was recognised as an important and powerful state, influential both in political matters and, following the formal adoption of Christianity, in the religious sphere also (Taklasedik 1981).

The scenario which best fits the archaeological and historical data would attribute Stelae 3, 2 and 1 in that order, with their associated monuments, to the period from the late third to the mid-fourth century AD, when the aspirations of Aksumite rulers were at their height. It would follow from this that the attempt to erect Stela 1, the final and most ostentatious manifestation of the old tradition, broadly coincided with the adoption of Christianity. The failure of this attempt may have been seen as symbolising the passing of the old order and would explain both why the series of great storeyed stelae came to an end and why no attempt was apparently made to remove the wreckage after the stela collapsed. If these arguments are accepted, together with those presented above that the three principal storeyed stelae mark royal graves, we are led to the tentative conclusion that the Stela-1 complex may have been intended as the burial place of the last Aksumite king to be interred according to the pre-Christian tradition.

Epigraphic, numismatic and historical evidence combine to suggest that Ezana's reign was followed by a period when Aksumite influence and prosperity declined, not recovering until the reign of Kaleb early in the sixth century. This may be reflected archaeologically in the apparent rarity of sites and monuments to which a final-fourth- or fifth-century date may be attributed.

There are at Aksum no large or elaborately carved stelae for which there is any reason to propose a date subsequent to that of the Stela-1 complex. Indeed,

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the next tomb in the westerly progression, the so-called Tomb of the False Door (Munro-Hay 1989: 104-13; Chapter 12, above) is a particularly interesting one: its design shows certain similarities with the stelae and their associated tombs, but instead of a stela it is surmounted by a squat substructure retaining the representation of a false door that is characteristic of the stelae. This tomb had been totally robbed in antiquity and no convincing archaeological dating evidence was recovered; it nonetheless seems reasonable to suggest that it may belong to a time not long subsequent to that of the Stela-1 complex. A second observation is that the mid-fourth-century date attributed to the Stela-1 complex coincides closely with the time when Aksum is known officially to have adopted Christianity. The advent of the new religion thus also marks a very pronounced stylistic change in the élite - presumed royal - funerary monuments. The logical conclusion is that two factors may have combined to initiate this change in funerary style: the increased ambition in tomb design beyond the capacity of available construction technology, and the adoption of a new state religion.

A further consequence is the possibility of a more precise understanding of Stelae 3, 2 and 1. It has been suggested that they may have been erected, in that order, to mark the graves of kings. The most recent, Stela 1, may have been the last before the adoption of Christianity under King Ezana in about AD 340. The succession of kings before Ezana is known from the coinage: the first issues, dated around AD 270, bear the name of King Endybis who was followed by Aphilas, Wazeba, Ousanas and then Ezana (Munro-Hay 1984; Munro-Hay and Juel-Jensen 1995). Although there are no inscriptions to indicate the names of those interred in the graves marked by the various stelae, we have here a promising shortlist of candidates.

The tombs marked by the great storeyed stelae in the central stelae area are at present known from the sole example of the Mausoleum, described above (pp. 165-79). It is proposed that the Mausoleum and East Tomb, with Stela 1 which was intended to mark them, represent the last of a westward progression of royal tombs of increasing size and grandeur. The collapse of Stela 1, broadly coinciding with the adoption of Christianity as the Aksumite state religion, seems to have led to the abandonment of the tradition of marking royal burial places with huge stelae. The Tomb of the False Door, continuing the westerly progression, may represent the succeeding type, with an underground section resembling the plan of the earlier Nefas Mawcha (p. 427) and a squat superstructure retaining a false door like those carved on the stelae.

Additional archaeological evidence may be cited in support of this scenario. Construction of the

terrace wall immediately west of Stela 1 has been shown to be integral with that of the Mausoleum (p. 188, above). It follows either that the entire terrace wall was built at this time or that a previously existing wall was extended westwards. Either could be viewed as a late stage in the development of the area as a dominating necropolis. At the westernmost extremity of the Stelae Park, primary archaeological evidence provides no clear view of when the Tomb of the False Door was constructed relative to the stelae, but a later date seems likely on typological grounds and would accord with the concept of progressive westward development.

The monuments within the Stelae Park are not restricted to those described above. Smaller and largely undecorated stelae, at least some of them presumably marking lesser burials, had been erected in earlier times and may have continued in vogue during the time marked by the principal storeyed stelae. There are also other tombs, not marked by surviving stelae, apparently very broadly contemporary, notably the so-called catacombs partly investigated by Chittick in 1974 (Munro-Hay 1989: fig. 6.24), and the Tomb of the Brick Arches. These are cut from the soft clayey rock which underlies the half of the area lying to the east of the Stela-2 site. To the west of the geological interface straddled by that monument (p. 143, above), the nature of the geology necessitated the digging of pits or cuttings to receive the monuments, as in the case of the Mausoleum and the Tomb of the False Door (Munro-Hay 1989: fig. 6.43).

The Tomb of the Brick Arches was intensively investigated between 1993 and 1996. Its location is shown in Fig. 416, adjacent to an angle in the main terrace wall where the foot of Stela 3 could be reached up a flight of monumental stairs (Fig. 417). The entrance to the tomb was located below the terrace, and it may thus have been regarded as lying outside the main burial area thus demarcated. The tomb was used for the interment of at least two male and one female individuals who, if not of the highest rank of wealth and importance, clearly had access to very substantial resources. The artefacts have strong affinities with those attributed to the primary use of the Mausoleum; Jacke Phillips argues above (pp. 194-6) that the pottery from the Tomb of the Brick Arches is probably somewhat later than that from the former monument, and this is not contradicted by the radiocarbon dates summarised above in Fig. 109.

One monument whose age and significance have not yet been considered is Nefas Mawcha (Littmann *et al.* 1913, II: 94-6; Munro-Hay 1989: 116-20; D.W. Phillipson 1997: 68-71; *idem.* 1998: 101-2). Like the Stela-1 complex, it occupies a position near the western end of the Stelae Park area, but, like the Tomb of the Brick Arches, it lies outside the

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Fig. 417 Steps excavated in 1954 east of Stela 3. The similarity to the steps in the adit to the Tomb of the Brick Arches is noteworthy. Photographs reproduced by kind permission of Jean Doresse.

principal burial area demarcated by the terrace wall. At the time that Nefas Mawcha was wrecked by the fall of Stela 1 it was apparently unfinished, work on dressing its capstone either having been abandoned or being still in progress. It is assumed that the monument, which has no known parallel beyond its membership of a poorly defined megalithic tradition, was intended for a funerary purpose. No evidence has yet been found that a burial was ever placed within it, although it has been partially investigated - without adequate publication - on so many occasions that this negative evidence must be regarded as inconclusive. Enormous resources were expended on its construction, its great syenite capstone - weighing some 360 tonnes - being the second-largest block of block of stone utilised at Aksum after Stela 1 itself. Its size, location and date, as well as some of the associated artefacts (pp. 198-9, above) thus all link it with the Stela-1 complex, despite its location below the main terrace. If, as argued above, Stela 1 and its associated monuments represent a royal tomb-complex of the period when Aksum adopted Christianity, the purpose of Nefas Mawcha is problematic. Its grandeur and marked ostentation are concordant with royal connections. Its location might imply that it was intended to receive a royal burial or that of a close associate of the king. Construction of tombs

and monuments on this grand scale must have begun long before a ruler's death, and could well have occupied much of his reign.

The Tomb of the Brick Arches was also apparently located outside the main stela area demarcated by the main terrace wall and may have been used for the interment of individuals who were not full members of the topmost, presumed royal, élite for whom the main terrace may have been reserved. If this were the case, the Tombs of Kaleb and Gabra Maskal might imply that this form of monument was subsequently adopted by those of the highest rank.

Following the events described above, the Stelae Park area may have retained some level of sanctity, despite probably not being used for royal burials, until the period around the late seventh or early eighth century which saw rapid reduction in prosperity and the transfer of the capital away from Aksum. Such a date is indicated for the beginning of rubbish-dumping in the Mausoleum and is a plausible estimate for robbing at the Tomb of the Brick Arches. Sometime afterwards the intentional toppling of Stela 2 may have taken place. Subsequent events remain largely unknown but, by around the seventeenth century if not before, the area around Nefas Mawcha was being used for the burial of low-status individuals and, by

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the nineteenth century, domestic occupation had spread to much of the area. This secular invasion of the area is all the more remarkable since there were clearly numerous extant stelae (and an oral history) attesting to its former status, and must represent a substantial shift in attitude with regard to the historic remains in the nineteenth century. The recent use of what is now the Stelae Park is considered more fully in Appendix XII.

Economy

The socio-economic inequality noted above seems to have extended through at least some parts of the Aksumite countryside. Elite structures, although concentrated in the western part of Aksum, have also been found in peripheral locations, and rich burials are indicated at several widely scattered sites. Within a short distance of Aksum were sites whose inhabitants seem mainly to have been engaged in the production of food, apparently thereby maintaining a reasonable degree of material prosperity, as did people involved with craftwork and manufacturing. There is now abundant evidence for economic specialisation. Certain areas (*e.g.* parts of Late Aksumite D site) obtained animal products through subsistence-level herding much as their Pre-Aksumite ancestors had done. Elsewhere, as at K site, such products were distributed secondarily to people whose primary economic specialism was in other activities. A similar picture emerges from study of lithic industries in areas to the west of Aksum: sites where specific types of scrapers were made appear to have been distinct from those where they were used.

Although until recently archaeologists and historians have placed almost exclusive emphasis on international aspects of the Aksumite economy, there can in fact be little doubt that this economy was locally based on the productivity of the land and indigenous agriculture. The 1993-7 research, together with that summarised by Bard *et al.* (2000), has indicated that, while sheep and goats were herded, cattle was the dominant domestic species, being used both for food and for traction. Donkeys, chickens (*cf.* McDonald 1992) and, rarely but perhaps surprisingly (*pp.* 414, 418, above), pigs were also available. Inscriptions indicate that the herds were augmented by capture and tribute in the course of military campaigns (Kobishchanov 1979; Munro-Hay 1991). The range of cultivated crops was remarkably similar to that exploited in the region during more recent times, including wheats, barley, teff, finger millet and sorghum as well as chick peas, noog and linseed. Cereals thus predominated, including varieties originating in the Near East as well as local domesticates. Oil was obtained from linseed and from the locally domesticated noog. Grape-pips and both seeds and textile fragments of cotton have also been

recovered; in neither case can one be certain whether the plants were grown locally or their produce imported from elsewhere. Grape vines were, however, known to the ancient Aksumites, being represented in contemporary artworks; rock-cut tanks at Adi Tsehafi and at Ham in Eritrea (D.W. Phillipson 1997: 162-5; Anfray 1965) may have been used for making wine.

While in Proto-Aksumite times external connections seem primarily to have been with the Nile Valley (Fattovich *et al.* 2000), it has long been recognised that the later Aksumites imported luxury goods from a wide range of sources, the evidence being both documentary and archaeological. The items concerned included glassware, beads, metals, textiles, wine and probably olive oil. What has only recently become apparent is the extent to which these imports provided stimuli for local production: glass vessels were, for example, made in imitation of foreign forms, Aksumite carved ivory and metalwork, best known from the Tomb of the Brick Arches (*pp.* 86-116, above), displayed great technological and artistic sophistication, while wine may have been obtained from local as well as imported sources.

The *Periplus of the Erythraean Sea* (Casson 1989) states that ivory was a major Aksumite export in the first century AD, and archaeological evidence now confirms this for later times also. The Tomb of the Brick Arches, securely dated to the fourth century AD, has yielded quantities of finely turned and carved ivory in the form of boxes, decorative panels and furniture-components that are interpreted as having formed parts of an elaborate chair or throne. At workshops on the western outskirts of Aksum highly standardised flaked stone tools were used in large numbers to process raw materials such as ivory, wood and soft stone.

The sixth-century Byzantine ambassador Nonnosus and the historian John Malalas noted the number and importance of elephants in Aksum and its environs (Munro-Hay 1991: 153, 219-20). Consideration of ivory enables us more fully to appreciate the importance of Aksum in international trade. During the first century AD, North African elephants were nearing extinction (Scullard 1974) and ivory was an extremely valuable commodity in the Roman Empire, being thinly cut and used in small pieces, often as inlay (Meiggs 1982). A second-century papyrus (Harrauer and Sijpesteijn 1985) indicates that ivory was also a major component in the Indian Ocean trade: African ivory was valued above its Indian counterpart in both India and China by virtue of its size, availability and carving properties. By the end of the third century AD, the supply of ivory in the Roman Empire was greatly enhanced, Diocletian's price-control edict attributing to it a very much lower value in real terms than it had enjoyed in earlier centuries (S. Williams

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1985). Significantly, this is the time at which we now have archaeological evidence for the plentiful supply of ivory at Aksum, only a few decades after the establishment of Aksum's coinage which was clearly intended to facilitate international trade.

In the fifth and sixth centuries, ivory became progressively more widely used in the Mediterranean world. By contrast, it seems to have had little appeal at this time among the Sassanians or, until much later, the Arabs. It was available in larger pieces implying, whatever may have been the practice in earlier times, that it was imported as whole tusks, probably including those of African bush elephants (Scullard 1974; Cutler 1984; Krzyszowska 1990; Krzyszowska and Morkot 2000). Dptyches and pyxides are among the items that were now made in greatly increased numbers, while the mid-sixth-century throne of Maximian at Ravenna (Rodley 1994) shows that ivory could now be used on exceptional occasions as a major component in furniture manufacture, not merely as inlay, thus reflecting what we now know to have been an Aksumite achievement some two centuries earlier.

Around the seventh century, there was again a marked reduction in the availability of ivory in the Mediterranean world (Cutler 1999). This date, as I shall argue later, coincides with the start of Aksum's decline as a major economic force and issuer of coinage. One of the factors which has been cited to explain this decline is the establishment of Arabian control over the Red Sea accompanying the rise and spread of Islam, effectively cutting Aksum off from the international trade-routes which it had previously exploited (cf. Sutton in Munro-Hay 1989: 1-6). There seems to have been a similar reduction at the same time in the availability of African ivory in India and China: the Aksumite ships recorded by Cosmas Indicopleustes (Wolska-Conus 1968-73) in the harbours of Ceylon, where goods for trade with more easterly regions were trans-shipped, no longer had access to the Indian Ocean. Gradually, more southerly sources for African ivory were found as sea-borne traders penetrated the East African shore as far as southern Mozambique (D.W. Phillipson 1993b: 230-1). In the early tenth century, al-Mas'udi visited the coast of what is now Kenya and Tanzania, commenting that most ivory exported from Africa went to India and China, not to Arabia (Freeman-Grenville 1962: 15). When African ivory once again reached the Mediterranean, it was in the west, across the Sahara (Levtzion and Hopkins 1981: 95-7; Insoll 1995).

An important component of Aksumite trade but one rarely discernible in the archaeological record would have comprised aromatics, often erroneously linked with southern Arabia to the virtual exclusion of northeast Africa (Hepper 1969; Gottsche 1986; see also Miller 1969).

Gold may have been another significant export. From about the third quarter of the third century it was used to produce coins, Aksum being the only polity in sub-Saharan Africa to have minted its own coinage in ancient times (cf., especially, Hahn 1983, 1999; Munro-Hay 1984; Munro-Hay and Juel-Jensen 1995; and other references cited in these works). Denominations were struck in gold, silver and copper alloy, those in the two less valued metals being frequently elaborated by the application of gilding to particular parts of the design. Aksumite gold coins are found only rarely in Ethiopia and Eritrea but are more frequent overseas, most notably in Yemen and India; significantly, they almost invariably bear Greek inscriptions. This, and the fact that their weight was apparently based on standards prevailing in the eastern Roman Empire, suggests that they were primarily intended for international circulation. By contrast, coins in silver and copper alloy are much more common on Aksumite sites and bear inscriptions in the local Ge'ez language, as befits a medium whose circulation was largely internal.

As Aksumite control over the Red Sea developed, the maritime route replaced the complex overland link to the Nile that had been in operation since pharaonic times (Sidebotham 1991; Peacock 1993). The range of Aksum's overseas trade extended widely over the coastlands of the Indian Ocean and the Mediterranean. Indeed, Aksum appears to have been a key link in the commerce between the Roman Empire and the Indian subcontinent (Desanges 1978a, b; Begley and de Puma 1991; Boussac and Salles 1995).

Material culture

Our knowledge of Aksumite art and technology is restricted by the limited survival of material. Although ivory has only been preserved in exceptional circumstances, most notably in the fourth-century Tomb of the Brick Arches, the techniques by which it was worked (pp. 460-8) are informative. While flaked stone tools were probably used in some stages of its initial preparation and shaping, metal was employed at later stages: sawing, filing, scraping, cutting, drilling and lathe-turning are all demonstrated, requiring a range of specialist tools. Figurative carving included motifs such as intertwined vines and animals which are widely represented in the ancient world, but displays characteristic African stylistic features. We can thus be confident that, not only was ivory a major export commodity, it was also worked locally with very considerable expertise.

Knowledge of Aksumite domestic artefacts is increasing. Pottery was, as elsewhere in sub-Saharan Africa, exclusively hand-made, without use of a wheel. The elaborately decorated Classical Aksumite wares are mainly known from fourth-century funerary contexts;

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doubt remains of the extent to which such vessels were the prerogative of the élite and/or reserved for interment with the dead. Elaborate painted decoration has been preserved in certain circumstances, almost invariably in tombs, but may have been widespread. Many of the vessels from tombs are small and poorly fired, with soft fabric which contrasts markedly with that recovered on domestic occupation sites. The full significance of this variation *vis-à-vis* chronology, status and function cannot be understood until further excavations have been undertaken and published. Pottery of particular interest includes bowls in the foot of which stand moulded figures of yoked humpless oxen, and jars with necks modelled in representation of female heads whose elaborate hairstyles strongly resemble those favoured in the area today.

It may be assumed that most domestic pottery was produced close to its area of use, although it has not yet proved possible to undertake the detailed fabric studies necessary to confirm this. At least some finer and smaller vessels were, however, transported over considerable distances. Although some Aksumite pottery was slipped and finely burnished, true glazes occur only on vessels - mostly wheel-thrown - which were imported from beyond the Aksumite polity. Imported pottery may be divided between vessels which came to Aksum primarily as containers for some foreign commodity, and those which were brought as luxury items in their own right. Examples of the two categories are large amphorae from Cyprus and/or Syria, which probably contained wine or olive oil, and the fine bowls of African Red Slip ware made in the Mediterranean regions of North Africa. The former, once their contents had been decanted or consumed, were re-used for a variety of purposes, while the characteristic shapes of the latter were imitated by Aksumite potters.

Quantities of glass vessels and beads are found on Aksumite sites, particularly but by no means exclusively in élite tombs. It was often assumed that all this material was imported and, indeed, very close parallels for some may be recognised at sites around the eastern Mediterranean. However, parallels for other items have proved impossible to find; and certain vessels, although closely resembling Mediterranean counterparts, display idiosyncratic features. The suspicion that some of these items may have been produced in Aksum, perhaps by reworking imported glass which may have been broken in transit, has recently been confirmed by the recovery of raw glass at K site (p. 402, above), providing clear evidence that some glass was worked there. Such a practice was by no means unique to Aksum, being attested for example at several broadly contemporary sites in the Sudanese Nile valley (Cool 1996; cf p. 459, above). It is not yet possible clearly to distinguish all imported glass vessels from

those that were produced locally, but it is clear that both categories are represented.

Gold, silver, ferrous and cuprous metals are well represented in the Aksumite archaeological record. They were clearly worked with considerable skill: in addition to the basic smelting and forging, techniques for which we have evidence include welding, riveting, production of even-thickness plates and wires, drilling, perforating, casting, polishing, plating (including both annealing and mercury gilding), and enamelling. Despite the recovery of slag and crucible fragments at K site, no extensive Aksumite metal-working sites have yet been located. Wherever they were, such sites and their associated debris must have been very substantial and their operation must have required much labour and fuel. Quarrying (pp. 229-47, above) must have involved the use of large numbers of iron wedges, none of which have yet been found. Although the *Periplus* (Casson 1989: 52-3) reports that iron and brass was imported to the region from overseas, the sheer scale of Aksumite metallurgy indicates that it was largely local, involving production of utilitarian and luxury goods: a few imported luxury items have nonetheless been recognised.

The 1993-7 Project undertook a study of the ancient quarries at Gobedra Hill, west of Aksum, and was able to ascertain the route by which stone may have been transported from there into Aksum. It was established that blocks of stone were detached by means of techniques known in Egypt from Ptolemaic times (Aston *et al.* 2000: 7; cf. also, for Sudan, Harrell 1999). Depending on the location of the particular quarry, a slipway (cf. Peacock and Maxfield 1997: fig. 7.2) may have been constructed to facilitate lowering the extracted blocks to level ground across which they could be transported to Aksum. A route has been traced along which even the largest stelae might have been transported without encountering impassable gradients. This and the possible methods of transportation and stela-erection are discussed above (pp. 247-54), with speculation on the huge resources that must have been required and the possibility of wheeled transport being employed.

Alongside the technological sophistication represented by the working of metal, ivory and glass, it is important to recognise that the Aksumites continued to make and to use flaked stone tools in continuation of traditions practised in the area for many centuries, if not millennia, previously. This, and the agricultural base on which the civilisation's prosperity ultimately depended, emphasise the local roots of ancient Aksumite civilisation.

Although there are major lacunae in research coverage, it is possible to suggest some changing patterns in Aksumite material imports. In the fourth century, foreign glass and occasional pieces of imported

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metalwork are represented, pottery from outside the Aksumite hegemony being effectively absent. By the sixth and seventh centuries, however, glazed pottery was imported from Mesopotamia / Syria and Egypt, amphorae and their contents from Cyprus, Syria and the northern Red Sea, and bowls from North Africa. Aksum's exports are less easy to recognise in the archaeological record of recipient countries, but gold coins in both Yemen and southern India indicate the scale of dispersal. Ivory cannot yet be traced to its original source but it is tempting to attribute the decline of its price in the Roman Empire during the late third century, and its sudden scarcity from the seventh, to the fluctuating fortunes of Aksum's export trade.

From the third century onwards there was a marked increase in Aksum's involvement in international affairs. Contact with South Arabia continued and developed, at times amounting to Aksumite political control (Smith 1954). More important, however, were links via the Red Sea both to the north with the Mediterranean world, and to the south, with lands bordering the Indian Ocean and, by way of south India and Sri Lanka, with regions further east. These facts have been appreciated for a long time, primarily from written sources. Recent research permits numerous refinements. Aksumite coinage was initiated late in the third century in order to facilitate international trade; its use was subsequently adopted in local transactions. It was probably during the third century that ivory from Aksum became readily available in the Roman Empire. Imports from that area may not have become common at Aksum until rather later, but the archaeology of this period is poorly known except through the élite graves whose artefact assemblages may be atypical in this regard. By the sixth century, imports are attested from many sources.

When considering imports, it is essential to include the less tangible as well as those directly represented in the archaeological record. Here must be included Christianity itself (D.W. Phillipson in press), which came in later Aksumite times to occupy a major place in state and popular affairs which continued for many hundreds of years after the decline of Aksum. From the third century, Aksum's aspirations to membership of the eastern Mediterranean world were symbolised by the use of Greek in stone inscriptions and by the issue of coins.

Coinage

The Late Aksumite deposits at D site yielded a total of 26 coins, study of which throws interesting light on the sequence and dating of the sixth-century and later coinage issues. There has been some uncertainty (cf. Munro-Hay 1984; Munro-Hay and Juel-Jensen 1995; Dr Rodolfo Fattovich *pers. comm.*) over the precise ordering of the last six coin-issuing kings of Aksum,

following the reign of Kaleb whose date is firmly fixed historically in the early sixth century. The sequence argued in the most recent and comprehensive publications (Munro-Hay and Juel-Jensen 1995; Munro-Hay 1999) is: Ioel (types 127-35), Hataz (types 136-42), Israel (types 143-4), Gersem (types 145-50) and, finally, Armah (types 151-3). Coins of Israel are rare, being represented by only a single example in the British Museum collection of 628 Aksumite coins, and two in the Juel-Jensen collection: none was found at D site. Ioel, Hataz and Gersem were, however, represented in D site Late Aksumite contexts by 6, 10 and 2 coins respectively. Remarkably, Armah - whose coins overall are among the commonest issues - was not represented, although a single example came from the mixed topsoil deposits. It may be tentatively suggested that D site may have been abandoned before Armah's reign, perhaps during that of Gersem. The D-site stratigraphy serves to confirm the sequence of rulers suggested by the recent numismatic studies cited above.

More generally, the total of 206 Aksumite coins recovered during the excavations described by Munro-Hay (1989: tab. 12.1) and in the present work (Appendix V) include only ten (4.8%) of Armah, less than half their representation in, for example, the British Museum collection (Munro-Hay 1999). Perhaps Aksum as a whole was significantly reduced in population and prosperity at this time; indeed, Aksum may already have lost its capital status. Economic change at this final stage is indicated in the coinage itself: Armah is the only coin-issuing king in the entire series for whom a gold issue is not known, and there appears to have been significant change in the weight of the base-metal coins.

The radiocarbon dates obtained on samples from D site provide a further indication of the absolute date at which these developments took place. Their evidence implies that this date may have been slightly later than that which has recently been argued, as in further discussed below.

Decline

The date and manner of Aksum's decline is a topic surrounded by controversy. Ethiopian tradition is often interpreted as indicating its survival as a political capital into the tenth century (Munro-Hay 1991: 95-9); and the Aksumite coinage was formerly interpreted as having continued until that date (Anzani 1926). More detailed study (Munro-Hay 1984) has, however, suggested a significantly shorter coinage chronology which has recently received support and minor modification from radiocarbon dates for Late Aksumite occupation at D site. It is now argued that issue of the coinage ceased by the end of the seventh century and that by or even shortly before that time

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Date according to calibrated radiocarbon	Phase	Coins					
		Anon	Wazena	Ioel	Hataz	Gersem	Armah
	4 - 6A						
late 6 cent. AD	7B						
	8		*	*	***		
	9	*		**	***	*	
mid- to late 7 cent.	10	*			*		
	11	*	*	***	****	*	
end-7 cent. AD	12 - 13						
	post-Aksumite				**	*	*

Fig. 418 Late Aksumite coinage chronology, as suggested by radiocarbon determinations at D site.

the scale of human settlement at Aksum had sharply declined. This conclusion was strongly argued by Butzer (1981) whose dating was, however, influenced by the long coinage-chronology then in vogue. Two factors may have contributed independently to this decline. Locally, the scale of the area's exploitation during the previous half-millennium must have had a great impact on the essentially fragile environment: there is now archaeological attestation for reduced use of timber for construction and for scarcity of fuel which will have reduced availability and increased the costs of metal and numerous other commodities; increased run-off and soil erosion will have reduced agricultural productivity and predictability, affecting not only the overall prosperity and physical well-being of the population but also the availability of labour for prestige projects. Internationally, the rapid expansion of Islamic control of the lands bordering the Red Sea, most notably the conquest of Egypt in AD 642, effectively cut Aksum's link with the long-distance trade on which her prosperity had partly depended. Traditions of ninth-century famine in Tigray have been noted by Pankhurst (1985).

For centuries thereafter, the peoples of highland Ethiopia developed their predominantly Christian traditions on an island surrounded by Islam, maintaining only tenuous links with their co-religionists around the Mediterranean. It is in the architecture and other accoutrements of mediaeval Ethiopian Christianity that the legacy of ancient Aksum may be most

clearly seen. Churches both built (as at Debra Damo - Matthews and Mordini 1959) and rock-cut (as at Lalibela - Buxton 1947; Gerster 1970) display the timber-frame construction attested in the Aksum élite structures and represented on the carved stelae.

Retrospect

We can now view Aksumite civilisation more clearly and firmly in its Ethiopian and African context. This was not, as some earlier European and, indeed, Ethiopian scholars have suggested, a transplant onto African soil of an essentially Arabian culture. Its subsistence economy and aspects of its technology were both firmly rooted in indigenous practices which may be traced back for many centuries if not millennia. The basic technologies are essentially African. Other elements, with undoubted South Arabian connections, had been present on the African side of the Red Sea long before the rise of Aksum. The location of Aksum may best be understood as facilitating exploitation of African resources. These developments began on the Ethiopian plateau at a time when links between that area and the outside world beyond South Arabia were far less developed than was subsequently the case.

Equally striking is the extent to which Aksum is shown to be directly ancestral to recent cultural phenomena in the northern Ethiopian highlands. The crops that were cultivated, the animals that were herded, the textiles, personal adornment, hair-styles and certain architectural elements all show close

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parallels over a period of more than fifteen hundred years. Even *gebeta* and the curse of lathyrism are now traced to ancient Aksum.

The research here described has thus confirmed Aksum's ancestral place for much of Christian Ethiopian civilisation. A much broader understanding of ancient Aksum is now available. The following may be listed among the Project's principal achievements:

- a) a detailed view of the local subsistence economy during Pre-Aksumite and Late Aksumite times
- b) a greatly improved understanding of the age, sequence, production and significance of the stelae
- c) discovery of finely carved ivory, study of which throws much light on Aksumite artistry, technology and international connections

d) illustration of the living and burial places of non-élite Aksumites

e) establishment of a detailed chronology, especially for the Classical Aksumite and Late Aksumite phases.

Aksum provides an important case-study of an ancient civilisation about which archaeological information is rapidly increasing but which is also known from a variety of historical sources such as are rarely available in sub-Saharan Africa. The picture that is emerging from recent research which has employed all these sources emphasises both the far-reaching contacts of the Aksumite state and the breadth of influence which these contacts had on the development of a polity whose roots were firmly anchored in its African homeland and whose descendants have continued to flourish into recent times.

Appendix I

The 1992 Research Design

(This is the text of the original research design prepared in September 1992 for consideration by the Ethiopian authorities and by potential financial supporters. It is reproduced verbatim, edited only by the omission of certain references to named individuals and organisations.)

PROPOSED RENEWAL OF ARCHAEOLOGICAL RESEARCH AT AKSUM, ETHIOPIA

The British Institute in Eastern Africa conducted large-scale archaeological investigations at Aksum in 1972-4, and now has pleasure in proposing their resumption. This paper presents outline proposals for a research strategy, for collaboration with Ethiopian and foreign scholars, for the participation and training of Ethiopian archaeologists, and for the publication of the results. It also considers the implications of the work both for monument conservation and for museum development.

Research objectives

The Institute proposes in the first instance a campaign of archaeological research based on five annual field seasons of approximately two months duration each. The Project would focus on the development of urbanism in northern Ethiopia, with an emphasis on domestic economy. The main objectives currently envisaged are:

a) to complete the work on the tomb-and-stelae complex conducted by the Institute under Dr Chittick's direction in 1973-4. The main task would be to complete excavation of the three major tombs (the 'Tomb of the Brick Arches', the 'Mausoleum' and the unentered 'East Tomb') discovered in 1974. Of these, the first offers excellent preservation of organic materials in partly waterlogged conditions,⁵⁸ the other two are megalithic constructions associated with the largest of the Aksumite stelae. It could be argued that, the work having been initiated by the Institute, this body has a moral obligation to complete it. It is reasonable to anticipate that these tombs will yield important results and will provide a good base on which to raise funds for future research.

b) to investigate Aksum as a town, with emphasis on domestic buildings (which have been effectively ignored by previous researchers) and economic developments through time. This is expected to throw light

⁵⁸ [When excavations were resumed in 1993, it was found that these waterlogged conditions no longer prevailed, as noted on p. 36, above.]

on the greater problems of early Ethiopian food production, and to permit an evaluation of the respective contributions to Aksumite civilisation of Arabian elements and of indigenous Ethiopian culture. The need for a clearly defined chronological framework for Aksumite chronology has long been felt, and its establishment would be one focus of the research at this stage.

c) to investigate the rural setting of Aksum and its relation to outlying settlements as well as to its predecessors. This would follow research begun by Dr Joseph Michels of Pennsylvania State University, and on the small-scale excavation of Gobedra Rockshelter by the Institute in 1974. A related topic would be investigation of the specialist workshops that may be inferred from the proliferation of so-called Gudit scrapers in several areas to the west of Aksum. Likewise, it would be important to study the stone-quarries where the stelae were evidently produced. It is only through working on this broad scale that we can hope fully to understand the basis of Aksum's wealth and the significance of its long-distance trade. Here, in particular, the Institute would seek to collaborate to the fullest possible extent with other research initiatives.

This tripartite strategy does not necessarily represent successive phases of research. Certain aspects, such as the quarries and the Gudit-scraper workshops, would be entrusted to particular specialists, with timing dependent on their availability as well as on funding. The detailed strategy will clearly have to be developed as the Project proceeds.

Personnel

The Institute has nominated Dr David W. Phillipson as Project Director for such work at Aksum as it may be permitted to undertake.

It is the Institute's firm intention to collaborate with Ethiopian scholars to the closest extent possible. Personnel at Addis Ababa University have been asked to act as historical advisors. Ethiopian professionals, students and assistants will be encouraged to participate throughout the Project, as noted above.

The Institute would also plan to recruit a team of specialists, including excavation supervisors, specialists in ceramic, numismatic, metallurgical and

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economic analysis and other fields, together with a photographer, architect and structural engineer.

Conservation

Archaeological research at Aksum cannot be separated from questions of monument conservation and presentation. The Institute has already established contacts relating to the International Campaign to Safeguard Ethiopian Monuments. There are several ways in which the Institute would hope to co-operate with this campaign. Excavation and recording should be conducted with a view to the eventual preservation of the remains, and to securing the authenticity of any consolidation and/or reconstruction which may be undertaken. It is also necessary to ensure that important materials are not destroyed or obscured in the process of conservation work.

These factors will be of particular significance in the tomb-and-stelae area. It is, for example, imperative that the associations of the great multi-storeyed stelae are thoroughly explored and that all available archaeological information is obtained: this will ensure that the permanent presentation of these monuments accurately reflects their unique importance.

Training

The Institute recognises that research at Aksum will provide excellent opportunities for the training of Ethiopian archaeologists and support personnel. Although the Institute cannot use its own funds to provide bursaries for study at United Kingdom

universities, it has links with other organisations able to finance such training.

It is anticipated that the Aksum excavations will provide excellent opportunities for Ethiopian students to obtain experience and training in archaeological field techniques. The Institute would also be keen to assist with advice and/or training in the field of museology, with particular reference to the preservation and display of Aksumite materials both at Aksum and elsewhere.

Publication

The Institute has developed several channels of publication which are now well established; they enable it to guarantee prompt publication of future research.

The Institute's 1972-4 work at Aksum has been fully published as volume 10 in its Memoir series: *Excavations at Aksum, an account of research at the ancient Ethiopian capital directed in 1972-74 by the late Dr Neville Chittick*, by Dr S. C. Munro-Hay. It is anticipated that future work at the site will also receive definitive publication in one or more volumes of this series. The Institute would be able to ensure that copies of such volumes were promptly available in Ethiopia at a realistic price.

It is recognised that accounts of all work undertaken should be promptly offered for publication within Ethiopia. Reports will therefore be offered regularly to *Annales d'Ethiopie*,⁵⁹ *Journal of Ethiopian Studies*, etc., while the Institute's own annual journal, *Azania*, is also available.

⁵⁹ [Contrary to intentions stated in 1993, publication of *Annales d'Ethiopie* was suspended for ten years after 1990.]

Appendix II

Classical Aksumite pottery: surface treatment and decoration (Jacke Phillips)

Although there are some exceptions, surface treatment on Aksumite pottery can generally be summarised by reference to six basic features, which are variously combined on certain vessels:

* **Plain.** A smooth burnished finish is often accompanied by a horizontal groove just below the interior or exterior rim or other minor articulation.

* **Rough-wiped.** Surfaces were irregularly wiped to drag gritty inclusions, producing a roughly textured surface. These vessels were usually painted.

* **Appliqué.** Small elements and elaborations were added to the surface or edges of the vessel.

* **Fenestration.** Apertures were cut through the vessel wall, apparently only on pedestal bases.

* **Painted.** Painted decoration is generally of two types, the result of different techniques: full decorative motifs, and highlighting of certain areas.

Full decorative motifs were almost always painted after firing and the vessel was not subsequently re-fired to fix the colour, resulting in what has been termed 'fugitive' decoration that is easily destroyed by changes in temperature, atmosphere or other conditions once the vessel is removed from its matrix, as well as by rubbing, brushing, washing or virtually any other method of touching the surface during archaeological processing. Consequently, there has in the past been little available information about the painted decoration, or appreciation of the extent to which at least some Aksumite pottery had been so decorated. Pottery from the Tomb of the Brick Arches was carefully collected and promptly examined, any considered to have painted decoration being separated from the rest and not washed. Despite these precautions, there was a clear deterioration in the brightness and preservation of the painted decoration between recovery and conservation. The proportion of recognisably painted sherds from the 1993-6 excavations in this tomb is estimated as roughly one third of the total. Time and resources permitted only a small quantity to be conserved, and only a small selection,

not necessarily representative, of the painted pottery is considered here.

Highlighting was much less common than full painted motifs. Paint was applied as an added decoration in itself. White paint has most commonly survived, but often the paint has disappeared completely, leaving only a better-preserved and often shiny surface to indicate its former existence. The paint was often applied over incised or moulded decoration, but having little co-ordinated relationship to it. The paint, and/or the technique, involved appears to have been different from that used in fugitive all-over painting, and the vessels may have been fired after the colour was applied.

Only natural colours appear to have been available: a brilliant white, ochre yellow, light orange, orange, orange-red, pink, dark red, and black. Samples examined by Dr Mark Clarke have proved of insufficient size to yield meaningful information as to the identity of the pigments. Mixing was uncommon and used chiefly in more complicated designs where subtle colouring was desired. Pink could be produced by mixing the red and white, the orange-red and oranges by mixing the yellow and the darker primary red, whilst mixing yellow and white could produce a lighter and more brilliant yellow colour. The pigments seem to have been ground to a powder and mixed with a binder, being then applied with brushes of varying widths. Solid background colours may have been applied by dipping. All full painted decoration was applied over a solid thickly-applied white undercoat which is often the only surviving evidence of the vessel's colourful past. Despite the complexity of many of the designs as recovered, the actual repertoire of decoration is quite limited, similar vessel forms being apparently decorated with similar designs.

* **Classical Aksumite decoration** can be incuse (incised / impressed) or moulded in relief. It generally consists of a combination of elements in a repetitive formula. These elements, in both horizontal and vertical formats in predictable locations, include Wilding's (Munro-Hay 1989: 239) ovoid walk punctate (OWP), dotted bands, corrugation or fluting, diamond-shaped diaper bands with dotted or ticked infill, 'Λ' marked

Archaeology at Aksum

dashed bands, and (horizontally only) two-line parallel chevrons. Illustrations of the recognised patterns are provided in Fig. 419; comments relate to material from the Tomb of the Brick Arches.

Horizontal patterns (neck/shoulder/upper body):

[A] corrugation only; virtually universal on jar necks; common on beakers and bowls

[B] two OWP bands, bordered by rough corrugation; rare on rebated vessels only

[C] two bands, one chevron and one OWP, in that order and separated by two or (usually) three lines of corrugation; very common on jar shoulders

[D] three bands, one chevron, one OWP, and one dashed, in that order and separated by two or (usually) three lines of corrugation; not uncommon on jar shoulders

[E] three bands, one OWP, one infilled diamond, and one OWP, in that order and separated by wide corrugation; rare on rebated vessel necks only (Figs 47b, g)

[F] four bands, one chevron, one OWP, one dashed, and another OWP, in that order and separated by three lines of corrugation; rare on the shoulders of jars only

[G] two bands, one unembellished and one OWP, in that order and separated by either two or three lines of corrugation; rare on jar shoulders only (Figs 49a, d, f)

[H] three bands, one chevron and two OWP, in that order and separated by three lines of corrugation; rare on jar shoulders only (Fig. 47d)

[J] one chevron band, with an unembellished (uncorrugated) band below; rare on jar shoulders only (Fig. 50c)

Vertical patterns (body):

[1] corrugation only; very rare on bowls and jars (Fig. 49f)

[2] alternating bands of corrugation and OWP; common on beakers, bowls and jars

[3] alternating OWP and infilled diamond bands separated by bands of corrugation; common

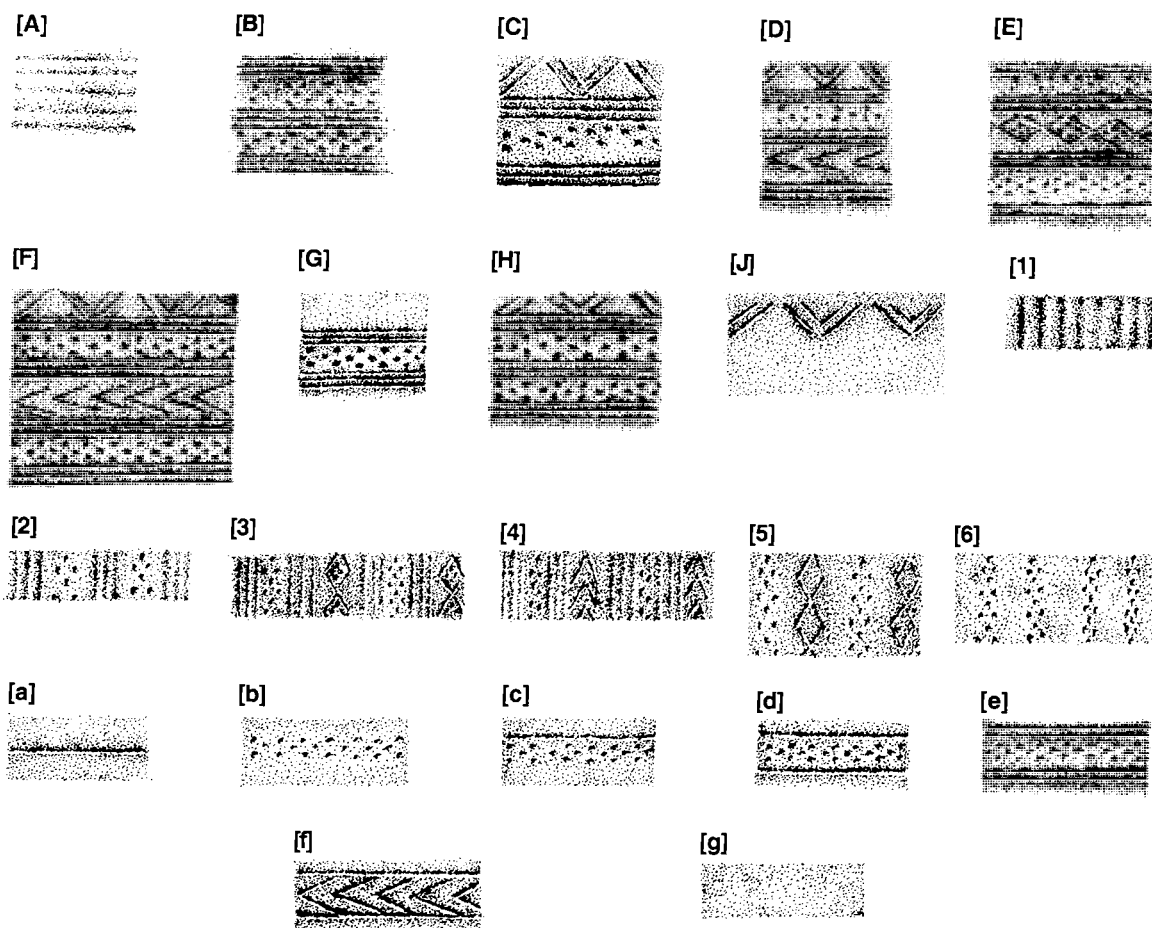


Fig. 419 Classical Aksumite pottery decoration.

Appendices

[4] alternating OWP and dashed bands separated by bands of corrugation; uncommon (Fig. 50c)

[5] alternating OWP and infilled diamond bands, without corrugation (perhaps due to incomplete preservation of the vessel surface); rare and found on beakers only

[6] OWP bands only, without corrugation (perhaps due to incomplete preservation of the vessel surface); rare on beakers, jars and rebated vessels

Horizontal patterns (base/lower body):

[a] incised line only; common on bowls, not uncommon on jars

[b] OWP band only; common on beakers and bowls, also on one rebated pot (Fig. 47g)

[c] OWP band below incised line; not uncommon on beakers and bowls

[d] OWP band with incised one-line border; not uncommon on bowls

[e] OWP band with incised two-line border; rare on bowls (Figs 43d, h)

[f] band of dashes with incised one-line border; rare on interior of basins

[g] devoid of horizontal embellishment, vertical pattern merely tapers out; common on beakers, bowls and jars.

Appendix III

Petrology of imported amphorae

(David Williams)

Sixty-one small chips of amphorae recovered from recent excavations at Aksum were submitted and examined in thin section under the petrological microscope. They were accompanied by drawings of the main amphora types represented (cf. Figs 283a-c, 343a), together with brief fabric descriptions and Munsell colour-chart references. The two main objectives of the analysis were to identify the particular amphora forms present, and to offer some indication of the geographical locations where they were originally made. Details of the samples examined are available in the Project Archive; a summary is presented in Fig. 420. With three exceptions (nos 59-61), the samples fall into four categories, as discussed below.

Two main fabric groups account for 56% and 21% of the samples. The smaller of these, representing thirteen samples, has inclusions derived from basic rocks identical with that associated with Late Roman I (LR1) amphorae from southeastern Turkey/Cyprus (Peacock and Williams 1986: class 44); there can be little doubt that these vessels originated in the Mediterranean region.

By contrast, the larger group, comprising thirty-four samples, has a distinctive granitic fabric. The group includes a small number of samples whose form resembles the 'Ayla-Aksum' amphora type (Hayes 1996: 159-61) which is said to have been made in the pottery kilns at Aqaba (Whitcomb 1995). The area around Aqaba contains granitic rocks but, without comparative samples from the kilns, it is at present difficult to say whether the Aksum vessels came from there. The fabric is also concordant with the geology of the Aksum region, so local production cannot be ruled out on petrological grounds. If some vessels in this group were made at Aqaba, we are still faced with the question of the source of the large number of other vessels in this fabric group. Did they also come from Aqaba, from another source with similar geology, or were they produced at or near Aksum? The latter suggestion is weakened by the fact that all pottery known to be of local Ethiopian manufacture is hand-made, without use of the potter's wheel that was invariably employed in making the amphorae. A fabric examination of locally made coarse Aksum pottery and a comparison with the amphorae is being undertaken in an attempt to answer this question.

It is more difficult to attempt to source the remainder of the Aksum samples analysed since, for the main part, the fabrics contain a range of common inclusions. Taken as a whole, the petrological evidence suggests that just under one-fifth of the samples certainly originated from the Mediterranean region. It seems likely that most of the remainder were either made at Aqaba or at some other unrecognised source having a similar geology. This suggests that the main source for foreign amphora-borne commodities imported to Aksum was from the area around the north of the Red Sea rather than the Mediterranean.

PETROLOGY AND FABRIC

Granitic fabric

All the samples listed under this heading (nos 1-34) share a common range of non-plastic inclusions derived for the most part from igneous rocks. These include frequent ill-sorted angular to subangular grains of quartz, large discrete grains of plagioclase and potash feldspar, strands of muscovite mica together with larger grains of biotite, occasional grains of pyroxene and amphibole and fragments of a granitic rock. There are also occasional pieces of a quartz-sandstone in some of the samples. Amongst this group there are some slight textural variations, nos 4, 8, 9, 18, 19, 20, 29, 30 and 33 being slightly more micaceous than the others.

The general uniformity of the group as a whole suggests that these amphorae may have originated in the same production region. The basement formations around Aksum include granites (syenites) and basalts (D.W. Phillipson 1998: 13). It is difficult to be certain until clay sampling and analysis of the local coarse pottery has been completed, but certainly the range of inclusions present in these thirty-four amphora sherds is not incompatible with a source in the general area of Aksum.

The drawings show that the amphora forms represented in this group include examples (nos 1, 2, 5, 7 and 32) of the so-called 'Ayla-Aksum' type of late fourth to fifth centuries AD, with lid-seated rim and long cylindrical body (Hayes 1996: 159-61; see D.W. Phillipson 1998: fig. 23 bottom left for an

Appendices

<u>No.</u>	<u>Co-ord- inates</u>	<u>Form</u>	<u>Ribbing</u>	<u>No.</u>	<u>Co-ord- inates</u>	<u>Form</u>	<u>Ribbing</u>
Granitic fabric				34.	Surface	small, narrow	some on neck
1.	D19(35)	large	deep	Fine, dense fabric with quartz			
2.	D16(22)	medium, handled	ridge for stopper	35.	D19(26)	long, thin	
3.	K5(4)	large, narrow	ribbed	36.	MK(4)	medium, globular	small
4.	K4(1)	globular	shallow	37.	K10(1)	?shouldered	worn
5.	D22(228)	narrow		38.	K2(3)	globular	shallow
6.	D22(269)	narrow, 2 handles	ribbed	39.	K2(4)	globular	irregular
7.	D22(228)	narrow	ridge for stopper	40.	D22(217)	?globular	shallow
8.	D22(210)	large, narrow	broad	41.	D22(220)	globular, shouldered	almost none
9.	D22(273)	large	broad, irregular	42.	MA21(5)	globular	shallow, irregular
10.	D22(209)	large, narrow	deep, regular	43.	D19(100)	medium/large, globular	broad, shallow, interior
11.	D22(207)	large, narrow	deep irregular	44.	D19(1)	large, ?globular	none visible
12.	D23(1002)	large	deep	45.	D19(3)	medium/large, globular	
13.	D23(1002)	large	deep, broad, regular	46.	K5(13)	?globular	irregular
14.	D22(239)	large	shallow, regular	47.	K9(7)	medium/large, narrow	shallow, ?regular
15.	M6A(8)	large	deep, irregular	Micaceous fabric			
16.	M6A(1)	large	worn	48.	D22(260)	?globular	none visible
17.	MA40(4)	large	broad	49.	K4(11)	?globular	shallow
18.	MA13(1)	medium, globular	small, regular	Tight-packed quartz fabric			
19.	M5(11)	medium/large	regular	50.	D22(219)	globular	shallow
20.	MA19(5)	large	regular	51.	M5A(5)	?globular	small
21.	E1(2)		worn, shallow	52.	E2(1)	globular	worn, widely spaced
22.	S7(6)	medium, ?globular		53.	K9(7)	?globular	irregular, shallow
23.	Unstratified	large, narrow	broad, shallow	54.	K7(6)	medium/large, globular	regular, narrow, deep
24.	S3(1)	narrow	shallow	55.	M6C(10)	medium/large, shouldered	small
25.	D19(13)	large, narrow	regular, deep	56.	D19(13)	medium globular, shouldered	irregular
26.	D19(85)	large, ?narrow	deep, regular	57.	K6(6)	?globular	ribbed
27.	D19(30)	large, narrow	deep, regular	58.	K5(6)	medium/large, globular	none visible
28.	D19(100)	large, narrow	deep, regular	Others			
29.	D19(13)	?globular	deep, flat	59.	D19(13)	wide	faint, irregular
30.	D19(16)	large	shallow, regular	60.	K10(1)	?globular	worn, shallow, internal
31.	D23(1009)	large	regular, shallow, narrow				
32.	D22(304)	large, narrow	irregular, shallow				
33.	D22(235)	large, narrow	wide,				

Fig. 420 Summary of amphora samples examined.

illustrated example from Aksum). Kilns are known at Aqaba (Whitcomb 1995) for this type of amphora, which seems to have had a fairly wide distribution (*ibid.*) and is known to have reached Yemen, along with 'a great amount of Aksumite hand-made pottery' (Sedov 1996: 28 and pl. IIa; see also Sedov 1992). The evidence from Aksum suggests that availability of these vessels may have continued well into the sixth century.

Fine, dense fabric with quartz

The fabric shared by samples 35 to 47 is fairly dense, with a fine-textured clay matrix containing moderately frequent silt-sized quartz grains and flecks of mica. Scattered throughout the matrix are prominent reddish brown pieces of serpentine and grains of pyroxene which are either colourless or stained reddish brown. This is a very distinctive fabric when viewed in thin section and the similarity of texture from sherd to sherd suggests that all the vessels were made at the same production centre or at least in the same region. This particular fabric has been encountered by the writer before and is associated with the late Roman amphora form LR1 (Peacock and Williams 1986: class 44). An examination of drawings of some of the vessels represented by the Aksum samples shows that they conform to the standard shape of the LR1 amphora type (*e.g.* nos 35, 36 and 47 in Fig. 420).

This amphora form was one of the most important and widely distributed during the late Roman and Byzantine periods. It is found in most countries that border on the Mediterranean, and also reached the Black Sea region and parts of northern Europe. It is now clear that the main centres of production were situated in two regions: along the coastal strip of Cilicia and northern Syria and on Cyprus (D.F. Williams 1982; Empereur and Picon 1989). The earlier, smaller form with ovoid body and rounded base, is first found in Kourion, Cyprus, which was destroyed by an earthquake *c.* AD 365 (D.F. Williams 1987). This early type has not been recognised at Aksum. The later, more widely distributed type, has a longer, cylindrical body, with widely-spaced ribbing on its middle, gradually narrowing at the shoulder and base of the vessel and accompanied by distinctive grooving on the interior wall of the vessel. The rim is plain, with a widish neck, and the handles thick and stumpy with a deep central groove. Examples of the latter type are found

as late as the mid-seventh century AD on the Yassi Ada wreck off the Turkish coast near Bodrum (G. F. Bass and von Doorninck 1982; van Alfen 1996).

The LR1 amphora is generally thought to have carried olive oil (Tomber and Williams 1986). This view seems to be confirmed by a contents analysis on a LR1 vessel from Sabratha, Tripolitania (Dr John Evans *pers. comm.*) and from labels painted on vessels from Ballana, Egypt, which appear to mention olive oil or olives (Emery and Kirwan 1938). However, other examples from Ballana and also from the Yassi Ada wreck had pitch-lining (*ibid.*; van Alfen 1996), which is normally suggestive of wine transportation. The picture is unclear at present, although both commodities may have been carried in similar vessels; re-use of amphorae is also attested.

The LR 1 type is very common in Egypt, at Saqqara, Kellia and particularly at Ballana, where it was thought to have had a local Egyptian origin (Emery and Kirwan 1938; see also Ballet and Picon 1987). At present, distinguishing LR1 produced in Cilicia and northern Syria and those from Cyprus can be difficult in view of the geological similarities of the two regions. However, the writer is currently making a detailed petrological study of the non-plastic inclusions present in the fabrics of LR1 amphorae, and also their textures, in order to differentiate between the production centres.

Micaceous fabric

It is difficult to be sure when dealing with small chip-pings, but the high mica content present in the fabric of two samples (nos 48, 49), with few additional inclusions, is reminiscent of the LR 10 amphora form, the so-called 'micaceous jar' (Peacock and Williams 1986: class 45). This form, which had a very long production period, is thought to have been made in western Turkey.

Tight-packed quartz fabric

Five samples (nos 50-4) contain a groundmass of tightly-packed well sorted quartz grains mostly up to 0.40 mm in size, with flecks of mica and sparse grains of reddish-brown amphibole. Attribution is difficult when dealing with such common inclusions, but at present a local source cannot be discounted on the petrological evidence. Four further vessels (nos 55-8) could represent slightly coarser versions of this fabric.

Appendix IV

Metallurgical examination and analysis

(Ann Feuerbach)

The study of objects from Aksum has yielded information on the different types of copper alloys and two methods of gilding. In order to investigate the nature of the original metal, twenty samples were examined with a scanning electron microscope equipped with an energy dispersive x-ray analyser for semi-quantitative elemental analysis. Corrosion and debris removed during conservation cleaning from nine samples, and one tack with its base edge polished, were placed on a stub coated with a conductive sticky tape. Ten other objects were sectioned with a diamond saw, mounted and polished using standard metallographic procedures. Metallographic examination of these latter samples was followed by semi-quantitative analysis. The elemental percentages which are mentioned below should be regarded as being very approximate, bearing in mind the factors set out below, along with the fact that the method used was semi-quantitative and the samples were for the most part corroded.

General questions which the research addressed included: the nature of the original metals, methods of manufacture and, in particular, methods of gilding. A number of complications are encountered when examining corrosion products in an attempt to ascertain the nature of the original metal. When an object corrodes the original microstructure is lost and the elemental composition alters. Relics of the original microstructure can occasionally be observed as pseudo-morphs in the corrosion products, thus providing some evidence for the method of manufacture, such as cold-working or casting (Scott 1991: 43-7). By definition, corrosion is an alteration of the original elemental composition. The various metals which compose an alloy react in their own particular manner in different environments. In objects of bronze (an alloy of copper and tin), the tin ions can migrate through the process called destannification; the distribution of tin in the corrosion products can vary enormously, from areas with no tin, to redeposited layers of tin on a surface. It is thus very difficult, if not impossible, to establish the original concentration of tin in a bronze. A similar process, dezincification, occurs with zinc in brass (an alloy of copper and zinc). In order to minimise these problems a number of analyses were, whenever possible, taken from different corroded areas of a single object; in addition, a large area of sample was analysed. The presence of these alloying elements

in a concentration greater than that which can reasonably be expected to be present as an impurity in copper can suggest what the original metal may have been. In this study, dark red corrosion is considered to be cuprite and the green corrosion to be malachite. These terms are used below, but it should be noted that this identification is based solely on visual examination by reflected light. Corrosion also produces complications when investigating methods of gilding, because it is at the interface between the copper substrate and the gold that most of the evidence would have been present. Bearing these complications in mind, there is still a great deal of information which can be obtained from corroded objects.

The items investigated represent a variety of materials and techniques. Two bronze objects show high proportions of tin: high-tin bronze generally contains between 15% and 27% tin, whereas speculum can be defined as having between 30% and 40% (Meeks 1993: 64-5). A fragment of a corroded ring from outside the Mausoleum, M/547, probably phase 3, showed a tin percentage of *c.* 15%. A fragment of a mirror, B/1779 (cf. Fig. 74), from the Tomb of the Brick Arches contained *c.* 30% tin, suggesting that it is speculum. High-tin bronzes and speculum are hard but brittle and exhibit a shiny, silvery reflective surface which can take a very good polish, which is the reason these alloys were used to make mirrors. The mirror appears to have been cold-worked into shape, as were Roman mirrors, whereas Chinese speculum mirrors tended to be cast into shape. Some of the other objects appear to have been made of brass which would have produced a shiny surface resembling gold.

A series of gilded pieces from the primary deposit in the Mausoleum was investigated. Most appear to have used foil for gilding. By definition, foil is thicker than 1 micron (Bray 1993: 183), and in this case the foil appears to have a standard thickness of *c.* 20 microns. In a number of instances, gilding appears to have been applied onto an object of almost pure copper; this would be consistent with diffusion bonding as gold foil adheres more easily to pure copper than to an alloy. The process of diffusion bonding involves burnishing the foil onto the object, which is then heated to red heat. At the interface where the gold and copper meet a thin layer of a copper-gold alloy is formed, bonding the gold to the copper. This method

was evidently used on an unidentified object, M/557\ (Fig. 421a). In the case of a nail M/543\, silver appears to have been applied by the same process, forming a copper-silver alloy at the interface. A cast copper handle, M/465\ (Figs 177f, 178e), on the other hand, appears to have been gilded by amalgam gilding, also called fire gilding (Fig. 421b). In that process a gold-mercury alloy is spread onto the surface of the object, which is then heated to red heat causing most of the mercury to evaporate and the gold to bond to the object.

Details of individual analyses follow.

TOMB OF THE BRICK ARCHES

Cast objects

These three items all come from the block of scrap metal found in the pit in Chamber A: samples were examined from the 'cover' B/3a1\ (Figs 76, 77), the 'trough' B/3a2\ (Fig. 78), and the rondel B/3a3\ (Figs 79, 80). In all three cases, corrosion was found to contain a few percent (<4%) of zinc, no tin being detected, suggesting that their original composition may have been brass. The clay-like material which was excavated out of these pieces contains copper and a trace of zinc which would suggest that they may have formed parts of casting cores, but this could also be due to contamination of the material by the objects corroding around it.

Inlaid plaque

A fragment of a bimetallic plaque with chequerboard design, B/226\ (cf. Fig. 87b), was examined. The frame of the plaque is composed of copper with *c.* 15% zinc, indicating brass. The elongated corrosion suggests that the plaque was cold-worked into shape. It was attached to an iron backing by an unidentified, now white-coloured, substance. The iron corrosion contains relic structures of wood, suggesting that the plaque was originally mounted onto a wood backing. The plaque contains open areas *c.* 6 mm square. Even with the use of x-rays, it was difficult to assess whether these apertures were individually cut out or formed by inlaying carefully placed individual brass squares. X-rays showed that the squares along the edge of the plaque are part of the frame. The squares within the plaque show a small line at the corners where two squares meet. This line might be due to corrosion in a high stress area, or it might be the meeting point between two separate inlay pieces. All areas analysed appeared to be brass.

The plaque also contains squares with an inlay of a siliceous material. This inlay material contains mostly silica (>30%) calcium (*c.* 10%), sodium

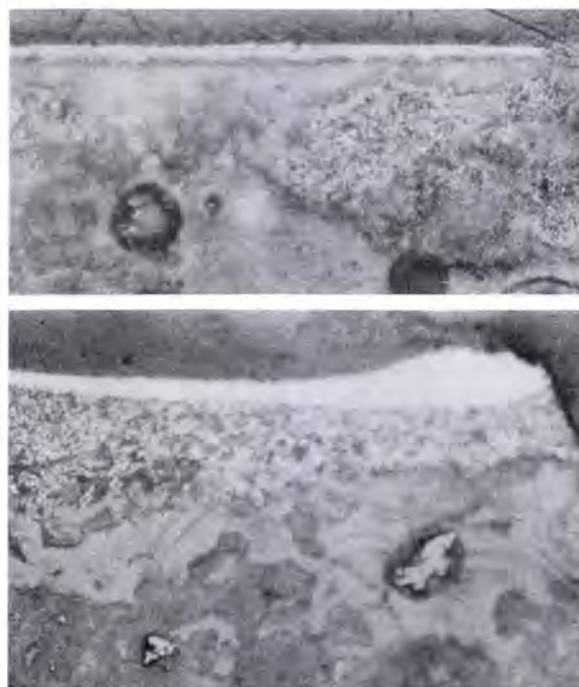


Fig. 421 Microphotographs showing methods of gilding: *a* - diffusion bonding; *b* - amalgam gilding.

(*c.* 15%) and potassium (*c.* 5%). There were at least two different colours used for the inlay. The first is an opaque copper red which exhibits a high degree of porosity. The second colour is a copper blue which was also highly degraded. Green may have also been present but it is not possible to tell if this colour is due to copper corrosion. The inlays could have been glass or enamel.

Mirror fragment

In the corrosion from the mirror B/1779\ (cf. Fig. 74), malachite and cuprite occur as elongated areas suggesting that the corrosion follows the original deformed grain boundaries; this would indicate that the mirror was cold-worked. The elemental analysis suggests that the mirror is speculum (*c.* 30% tin). Metal is still present on one surface area, but may be redeposited. This metallic layer is of a composition consistent with speculum.

MAUSOLEUM PHASE I

Gold foil

The two pieces examined, M/566\ and M/201\ (cf. Fig. 177b), are relatively pure gold with traces of silver (*c.* 2%). M/566\ is encased in a white material, perhaps clay composed mainly of silica, alumina, and potassium.

Appendices

Gilded handle

Examination of this specimen, M/465\ (Figs 177f, 178e), produced interesting results. In metallographic section, cuprite could be seen directly under the gold layer. The corrosion of the malachite suggested that the handle had been cast, while analysis of the cuprite and malachite corrosion suggested that it was made of copper. The metallography also showed that the gold was at one point liquid, implied by the thicker area of gold at the edge due to its surface tension (Fig. 421b). The SEM image of the metallographic sample showed that the gold layer has a granular structure consistent with that of amalgam gilding. The elemental analysis also showed that mercury was present, thus confirming that amalgam gilding had been used.

Other gilded objects

Metallography of specimen M/557\ indicated a layer of gold with relatively consistent thickness suggesting gold foil (Fig. 421a). The elemental analysis of the malachite and cuprite found only copper. The probable method employed was diffusion gilding onto a copper object.

Metallography of a second gilded object, M/586\, indicated a layer of pure gold *c.* 20 microns in thickness, suggesting gold foil. The object itself has completely corroded to cuprite and malachite, no elements other than copper being detected. The gold layer was probably applied by diffusion bonding.

Nails and tacks

Two nails, M/197\ and M/200\ (Fig. 178c), appear to have been gilded with relatively pure gold foil,

containing a small amount of silver. Under the gold, the nails themselves have a layer of cuprite containing no tin or zinc. The application of relatively pure gold on top of copper suggests that a diffusion gilding process was used. A third nail, M/543\, appears to have been covered with silver.

Corrosion on nail M/199\ contained copper and iron but no evidence of silver. The fragment analysed may not have been representative of the nail as a whole, and the iron may be contamination from the soil in the burial environment.

The corrosion from tack M/463\ contains mostly copper (*c.* 40%) and silver (*c.* 20%) with traces of tin (*c.* 1%). A second tack, M/563\ (Fig. 178j), contains mostly silver (about 70%) with a significant amount of copper (*c.* 20%); this would be consistent with a low melting temperature suggesting that the silver was originally cast before being worked into its final shape. The small amount of tin (*c.* 4%) may suggest that it was bronze that was added to the silver.

Corrosion from sheet

The elemental analysis indicated that M/401\ is a corroded piece of copper-silver foil.

MAUSOLEUM PHASE 3

Ring

A ring (M/547\) is totally corroded but a high level of tin was found in the corrosion, suggesting that it was originally a high-tin bronze.

Appendix V

Excavated Aksumite coins
(D.W.P.)

The coins were cleaned and identified in the field by Noël Siver, according to the typology of Munro-Hay (1984). In 1997 they were examined at Aksum by Professor Wolfgang Hahn who confirmed and amplified Ms Siver's identifications. In 1998 monochrome photographs of nearly all the identified coins were

examined by Dr Bent Juel-Jensen who has confirmed correlations with the typology of Munro-Hay and Juel-Jensen (1995), adding a number of additional comments. The coins are listed in Fig. 422 with representative specimens, as indicated, illustrated in Figs 423 and 424.

Inventory number	Munro-Hay 1984	Type-number (Munro-Hay and Juel-Jensen 1995)	Notes	Fig.
D SITE				
D/6\	Anon. AE 2 gilt	76	-	-
D/49\	Hataz AR 1	137	-	-
D/168\	Gersem AE 1a	149	-	-
D/183\	Hataz AE 2	141	-	-
D/228b\	Hataz AE 2	141	-	-
D/229\	Anon. AE 2	76	-	-
D/231\	Gersem AR 1	147	-	-
D/249\	Wazena AE 1 gilt	120	-	424b
D/251\	Hataz AE 1	140	-	-
D/256\	Hataz AR 1	137	-	-
D/262\	loel AE 3	134	cf. JJ 146	423a
D/267\	loel AE 1	132	same dies as JJ 333	423b
D/270\	loel AE 1 (?)	131-2 (?)	-	-
D/272\	Hataz AE 1	140	-	-
D/274\	Hataz AE 1	140	-	-
D/276\	loel AE 1	131	almost certainly overstruck on type 134; other examples of this are known, suggesting that type 134 pre-dates type 131 (and 132)	-
D/277\	loel AE 1	132	-	-
D/295\	Anon. AE 2 gilt	76	overstruck on MHDYS AE 1 (type 70)	423c
D/335\	loel AE 1 (?)	131-2 (?)	-	-
D/337\	Hataz AE 2	141	-	-
D/341\	loel AR 2	130	unvocalised form on reverse, cf. JJ 210/392	-
D/351\	Hataz AR 1	137	-	-
D/363\	Gersem AE 1	148	-	423d
D/374\	Hataz AE 2	141	-	-
D/382\	Armah AE 1a gilt	153	-	-
D/387\	loel AR 2	130	unvocalised form on reverse, cf. JJ 210/392	424a
D/414\	Wazena AE 1 gilt	118-23	-	-
D/426\	Hataz AR 1	137	-	-
D/656\	Anon. AE 1	52	-	-
D/721\	Hataz AE 1	140	-	-

Fig. 422 Excavated Aksumite coins.

Appendices

Inventory number	Munro-Hay 1984	Type-number (Munro-Hay and Juel-Jensen 1995)	Notes	Fig.
EAST TOMB				
E/5\	Anon. AE 2 gilt	76	-	-
K SITE				
K/21\	Anon. AE 2 gilt	76	-	-
K/22\	Hataz AR 1	137	-	424c
K/40\	Hataz AR 1	137	-	-
K/46\	Gersem AE 1	148	-	-
K/49\	Hataz AR 1	137	-	-
K/52\	?	?	-	-
K/62\	?	?	-	-
K/64\	Wazena AE 1	118	-	-
K/68\	Armah AE 1a gilt	153	-	424d
K/103\	Anon. AE 2	76	-	-
K/107\	loel AE 3	134	-	-
K/117\	?	?	-	-
K/118\	Wazena AE 1 gilt	118	-	-
K/143\	loel AE 3	134	-	-
K/157\	Hataz AR 1	137	-	-
K/163\	Hataz AE 2	141	-	-
K/171\	Hataz AE 2	141	-	-
L SITE				
L/1\	Anon. AE 2 gilt	76	-	-
MAUSOLEUM				
M/155\	Armah AE 1 gilt	153	-	-
M/166\	loel AE 1	131-2	-	-
M/198\	Anon. AE 2 gilt	76	-	-
M/404\	Hataz AR 1	137	-	-
STELA-2 SITE				
R/3\	Wazena AE 1	118-23	-	-
R/26\	Gersem AR 1	147	vocalised form on obverse, cf. JJ 182	-
R/28\	Hataz AE 1	141	-	-
R/29\	Gersem AR 1	147	-	-
S/4\	Anon. AE 1	51-2	-	-

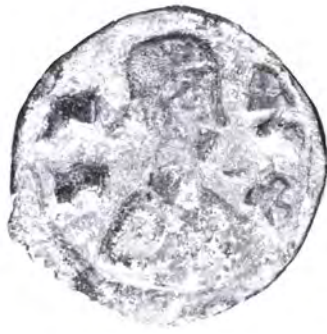
Fig. 422 Excavated Aksumite coins (continued).



Fig. 423 Aksumite coins: **a** - type 134 [Ioel AE 3]; **b** - type 132 [Ioel AE 1]; **c** - type 76 [Anon AE 2]; **d** - type 148 [Gersem AE 1]. For further details, see Fig. 422.

Fig. 424 (opposite) Aksumite coins: **a** -type 130 [Ioel AR 2]; **b** - type 120 [Wazena AE 1]; **c** - type 137 [Hataz AR 1]; **d** - type 153 [Armah AE 1a]. For further details, see Fig. 422.

Appendices



a



b



Appendix VI

Radiocarbon dates

(Compiled by D.W.P., incorporating data supplied by Paul Pettitt, Sheila Boardman and Rowena Gale)

Details of the radiocarbon dates currently available from the excavations here described are summarised in Fig. 425. The analyses, undertaken by the Radiocarbon Accelerator Unit of Oxford University's Research Laboratory for Archaeology and the History of Art, with financial support from the Natural Environment Research Council, have been reported by Paul Pettitt. Identifications of the materials sampled were made by Sheila Boardman in the case of seeds and Rowena Gale for the wood.

Lab. no (OxA-)	Strati- graphy	Sample S=seed C=charcoal	$\delta^{13}\text{C}$	Uncal. age bp	Cal. date BC/AD (68.2% confid.)	Cal. date BC/AD (95.4% confid.)
ANQQR BAAHTI						
8232	A2(5)	S: <i>Hordeum</i>	-22.8	165±35	1660-1780 (0.20) 1730-1820 (0.64) 1920- (0.16)	1650-1890 (0.86) 1910- (0.14)
8360	A2(4)	C: <i>Ficus</i>	-25.1	175±35	1660-1690 (0.19) 1730-1810 (0.69) 1930- (0.12)	1650-1880 (0.88) 1910- (0.12)
BAAHTI NEBAIT						
8359	N1(5)	C: <i>Rhus</i>	-23.5	9495± 50	9120-8990 BC (0.43) 8890-8880 BC (0.02) 8820-8720 BC (0.47) 8710-8690 BC (0.06) 8660-8650 BC (0.02)	9150-8600 BC (1.00)
8384	N1(5)	C: <i>Rhus</i>	-26.3	9975± 55	9610-9550 BC (0.24) 9540-9520 BC (0.07) 9490-9430 BC (0.21) 9420-9300 BC (0.48)	10000-9900 BC (0.02) 9750-9250 BC (0.98)
TOMB OF THE BRICK ARCHES						
8340	B/3\	C: <i>Ficus</i>	-26.1	1705±45	250- 300 (0.36) 320- 400 (0.64)	230- 430 (1.00)
8341	B/3\	C: <i>Acokanthera</i>	-23.4	1655±40	340- 430 (1.00)	250- 460 (0.96) 480- 530 (0.04)
8363	BG(15)	C: <i>Maytenus</i>	-22.7	1725±35	250- 345 (1.00)	230- 400 (1.00)
8364	BG(9)d	C: <i>Ficus?</i>	-24.3	1725±40	250- 380 (1.00)	220- 410 (1.00)
8365	BG(9)d	C: <i>Olea</i>	-24.0	1750±35	230- 340 (1.00)	140- 170 (0.03) 200- 390 (0.97)
8984	BB(15)	Charred bone	-6.7	1925±50	20- 140 (1.00)	40 BC - 230 (1.00)

Fig. 425 Radiocarbon determinations from the 1993-7 excavations at Aksum. Dates are AD unless specified otherwise.

Appendices

Lab. no (OxA-)	Strati- graphy	Sample S=seed C=charcoal	$\delta^{13}\text{C}$	Uncal. age bp	Cal. date BC/AD (68.2% confid.)	Cal. date BC/AD (95.4% confid.)
MAUSOLEUM						
8366	MF(arch)	C: <i>Acacia</i>	-22.5	1745±30	240- 265 (0.27) 280- 335 (0.73)	220- 390 (1.00)
8367	ME34(5)	C: <i>Ficus</i>	-24.1	1645±35	345- 430 (1.00)	260- 290 (0.06) 320- 460 (0.88) 480- 530 (0.06)
GUDIT STELAE FIELD						
8358	G2(5)q	C: <i>Rhus</i>	-24.5	1825±40	130- 230 (1.00)	80- 260 (0.96) 290- 320 (0.04)
8342	G2(4)q	C: <i>Acokanthera</i>	-22.6	1780±40	140- 170 (0.13) 190- 260 (0.56) 280- 330 (0.31)	120- 350 (1.00)
D SITE						
8229	D13(2)-ph.2A	S: <i>Triticum</i>	-21.9	2485±40	770- 750 BC (0.08) 710- 530 BC (0.92)	800- 470 BC (0.96) 450- 410 BC (0.04)
8282	D22(349)-ph.2	S: <i>Triticum</i>	-21.2	2430±50	760- 690 BC (0.32) 650- 640 BC (0.02) 550- 400 BC (0.66)	770- 400 BC (1.00)
8228	D22(277)-ph.3B	S: <i>Gossypium</i>	-25.3	1240±35	690- 810 (1.00)	680- 880 (1.00)
8334	D22(277)-ph.3B	C: <i>Ficus</i> & <i>Acokanthera</i>	-24.7	2480±45	770- 750 BC (0.08) 720- 520 BC (0.92)	790- 470 BC (0.94) 450- 410 BC (0.06)
8283	D19(100)-ph.7B	S: <i>Hordeum</i>	-22.8	1430±50	565- 580 (0.07) 590- 660 (0.93)	530- 680 (1.00)
8983	D19(100)-ph.7B	S: <i>Leus</i>	-20.7	1415±50	595- 665 (1.00)	540- 690 (1.00)
8285	D19(35)-ph.9A	S: <i>Hordeum</i>	-21.6	2190±50	370- 380 BC (0.56) 260- 190 BC (0.44)	390- 120 BC (1.00)
8336	D19(35)-ph.9A	C: <i>Ficus</i> & <i>Acokanthera</i>	-23.7	1590±40	420- 530 (1.00)	380- 570 (1.00)
8337	D22(220)-ph.9A	S: <i>Hordeum</i>	-21.0	1520±50	450- 600 (1.00)	420- 630 (1.00)
8230	D16(26)-ph.10	S: <i>Lagendua</i>	-23.2	1360±40	630- 685 (1.00)	600- 720 (0.94) 740- 770 (0.06)
8286	D19(40)-ph.10	S: <i>Cicer</i>	-20.4	1115±45	885- 975 (1.00)	800-1010 (1.00)
8231	D16(18)-ph.11	S: <i>Linum</i>	-24.7	1285±40	675- 725 (0.60) 735- 770 (0.40)	650- 820 (1.00)
8335	D16(18)-ph.11	C: <i>Acacia</i> & <i>Acokanthera</i>	-23.3	1290±45	670- 725 (0.62) 735- 770 (0.38)	650- 860 (1.00)
8287	D22(248) -ph.12-13	S: <i>Vitis</i>	-22.9	1305±50	660- 770 (1.00)	640- 860 (1.00)

Fig. 425 Radiocarbon determinations from the 1993-7 excavations at Aksum (continued). Dates are AD unless specified otherwise.

Archaeology at Aksum

Lab. no (OxA-)	Strati- graphy	Sample S=seed C=charcoal	$\delta^{13}\text{C}$	Uncal. age bp	Cal. date BC/AD (68.2% confid.)	Cal. date BC/AD (95.4% confid.)
K SITE						
8288	K7(8)-ph.I	S: <i>Hordeum</i>	-21.5	1585±50	420- 540 (1.00)	340- 600 (1.00)
8338	K7(8)-ph. I	C: <i>Acokanthera</i>	-23.4	1590±50	420- 540 (1.00)	340- 600 (1.00)
8289	K8(3/6)-ph.V	S: <i>Triticum</i>	-21.7	1055±50	890- 920 (0.15) 940-1020 (0.85)	870-1050 (1.00)
8339	K8(3/6)-ph.V	C: <i>Acacia</i>	-24.3	1665±45	260- 280 (0.11) 330- 430 (0.89)	240- 460 (0.98) 480- 530 (0.02)

Fig. 425 Radiocarbon determinations from the 1993-7 excavations at Aksum (continued). Dates are AD unless specified otherwise.

Appendix VII

Archaeobotanical methodology

(Sheila Boardman and Rowena Gale)

Sampling and recovery of charred plant remains took place during the 1995-7 field seasons. At the Anqer Baahti and Baahti Nebait rockshelters and at D and K sites, bulk soil samples of 15 to 50 litres were taken from all secure excavated contexts. At the Stela-2 site, three samples were collected from the hearth and floor of the recent house for comparison with the Pre-Aksumite and Late Aksumite domestic-occupation material sampled at D and K sites. These samples were processed by means of a purpose-built water separation machine employing a combination of flotation for retrieval of plant material as 1.0 and 0.3 mm flots, and wet-sieving for collection of residues in 1 mm mesh (Fig. 426; also Phillipson, Reynolds *et al.* 1996).

At the other sites, smaller (0.1 to 1 litre) soil samples were obtained from selected contexts only, and were processed by hand; combined flotation and water separation was again used, with sieve mesh sizes as noted above. At the Tomb of the Brick Arches, the Mausoleum and the Gudit Stelae Field, sampled contexts included primary burial and construction deposits, contents of ceramic vessels, the block-lifted soil which surrounded important artefacts (such as the ivory plaques and cuprous hoard in the Tomb of the Brick Arches), and secondary midden deposits. These samples yielded artefacts and material for radiocarbon dating, as well as charred plant remains.

Following processing, the flots were allowed to dry slowly before sorting or assessment, re-packing and transportation to Addis Ababa University for further study. Sample residues were sorted and plant material transferred to Addis Ababa University.

Identifications

During 1997 and 1998, two study seasons totalling four months were spent at the National Herbarium, Biology Department, Addis Ababa University, where the sorting of most flots and the majority of identifications were carried out. Initially, all coarse flots (>1 mm) were totally sorted for charred plant macrofossils, fragments of wood charcoal greater than 2 mm being retained. The quantities of charcoal, charred seeds and other remains were recorded, together with evidence for recent contamination such as modern rootlets, fresh seeds/fruits, rodent bones and insect remains. The fine flots (0.3 - 1 mm) from all samples containing charred plant remains were fractioned and portions of these, generally <1/64, sorted for charred macrofossils.

The uncharred seeds and fruits encountered were generally fresh in appearance and were frequently accompanied by fragile soft tissue, flowers, leaves, stems, *etc.*, none of which can be expected to have survived from antiquity on the freely draining sandy soils which surround Aksum. These were all considered to be modern contaminants and have not been discussed in the preceding chapters, except where they shed light on post-depositional disturbance of the archaeological deposits.

The number and level of identifications achieved was greatly influenced by the very tight schedule, and by the reference material available in Addis Ababa. Plant reference material for crop plants and some related species was provided by the National Herbarium, and by the International Livestock Research Institute (ILRI) in Addis Ababa. Use was also made of plant reference material collected in the field



Fig. 426 Flotation for the recovery of archaeobotanical materials.

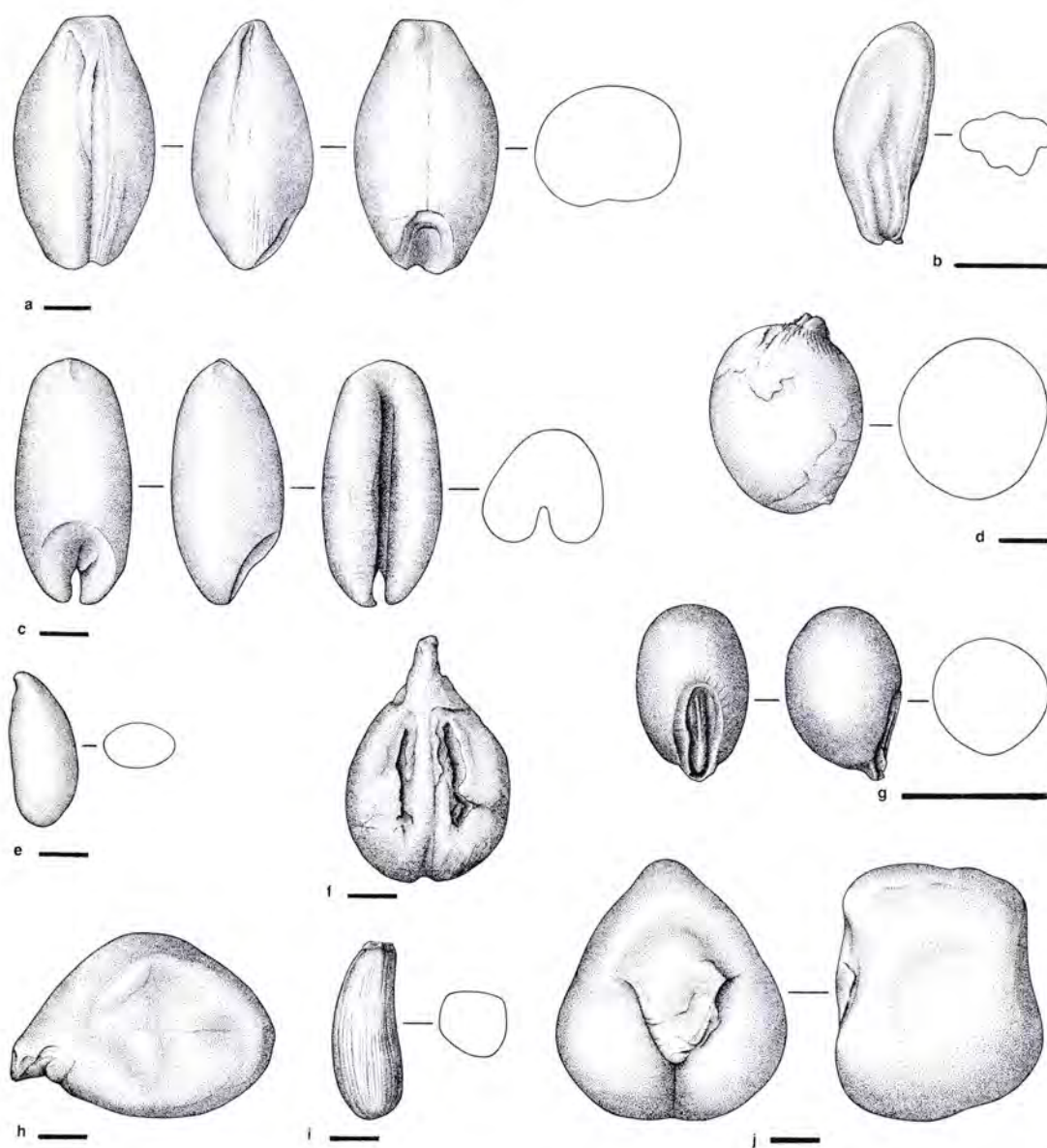


Fig. 427 Seeds: a - hulled barley, b - cress, c - emmer, d - cotton, e - flax, f - grape, g - teff, h - chickpea, i - noog, j - grass pea. Scale: the bar beneath each drawing represents 1 mm.

and bought from markets in Aksum, Gondar and Debarak. At the time of writing, identification of the wild plant species is far from complete.

Cultivated teff was tentatively distinguished from other *Eragrostis* species, using grain characteristics, as follows. A study of the surface characteristics of modern specimens of cultivated teff and other *Eragrostis* species proved inconclusive. These features are also likely to be most affected by adverse preservation condition in charred grain. Size and overall grain dimensions were therefore used. This is different from, but presumably overlaps with, the index based on

length, breadth and width ratios employed by d'Andrea *et al.* (1999). The latter index was developed following charring experiments on different *Eragrostis* species, and collection of extensive metrical data on the charred and uncharred grain (Dr C. d'Andrea *pers. comm.*). Here, turgid (*i.e.* clearly very swollen or inflated, but non-distorted) grains which were greater than 1 mm in length were classified as definite teff (*E. tef*). Other *Eragrostis* species known in the region today which fall within this size range all have grains with narrow or narrowly ellipsoid dimensions, *i.e.* *E. longifolia* Hochst. ex Steud., *E. heteromera* Stapf and *E.*

Appendices

paniciformis (A. Br.) Steud. Turgid grains 0.9-1 mm long are classified here as probable tef (*E. cf. tef*), and smaller grains as *Eragrostis* sp. Grains less than 0.9 mm long were found in modern samples of cultivated teff which were collected from fields around Aksum, or bought from markets. However, there are a large number of other possible *Eragrostis* species within this size range, many of which have ellipsoid to subrotund grain, whose dimensions, following charring, merge with those of the more turgid cultivated teff. In using this broad index it is assumed that, on charring, all *Eragrostis* grains will tend to become smaller and fatter overall, not longer and slimmer. Limited charring experiments by the author and more extensive experiments by others indicate that all cereals show this tendency. Examples of seeds from Aksum are illustrated in Fig. 427.

CHARCOAL

Many charcoal samples noted in previous chapters derive from the bulk soil samples described above. Additional charcoal samples collected during excavation were dried slowly at room temperature before being packed for export. Nineteen samples were selected for detailed species identification, largely to isolate suitable material for radiocarbon dating. Other samples were more selectively analysed, particular attention being paid to domestic contexts associated with Pre-Aksumite and Late Aksumite occupation at D site, where charcoal was often abundant and well preserved.

Identifications by Rowena Gale

The samples typically included ten or more fragments of charcoal, some of which measured up to 100 mm or

more. Fragments from each sample were fractured to expose fresh transverse surfaces and sorted into groups based on the anatomical features observed using a x20 hand lens. Representative fragments from each sample were selected for detailed study at high magnification. These were fractured to expose the tangential and radial planes, supported in washed sand, and examined using a Nikon Labophot microscope at magnifications of up to x400. The anatomical structure was matched to reference slides prepared by Sheila Boardman and Tsige-meskel Wondimhunegn using the facilities at the Royal Botanic Gardens, Kew. Wood samples used for the slides were provided by The Woody Biomass Inventory for Strategic Planning Project, Addis Ababa, and by Economic Botany, Royal Botanic Gardens, Kew. The selection of reference material (wood blocks) was based on present day vegetation and plant communities described in Friis (1992). When possible the maturity of the wood (*i.e.* roundwood or trunkwood) and number of growth rings were recorded from the charcoal. It should be noted that measurements of stem diameters are from charred material; when living these stems may have been up to 40% wider.

The charcoal samples contained a wide range of taxa and, while it was possible to match some charcoal to the reference material, it was clear that a broader range was required to identify the remaining material. It is possible that much of the charcoal currently unidentified could be matched, or named more certainly, when work on the remaining reference material is completed. Charcoal selected for radiocarbon dating comprised either narrow stemmed (*i.e.* juvenile) material, or the most securely named and short-lived taxon.

Appendix VIII

Archaeozoological methodology

(Chester R. Cain)

Analysis of the faunal material was conducted during the 1996 and 1997 field seasons. Priority was given to study of material from the K and D sites in order to obtain information on the domestic economy of ancient Aksum. A small amount of M faunal material from the earliest deposits in the Mausoleum was briefly described. The methods of analysis employed for the material from D and K sites are discussed below.

Excavation was generally with trowels and picks, resulting in a high frequency of modern breaks; sieves were rarely employed. In one seemingly representative sample from D13(2), 73% of identifiable fragments had suffered modern damage. This recovery strategy may have introduced biases like those observed in Mesopotamia by Zeder (1985, 1991). In addition to this hand-collected material, the bone fractions of flotation samples from D16, D22, K2 and K4 were also studied. The latter were not quantified, but their analysis revealed some additional examples of fish and bird remains; there was also a higher proportion of burned bone among the small fragments in the flotation samples than was observed in the hand-collected material.

Modern comparative material was collected locally because no appropriate osteological comparative collection was available in Ethiopia and because the faunal material had to be studied in Aksum. Identification was also based on the author's experience and on reference to osteological atlases (Barone 1980; Boessneck 1969; Brown and Gustafson 1979; Cornwall 1956; Hillson 1992; Krzyszkowska 1990; MacDonald 1992; Olsen 1964; Schmid 1972; Walker 1985).

Individual bone specimens larger than 10 mm in maximum dimension were classified as identifiable or minimally identifiable / non-identifiable. Following procedures used to study other East African faunal assemblages (Bunn *et al.* 1980; Gifford *et al.* 1980; Marshall 1990), the following information was recorded for each identifiable specimen: provenance (site/trench/context), element, segment, portion, completeness, side, age, taxon, size-class, maximum dimension, cut marks, gnaw marks, burning, and measurements. Each identifiable element was recorded in a modified archaeozoological code for body parts (based on Gifford and Crader 1977; Marshall 1990, *pers. comm.*). Segment and portion were recorded as

anatomical directions (Gifford and Crader 1977; Klein and Cruz-Urbe 1984).

Since it was not permissible to remove specimens from Aksum, photographs and / or drawings were made of specimens that required further comparison with reference material or consultation with other faunal specialists. Possibly pathological specimens were also photographed. Further identifications were subsequently made using the comparative collections of the Zooarchaeology Laboratory at Washington University in St Louis and of the Department of Zoology at the Field Museum of Natural History in Chicago.

Broad anatomical categories were used for minimally identifiable and non-identifiable specimens: *e.g.* long bone, cranial, axial (Gifford *et al.* 1980; Marshall 1990). The occurrence of burning and cut marks was also noted. Minimally identifiable fragments were counted and recorded in a modified system for manipulation with the more identifiable remains (Gifford *et al.* 1980; Marshall 1990).

Taxon was recorded to genus or the most detailed taxonomic category possible. The lack of an extensive comparative collection hindered the identification of less distinctive skeletal elements beyond the taxonomic categories of Ungulata and Artiodactyla. Problems that were encountered included differentiating sheep from goat and domestic cattle from local wild large bovids. Despite the fragmentary nature of the material, I attempted to follow the criteria used by other researchers (*e.g.* Boessneck 1969) for differentiating goat and sheep remains. A number of elements probably representing less identifiable fragments of wild bovids, domestic bovids, and other ungulates could only be identified to Family or Order, potentially identifiable elements being assigned to a size-class based on those commonly used for bovids (Brain 1981; Bunn and Kroll 1986; MacDonald 1995, Marshall 1986).

The majority of identifiable fragments were cattle; and most of the less identifiable specimens belonged to size-class III. Ungulates of size-class III were therefore treated as representing cattle in many analyses, such as those of body-part representation and aging. The more inclusive taxonomic category Ungulate was employed for the size-class in order to reflect the possibility that some Perissodactyla and non-cattle Artiodactyla were included among the less identified fragments.

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Measurements of more complete specimens from fully fused elements were taken with callipers to 0.1 mm precision, following the standards suggested by von den Driesch (1976; see also Boessneck and von den Driesch 1978; Grigson 1965; Hole *et al.* 1969; Klein and Cruz-Uribe 1984: 22-3; Meadow 1989, 1991; Uerpmann 1978). Details and conclusions derived from these measurements will be published elsewhere.

Age was recorded for both long bones and teeth. The state of epiphysial fusion was recorded as either immature (unfused) or adult (fused). Wear stages of isolated teeth and tooth rows were recorded using the system described by Marshall (1990: tables 10.1, 10.2; cf. Payne 1973; Silver 1969; Wilson *et al.* 1982). Few rows of *in situ* teeth were recovered and therefore the most reliable means of determining animal age at death was not available for the Aksum assemblage. Isolated teeth could, however, be used to construct a general picture of the age of the cattle from Aksum, almost all being adult *sensu lato* with all teeth erupted and in moderate wear. The use of bone fusion data provided the best basis for estimating the age at death of cattle at Aksum. Sexing criteria were not recorded for the Aksum cattle remains (Grigson 1982).

Number of Identifiable Specimens (NISP) rather than Minimum Numbers of Individuals (MNI) was used to analyse taxonomic frequency and body part representation. This is because the deposits from which the samples came represent continued occupation over a period of years, the faunal material thus representing an accumulation from numerous

activities. Other methods of determining abundance are problematic in faunal assemblages with aggregation of this kind (Grayson 1984: 91-2). Also, measure of faunal density (*e.g.* Zeder 1985, 1991) was not used in the analysis because soil-volume estimates for individual contexts are not available.

A direct measure of fragmentation, 'percent complete', was recorded as a proportion of the complete circumference for identifiable long bone shafts and proportion complete of whole element for some articular ends and other appropriate elements (Bunn 1983; Bunn and Kroll 1986; Marshall 1990).

Analysis of average maximum dimension and average percent-complete for size-class III specimens was used to examine 'intensity of fragmentation' (Lyman 1994: 334-6) between contexts, assemblages from D and K sites all giving similar results. Differences in the other measures, such as body part representation, are thus attributed to cultural processes rather than preservational ones.

Each element was inspected with a hand-lens to identify traces of cutting, chopping, trampling, carnivore and rodent gnawing (Behrensmeier *et al.* 1986; Blumenschine 1988; Blumenschine and Marean 1993; Brain 1981; Fisher 1995; Lyman 1994; Potts and Shipman 1981). Burning was recorded according to colour (black, white, etc.) and approximate percent of the element burned (Marshall 1990; Shipman *et al.* 1984).

Further details of the Aksum archaeozoological analyses will be incorporated in a doctoral dissertation currently under preparation at Washington University, St Louis.

Appendix IX

Inscriptions
(Roger Schneider)

The inscription on the brass rondel from the Tomb of the Brick Arches

The specimen is described and illustrated above (pp. 97-100). The surviving letters have been numbered for ease of reference as shown in Fig. 428. They may be transcribed as follows:

- | | |
|---|-------------------|
| 1 = <i>t</i> | 6 = <i>l</i> |
| 2 probably to be reconstructed as <i>alef</i> , the glottal stop which may be followed by any, or no, vowel | 7 = <i>b</i> |
| 3 = <i>s</i> | 8 = <i>t</i> |
| 4 = <i>'ayn</i> | 9 = <i>'alef</i> |
| 5 = stroke (word divider) | 10 = <i>g</i> |
| | 11 = stroke? |
| | 12 = <i>'alef</i> |
| | 13 = <i>t</i> |
| | 14 = <i>z</i> |
| | 15 = <i>g</i> |
| | 16 = <i>n</i> |
| | 17 = stroke |
| | 18 = <i>z</i> |
| | 19 = <i>z</i> |

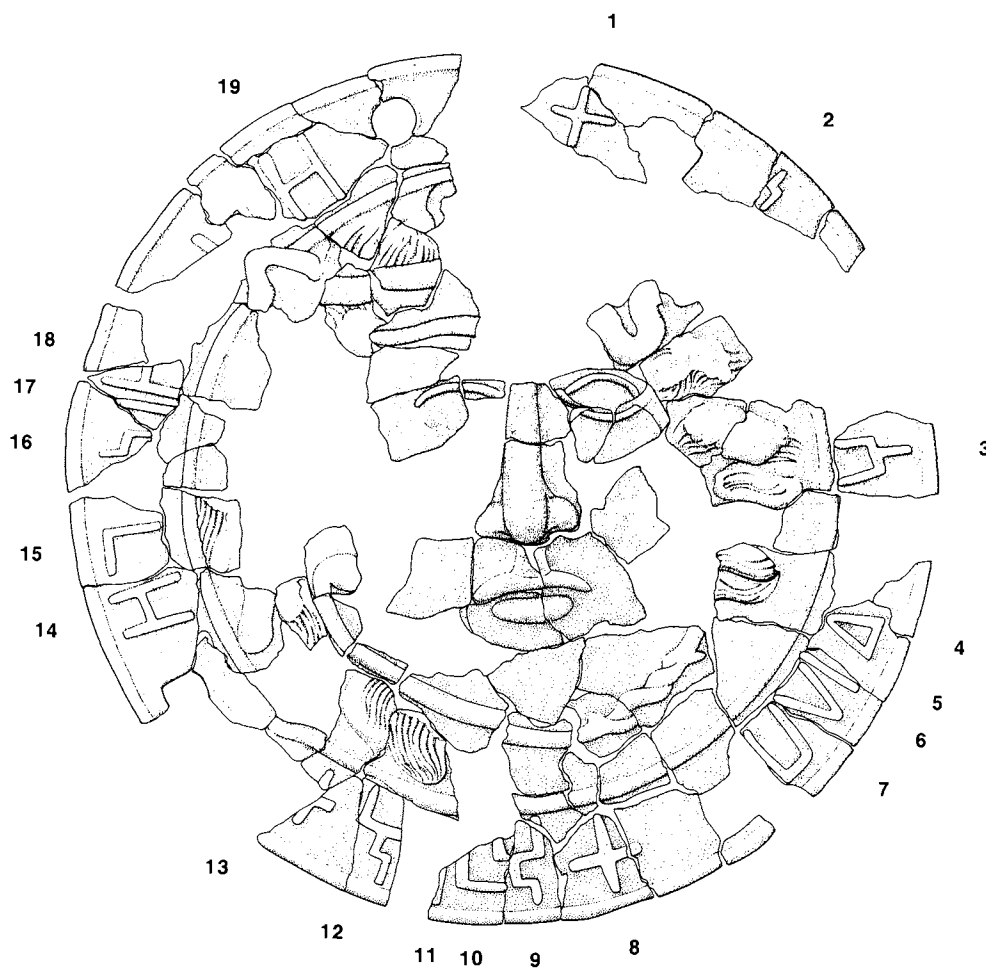


Fig. 428 The brass rondel from the Tomb of the Brick Arches, with key to inscription.

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At first the writing gives the impression of being early; but there is an evident effort to create a monumental style, regular and strictly geometrical, using straight lines only. There is nothing cursive in these letters.

For the early period of Ethiopian writing we have only two reasonably secure dates. The first is that of the bronze object of the *nagashi* Gadar from Addi Gelamo (Caquot and Drewes 1955; Bernand *et al.* 1991: 219-20, no. 180). The second is for Ezana's inscriptions in unvocalised Ethiopic script concerning his expedition against the Beja (Littmann *et al.* 1913, IV: 8ff; Bernand 1982; Bernand *et al.* 1991: 241-50, nos 185(ii) and 185*bis*(ii)). Gadar is attested by South Arabian inscriptions in Yemen, once around AD 200, and again some years later (CIH 1908: 323-34; Jamme 1962: 132; Robin 1981). Ezana's inscriptions can be tentatively dated around the middle of the first half of the fourth century AD. Between these, we know of only a handful of short texts or graffiti, all in so-called cursive script, such as the Safra texts (Bernand *et al.* 1991: 227-32, no. 183).

Of the letters on the rondel from the Tomb of the Brick Arches:

- the *s* (3) and *b* (7) tell us nothing
- the *t* (1, 8, 13) has practically already the Ethiopian form +, whereas Gadar still has the South Arabian form *x*: however the Ethiopian form appears before Gadar and the two coexist for some time
- the *l* (6) has the Ethiopian form, which appeared before Gadar
- the *g* (10, 15) is oriented like in Ethiopian; Gadar still follows the South Arabian orientation, although the Ethiopian form had been known earlier
- the *z* (14, 18, 19) with a single transverse stroke, was already known well before Gadar
- the '*alef*' (9, 12) has a rectangular base. This form is last used by Gadar. After him the only form attested is the cursive one, except for Ezana DAE 7 and 7*bis*, but this is an artificial *archaisant* writing which is not even internally consistent. The '*alef*' in the present inscription reproduces the South Arabian form even more closely than does Gadar.

In itself, the shape of the subsisting letters does not help us very much, because the range of possible dates is much too wide. On the other hand, the rigidly geometrical monumental style can give the impression of an early period rather close to Gadar; on the basis of the primitive form of '*alef*' one could even be tempted to place it before Gadar. The characteristic letters which would narrow the range of possible dates are missing, with one fortunate exception, the triangular

'*ayn*' (4). The old form of '*ayn*' is a circle and it is only some time after Gadar that this circle becomes gradually a triangle. Here we have a perfect triangle, stylised and absolutely geometrical.

The inscription must therefore date at least some decades after Gadar. I would place it somewhere in the second half of the third century, surely not earlier. Like Ezana's DAE 7 and 7*bis* it is an artificial writing, different from that in daily use, but our scribe was much more skilled than Ezana's.

As for the meaning of the inscription, I confess that I am unable to make out even a single word.

The inscribed letter on the roof of the Mausoleum

The single inscribed letter on the underside of one of the roof slabs in Mausoleum sidechamber E has been noted and illustrated above (p. 176).

The letter is clearly the consonant '*alef*', the glottal stop which may precede any or no vowel in Ethiopic languages. In the southern Semitic languages of Ethiopia such as Amharic it is no longer pronounced, but it functioned in Ge'ez in Aksumite times and is retained in Tigrinya.

The form of this letter used in the Mausoleum is notable in several respects, having a rectangular base surmounted by an angular '*ladder*'. What at first sight appears to be a squared foot is in fact an irregularity of the rock. It thus presents the same geometrical form of '*alef*' as seen on the brass rondel from the Tomb of the Brick Arches, discussed above. The latest attestation of this shape so far known occurs in the small inscription of the *nagashi* Gadar on the so-called sceptre from Addi Gelamo, dating c. AD 200 (Caquot and Drewes 1955; Bernand *et al.* 1991: 219-20, no. 180). Later usages, as on schist plates from Safra and Matara (Drewes and Schneider 1967, 1972; Drewes 1962; Bernand *et al.* 1991: 221-32, nos. 181-3.) and the stelae at Matara and Anza (Ullendorff 1951; Drewes 1962; Bernand *et al.* 1991: 312, 318, nos. 218, 223), are all of the modern form with triangular base and no '*ladder*'. The date of these later examples is not easy to determine, but the schist plates could be as early as the mid-third century and the Matara stela is clearly pre-Christian. However, Ezana himself used the squared form represented in the Mausoleum, both in his inscription DAE 7 and in its recently discovered counterpart (Bernand *et al.* 1991: 241-50, nos. 185.ii and 185*bis*.ii). For some reason, these inscriptions adopted several letter-forms which were already out of use elsewhere and which were not used again subsequently. Drewes (1962) established that inscription DAE 7 does not fit into the normal palaeographic evolution and that it must be archaisant.

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This view has been confirmed by the subsequent discovery at Geza Agmai (Bernand *et al.* 1991: 246-50, no. 185*bis*), where the engraver normally used the archaic squared form but on at least three occasions he apparently forgot himself and used the triangular form.

As for the significance of this letter, I am not able to make any suggestion. There is no reason to suppose that it is a monogram. Its date cannot be later than Ezana, but I cannot venture an opinion as to how much earlier it might be.

Appendix X

A sample of render from the Mausoleum

(Graham C. Morgan)

The sample supplied was examined microscopically and chemically. It consisted of two apparently different lime mortar samples, one finer than the other:

1. A coarse off-white to cream lime mortar render or plaster 30 mm thick. This sample contained *c.* 33% acid-soluble (lime).
2. A similar piece with a very coarse aggregate, showing a flat surface with a red to brown colouration. This may have been intentional or simply discolouration by soiling either in the ground or on the original building. The presence of many small holes within the mortar suggests that it originally contained chopped grass or straw, a common additive to ancient mortar and plaster. The sample contained *c.* 36% acid-soluble (lime).

The samples were treated with dilute hydrochloric acid, removing the lime and leaving an acid-insoluble aggregate. The residues were then washed,

dried and graded for comparison, being found to be mainly composed of angular fragments of a hard white kaolin-like clay mineral containing fine rounded quartz grains, with smaller quantities of burnt brick or fired clay, probably residues from the lime burning. Some of the kaolin material had a red-to-pink iron colouration on its surface.

These samples probably represent two different batches of a lime mortar render. The lime components are very similar, suggesting a mix of about one part lime to two parts aggregate. The particle size-distribution graphs (Fig. 429) show that the aggregate is poorly graded and could be either crushed or weathered rock, the graphs reflecting the coarse and fine grades respectively. The aggregate is presumably a local geological deposit but the lime must have been brought in from elsewhere, probably from the nearest suitable limestone source.

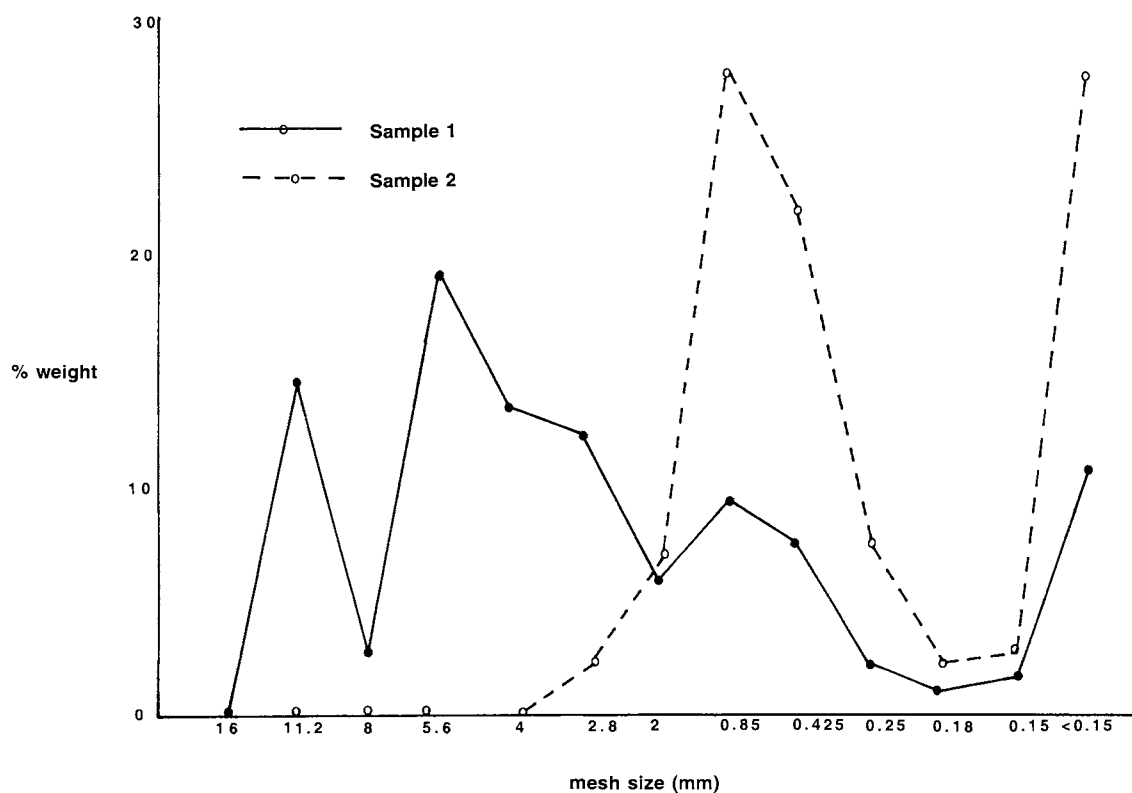


Fig. 429 Analysis of render from the Mausoleum.

Appendix XI

Magnetic susceptibility readings

(Jillian B. Phillips and Jennifer P. Ford)

The significance of magnetic susceptibility has been noted above (pp. 229-30). The figures presented in Fig. 430 represent the ranges of measurements recorded at Gobedra Quarries I to V. Fig. 431 provides readings from various stelae and other monuments, with indications of the quarries from which they might possibly have been derived. It must be emphasised that these data merely provide indications of possible sources, not proof of provenance (cf Williams-Thorpe *et al.* 1997).

Quarry	No. of readings	Range	Mean
I	7	0.36 - 0.71	0.53
II	15	0.42 - 1.21	0.66
III	36	0.56 - 1.54	0.85
IV	17	0.48 - 0.80	0.63
V	21	0.38 - 0.76	0.50

Fig. 430 Magnetic susceptibility readings from Gobedra Quarries I - V.

Monument	Mag. Sus. readings	COULD come from
Stela 1	0.96, 0.96, 1.08, 1.27, 1.28, 0.25	III
Mausoleum: east portal	0.27	None
Mausoleum: lintel over east portal	0.25, 0.33	None
Nefas Mawcha: slab over passage	0.21, 0.26	None
Nefas Mawcha: main capstone	0.56, 0.59, 0.73, 0.76, 0.80	II, III, IV
Tomb of False Door: slab with door	0.42, 0.45, 0.46, 0.50	I, II, IV, V
Stela 3	1.09, 1.10, 1.13, 1.23	III
Stela 3: rear baseplate	0.66, 0.74, 1.02, 1.53	III
Stela 4	0.70, 0.78	II, III, IV
Stela 4: front baseplate	0.66, 0.89	II, III
Stela 4: rear baseplate	0.90, 0.94	II, III
Stela 5	0.64, 0.66, 0.66	Any
Stela 5: baseplate	0.69	Any
Stela 7	0.71, 0.79	II, III, IV
Stela 8	0.86, 0.90, 0.92, 1.01	II, III
Stela 9	0.33, 0.46, 0.55, 0.63	None
Stela 10	0.41, 0.45, 0.72, 0.83	I
Stela 11	1.29, 1.75, 1.86	III
Stela 12	1.46, 1.76	None
Stela 13	0.18, 0.24, 1.32	None
Stela 16	0.34, 0.56, 0.75, 1.01	None
Stela 17	0.12, 0.14, 0.15, 0.19	None
Stela 18	0.28, 0.38	None
Stela 19	0.58, 0.78, 0.81	II, III
Stela 20	0.65, 0.73, 0.86, 0.87	II, III
Stela 20: front baseplate	0.70, 0.70, 0.82	II, III
Stela 20: rear baseplate	0.75, 1.15, 1.20	II, III

Fig. 431 Magnetic susceptibility readings from selected monuments at Aksum, indicating Gobedra quarries from which they could have been derived. Numbering of monuments follows the system devised by the Deutsche Aksum-Expedition (see D.W. Phillipson 1997).

Appendices

Monument	Mag. Sus. readings	COULD come from
Stela 21	0.13, 0.18, 0.27, 0.30	None
Stela 21: front baseplate	0.29, 0.33	None
Stela 21: rear baseplate	0.54	I, II, IV, V
Stela 22	0.39, 0.46	I, V
Stela 23	0.10, 0.26	None
Stela 24	0.71, 0.73	II, III, IV, V
Stela 24: baseplate	0.85	II, III
Stela 25	0.80, 0.85, 1.02	II, III
Stela 26	0.68, 0.83, 1.09	II, III
Stela 27	0.21, 0.22	None
Stela 28	0.61, 0.65	Any
Stela 29	0.65, 0.69	Any
Stela 30	1.00, 1.01	II, III
Stela 31	1.05, 1.32	III
Stela 31: front baseplate	0.95, 1.27	III
Stela 31: rear baseplate	0.97	II, III
Stela 32	0.31, 0.51	None
Stela 34	0.94, 1.02	II, III
Stela 109	0.65, 0.66, 0.88	II, III
Stela 110	0.61, 0.61, 0.62	Any
Stela 111	0.32, 0.44	None
Stela 112	0.41	I, V
Stela 113	0.14, 0.42, 0.51	None
Stela 114	0.77, 0.97, 1.36	II, III
Gudit Stela 1	0.38, 0.49, 0.58	I, V
Gudit Stela 2	0.32, 0.42	None
Other Gudit stelae	0.34, 0.37, 0.43, 0.48, 0.49, 0.49, 0.49, 0.57, 0.62, 0.63, 0.68, 0.70, 0.75, 0.97, 1.00, 1.03, 1.21, 1.33, 1.56, 1.75	Any
Dungur: steps	0.90, 0.97	II, III
Dungur: corner blocks of central wall	0.12, 0.17, 0.33, 0.45, 0.51	None
Dungur: re-used baseplate	1.07, 1.10	II, III
Dungur: basin	1.88	None
Dungur: capital	0.06	None
Throne 1: seat	0.17	None
Pillars around throne 1	0.13, 0.16, 0.37	None
Throne 2: seat	0.41	I, V
Pillar southeast of Throne 2	1.23	III
Throne 3: seats	0.16, 0.21	None
Throne 3: base	0.44	I, II, V

Fig. 431 continued Magnetic susceptibility readings from selected monuments at Aksum, indicating Gobedra quarries from which they could have been derived. Numbering of monuments follows the system devised by the Deutsche Aksum-Expedition (see D.W.Phillipson 1997).

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Monument	Mag. Sus. readings	COULD come from
Throne 4: seat	0.52	I, II, IV, V
Throne 4: base	0.47	I, II, V
Throne 5: seat	0.54	I, II, IV, V
Throne 5: base	0.32	None
Throne 6: seat	0.41	I, V
Throne 6: base	0.03, 0.05	None
Throne 6: cornerstones	0.14, 0.27, 0.30	None
Throne 7: seat and base	0.15	None
Throne 7: cornerstones	0.02, 0.11, 0.38	None
Throne 8: seat and base	0.29	None
Throne 8: step	0.16	None
Throne 8: cornerstones	0.25, 0.45	None
Throne 9: seat and base	0.30	None
Throne 9: cornerstone	0.27	None
Throne 10: seat	0.10	None
Throne 10: base	0.51	I, II, IV
Throne 10: cornerstones	0.30, 0.38, 0.57	None
Throne 11a: base	0.66	Any
Throne 11a: cornerstone	0.25	None
Throne 11b: seat	0.42	I, V
Throne 11b: base	0.40	I, V
Throne 11b: cornerstones	0.21, 0.35	None
Throne 12: seat	0.26	None
Throne 12: base	0.45	I, II, V
Throne 14: seat	0.17	None
Throne 14: base	0.18	None

Fig. 431 continued Magnetic susceptibility readings from selected monuments at Aksum, indicating Gobedra quarries from which they could have been derived. Numbering of monuments follows the system devised by the Deutsche Aksum-Expedition (see D.W.Phillipson 1997).

Appendix XII

Recent use of the Stelae Park area

(Jacke Phillips)

The recent use of the Stelae Park area was not specifically investigated by earlier excavators and is not discussed by Munro-Hay (1989). A certain amount of relevant evidence was, however, recorded in 1972-4 and is included in this account.

During the 1960s, the then governor-general of Tigray, Ras Mengesha Seyoum, directed that the area around the principal stelae at Aksum should be converted into a park. The resultant clearance involved use of a bulldozer: buildings and roads were demolished and landscaping undertaken which incorporated the exposed architectural elements and stelae (cf. Munro-Hay 1989: pl. 2.5. The present appearance of the Stelae Park is thus less than four decades old. Although the landscaping destroyed most of the upper occupation levels, much evidence for its former appearance is preserved in old photographs and maps.

Most early travellers described only the stelae themselves, not their immediate surroundings. An exception is James Bruce (1790, III: 129, 132), who noted in 1770 that the stelae stood in a 'square' in the 'centre of [the] town' of 'about 600 houses'. In 1906, the DAE recorded the area as a suburb with several separate walled compounds and houses interspersed amongst the stelae (Littmann *et al.* 1913, II: pl. I, fig. 8; D.W.Phillipson 1997: figs. 11, 12). Their plans and photographs⁶⁰ clearly show how the area sloped gently down from the foot of Beta Giyorgis, the visible stelae being incorporated into a flourishing occupation area: Stela 1 was a boundary between two domestic compounds, the baseplate of Stela 3 used as a working surface by women and its surrounding area apparently unenclosed, with houses and compounds interspersed around the other stelae. Tracks passed between Stelae 2 and 3 and, to the west, over the area where the Tomb of the False Door was subsequently exposed. These north-south tracks joined two east-west roads which are still in use.

Apart from the removal of the fallen Stela 2 to Rome in 1937, the Italian occupation seems to have had little visible effect on this area of Aksum. An aerial photograph (Doresse 1956: 46) shows the area prior to the excavations of 1954-7 which exposed much of the main east-west Aksumite terrace wall which forms the present southern boundary of the

⁶⁰ According to Littmann *et al.* (1913), 'Enclosure A' was occupied in 1906 by the Governor of Tigray, Dejazmatch Gabra Sellassie; but see D.W.Phillipson 1997: 37.

Stelae Park, and lowered the ground to its south to approximately its present level. The 'Enclosures A and B', recorded by the Deutsche Aksum-Expedition, had already been demolished. Around Nefas Mawcha, the central capstone of which previously lay just above the surrounding ground surface, the excavations revealed some 75 graves to the east of Stela 1 (de Contenson 1959: 32-4, pls xx, xii), with 17 more to the west and southwest of Stela 1 (Leclant 1959: 6-10, pl. x), all marked by a near-total absence of grave goods and probably dating between the seventeenth and nineteenth centuries. Further traces of this cemetery were observed in 1973 (Munro-Hay 1989: 328, fig. 4.1) in an area where the DAE had worked in 1906 (D.W.Phillipson 1997, 68-71) without, apparently, encountering remains of burials. This area seems to have been a cemetery for perhaps as long as two centuries, Nefas Mawcha possibly serving as a focal point.⁶¹ Prior to this excavation, the western interior wall of the gatehouse and corner to the exterior wall of the 'Enclosure A' recorded by the DAE (Littmann *et al.* 1913, II: fig. 8, pl. xvi.a; D.W.Phillipson 1997: fig. 12) were recorded, as well as remains of a round house that seems to have been located within the enclosure just west of the gatehouse. This round house is also seen in a photograph taken in 1948 by Mr David Buxton (*pers. comm.*), while the wall of the DAE's 'Enclosure B' was encountered by the 1955-6 excavators (Leclant 1959: pl. ii - 'M3'). This suggests that this area had ceased to be used as a cemetery before the end of the nineteenth century, as it was covered by housing in 1906; it is possible that the existence of a cemetery had been forgotten by the time the houses were constructed.

Farther east, Doresse recorded a 'charnier d'ossements confus et très tassés ... évidemment d'âge très postérieur' in the area of the Tomb of the Brick Arches (Leclant 1959: 10-12; Munro-Hay 1989: 55).

Other putatively recent burials were noted during the 1972-4 excavations in other areas of the Stelae Park: four or five in ST XI (1) and two in ST V (4) and (7) (Munro-Hay 1989: 67, 324, figs 4.1, 4.3). In view of the extensive disturbance to which the entire area had been subjected, this distribution need bear

⁶¹ This was a common practice in, for example, the early Christian Sudan; indeed, Muslim cemeteries there are still commonly located close to pre-Islamic monuments associated with holy men.

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no relationship to the former extent of a cemetery: it may be that burials were also previously present in other parts of what is now the Stelae Park.

Evidence for modern occupation was recovered in two of the four areas excavated in 1993-7: above and immediately west of the Mausoleum, and in the upper levels of the Stela-2 site. A single grave was encountered in the latter area, and human bones recovered in the upper fill of the Mausoleum (pp. 149, 216-7, above) may be connected with the nearby cemetery; their pattern of deposition suggests deposition through the shafts, along with other material including animal bones and pottery. This would indicate that the upper levels of the Mausoleum fill may have been deposited no earlier than the seventeenth century AD; no evidence for an earlier date has been recovered.

The DAE plan and photographs of the Stela-2 area (D.W. Phillipson 1997: figs 12, 42) indicate two round houses immediately west of the fallen stela within 'Enclosure A' while, to its east, a north-south wall separated this enclosure from the adjacent track. The 1997 excavation exposed part of the more northerly house, while a feature revealed in 1994 may have been part of the enclosure wall. Elderly residents of Aksum still recall a hollow beneath the fallen Stela 2, often used as a cool resting place for reading. During the excavation, masses of moulded beer bottles were

recovered in the upper levels (p. 156, above), demonstrably Italian and dating to the mid-1930s, as well as other evidence for abundant refreshment, presumably thrown into the hollow after the stela had been removed.

The nature of 1960s landscaping in the immediate vicinity of the Mausoleum has been noted above (pp. 30, 157-9). The ground level around trenches M5-7 approximates to that which previously prevailed, although it is clear that some landscaping is represented in the two uppermost levels of these trenches. Immediately below were exposed walls of a quadrangular building, probably that shown within 'Enclosure B' on the plan prepared by the Deutsche Aksum-Expedition (D.W. Phillipson 1997: fig. 12). This building is not visible in 1954-7 photographs, although a north-south wall may be discerned parallel to and west of Stela 1 (Doresse 1956: 45).

Professor Merid Wolde Aregay (*pers. comm.*) suggests that the domestic occupation of the area followed the social and political changes after the death of Tewodoros II in 1868, when the power of the Church in Aksum was superseded by that of the secular nobility who may have authorised construction on what had previously been church property. He also suggests that the cemetery may have been for those who died when Aksum was sacked by Ahmad Gragn c. 1535.

Appendix XIII

Inventory numbers of illustrated artefacts

(D.W.P.)

These details are provided in order to facilitate cross-reference to the artefact inventory which may be consulted in the Project Archive. The full stratigraphic provenance of each artefact is recorded in the inventory. Details of non-inventoried items are omitted from this list except where inventoried and non-inventoried items are shown in the same figure.

- Fig. 43: a = B/516\, b = B/564\, c = B/844\
d = B/967\, e = B/1576\, f = B/1296\
g = B/598\, h = B/563\, i = B/517\
j = B/1339\, k = B/961\, l = B/718\
Fig. 44: a = B/962\, b = B/406\, c = B/839\
d = B/1735\, e = B/514\, f = B/218\
g = B/1908\, h = B/1393\, i = B/848\
j = B/1749\
Fig. 45: a = B/564\, b = B/718\, c = B/406\
d = B/1689\, e = B/1890\, f = B/1895\
Fig. 46: a = B/1293\, b = B/1639\
Fig. 47: a = B/1589\, b = B/1912\, c = B/828\
d = B/764\, e = B/988\, f = B/1468\
g = B/907\, h = B/1639\
Fig. 48: B/1899\
Fig. 49: a = B/1360\, b = B/1911\, c = B/1569\
d = B/1477\, e = B/774\, f = B/1738\
Fig. 50: a = B/1315\, b = B/1579\, c = B/1902\
Fig. 51: a = B/1361\, b = B/731\
Fig. 52: a = B/760\, b = B/1689\
Fig. 53: a = B/1635\, b = B/1641\, c = B/1290\
d, f = B/1642\, e = B/157\
Fig. 54: a = B/1903\, b = B/1392\, c = B/766\
d = B/1905\
Fig. 55: B/317\
Fig. 56: B/1670\
Fig. 58: a = B/22\, b = B/40\
Fig. 59: a = B/36\, b = B/1739\, c = B/390\
d = B/1721\
Fig. 60: a = B/40\, b = B/1721\
Fig. 61: a = B/1450\, b = B/333\
Fig. 62: a, b = various, c = B/413\, d = B/818\
Fig. 64: a = B/294\, b = B/140\, c = B/12\
d = B/135\, e = B/430\, f = B/442\
g = B/10\, h = B/176\, i = B/990\
j = B/158\, k = B/442\, l = B/294\
m = B/388\, n = B/52\, o = B/1486\
p = B/50\, q, t = B/443\, r = B/519\
s = B/363\
Fig. 65: a = B/73\, b = B/94\, c = B/52\
d = B/158\, e = B/44\, f = B/57\, g = B/18\
Fig. 66: a = B/1554\, b = B/808\, c = B/1883\
d = B/1882\, e = B/192\
Fig. 67: a = B/1835\, b = B/1836\, c = B/1868\
d = B/243\, e = B/335\, f = B/1844\
g = B/1842\, h = B/1230\, i = B/857\
j = B/1807\, k = B/1671\, l = B/1469\
m = B/1466\, n = B/926\, o = B/222\
p = B/299\, q = B/1729\, r = B/191\
Fig. 69: a = B/1768\, b = B/337\, c = B/651\
d = B/1172\, e = B/1743\
Fig. 70: a = B/272\, b = B/502\, c = B/792\
d = B/298\, e = B/1553\, f = B/1229\
g = B/891\, h = B/479\, i = B/899\
j = B/611\
Fig. 71: a = B/1484\, b = B/298\, c = B/350\
d = B/891\, e = B/793\, f = B/611\
g = B/1466\, h = B/1469\
Fig. 72: a = B/1777\, b = B/1834\, c = B/1838\
d = B/1809\, e = B/1840\, f = B/1774\
g = B/1804\, h = B/1839\
Fig. 73: a, b = B/775\, c = B/1773\, d = B/1810\
Fig. 74: a = B/1810\, b = B/1773\, c = B/1775\
Fig. 75: B/3\
Fig. 76: B/3a1\
Fig. 77: B/3a1\
Fig. 78: B/3a2\
Fig. 79: B/3a3\
Fig. 80: B/3a3\
Fig. 81: a = B/3a5\, b = B/3a4\, c = B/3a11-25\
Fig. 82: B/3a5\
Fig. 83: a = B/3a26\, b = /3a29\
Fig. 84: B/3a4\
Fig. 85: B/3a6-25\
Fig. 86: B/1626\
Fig. 87: a = B/535\, b = B/1304\, c, d = B/730\
Fig. 88: a = B/46\, b = B/1034\, c = B/419\
d = B/1304\, e = B/636

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- Fig. 89:** a = B/1732\, b = B/1236\, c = B/216\
Fig. 90: a = B/5\, b = B/1837\, c = B/767\
d = B/1239\, e = B/1305\, f = B/1495\
g = B/1728\, h = B/840\
Fig. 91: a = B/840\, b = B/1495\, c = B/1728\
Fig. 92: a = B/275\, b = B/240\, c = B/1182\
d = B/1841\, e = B/1776\, f = B/1849\
g = B/1797\, h = B/1765\, i = B/1234\
j = B/1746/7\, k = B/1501\, l = B/1751\
m = B/1539\, n = B/1752\, o = B/1748\
p, q = B/1750\
Fig. 93: B/1498\
Fig. 94: a = B/1449\, b = B/955\, c = B/1100\
d = B/1076\, e = B/1584\, f = B/1238\
g = B/173\, h = B/1283\, i = B/488\
Fig. 95: a-c = B/313\
Fig. 96: a, b = B/313\
Fig. 97: a = B/882\, b = B/883\
Fig. 98: a, c = B/883\, b = B/882\
Fig. 99: B/781\
Fig. 100: a = B/491\, b = B/1359\, c = B/1668\
d = B/227\, e = B/319\, f = B/1373\
g = B/781\, h = B/256\, i = B/319\
j = B/1279\, k = B/210\, l = B/319\
m = B/789\
Fig. 101: B/1508\
Fig. 102: a = B/1508a2\, b = B/1496\
c = B/1489.1\, d = B/1489.3\, e = B/1489.2\
f = B/1545\, g = B/1493\, h = B/1525\
Fig. 103: a = B/1493\, b = B/1493\, c = B/1197\
d = B/1456\, e = B/1493\, f = B/1489.1\
g = B/1525\
Fig. 104: a-d = B/1388\, e = B/424\, f = B/954\
g = B/511\
Fig. 105: B/1617\
Fig. 106: a = B/58\, b = B/748\, c = B/215\
d = B/666\, e = B/431\
Fig. 107: B/531\
Fig. 108: a = B/1787\, b = B/711\, c = B/728\
Fig. 124: R/24\, R/27\, R/36\
Fig. 125: a = S/21\, b = S/2\, c = R/4\
d = uninventoried from S9(2) and S9(3)
Fig. 169: a = M/97\, b = M/246\, c = M/591\
d = M/372\, e = M/456\, f = M/622\
Fig. 170: a = M/135\, b = M/450\, c = M/577\
d = M/389\, e = M/385\
Fig. 171: a = M/591\, b = M/97\, c = M/450\
Fig. 173: a = M/250\, b = M/408\
Fig. 174: a = M/168, 170, 173, 176, 184, 185,
193, 195, 202, 212\, b = M/176\
Fig. 176: a, b, d = M/534\, c = M/592\
e = M/407\, f = M/545\
Fig. 177: a = M/264\, b = M/194\, c = M/194\
d = M/178\, e = M/586\, f = M/465\
Fig. 178: a = M/264\, b = M/171\, c, d = M/197\
e = M/465\, f = M/563\, g = M/401\
h = M/543\, i = M/508\
Fig. 179: a = M/584\, b = M/599\, c = M/527\
d = M/187\, e = M/167\, f = M/127\
g = M/589\, h = M/208\, i = M/596\
j = M/595\, k = M/236\, l = M/598.2\
m = M/598.1\, n = M/594\
Fig. 180: a = M/462\, b = M/610\, c = M/403\
d = M/535\, e = M/609\, f = M/571\
g = M/604\, h = M/203\, i = M/474\
j = M/446\, k = M/453\, l = M/581\
m = M/459\, n = M/590a\, o = M/590b\
p = M/588\, q = M/526\, r = M/582\
Fig. 181: a = M/567\, b = M/521\, c = M/455\
Fig. 182: M/626\
Fig. 183: a = M/444\, b = M/311\ and M/312\
Fig. 184: a = M/47\, b = M/615\, c = M/83\
d = M/44\, e = M/106\, f = M/88\
g = M/86\
Fig. 185: M/41\
Fig. 186: M/77\
Fig. 187: a = M/153\, b = M/58\
Fig. 188: a = M/503\, b = M/14\, c = M/480\
d = M/397\, e = M/483\, f = M/11\
g = M/284\, h = M/317\, i = M/422\
j = M/319\
Fig. 189: a = M/159\, b = M/132\, c = M/54\
d = M/105\, e = M/291\, f = M/368\
g = M/485\
Fig. 191: a = M/210\, b = M/253\
Fig. 192: a = M/213\, b = M/20\, c = M/6\
d = M/18\, e = M/25\, f = M/96\, g = M/5\
h = M/216\, i = M/165\, j = M/56\
Fig. 194: a = M/429\, b = M/245\
Fig. 195: a = M/75\, b = M/568\
Fig. 196: a = M/7\, b = M/164\
Fig. 197: a = M/79\, b = M/364\
Fig. 198: M/162\
Fig. 199: a = uninventoried from MF41(3),
b = uninventoried from MA11(3) and
MA13(1)
Fig. 214: Z/17\
Fig. 247: a = D/425\, b = D/531\, c = D/698

Appendices

- Fig. 265:** a = D/798\, b = D/314\, c = D/10\
d = D/780\, e = D/891\, f = D/114\
g = D/901\, h = D/824\, i = D/796\
j = D/465\, k = D/629\.
- Fig. 266:** a = D/427\, b = D/349\, c = D/315\
d = D/902\, e = D/860\, f = D/292\
g = D/636\.
- Fig. 267:** a = D/936\, b = D/873\, c = D/694\
d = D/641\, e = D/781\.
- Fig. 268:** D/735\.
- Fig. 269:** a = D/858\, b = D/702\, c = D/735\.
- Fig. 270:** a = D/937\, b = D/463\, c = D/582\
d = D/757\, e = D/679\, f = D/939\
g = D/129\, h = D/294\.
- Fig. 271:** D/734\.
- Fig. 272:** a = D/531\, b = D/559\, c = D/89\
d = D/928\, e = D/569\, f = D/987\
g = D/915\, h = D/524\, i = D/371\.
- Fig. 273:** a = D/125\, b = D/914\, c = D/461\
d = D/919\, e = D/916\, f = D/988\
g = D/606\, h = D/473\, i = D/516\.
- Fig. 274:** a = D/557\, b = D/553\, c = D/951\.
- Fig. 275:** a = D/501\, b = D/520\, c = D/508\
d = D/511\, e = D/592\, f = D/667\.
- Fig. 276:** a = D/123\, b = D/190\, c = D/307\.
- Fig. 277:** a = D/480\, b = D/417\, c = D/507\.
- Fig. 278:** a = D/957\, b = D/910\, c = D/1018\
d = D/585\, e = D/547\, f = D/927\.
- Fig. 279:** a = D/947\, b = D/993\, c = D/481\
d = D/535\, e = D/493\.
- Fig. 280:** a = D/471\, b = D/979\, c = D/948\
d = D/502\, e = D/302\, f = D/570\
g = D/718\, h = D/655\, i = D/921\
j = D/1010\, k = D/925\.
- Fig. 281:** D/391\
- Fig. 282:** a = D/543\, b = D/286\, c = D/257\
d = D/447\, e = D/920\, f = D/916\
g = D/538\.
- Fig. 283:** a = uninventoried from D19(35), (39),
b = D/403\, c = uninventoried from
D22(228), d = D/290\, e = D/394\
f = D/658\, g = D/384\, h = D/1008\
i = D/289\, j = D/362\, k = D/699\
l = D/556\.
- Fig. 284:** a = D/290\, b-d, g = D/394\
f = D/289\, h = D/329\, i = D/362\, D/403\.
- Fig. 285:** a = D/556\, b = D/440\.
- Fig. 286:** a = D/440\, b = D/436\, c = D/539\
d = D/1002\, e = D/540\, f = D/543\
g = D/478\, h = D/453\, i = D/554\.
- Fig. 287:** a = D/366\, b = D/519\, c = D/370\
d = D/536\, e = D/994\, f = D/487\
g = D/550\, h = D/978\.
- Fig. 288:** a = D/593\, b = D/522\, c = D/505\
d = D/290\, e = D/479\, f = D/609\.
- Fig. 289:** D/788\.
- Fig. 290:** a = D/175\, b = D/709\, c = D/303\
d = D/697\, e = D/406\, f = D/741\
g = D/51\, h = D/254\, i = D/332\
j = D/199\, k = D/986\, l = D/768\
m = D/176\.
- Fig. 291:** D/537\.
- Fig. 293:** a = D/386\, D/400\, b = D/670\
c = D/333\, d = D/252\, e = D/683\
f = D/271\, g = D/252\, h = D/404\
i = D/405\.
- Fig. 294:** a, c = D/252\, b = D/237\, d = D/221\.
- Fig. 296:** a = D/182\, b = D/187\, c = D/652\
d = D/688\, e = D/198\, f = D/646\
g = D/674\, h = D/385\, i = D/174\
j = D/244\, k = D/223\, l = D/56\
m = D/410\, n = D/782\, o = D/401\
p = D/224\, q = D/344\.
- Fig. 297:** a = D/783\, b = D/179\, c = D/389\.
- Fig. 298:** a = D/373\, b = D/692\, c = D/778\
d = D/785\.
- Fig. 299:** a = D/259\, b = D/248\, c = D/396\
d = D/364\, e = D/360\, f = D/930\
g = D/298\, h = D/357\, i = D/250\
j = D/666\, k = D/989\, l = D/412\
m = D/346\, n = D/253\, o = D/661\
p = D/376\, q = D/748\, r = D/397\.
- Fig. 300:** a = D/178\, b = D/184\, c = D/423\
d = D/395\, e = D/90\.
- Fig. 301:** a = D/297\, b = D/358\, c = D/164\
d = D/411\, e = D/399\.
- Fig. 302:** a = D/1021\, b = D/1027\.
- Fig. 305:** a = D/191\, b = D/192\.
- Fig. 306:** D/192\.
- Fig. 307:** a = D/379\, b = D/260\, c = D/173\
d = D/421\.
- Fig. 308:** D/379\.
- Fig. 309:** a = D/710\, b = D/392\, c = D/737\
d = D/669\, e = D/380\, f = D/779\
g = D/665\.
- Fig. 310:** a = D/779\, b = D/665\.
- Fig. 317:** D/737\.
- Fig. 340:** a = K/228\, b = K/153\, c = K/139\
d = K/266\, e = K/298\, f = K/264\
g = K/309\, h = K/148\, i = K/271\.

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- Fig. 341:** a = K/237\, b = K/210\, c = K/284\
d = K/269\, e = K/282\, f = K/295\
g = K/136\, h = K/325\, i = K/187\
j = K/289\.
- Fig. 342:** a = K/24\, b = K/328\.
- Fig. 343:** a = K/262\, b = K/9\, c = K/14\
d = K/98\, e = K/268\, f = K/330\
g = K/327\.
- Fig. 344:** K/33\.
- Fig. 345:** a = K/135\, b = K/191\, c = K/310\
d = K/273\, e = K/321\, f = K/304\.
- Fig. 346:** K/96\.
- Fig. 347:** a = K/318\, b = K/221\, c = K/17\
d = K/238\, e = K/188\.
- Fig. 349:** a = K/239\, b = K/170\, c = K/245\
d = K/220\.
- Fig. 350:** a, b = K/256\, c, d = K/170\
e = K/66\, f = K/59\, g = K/28\, h = K/45\
i = K/18\, j = K/50\, k = K/7\.
- Fig. 352:** a = K/71\, b = K/54\, c = K/38\
d = K/99\, e = K/104\, f = K/106\
g = K/140\, h = K/35\, i = K/172\
j = K/61\, k = K/56\, l = K/67\
m = K/35\.
- Fig. 353:** a = K/56\, b = K/35\, c = K/216\.
- Fig. 354:** a = K/233\, b = K/125\, c = K/57\
d = K/121\.
- Fig. 355:** a = K/65\, b = K/183\, c, d = K/90\
e = K/138\, f = K/110\, g = K/189\
h = K/116\.
- Fig. 356:** a = K/184\, b = K/236\, c = K/124\
d = K/337\.
- Fig. 358:** a = K/128\, b = K/60\, c = K/19\
d = K/179\, e = K/164\, f = K/259\
g = K/127\.
- Fig. 359:** a = K/97\, b = K/122\, c = K/231\
d = K/260\, e = K/241\.
- Fig. 363:** a = uninventoried from K5(10),
b = uninventoried from K8(4).
- Fig. 403:** K/164\.
- Fig. 404:** B/1617\.
- Fig. 405:** a = B/882\, b, c = B/883\
- Fig. 406:** a, b = D/1021\, c = uninventoried from
D22(219), d = B/781\.
- Fig. 407:** a = uninventoried from K4(5),
b = B/210\, c = B/227\, d = B/1409\.
- Fig. 408:** a = B/1493\, b = K/128\, c = B/882\.
- Fig. 409:** a, b = B/883\, c = B/1388\.
- Fig. 410:** a = B/781\, b = B/460\.
- Fig. 411:** a = B/1197\, b = B/227\, c = B/491\.
- Fig. 412:** uninventoried from K4(10)
- Fig. 413:** a = B/1489a\, b = B/1525\, c = B/431\
d = B/1197\.
- Fig. 414:** B/1493\.
- Fig. 421:** a = M/557\, b = M/465\.
- Fig. 423:** a = D/262\, b = D/267\, c = D/295\
d = D/363\.
- Fig. 424:** a = D/387\, b = D/249\, c = K/22\
d = K/68\.
- Fig. 428:** B/3a3\.

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