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LATER STONE CERAMIC STRATIGRAPHY AND DIRECT DATES ON POTTERY: A COMPARISON*

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ABSTRACT

Unstratified fills in rock shelters of the upper Karoo, spanning the last millennium, are subjected to fine-scale correlation using Later Stone Age ceramic marker motifs. A five-phase framework generated by direct dates (thermoluminescence and radiocarbon) on surface sherds provides the sequence of markers. Before this framework can be applied as a heuristic device for the planned seriation of surface sites,it must be validated by stratified sequences. Excavated marker sherds were projected on to the composite sections of eight shelter fills, and their positions were used to identify phase boundaries. Results show that multiple, unpatterned gaps in occupation are a hallmark of all the shelters. Alternately, the five-phase framework is too simple a construct to reflect reality. However, stratified charcoal dates in three shelters have also revealed occupation gaps, thus supporting the first interpretation. Nonetheless, the dated framework remains incomplete since new potential marker motifs can be identified in the stratified sequences.

INTRODUCTION

Slow rates of change in the shapes and frequencies of Later Stone Age lithic tools over the past millennium make them poor chronological markers. Although very abundant in the unstratified fills of Karoo rock shelters, lithics are of little use for fine-scale correlations between excavated sites (Pease 1993). While much scarcer, the LSA ceramics associated with the stone tools exhibit more rapid change and are potentially more sensitive markers. Sherd samples were recovered from several shallow rock shelter fills in the upper Seacow River valley, but fine-scale correlations were hampered by inadequate sherd numbers and by doubts about churning of the deposits (Sampson *et al.* 1989). The goal of this correlation was to provide a basis for chronological seriation of much larger samples collected from about a thousand surface sites in the same area (Sampson 1988; Hart 1989). Chronological resolution was greatly improved by direct dating of sherds from surface sites. Twelve thermoluminescence (TL) dates were obtained from fine-grain minerals in pastoralist (ancestral Khoi) wares (Sampson *et al.* in press), and thirty radiocarbon dates were obtained from fibre temper in the cooking bowls made by the herders and by their hunter-gatherer neighbours (Sampson & Vogel 1995).

All dates obtained directly from surface sherds are summarised in Figure 1, with all calibration intercepts for each radiocarbon date plotted on the same framework. Five phases are suggested by these data, each phase represented by a unique combination of stamp-impressed motifs in the fibre-tempered bowls. While valuable as a heuristic device for seriation, the validity of this five-phase framework is still not completely secure. An untested assumption of the scheme is that the age-range of each dated motif is fully covered by the available dated sherds. When the purported age range for any radiocarbon-dated motif is plotted against the number of dates run on that motif, it emerges that motifs with longer ranges are invariably represented by more dates and *vice versa* (Fig. 2). If more dates were run on the short-lived motifs would they not, too, emerge with

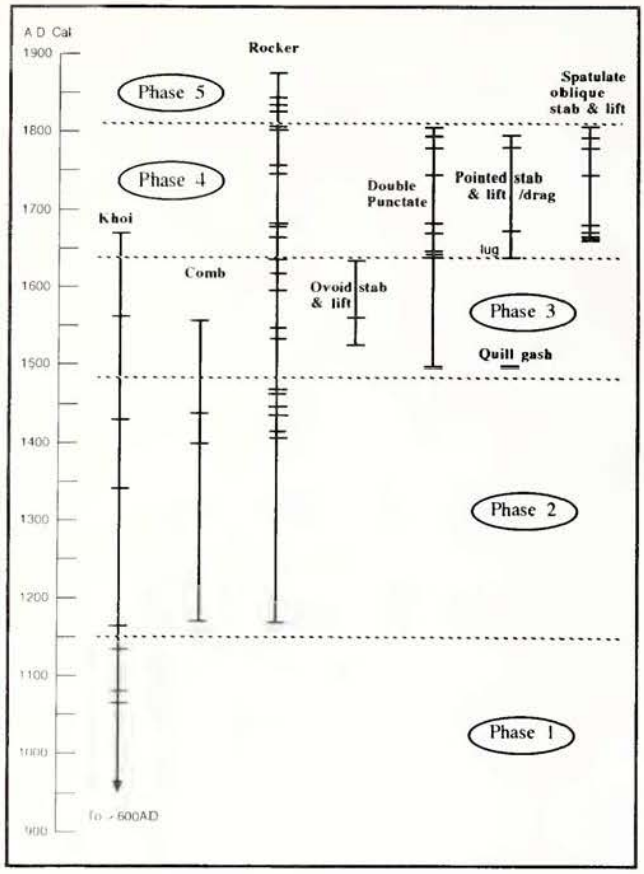

Fig. 1. Summary chart of direct dates obtained for upper Seacow valley ceramics. Dates are short horizontal bars; age-ranges for individual marker types/motifs are vertical bars; dashed lines denote phase boundaries. Khoi and Comb are TL dates, after Sampson *et al.* (in press). The rest are radiocarbon dates, after Sampson & Vogel (1995).

longer life histories? Clearly, the weakest part of this proposed framework is Phase 3, characterised by two motifs for which only one date each is available.

In this paper we return to the original sherd stratigraphies in the excavated rock shelters to test the validity of the new five-phase framework. Previously, the excavated samples had been systematically searched for refits in order to resolve questions of localised churning (Bollong 1994). For each shelter fill, sherd positions are projected on to a composite section of the deposit and the section is then sliced into superimposed chrons based on the combinations of sherds present at different levels. The range of sherds in the fitted chron at the base of the fill should contain sherds that match the composition of Phase 1 in the framework, and so on up the sequence. However, occupational gaps are known to occur (Hart 1989) and some shelters will have too few sherds to supply an adequate test. Also, it is intuitively reasonable to expect Phase 3 to test poorly. Finally, we should expect other motifs not covered by the dating program to show up on individual sections. It may be possible to add some of these to the overall scheme if they show up consistently in certain phases in all tested shelters.

Shelter locations and trench dimensions are given in Sampson *et al.* (1989), as are details of the recovery and recording procedures.

RESULTS

Subdivision of eight shelter fills into equivalent phases can be attempted. Bloubos and Van Zyls Rus Shelters are not considered here because their sherd samples are too small to allow reasonable comparisons.

Volstruisfontein Shelter

Whether Phase 1 is present at the base of this small trench (Fig. 3) remains uncertain because the lowermost specimens form an isolated patch of rare, small crumbs of undecorated fibre-tempered ware. If these have not been churned in from above, they are still not certainly of Phase 1 date because there are no Khoi sherds with them, a required marker for Phase 1. Also, one of the deepest crumbs may have a trace of comb stamp decoration on its outer surface. If so, then Phase 2 may begin the Volstruisfontein sequence. The latter interpretation is preferred because it is supported by the basal date of the overlying unit. Phase 2 is better represented by the modest, but adequate sample of Khoi, rocker and comb stamp sherds found mid-way through the deposit. A radiocarbon date on charcoal from the base of this horizon gave 560 $\pm$ 70 BP (uncal.) (Hart 1989), which fits with the later part of the Phase 2 chronology (Fig. 1).

Evidently the extremely rare cord-impressed decoration belongs in later Phase 2. The recovery of two refitting sherds with this motif is fortunate, since so little corded ware was found elsewhere in the valley (Sampson 1988:98) and no direct dates could be obtained.

The fibre-tempered lug fragment and the refitted undecorated sherd fragment next to it in the Phase 2 level (Fig. 3) is problematic because the lug fragment fits to another from much higher in the sequence in a position ascribed to Phase 4 (see below). Rodent burrows were reported in this vicinity (Hart 1989). A pair of refitting plain fibre-tempered sherds from the Phase 2 level nearby shows that this disturbance was highly localised. While there is clearly an isolated disturbance, it is less clear whether the disruption has caused one of the two separated sherds to move up or down the sequence. The one available direct date for a fibre-tempered lug placed this attribute in Phase 4 (Fig. 1), but that specimen was also decorated (the Volstruisfontein fragments are plain). This direct date could support a case for the uppermost fragment being *in situ* while the lower two have been carried downwards. However, a reverse scenario is even more plausible (two below *in situ*, one moved above), especially in the light of evidence from Haaskraal (see below).

Phase 3 cannot be confirmed in the overlying lens for want of suitable markers. The lower interface of the lens is clearly demarcated by a sharp decrease in faunal density (Sampson & Plug 1993:62). Within this (Phase 2?) lens, comb stamp outnumbers rocker stamp sherds which is to be expected since Volstruisfontein is located within in the densest patch of comb stamp distribution in the upper valley (Sampson 1988). The refits and close matching patterns of the comb stamp sample suggest that they are all from the same vessel.

Unfortunately none of the three Phase 3 marker motifs

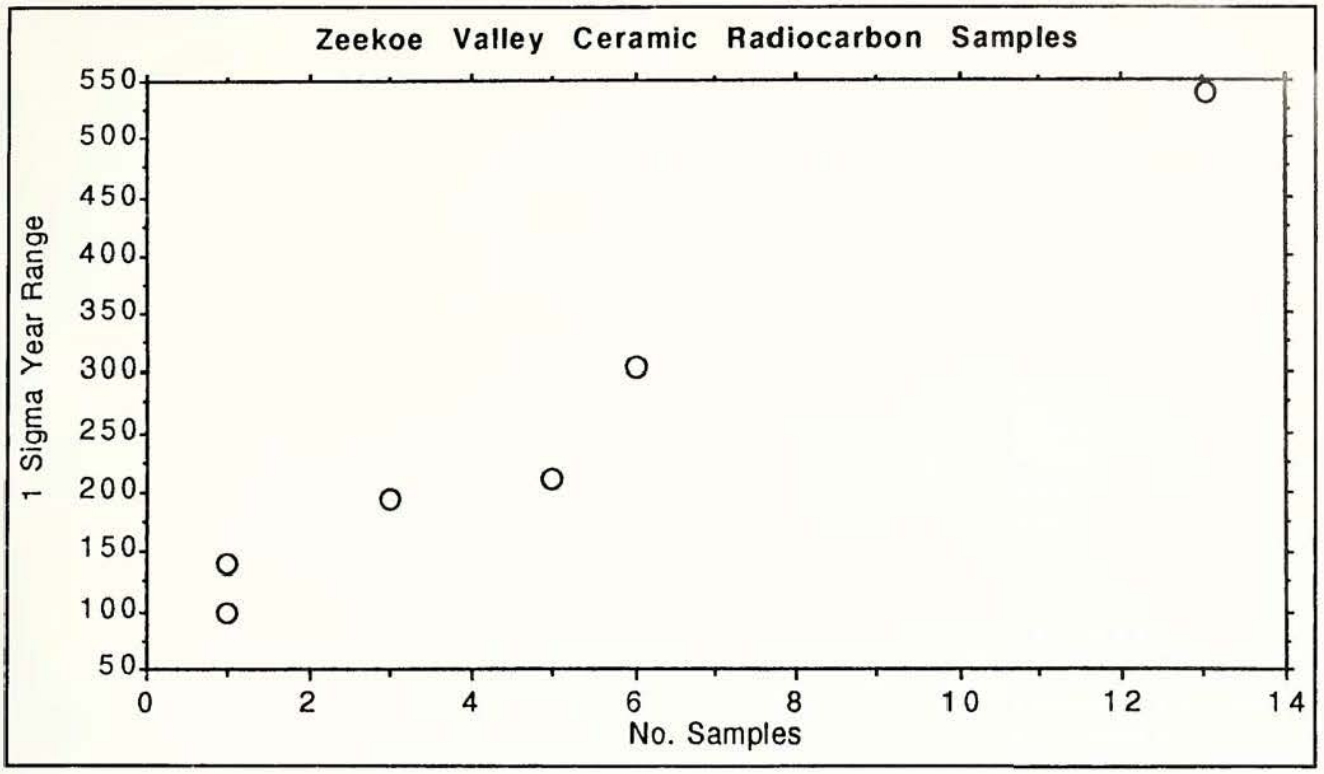

Fig. 2. Covariance between purported age-ranges of six radiocarbon-dated motifs, and the number of vessels dated per motif.

(ovoid stab and lift, double punctate, and quill) is present. This is also to be expected since these motifs were extremely rare (double punctate) or absent (ovoids, quill) from this side of the upper valley (Sampson 1988). Although the lens could be a late deposit of Phase 2, this cannot be confirmed until further charcoal dates are obtained or the sample is increased.

Phase 4 is apparently represented by the overlying lens at the back of shelter. This lens yielded one rocker stamp sherd and a possible sherd of the Phase 4 marker motif, the large spatulate oblique stab and lift. However, the stylus used on this specimen was of pyramidal shape and the angle of entry was not markedly oblique, so this is not a typical specimen. Khoi and comb stamp are absent. Also in the Phase 4 lens are two variants of the marker motif, namely small spatulate, oblique stab and lift and the large spatulate vertical stab and lift. Their association here is fortunate since neither was sampled by the direct dating program. The lug fragment is probably derived (see above).

Phase 5 is also well defined by the presence of European items in the deposit (Voigt *et al.* 1995) and by a sharp decline in faunal density (*ibid.*). There is a relatively deep lens at the rear of the shelter and another shallower lens near the drip line. Only rocker stamp sherds are present in this near-surface unit, which matches well with the new framework.

Haaskraal Shelter

Two separate excavations were conducted at this site, one in the shelter fill and another in the talus rubble which built up behind a dry stone (kraal) wall outside the shelter. The trench system inside the shelter is too varied to permit a single composite section of the whole deposit, and the forward angle of dip of the fill also prevents a composite view running parallel with the rear wall. Consequently three views must be presented, with sherd positions in only the nearest meter of deposit projected on to each.

The first composite section is of the trench running from the back wall of the shelter (trench JIEA), through a historical stone wall at the drip line and out on to the top of the talus (Fig. 4). A very small Phase 1 sherd sample is present at the base of the ceramic sequence, with a single Khoi and several plain fibre-tempered sherds. It is not visible at the back of the shelter. Two charcoal dates of 1140 ± 60 BP (uncal.) and 1180 ± 70 BP (uncal.) were obtained from this thin horizon (Hart 1989), dates which are in keeping with those obtained directly from Phase 1 vessels (Fig. 1).

Phase 2 is clearly demarcated in the trench by rocker stamp, a possible comb stamp and several Khoi sherds. Interfaces cannot be discerned at the back of the shelter for want of adequate samples. There is also a small spatulate stab and drag pattern which was not tested in the direct dating program. The pair of matching, fibre-tempered lug fragments is firmly positioned in Phase 2. Only the latest part of Phase 2 is present in the shelter. A charcoal date of 544 ± 43 BP (uncal.) (Hart 1989) together with AMS dates from sheep remains at 410 ± 65 BP (uncal.) and from cattle remains at 515 ± 65 BP (uncal.) (Plug *et al.* 1994) indicate a 500 year gap in the sequence at the interface between Phases 1 and 2. This gap coincides with the dearth of direct dates for early Phase 2 (Fig. 1).

There could be another break above Phase 2 since

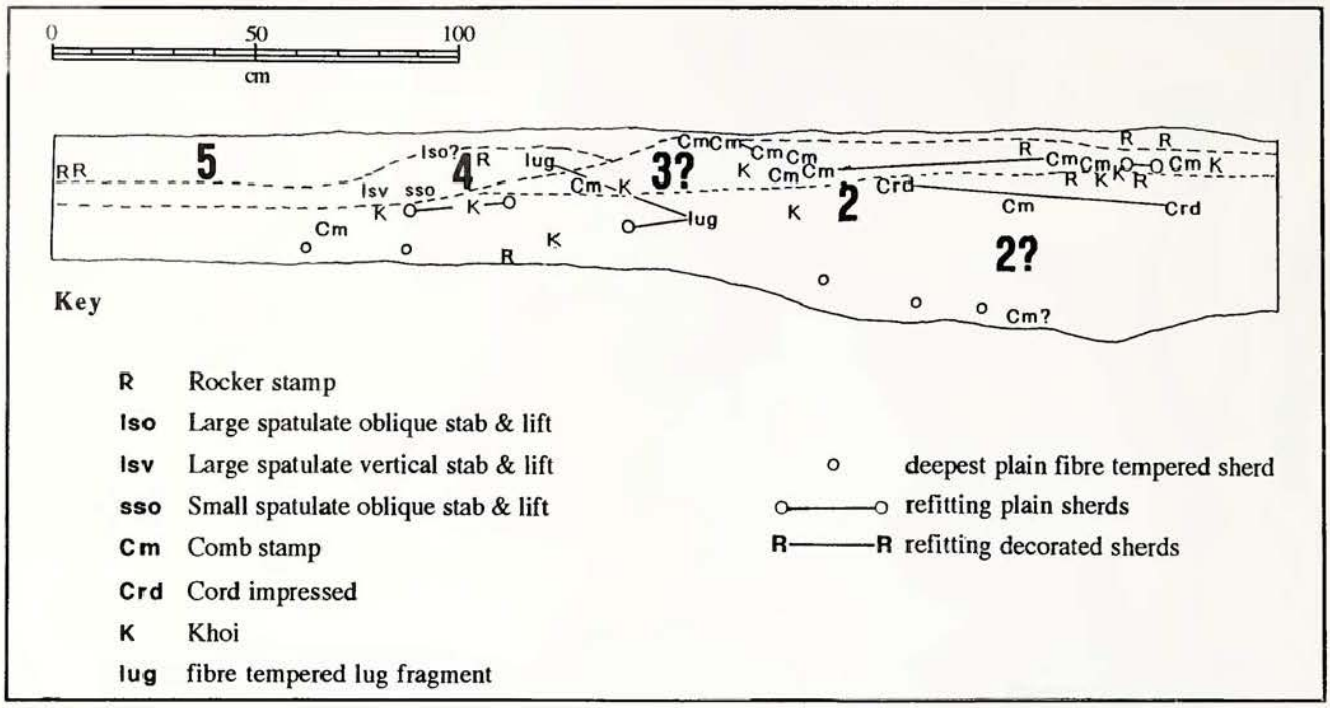

Fig. 3. Phase boundaries (stippled lines) in Volstruisfontein Shelter, showing positions of marker sherds in each numbered phase.

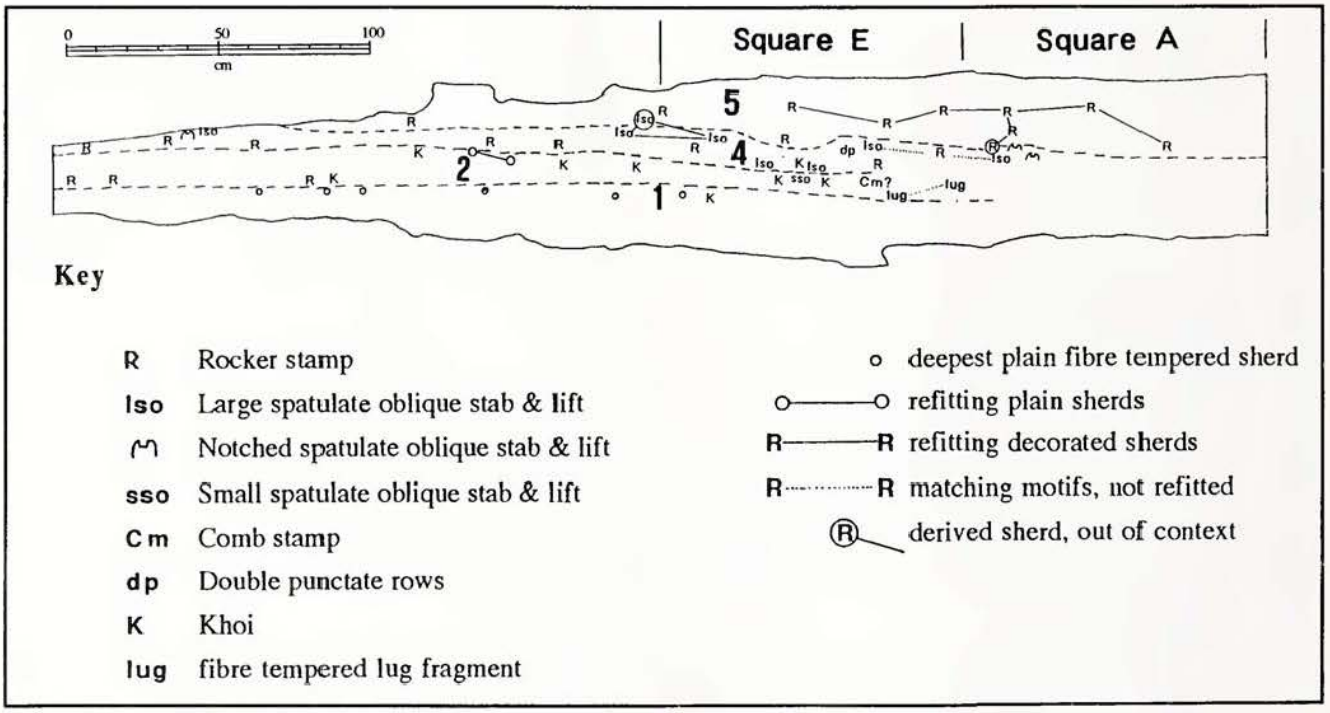

Fig. 4. Phase boundaries (stippled lines) in Haaskraal Shelter trench JEIA, showing positions of marker sherds in each numbered phase.

Phase 3 cannot be discerned at all by ceramic criteria. Also, there are no charcoal dates that might confirm this period.

Phase 4 is well represented in the trench, although its lower interface cannot be defined at the back of the shelter. Its upper level has been pitted in at least two places where historical livestock remains were buried into Phase 4 from above (*ibid.*). There are rocker stamp sherds, a single Khoi specimen, and a double punctate. The typical Phase 4 marker, large spatulate stab and lift, is very well represented, including three refitted sherds and a pair of matching patterns. Also present are good examples of the notched spatulate stab and lift motif, and a specimen of double-notched spatulate stab and lift,

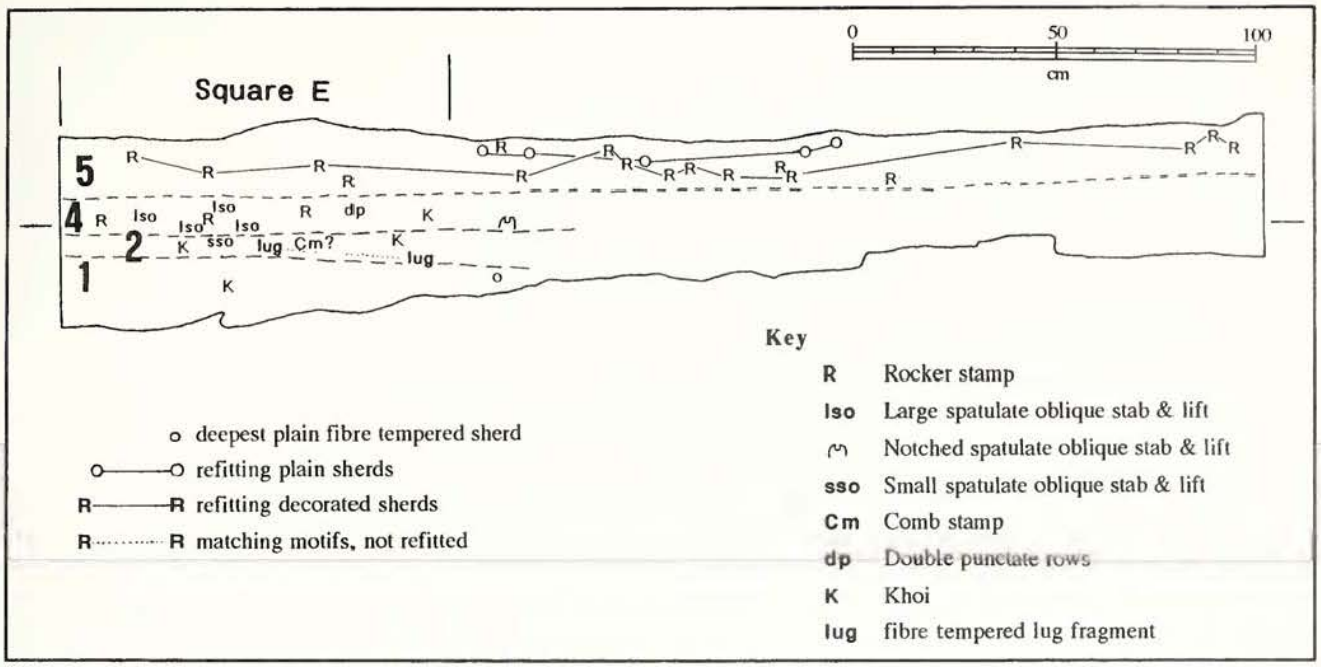

Fig. 5. Phase boundaries (stippled lines) in Haaskraal Shelter trench EFG, showing positions of marker sherds in each numbered phase.

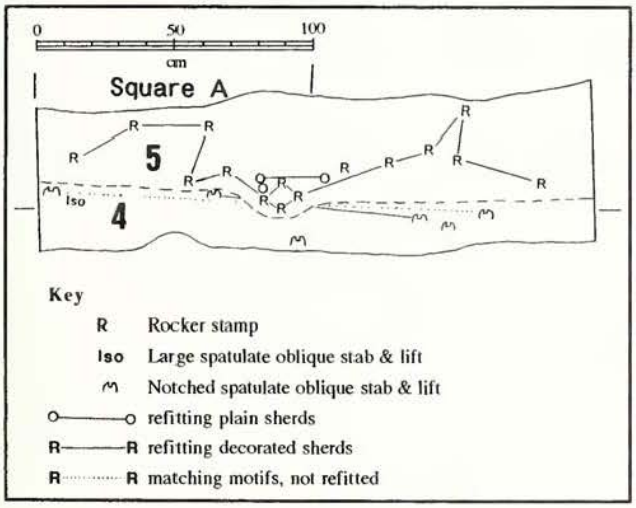

Fig. 6. Phase boundaries (stippled lines) at the back of Haaskraal Shelter (squares AB), showing positions of marker sherds in each numbered phase.

neither of which was covered by the direct dating program. The local disturbances have intruded a Phase 5 rocker (together with a glass trade bead) sherd into this level. Fortunately it refits to a Phase 5 bowl distributed above it (Bollong 1994). Also, a single large spatulate sherd was certainly dug out of Phase 4 into the base of overlying Phase 5 levels, because the sherd refits to a pair firmly positioned in Phase 4.

Phase 5 is exceptionally well represented by a set of refitting rocker stamp sherds from a single bowl, associated with European artifacts and livestock (Hart 1989; Voigt *et al.* 1995). As predicted by the direct dating program, there are no other motifs present, nor is there any Khoi.

The second composite section (EFG) is at right angles to trench JIEA and runs parallel with the back wall. It has one meter square (E) in common with the first trench (Fig. 5). The contents of this square also defines the division ofthe whole of trench EFG, which contributes no new information. There is another plain fibre-tempered sherd in Phase 1, and another notched spatulate stab and lift in Phase 4. Many more conjoining pieces of the rocker-stamped bowl in Phase 5 were recovered from this trench at the same levels as numerous European item sand livestock remains. There are also some refitted undecorated sherds from above the rocker refits.

Two squares at the back of the shelter (Fig. 6) include one (A) which overlaps the back of trench JIEA. The lower part of the sequence is truncated here by bedrock. There are are more notched spatulate stab and lift sherds in Phase 4, two of which refit. There is also a pair of matching double-notched spatulates from two meters apart. Several more refitting pieces of the rocker stamp bowl are present in Phase 5 along with some undecorated refits. The disturbance caused by pitting of the lower levels of Phase 5 can be traced through the refits. European items and livestock remains were also involved in this localised churning.

Overall, Haaskraal shelter fits reasonably well with the phase sequence constructed from the direct dates, and it even shows a clear gap in early Phase 2. Once again, Phase 3 cannot be resolved in the stratified sequence because its marker motifs are generally scarce in the west side of the upper Seacow valley.

Haaskraal Talus

The diagonal slope of the deposits across the excavations makes it impossible to project all the sherd

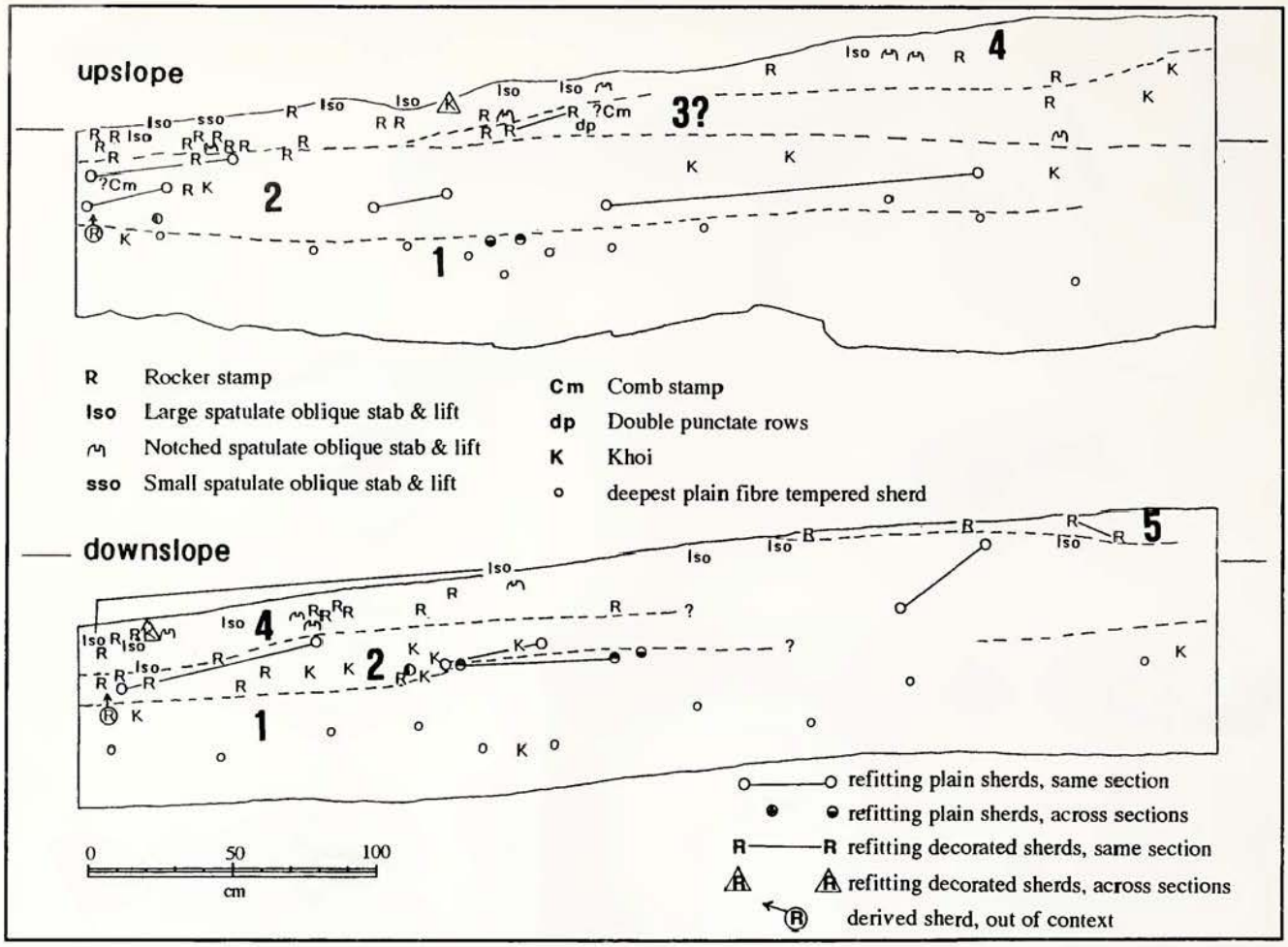

Fig. 7. Phase boundaries (stippled lines) in upslope and downslope sections of Haaskraal Shelter talus, showing positions of marker sherds in each numbered phase.

positions on to one composite section. Interfaces between ceramic zones also slope forward, and these become so blurred on a single section that they cannot be defined. Consequently two sections are shown of the upslope and downslope halves of the deposit (Fig. 7).

In the upslope half, Phase 1 is represented at the base of the sequence by only one Khoi sherd together with several fibre-tempered plain sherds, some of which occur deeper in the deposits. A small crumb of rocker stamp ware near the Khoi sherd may be a wall drop from above, but it is too small to match with any Phase 2 rocker patterns. A few plain refits help to tie the upslope and downslope interfaces together correctly.

The Phase 2 levels yielded a small but unambiguous sample that includes Khoi, rocker stamp and comb stamp only. There are several refits, some of which cross to the downslope section.

Phase 3 may be present on the talus, with Khoi, rocker stamp, comb stamp and double punctate, the latter being a Phase 3 marker. Three other sherds are possibly double punctate or an early expression of notched spatulate. Rocker stamp outnumbers comb stamp, which is to be expected since Haaskraal is situated on the outer edge of comb stamp distribution in the upper valley (Sampson 1988).

Phase 4 is very well defined by the uppermost layer of rare Khoi, some rocker stamp, double punctate, and several sherds of large spatulate stab and lift which is the marker for Phase 4. A few, good examples of notched spatulate stab and lift also occur here, and a small spatulate oblique stab and lift. As neither of these motifs were directly dated, it is useful to have both sealed in Phase 4 deposits. Comb stamp is absent, as predicted by the direct dating scheme (Fig. 1).

Phase 5 is missing from the upslope half of the talus deposits. This is confirmed by the absence of European artifacts, but there are a few fragments of possibly European-derived livestock at the surface (Plug *et al.* 1994:39).

In the downslope half of the deposits, Phase 1 is somewhat better represented at the base of the sequence by Khoi and undecorated fibre-tempered ware, although there is again a solitary crumb of the latter with a hint of impressed decoration. Although the kraal wall itself yielded a rocker stamped sherd at this level, the slope dips towards the wall in such a way that this specimen must belong to the overlying horizon.

Phase 2 is well defined and contains only Khoi and rocker stamped sherds. However, none was recovered from the east end of the trench, thus the interfaces that bound Phase 2 cannot be accurately delineated. Sediment between the rocks in the kraal wall itself produced a

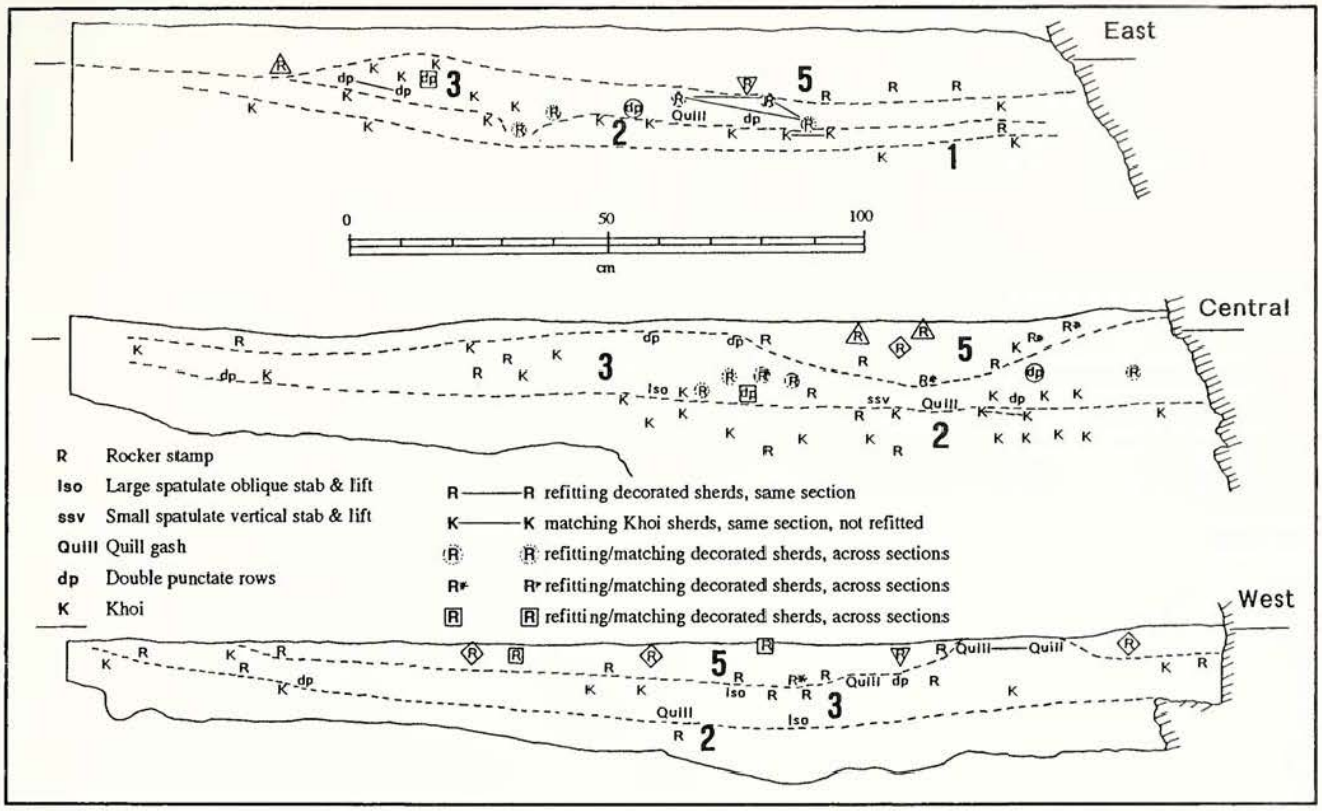

Fig. 8. Phase boundaries (stippled lines) in Driekoppen Shelter, showing positions of marker sherds in each numbered phase.

large spatulate oblique stab and liftspecimen, which is ascribed to the overlying layer, based on the angle of dip projected into the wall.

Phase 3 cannot be demarcated for want of marker specimens. Although there are no anomalous sherds present between the estimated interfaces, the sample is too small to be certain. A pair of refitted plain sherds in the downslope section (right) points unambiguously to a local disturbance in the deposits.

Phase 4, by contrast, is well delineated by an adequate sample of rocker stamp, large spatulate stab and lift, and notched spatulate stab and lift. There is also a Khoi sherd which refits to one from the upslope Phase 4 level. A plain sherd also refits to one in Phase 2, signaling the only localised disturbance to bedetected.

Phase 5 is represented by a thin surficial horizon at the east end of the trench. One of the three rocker specimens in this unit refits to the near-complete Phase 5 bowl from the shelter, so the ascription to this phase is confirmed even though the sherd sample is small.

Overall, the ceramic sequence in the talus reflects the direct dating framework of five phases. This suggests in turn that the talus has sound stratigraphic integrity and is not widely churned or mixed, as was originally proposed by Sampson *et al.* (1989). In this light, the near-modern radiocarbon date (SMU-1639) from diffused charcoal grains (Hart 1989) in the Phase 2 levels is a clear contradiction, which remains to be explained.

Driekoppen Shelter

Three contiguous composite sections are needed, each two metres thick and running from the rear wall out to the drip line (Fig. 8) in order to cover this extensive excavation. The deposits dip slightly from the talus down to the rear wall, but large firepits disrupt the layering of the the central and west areas. The sherds are are unusually small in this site, and refits between sherds are few. However, small, matching pieces of some vessels can be traced across large areas of the fill.

Phase 1 is relatively well defined at the deeper east end of the fill where only Khoi and undecorated fibre-tempered sherds occur at the base of the sequence. It either lenses out or is truncated by a disturbance half way through the central section, and it is truncated by sloping bedrock in the shallow west section.

Phase 2 deposits are clearly defined in all three sections as a continuous horizon with Khoi and rocker stamp only. This shelter may be outside the distribution of comb stamp ware, which would explain its absence from here.There may be some churning in the central section.

Phase 3 is well represented in the overlying layer which contains Khoi, rocker stamp, quill, and double punctate decorations. A motif not covered by the direct dating program is also present in these levels, namely small spatulate vertical stab and lift. There are definite sherds with large spatulate oblique stab and lift near the base of this layer in the central and west sections. Since the dating program isolated this motif as a good marker for Phase 4 only, this clearly conflicts with those results. Either the motif is also present in Phase 3, or the overlying Phase 4 layer has been churned into the underlying levels.

Phase 4 is apparently missing from the sequence.

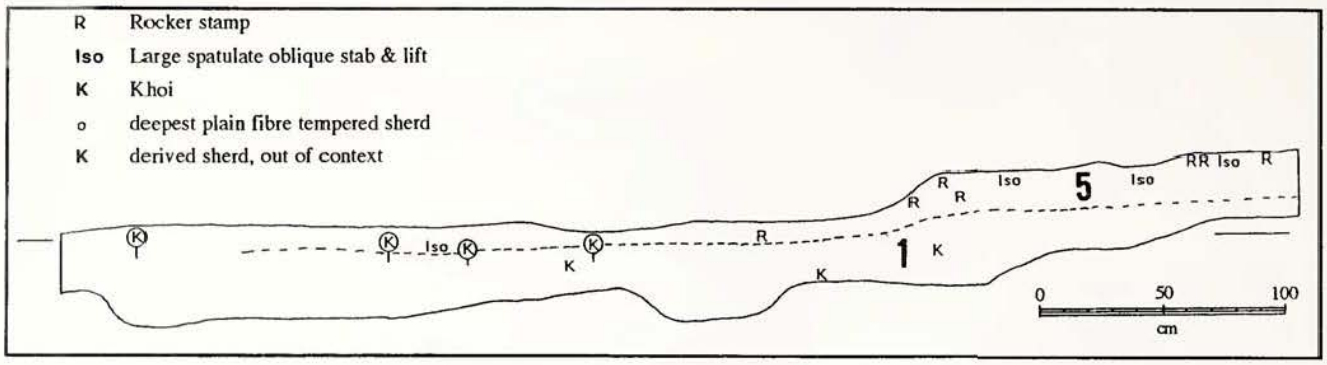

Fig. 9. Phase boundaries (stippled lines) in Leeuhoek Shelter, showing positions of marker sherds in each numbered phase.

Phase 5, containing only rocker stamp sherds, is certainly present but there are signs of heavy disturbance in the central and possibly in the west sections where large, charcoal-filled fire pits were dug into the underlying levels. Consequently a piece of Khoi pottery, and possibly other pieces, have been moved upwards in the central section. Two quill sherds in the west section probably suffered a similar fate. European items have also been thrust down into underlying Phase 3 levels in some places.

Overall, the shallow Driekoppen fill with its high yield of decorated sherds has yielded a clear sample of Phase 3, but the normally well defined Phase 4 is absent or at best ephemeral and destroyed by later disturbances. Also, the integrity of the main Phase 4 marker motif (large spatulate oblique stab and lift) is called into question.

Leeuhoek Shelter

The composite section of this fill runs parallel with the rear wall, and sherd positions have been projected on to the profile from one metre on either side of the section (Fig. 9). This extensive fill is very shallow and compressed. There may be an ephemeral Phase 1 sample at the base of the sequence, but the sample is too small to be certain. There is a substantial gap in the record, followed by a Phase 5 deposit heavily laden with European artifacts and livestock (Voigt *et al.* 1995), and associated with a stone wall built up almost to the ceiling. In the thinnest and most compressed part of this layer there are four Khoi sherds which are surely derived from below. In the thicker, undisturbed part ofthe layer there are sherds with a typical large spatulate oblique stab and drag motif. These are definitely *in situ* and in direct association with the Phase 5 rocker stamp sherds. Stab and drag motifs were not covered by the direct dating program, and this is the only proof that any non-rocker motif survived into Post-contact times in the upper Seacow valley.

Abbot's Cave

Here, the composite section runs across the middle of the cave from one side wall to the other, with sherd position from two metres at the back and two metres at the front projected on to the profile (Fig. 10). Phase 1 may be present at the base of the sequence, but there is only one Khoi sherd at this level so the sample is not adequate for firm identification. There was not enough charcoal to obtain radiocarbon dates from the base of the sequence.

Phase 2 is moderately well represented with Khoi and rocker stamp sherds, but there are also four radiocarbon dates on charcoal (stippled outlines in Fig. 10) spanning 760 ± 50 BP (uncal.) to 430 ± 50 BP (uncal.), which firmly establish this layer as later Phase 2. It is note worthy that the rocker stamped sherds are all in the upper portion of this layer, reflecting the distribution of direct radiocarbon dates of this motif (Fig. 1). The solitary sherd with large spatulate oblique stab and lift from Phase 2 levels is almost certainly derived from above due to localised burrowing (there is a European peach stone from near this sherd).

Phase 3 is apparently missing from the sequence. The purported Phase 3 marker motifs were relatively common on the east side of the study area (Sampson 1988), so their absence is less likely to result just from regional scarcity.

Phase 4 is clearly demarcated by two large spatulate oblique stab and lift specimens associated with several rocker stamped sherds, by a solitary Khoi sherd, and by a charcoal date (stippled in Fig. 10) of 250 ± 50 BP (uncal.). Three sherds with small spatulate oblique stab and lift are also firmly associated with the layer. This motif was not included in the direct dating program.

Phase 5 is clearly demarcated by an abundant sample of European artifacts and livestock (Voigt *et al.* 1995) with a thick capping of compact sheep dung. A charcoal date at the base of the layer gave 100 ± 45 BP (uncal.). Besides the ubiquitous rocker stamp sherds, the layer yielded is a solitary Khoi specimen and another which may be comb stamp rather than rocker. These, and a heavily worn notched spatulate speciment from the surface dust, are almost certainly derived through ground squirrel burrowing from the lower levels. The origin of a solitary sherd with small spatulate oblique stab and drag is less certain.

Lame Sheep Shelter

The composite section also runs through the middle of this fill, with sherd positions from two metres on either

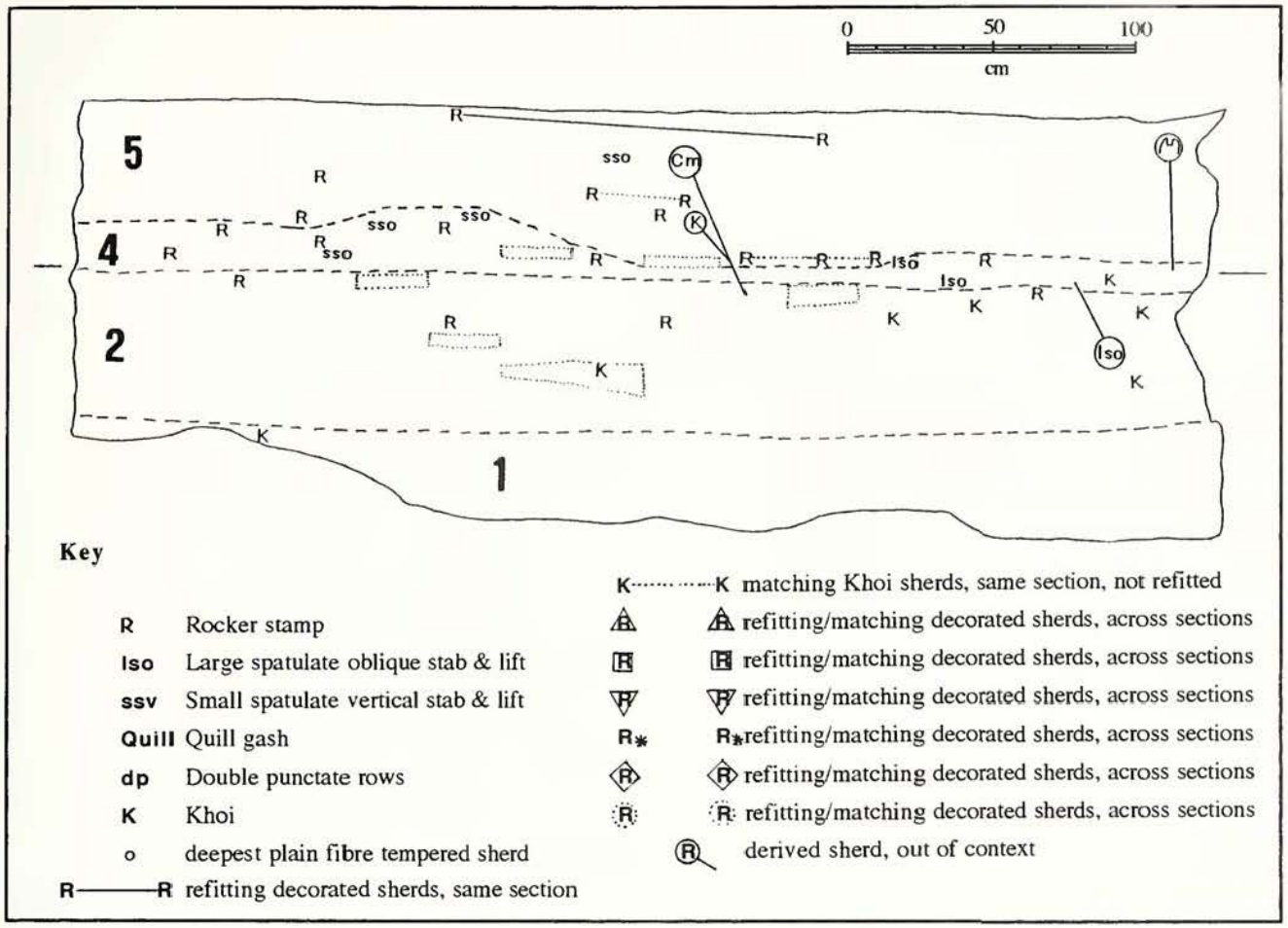

Fig. 10. Phase boundaries (stippled lines) in Abbot's Cave, showing positions of marker sherds in each numbered phase.

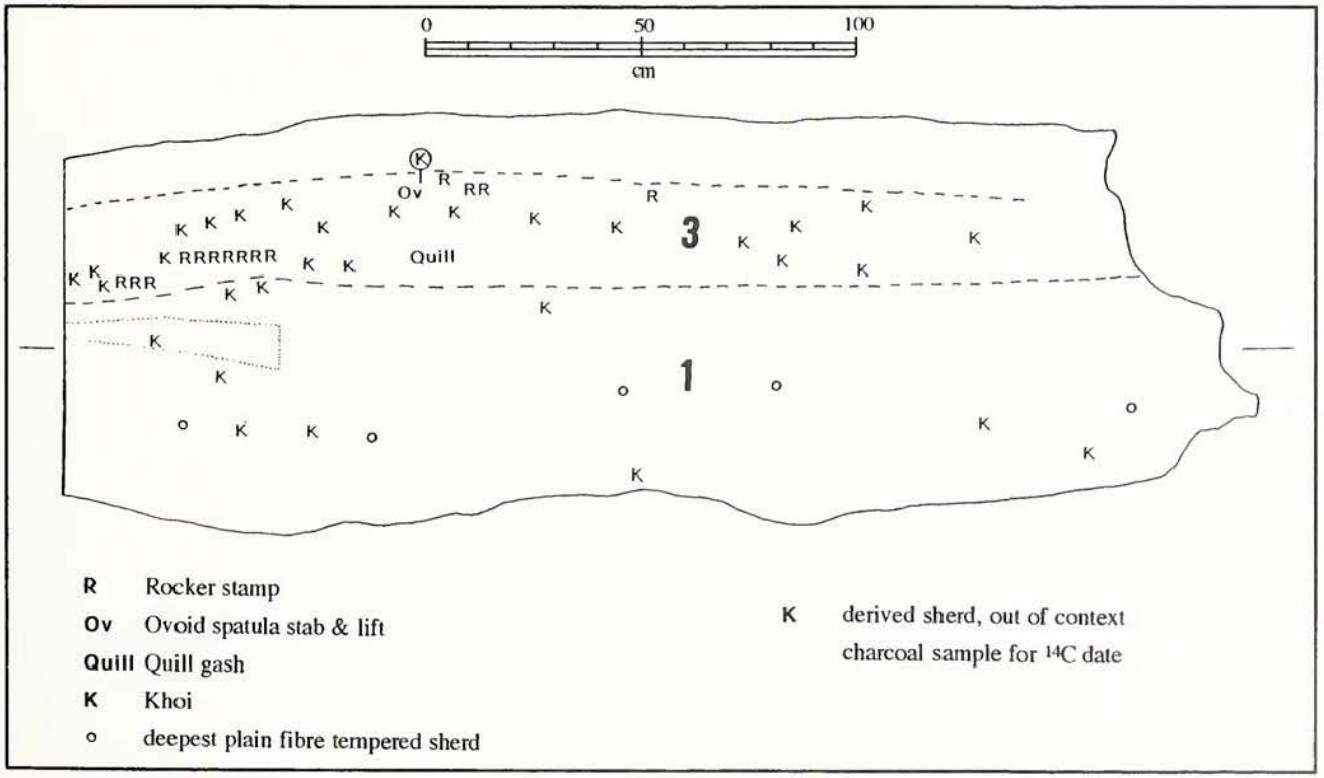

Fig. 11. Phase boundaries (stippled lines) in Lame Sheep Shelter, showing positions of marker sherds in each numbered phase.

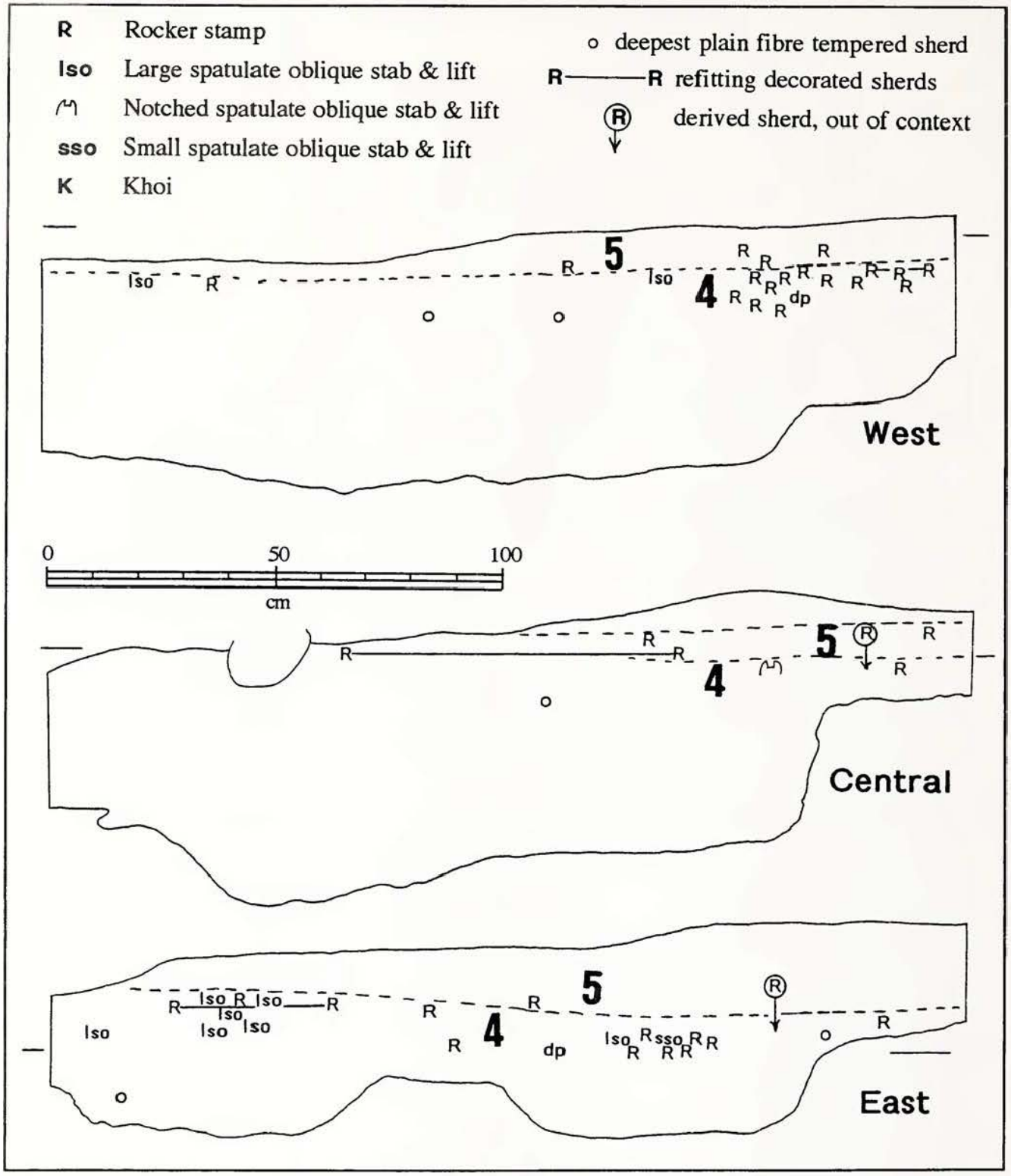

Fig. 12. Phase boundaries (stippled lines) in Boundary Shelter, showing positions of marker sherds in each numbered phase.

side of it projected on to the profile.

Phase 1 is unusually well represented here, in contrast to the neighbouring Abbot's Cave deposits. There are numerous Khoi and undecorated fibre-tempered sherds in the base of the Lame Sheep sequence, with a charcoal sample (stippled in Fig. 11) dated to 1350 ± 50 BP (uncal.). There are remains of cattle and sheep in this layer (Voigt *et al.* 1995).

Phase 2 appears not to be present, even though it is well represented in Abbot's Cave next door.

Another marked contrast with the neighboring fill is that Phase 3 is exceptionally well represented here. Besides relatively abundant Khoi sherds, there are several pieces of the same rocker stamped vessel, and both the distinctive Phase 3 marker motifs are present. As predicted by the scanty direct dating evidence (Fig. 1) the quill sherd underlies the ovoid (round) stab and lift motif.

Again contrasting with the neighboring fill, the rest of

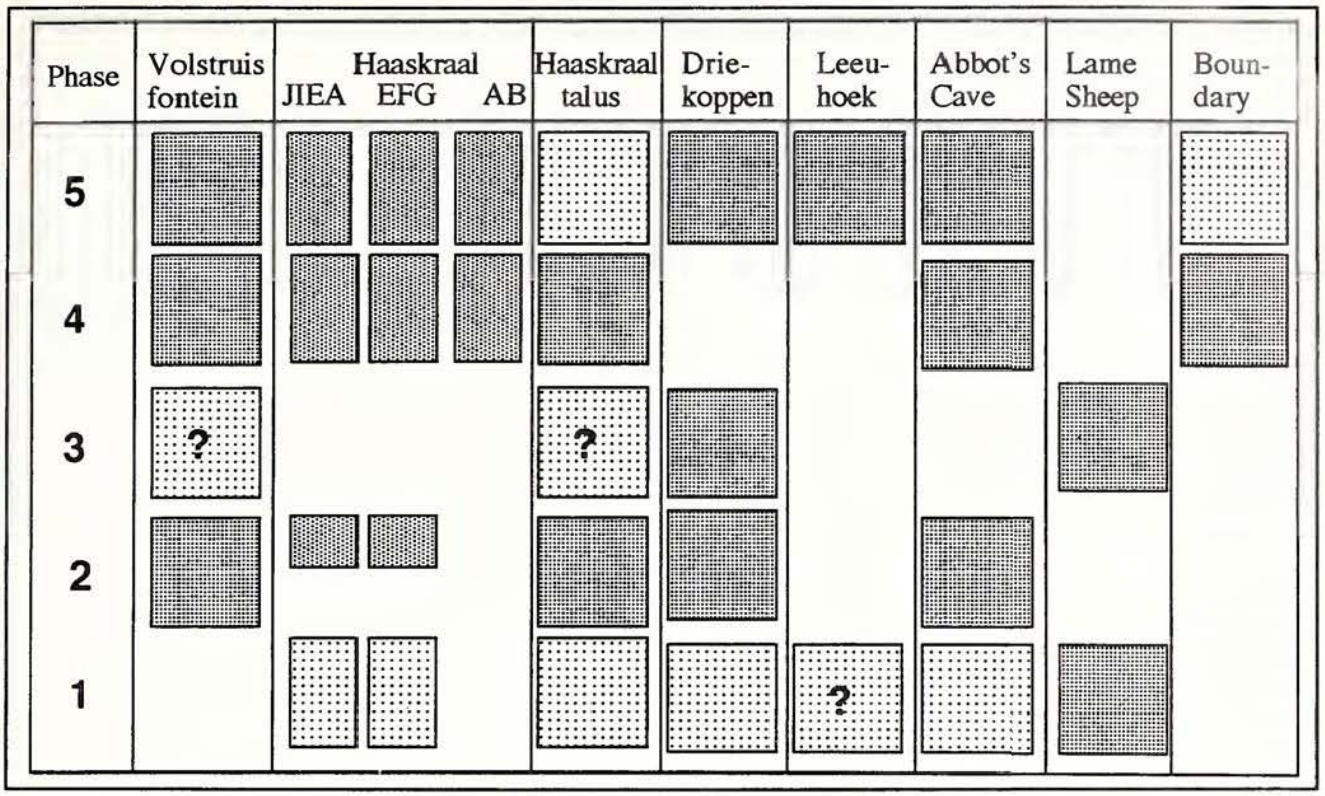

Fig. 13. Correlation chart of ceramic phases present in eight shelters. Light stipple denotes ephemeral presence.

the sequence is missing from this shelter. The reasons for this oscillating occupation of adjacent caves is not easily explained, but may have something to do with early inaccessibility to Abbot's, followed by a side wall collapse which opened it to the elements. A still later roof collapse at Lame Sheep probably made it less attractive than the adjacent cavity in the later phases.

Boundary Shelter

A composite section of the west end of the excavation allows sherds across 2.75 meters of the fill to be projected on to it (Fig. 12). As the fill slopes sharply upwards in the easternmost portion of this trench, it is shown separately as a central, 25 cm wide slice. A second trench at the elevated eastend of this shelter is shown as a composite with sherd positions projected on to it from up to a metre away.

The first ceramic level to occur in this shelter is of clear Phase 4 composition. There are rocker stamp, large spatulate stab and lift, and double punctate sherds in sufficient numbers to make this a reasonably firm identification. Khoi is absent. There are also motifs which were not incorporated in the direct dating program, namely small spatulate oblique stab and lift, and notch spatulate stab and lift.

Phase 5 is not well represented in the overlying layer which also contains European artifacts and livestock. There are too few rocker stamp sherds and specimens in the east and central sections match a vessels from the underlying Phase 4 layer. This was probably derived from upslope outside the shelter and brought in with the sterile hillwash that flowed in from the side of the shelter to cap the Phase 5 deposit.

FINE-SCALE CORRELATIONS

A correlation chart for ceramic phases in the eight excavated rock shelter deposits is shown in Figure 13. All the shelters show gaps in their depositional history, except possibly Haaskraal talus. Phase 1 is represented by only one substantial accumulation at the base of the Lame Sheep Shelter, while three others have small samples and Leeuhoek may have an ephemeral trace. The foundations of the kraal wall on the Haaskraal talus (Hart 1989) is probably tied to this horizon.

Phase 2 is well represented in four deposits and absent in three others on the east side of the upper valley. Only Haaskraal Shelter has sufficient associated charcoal dates to demonstrate a depositional hiatus in the first half of Phase 2.

Phase 3 is clearly demarcated in Driekoppen and Lame Sheep, but cannot be confirmed at Volstruisfontein or Haaskraal talus because the marker motifs for the phase are too rare and were not recovered in the appropriate levels. It cannot be discerned at all in four of the other deposits.

Phase 4 is firmly established in four shelters, but missing from three others. There are no small samples with insufficient marker motifs.

Phase 5 is also well represented in five deposits and ephemerally present in two others. Only Lame Sheep is evidently without this phase. There is no obvious patterning in the occurrence of depositional gaps. Even between adjacent deposits like Abbot's and Lame Sheep, the sequences are not the same. Overall, there are more hiatuses in the eastern cluster of shelters. Although Phases 1 and 3 are not as well supported by the stratified

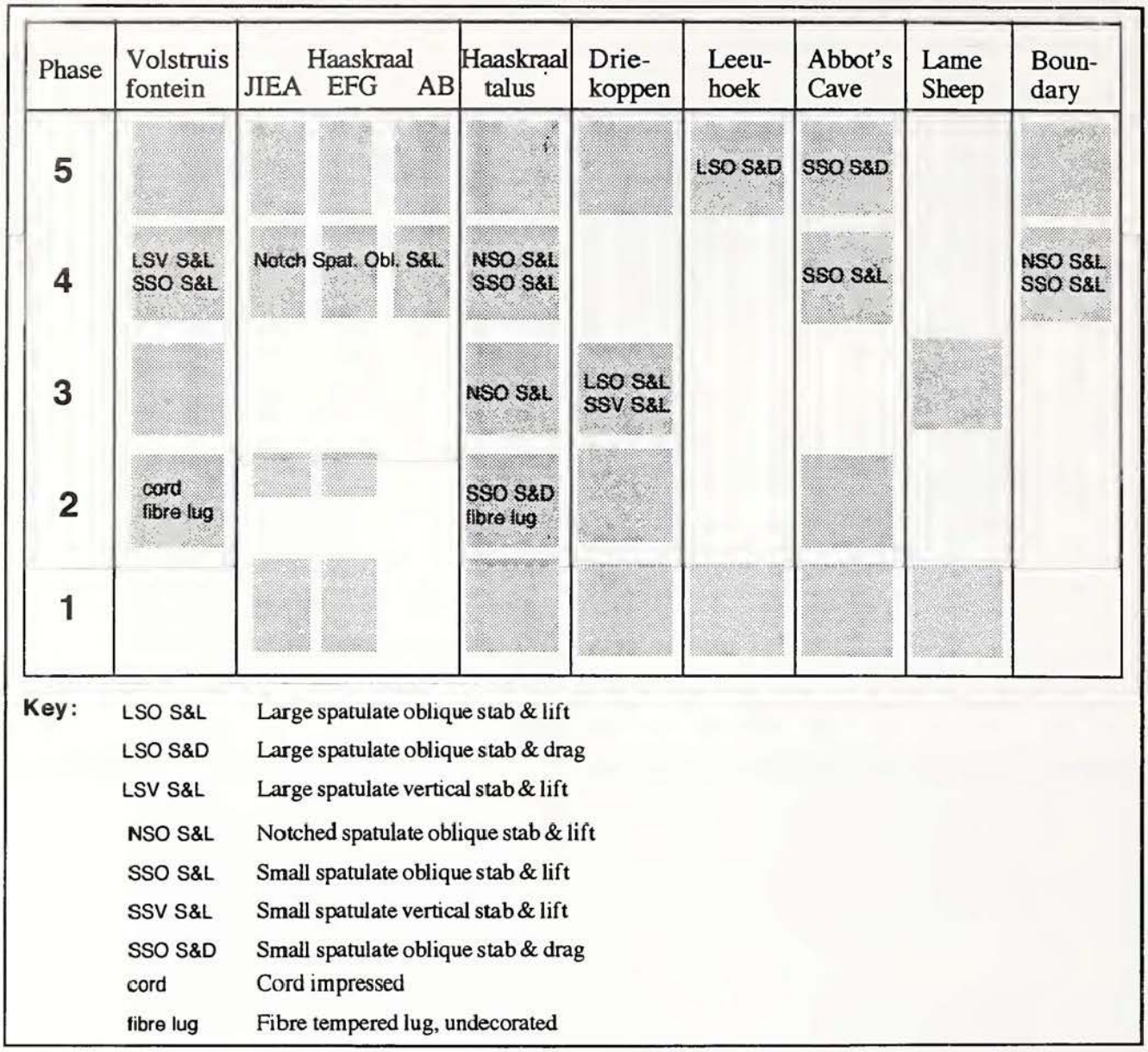

Fig. 14. Correlation chart showing stratigraphic positions of ceramic motifs not tested in the direct dating program. Motifs are described in Sampson (1988).

data as Phases 2, 4, and 5, the anticipated difficulty in discerning Phase 3 did not occur, at least on the east side of the upper valley. Overall, the ceramic stratigraphy goes some way to supporting the 5-phase framework suggested by the direct dating program.

Other Potential Markers

Decorative motifs for which there were no direct dates were repeatedly encountered in the excavated sequences, and some of those motifs recurred in the same horizon (Fig. 14).

In Phase 1 there were small crumbs with faint traces of stamp impressions on their outer surfaces, but the motif could not be recognised. These were seen at Volstruisfontein and Haaskraal. Parts of some deposits showed rocker stamp vessels at the very base of the sequence, and were assigned to Phase 2. It could be that Phase 1 included some decoration, but the question cannot be resolved without AMS dates on those specific basal sherds.

In Phase 2, fibre-tempered lugs without decorations were recovered from Volstruisfontein and Haaskraal talus. Therefore lugs were not restricted to Phase 4, for which there is a solitary direct date.

Phase 2 also yielded the very rare cord-impressed motif (at Volstruisfontein) and a possibly related pattern of small spatulate oblique stab and drag (at Haaskraal talus) If the stylus is held at an angle to the line of drag, it is possible to create an imprint that resembles single cord impression, so the two may be related.

Phase 3 is difficult to evaluate because the record of its presence is so ambiguous. Only one of the two reasonably secure Phase 3 samples (at Driekoppen) yielded undated types. These included small spatulate vertical stab and lift, also large spatulate oblique stab and lift. Securely dated as the main Phase 4 marker, this is

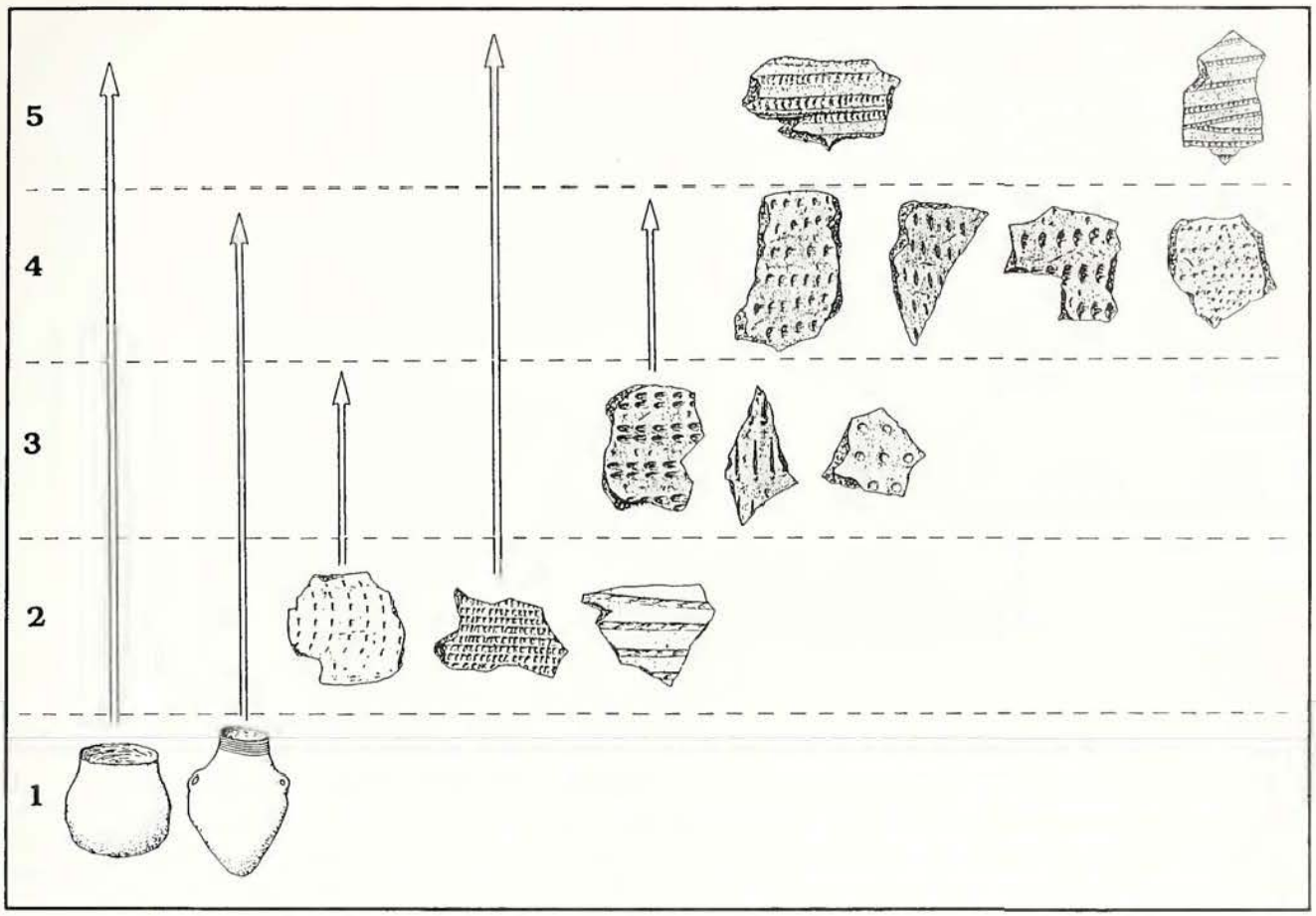

Fig. 15. Summary diagram of ceramic types and motifs present in each phase. Direct dated motifs are augmented by others found consistently in the same stratified positions.

not found in Phase 3 elsewhere. If the Driekoppen specimens were not churned downwards by the firepits dug in from above, they raise the possibility that the motif was indeed present earlier, albeit in small numbers.

Phase 4 has produced more undated potential markers, all based on the spatulate stylus. The most recurrent motif (at four sites) was the small spatulate obliquestab and lift, which differs only in spatulate tip width from the main marker type. Notched spatulate stab and lift was another recurrent pattern (in three deposits). There is also one case of large spatulate vertical stab and lift, which differs from the main marker only in the angle of entry of the stylus tip. It can also be noted that rare Khoi sherds were recovered from the Phase 4 levels of three deposits, adding support for the single TL date which suggested a dwindling Khoi survival into Phase 4 times.

Phase 5 produced large and small spatulate stab and drag motifs in two sites on the east side of the upper valley. Stab and drag is certainly present in the Post-contact levels of Glen Elliott and Zaayfontein on the Orange River (Sampson 1967a & b). It is thus reasonable to expect Phase 5 surface samples to include rare examples of stab and drag also. The Khoi sherds found in Phase 5 levels at Abbot's, Lame Sheep, and Leeuhoek are in each case associated with disturbances which suggest they are derived from lower in the sequence.

CONCLUSIONS

Overall, the ceramic stratigraphy supports the 5-phase chronological framework of ceramic markers, based on the direct dating of sherds. Although none of the excavated sequences flatly contradict the proposed framework, neither does any one shelter fill satisfactorily duplicate the whole, unbroken sequence. Either multiple, unpatterned gaps in occupation are a hallmark of all the shelters, or the five-phase framework is too simplistic as a heuristic device for the planned seriation of surface sites. However, stratified charcoal dates from three shelters definitely support the former interpretation.

More marker motifs are suggested for Phases 2, 4, and 5 than were captured in the sample used for direct dating. The combined results of the direct dating program and the excavation program (Fig. 15) suggest a substantial revision of the middle part of the sequence proposed by Sampson *et al.* (1989). Phase 1 is still represented by Khoi and undecorated fibre-tempered ware. Phase 2 heralds the introduction of rocker, comb, and cord motifs to the fibre-tempered vessels. Phase 3 sees the further addition of double punctate, quill and ovoid stab and lift motifs, but cord drops away. Phase 4 is characterised by four variants of the spatulate stab and lift family of motifs, while comb, quill and ovoid drop

out. Phase 5 is still characterised by rocker stamp with very rare occurrences of spatulate stab and drag motifs. Khoi ware drops away, as does the double punctate motifs and the four spatulate stab and lift motifs on the fibre-tempered ware.

These criteria greatly enhance our ability to seriate the large sample of surface sites based on their ceramic contents.

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