

# Beyond the drip-line: a high-resolution open-air Holocene hunter-gatherer sequence from highland Lesotho

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*The activities of hunter-gatherers are often captured in rockshelters, but here the authors present a study of a riverside settlement outside one, with a rich sequence from 1300 BC to AD 800. Thanks to frequent flooding, periods of occupation were sealed and could be examined in situ. The phytolith and faunal record, especially fish, chronicle changing climate and patterns of subsistence, emphasising that the story here is no predictable one-way journey from hunter-gatherer to farmer. Right up to the period of the famous nineteenth-century rock paintings in the surrounding Maloti-Drakensberg region, adaptation was dynamic and historically contingent.*

**Keywords:** southern Africa, late Holocene, Neoglacial, hunter-gatherers, fishing, space, intensification, nondirectionality, phytoliths

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## Introduction

Rockshelters loom large in the archaeology of hunter-gatherers worldwide — and southern Africa is no exception. Highly visible and easy to locate, they typically preserve well-stratified deposits rich in material culture and organic remains. Yet they capture only a fraction of people's activities, most of which took place beyond the drip-line. Landscape-oriented research (e.g. Sampson 1985) confirms that at many times and in many places people camped in the open, just like recent Kalahari Bushmen. Away from the coast, however, where shell middens provide obvious contexts for archaeological investigation (e.g. Jerardino & Yates 1997), few open-air sites of Holocene age have attracted serious excavation. In areas like the Karoo, the semi-arid interior of western South Africa, they are often deflated, with bone and macroplants poorly preserved, while elsewhere dense vegetation may render their discovery difficult. Rare exceptions have received only limited investigation.

This paper summarises work at an open-air site that, unusually, combines excellent faunal preservation, high quality spatial patterning and good temporal resolution over multiple occupation episodes. Likoang is significant for what it tells us about hunter-gatherers in the Maloti-Drakensberg mountains of Lesotho, but also because it addresses wider debates, including the exploitation of aquatic resources (freshwater fish), shifts in seasonal focus linked to climate change, and forager acquisition of domestic livestock. Such debates have broad relevance since issues of intensification using resources of the kind that Hayden (1990) terms *r*-selected, the impact of global climatic pulses like the late Holocene Neoglacial (e.g. Jerardino 1995), and the relations between hunter-gatherers and farmers (Spielmann & Eder 1994) are topics far from unique to southern Africa. For Bushman rock art the critical role of ethnohistoric observations of painted sites in the very part of the Maloti-Drakensberg mountains where Likoang is located (Lewis-Williams 2003) also means that archaeological excavations there can help establish something of the historical dynamics of the region's late Holocene forager societies and thus the reliability with which late nineteenth-century comments can, or should, be generalised across time and space.

## Stratigraphy and sequence

Likoang (29°44'08"S, 28°45'47"E; 1725m asl) lies in Lesotho's eastern highlands at a confluence where a small stream joins the Senqu (Orange) River (Figures 1 & 2, upper). The site was discovered as a result of a flood event that had cut through the deposit and left it open to erosion: no artefacts were visible on the surface. Excavations in 1995 and 1998 proceeded stratigraphically to a depth of 4.5m, decreasing from an original 30m<sup>2</sup> to a smaller 3.5m<sup>2</sup> trench (Figures 2, lower & 3). Spatial control was maintained by employing 0.25m<sup>2</sup> quadrats and three-dimensionally recording significant finds; all sediment (except that from culturally sterile layers and the 1995 component of Layer I) was sieved through a 2mm mesh.

Likoang's stratigraphy is relatively straightforward (Figure 4), consisting of occupation levels separated by episodes of flooding from the river. The lie of the layers, sloping down from west to east, suggests they were part of the talus of a now buried rockshelter at the far western edge of the excavated area. Several of the later occupation strata (e.g. Layers III,

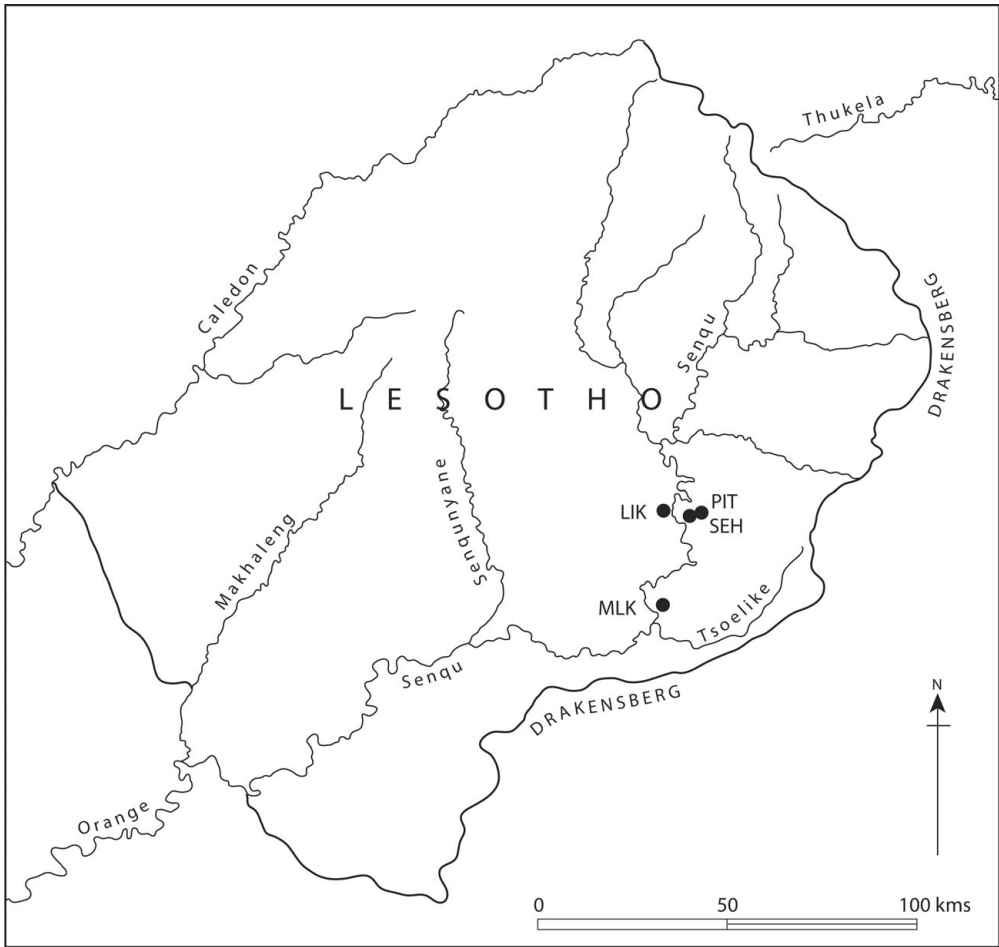
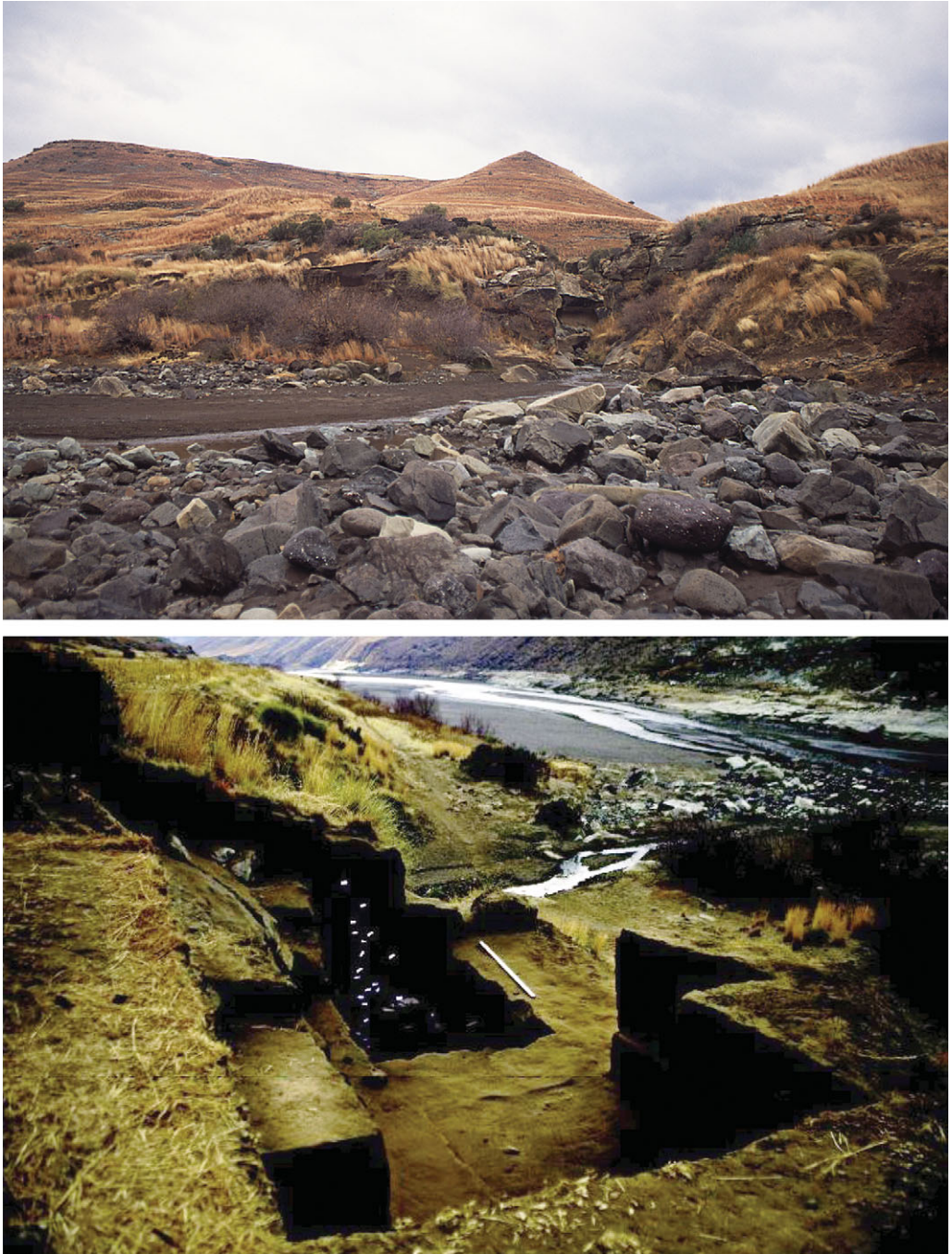


Figure 1. The location of Likoeng. Key: LIK Likoeng; MLK Melikane; PIT Pitsaneng; SEH Sebhonghong.

V and VII/IX) were clearly laid down very rapidly, facilitating *in situ* preservation of bone, features and the spatial patterning of human activities. Combined with clear stratigraphic alternation of occupation and non-occupation levels, 18 radiocarbon determinations make Likoeng one of southern Africa's most precisely resolved late Holocene hunter-gatherer sequences (Table 1). When calibrated (McCormac *et al.* 2004), they identify four main phases of occupation, each ephemeral in nature. Phase A (Layers XVI and XVII) falls between 1700 and 1000 cal BC; Phase B (Layers XI, XIII, XIV and XV) represents intense activity *c.* 1000–200 cal BC; Phase C (Layers III–VII/IX) includes at least three short-lived occupations between 100 cal BC and cal AD 250; and Phase D (Layer I) dates to the eighth/ninth centuries cal AD, consistent with the presence of a *Msuluzi* or (more likely) *Ndondowane* Early Iron Age sherd (Mitchell *et al.* 2008). Within and between these phases, Layers 0, II, IV, VI, X, XII and XVI represent times when people were effectively absent from the site.



*Figure 2. Likoang; upper) looking toward the site across the Senqu River; lower) at the close of excavation in 1998.*

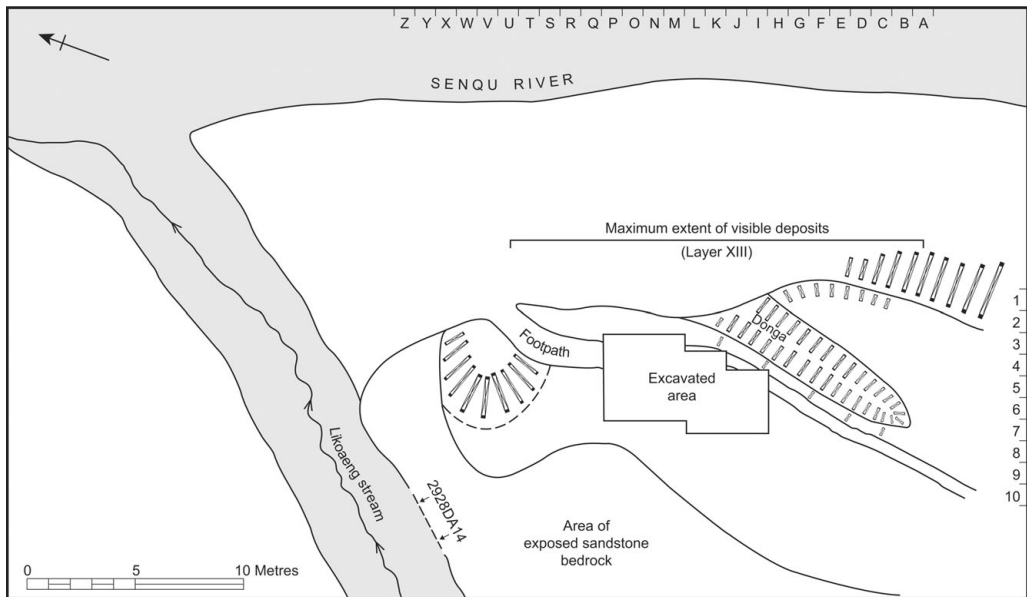


Figure 3. Likoeng: site plan.

## Toolkits

Across this time-span the flaked stone artefacts left by those using Likoeng belong to the post-classic Wilton industry, but differ between phases (Mitchell 2009a). In Phase A stone artefacts and formal tools are rare, suggesting visits were brief and/or by small numbers of people, while high percentages ( $\geq 20$  per cent) of quartzite and tuff hint at differences in exploitation of the wider landscape at this time compared to what followed. Phase B, by contrast, displays the highest artefact densities in the entire sequence and gradual changes in raw material usage (hornfels superseding quartzite and tuff, for instance). Scrapers dominate the formal tool class, followed by adzes and a variety of backed microliths, principally bladelets and points. After a sharp break in occupation (Layer X), Phase C shows a decreased intensity of stoneworking, suggesting that visits were now shorter. Other changes include enhanced use of opaline (crypto-crystalline silica), employment of a bladelet reduction technique, manufacture of backed bladelets and backed points that were also pressure-flaked across their dorsal and ventral surfaces, and an increased role for scrapers relative to other retouched tools. Very low artefact densities indicate that Phase D, the most recent occupation trace, represents a different use of the site associated with substantially reduced use of opaline, enhanced presence of hornfels, a complete absence of backed microliths, and access to both pottery and iron (two small corroded objects, one directly dated to the eighth/ninth centuries cal AD;  $1290 \pm 30$  BP; GrA-26831). Fine line Bushman paintings at the 2928DA14 site in the Likoeng ravine include two figures carrying shields of a type historically associated with southern Nguni-speakers (represented today by the Zulu and Xhosa), documenting further use of the locality in recent centuries (Challis *et al.* 2008). Bushmen continued to live in the area until the early 1900s (Vinnicombe 2009); their

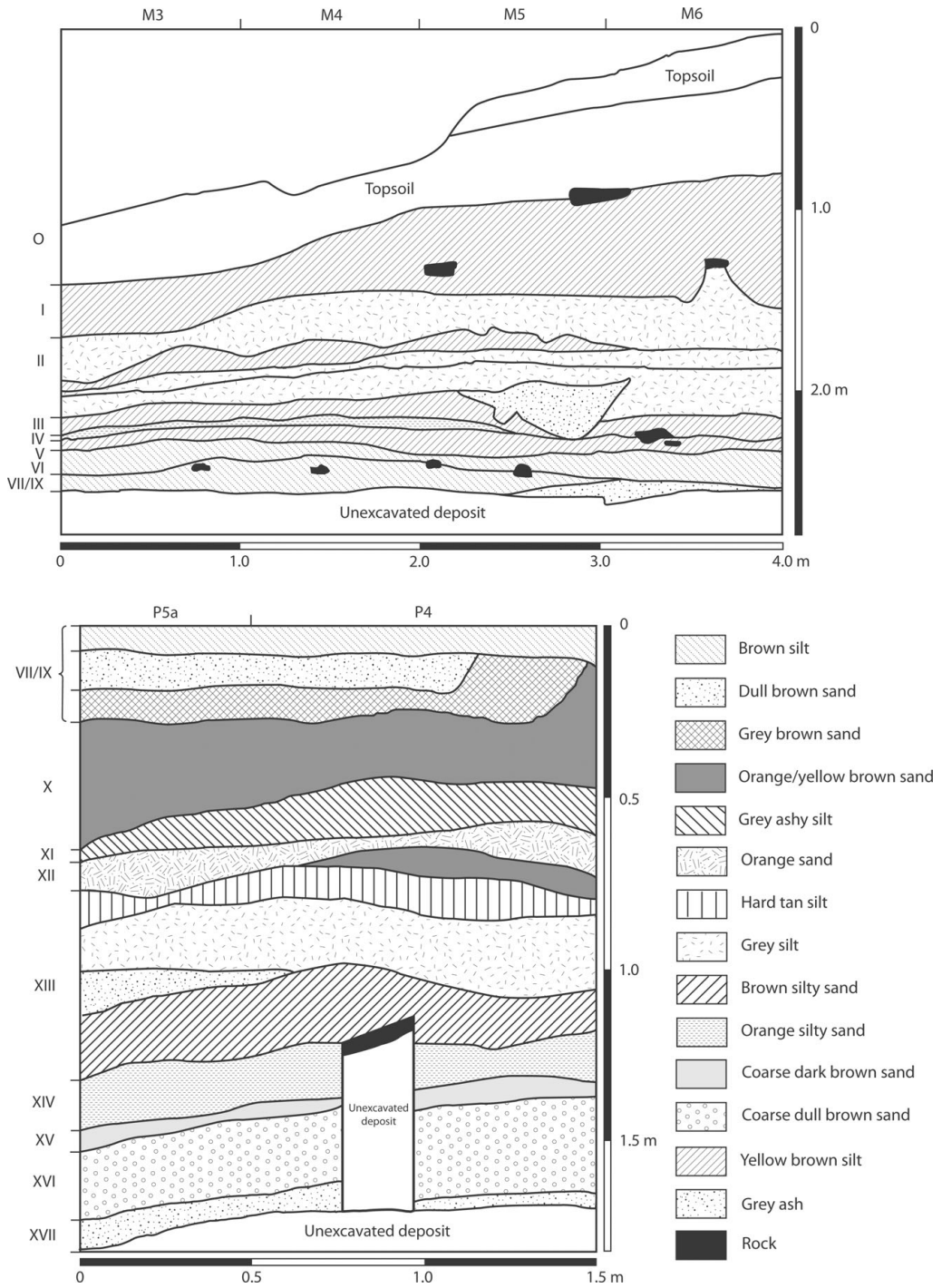


Figure 4. Likoang stratigraphy: (upper) section running from east to west in the upper deposit from the modern topsoil to the base of Layer VII/IX along the (subsequently removed) south side of Squares M3–6; (lower) section running from west to east in the lower deposits from the top of Layer VII/IX to the base of Layer XVII along the north side of Squares P5 and P6. Underlying culturally sterile sands are not shown.

Table 1. Likoang: radiocarbon dates.

Phase	Layer	Lab. no.	Material dated	<sup>14</sup> C BP	Calibrated date range (2σ)
D	I	GrA-23237	Sheep bone	1285±40	AD 682–889
D	I	GrA-26831	Iron	1290±30	AD 688–880
D	I	Pta-7877	Wood charcoal	1310±80	AD 647–958
C	III	Pta-7865	Wood charcoal	1830±15	AD 140–339
C	III	Pta-7097	Wood charcoal	1850±15	AD 134–322
C	V	Pta-7092	Wood charcoal	1850±40	AD 90–377
C	V	Pta-9048	Wood charcoal	2000±70	150 BC–AD 238
C	V	Pta-7870	Wood charcoal	2100±80	354 BC–AD 128
C	VII/IX	Pta-7876	Wood charcoal	2020±60	156 BC–AD 213
C	VII/IX	Pta-7098	Wood charcoal	2060±45	163 BC–AD 116
B	XI	Pta-7101	Wood charcoal	2390±60	748–204 BC
B	XIII	GrA-23236	Mammal bone	2555±45	790–416 BC
B	XIII	Pta-7093	Wood charcoal	2650±60	898–523 BC
B	XIII	GrA-23239	Wood charcoal	2860±45	1112–834 BC
B	XIII	GrA-23233	Mammal bone	2810±45	1007–811 BC
B	XV	GrA-23232	Wood charcoal	3355±45	1727–1454 BC
A	XVII	GrA-26178	Eland bone/tooth	2875±35	1114–850 BC
A	XVII	GrA-13535	Wood charcoal	3110±50	1432–1130 BC

cultivation of tobacco along the Likoang stream gave the area its name, ‘the place of the tobacco plants’ (D. Ambrose *pers. comm.*).

## Space

The use of space was most clearly apparent in Layer III (Phase C), where four hearths were defined in a row running north/south parallel to the Senqu River and the rockface behind the excavation (Figure 5). Nearby ‘blank’ areas with few or no artefacts or bones (Figure 6) may be understood as ‘negative’ impressions of former huts (cf. Bartram *et al.* 1991: 96) similar to those described for nineteenth-century Lesotho Bushmen (Arbousset & Daumas 1968: 250); they neatly match the dimensions of windbreaks recorded for recent Kua (Bartram *et al.* 1991: fig. 9) and Ju/’hoansi (Lee 2003: 36) hunter-gatherers in the Kalahari. High concentrations of stone-knapping debris, retouched tools, mammal bones and fish remains within and close to the hearths imply this was a domestic area and the hearths themselves occur midway between the entrances of the postulated shelters (cf. Bartram *et al.* 1991: 97). While recutting of Hearth 2 and the large ashy smear spreading north and east from Hearth 1 suggest they were repeatedly cleaned out, indicating extended use, briefer events are captured by the probable breakage of a single item of ostrich eggshell beadwork between Hearths 2 and 3 and the focus on backed microlith production/use around Hearths 2 and 4 (Mitchell *et al.* 2006).

Fitting one of two models of Kalahari Bushman campsite organisation (Yellen 1977), the linear arrangement of the Layer III hearths reflects the presence of two ‘givens’ at the site, the parallel orientations of the rockface against which occupation took place and of

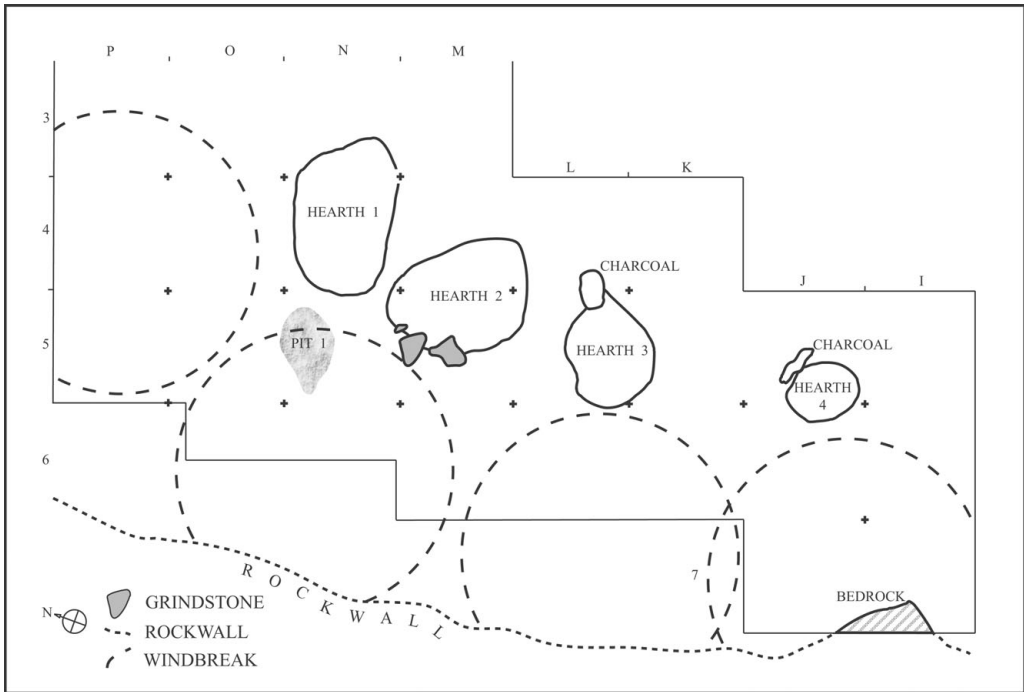


Figure 5. Likoang: Layer III, showing the location of excavated features, the rock face and the possible locations of hypothesised windbreaks (dashed lines) within the excavation grid. Divisions between grid squares are at 1m intervals.

the river beyond. Both also shaped earlier occupations within Phase C, as hearths in Layers V and VII/IX are oriented in the same way, with areas between them and the rockface producing markedly fewer artefacts or bones. Whether comparable resolution exists in earlier occupation periods (Phases A and B) remains unknown, barring further, much larger scale excavation of these lower deposits. However, their spatial coherence and the exceptional quality of Likoang's faunal preservation argue strongly for the Phase C occupations, at least, having been short-lived occupation episodes of perhaps a few weeks duration, the debris from which was then rapidly covered up.

## Subsistence

In addition to smaller samples of mammalian, bird, reptile, amphibian and molluscan remains, the excavations yielded an estimated 1.3 million fish bones, of which 61 241 were identifiable to species, genus or related genera. The absence of carnivore and rodent activity, the frequently burnt state of the bones and their association with cultural debris identify people as the agents responsible for accumulating what is the largest archaeological freshwater fish assemblage in southern Africa. Together, the Orange River mudfish (*Labeo capensis*), the largemouth yellowfish (*Labeobarbus kimberleyensis*) and the smallmouth yellowfish (*Labeobarbus aeneus*) account for >99 per cent of all taxonomically identifiable remains (Plug *et al.* 2010). The presence of several individuals with estimated standard lengths (Skelton 2001) 22–45 per cent greater than the known southern African record suggests



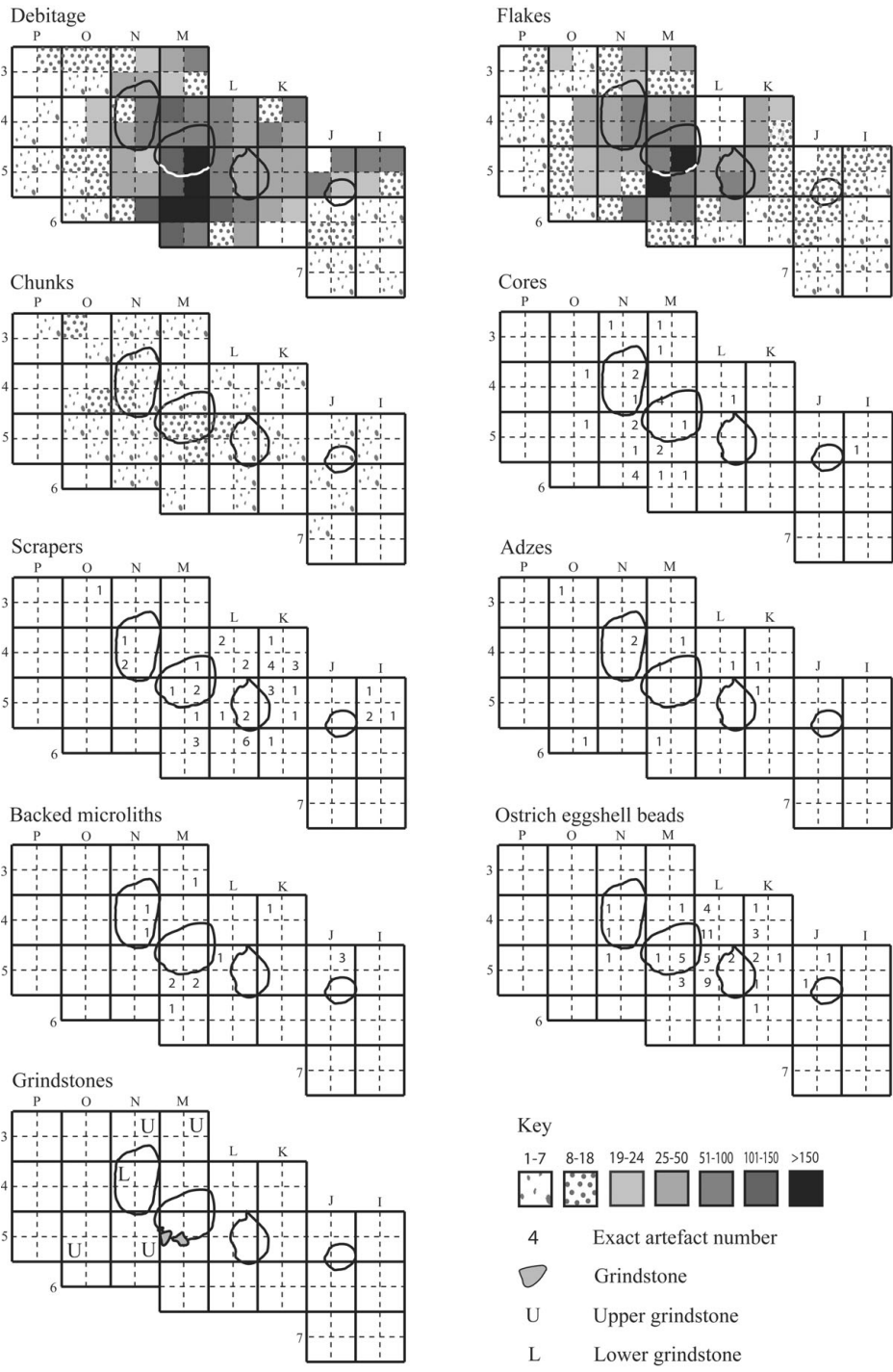


Figure 6. Likoeng: Layer III, showing the distributions of selected artefact classes in relation to Hearths 1–4. Debitage includes all unmodified flaked stone <10 mm in maximum dimension, flakes are >10 mm in size. Hearths can be identified by reference to Figure 5. Relatively 'blank' areas in these plans correspond to the putative windbreaks shown there.

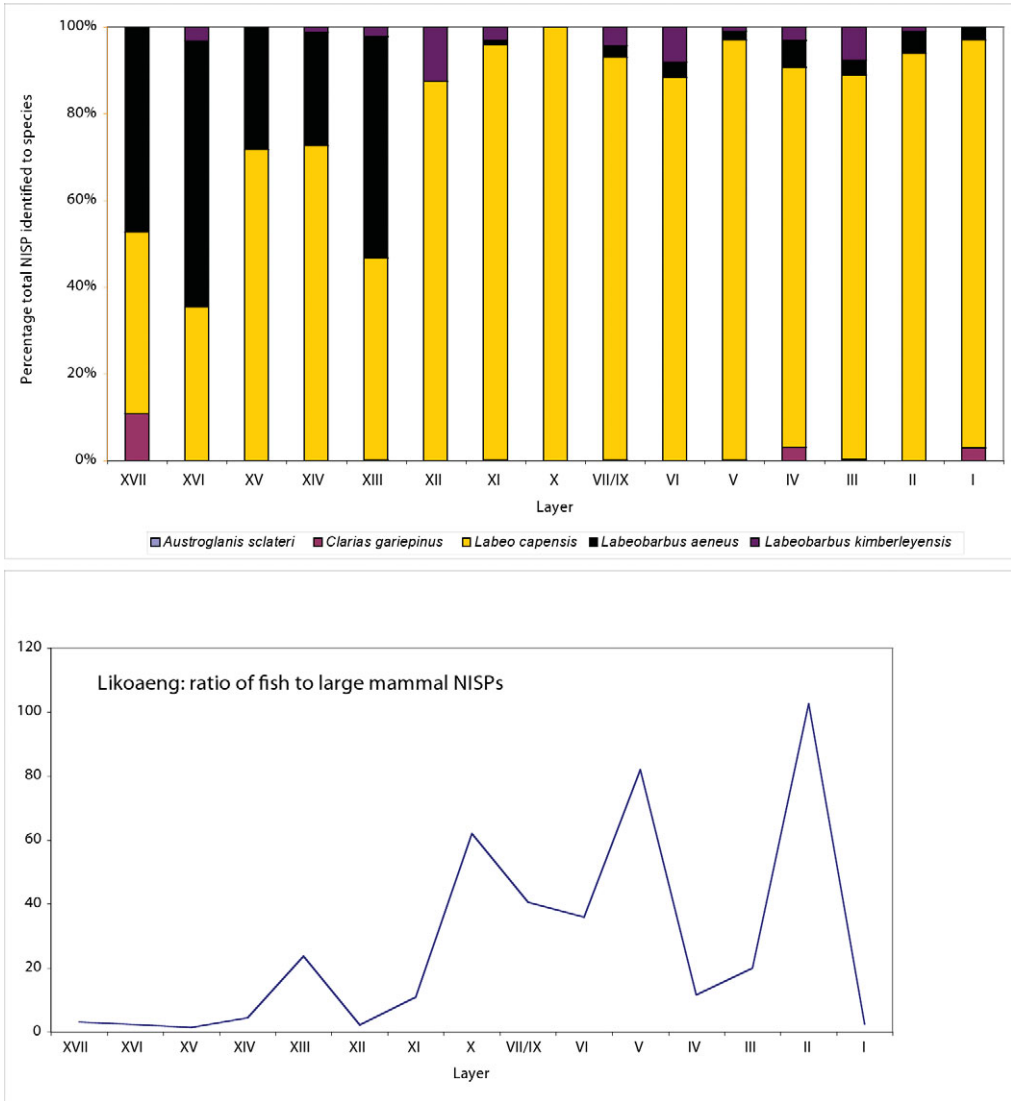


Figure 7. Likoang: percentage abundance of fish taxa identified to species using NISP and relative abundance of fish and large mammals using NISP.

that ecological conditions were more favourable in the past. Competition from introduced rainbow trout (*Oncorhynchus mykiss*) and the effects on river waters of extensive recent soil erosion are likely reasons for the regression of the native species.

Pronounced changes in the importance of both individual fish taxa and of fish relative to other sources of animal protein are evident (Figure 7). *Labeobarbus aeneus* is most common in Layer XIII (especially its early and middle phases) and the smaller samples from Phase A (Layers XVI and XVII), while *Labeo capensis* overwhelmingly dominates Phases C and D (Layers I to XII), accounting for 93 per cent of identifiable specimens (NISP). *Labeo capensis* spawning concentrates in November, while for *Labeobarbus aeneus* it falls between

November and February with a January peak. In the upper half of the sequence, people were thus probably present in spring, but especially November, leaving before *Labeobarbus aeneus* was ready to breed. Earlier, however, a more extended (though not necessarily continuous) occupation is likely, but with a strong emphasis on January in early/middle Layer XIII (where *Labeobarbus aeneus* comprises >90 per cent of all fish identified to species). Fish were probably caught using several methods: baskets and traps (as depicted in rock art only metres away at 2928DA14; Challis *et al.* 2008); angling (suggested by a single bone hook from Layer XIII and, significantly, used as a summer fishing tactic by local nineteenth-century Bushmen; Vinnicombe 2009: 181); and spearing (depicted at two nearby rockshelters; Smits 1973), something supported by cranial bones bearing neat, circular perforations similar in size to the many bone points found in excavation.

Likoaeng's mammalian fauna fits historical and ecological expectations, with grey rhebuck (*Pelea capreolus*), mountain reedbuck (*Redunca fulvorufula*) and eland (*Tragelaphus oryx*) the most common ungulates. Smaller numbers of other bovids, warthog and hares account for most of the remaining sample. An unmodified vervet monkey (*Cercopithecus aethiops*) tooth and three modified marine/estuarine shells suggest contact with the KwaZulu-Natal lowlands on the far side of the uKhahlamba-Drakensberg escarpment. Conversely, finished ostrich eggshell beads and an ostrich fibula fragment (perhaps destined for making arrowpoints; cf. Stow 1905: 68) indicate connections west toward the Caledon Valley.

Macromammals (>1kg) varied in importance during Likoaeng's occupation (for a report see Plug *et al.* 2003). More common relative to fish in the lower half of the sequence (Phases A and B), they decline in importance after Layer XI. There is also a difference in the *types* of large mammal present, with large or very large bovids, suids and equids commoner early on, small and medium bovids and hares (*Lepus saxatilis*) more frequent higher up, especially in Phase C. This change is most striking with respect to eland. The partly articulated and exceptionally well-preserved remains of three individuals were found in the 3.5m<sup>2</sup> area at the sequence's base (Layer XVII). Almost certainly killed and processed on the spot, these animals may have fallen victim to the kind of drive witnessed nearby at the close of the nineteenth century (Vinnicombe 2009: 176–7). By contrast, eland have a NISP count of just four in Layer XI (the youngest occupation of Phase B), and are absent from Phases C and D.

To our surprise, we also identified domestic livestock at Likoaeng. All told, nine bones and teeth are attributable to sheep/goat, two to sheep (*Ovis aries*) and eight to cattle (*Bos taurus*). Most come from Layer I (Phase D), with a few small fragments displaced downward as far as Layer VI. AMS-dating of a sheep/goat right ulna from Layer I (1285±40 BP; GrA-23237) confirms their antiquity. Although cattle remains lacked sufficient collagen for dating, the absence of subsequent post-depositional disturbance or recent Sotho activity at Likoaeng argue that they too are of late first millennium AD age. Both sheep and cattle include adult animals, but at least one juvenile sheep is also present.

## Discussion

Palaeoenvironmental data from our excavations provide the starting point for our discussion (Figure 8), in which we equate the phases of occupation with pulses in climatic variation.

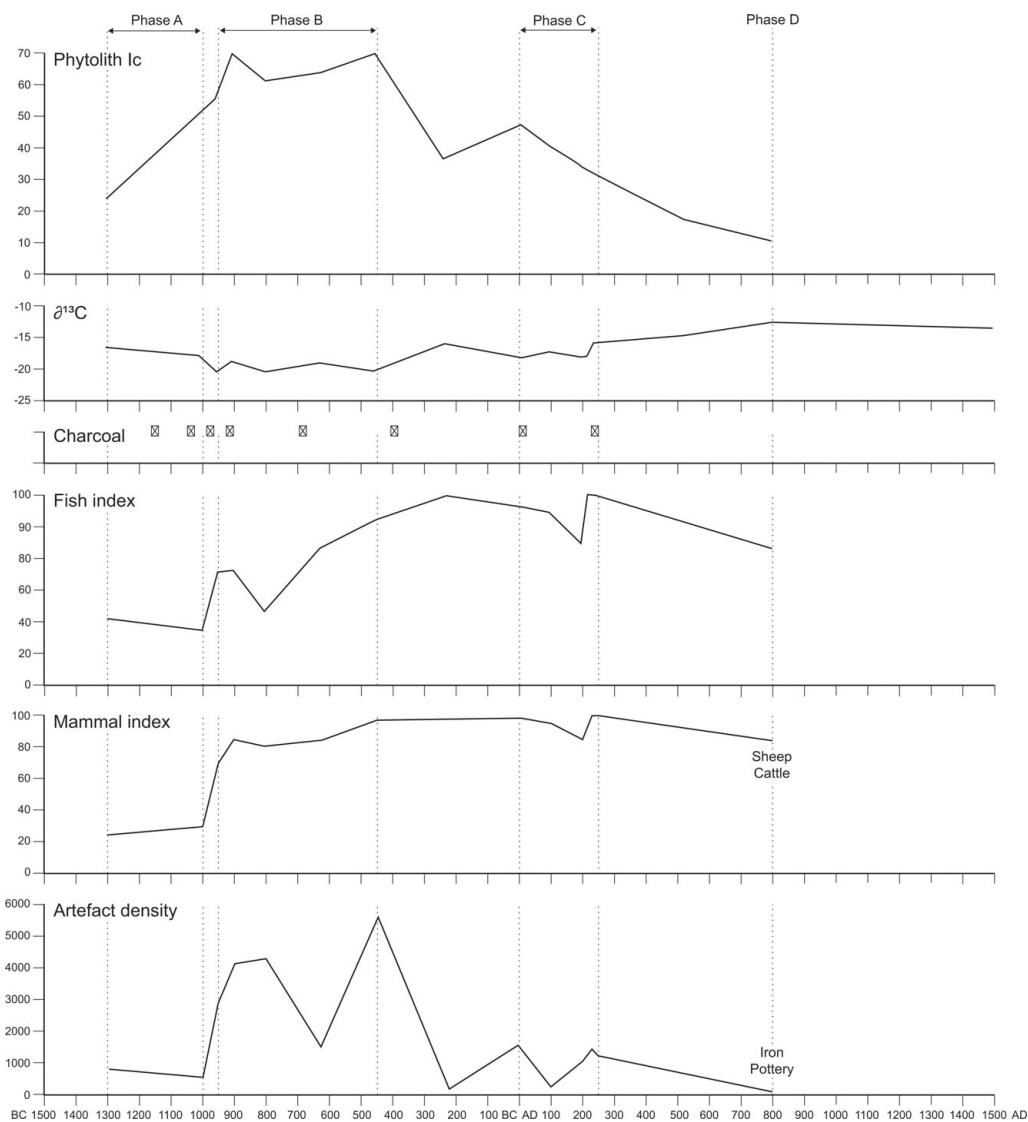


Figure 8. Likoang: summary palaeoenvironmental data in relation to successive phases of occupation and changes in site use. Phytolith Ic: ratio of  $C_3$  to  $C_4$  morphotypes;  $\delta^{13}C$ : stable carbon isotope signal of soil organic matter; Charcoal: presence of *Acacia* sp. (Phases A and C; a drier, warmer indicator) and of *Euryops* sp. and *Protea* sp. (Phase B; cooler indicators); Fish index: *Labeo capensis* as percentage of all fish NISP identified to species; Mammal index: small and medium game as percentage large mammal (>1kg) NISP (small/medium taxa: *Lepus saxatilis*, *Oreotragus oreotragus*, *Pelea capreolus*, *Procavia capensis*, *Raphicerus campestris*, *Redunca fulvorufula*, *Sylvicapra grimmia*, small and medium bovids; carnivores, rodents and primates excluded from calculations); Artefact density: number of stone artefacts per cubic metre of deposit.

Phytolith samples indicate that  $C_4$  grassland similar to today's *Themeda-Festuca* veld dominated during Phase A, but that near the start of Phase B (c. 1000 cal BC) there was a switch to  $C_3$  pooid grassland. From 200 cal BC a mix of  $C_3$  and  $C_4$  taxa is evident, followed by a return to  $C_4$ -dominated grassland from Layer II. Stable carbon isotope analysis of bulk

sediment organic matter tracks these changes, with  $\delta^{13}\text{C}$  values becoming more negative during Phase B before reversing and rising to  $-13.7\text{‰}$  in Phase D.

Since temperature is the dominant control on the growth of  $\text{C}_3$ - and  $\text{C}_4$ -photosynthesising plants in Lesotho (Vogel *et al.* 1978), these changes are best understood as reflecting a significant ( $\geq 400\text{m}$ ) downslope expansion of Alpine grassland because of cooler (and perhaps also wetter) conditions during the first millennium BC (Phase B) (Parker *et al.* 2011). Increased numbers of phytoliths of woody taxa resembling *Erica* and *Euryops* spp. support this interpretation, as does their presence and that of *Protea*, plus increased representation of *Leucosidea sericea*, in the associated charcoal record. Also fitting this environmental sequence, *Acacia* charcoals, indicative of drier, warmer conditions, are restricted to Phases A and C.

The colder episode registered at Likoaeng in Phase B corresponds well to Neoglacial conditions reported elsewhere in southern Africa during the first millennium BC that resulted from northward latitudinal shifts of frontal systems and relatively strong atmospheric circulation. Its effects on resources important to people were probably complex, but colder river temperatures likely favoured *Labeobarbus aeneus* over *Labeo capensis* (Arthington *et al.* 2003), helping explain the former's increased abundance during Phase B. They may also have encouraged greater use of seasonally predictable spawning events since a shift to less palatable  $\text{C}_3$  grasses could have reduced the availability of large mammals, while lower snowlines and thus increased spring flooding enhanced the predictability and size of fish runs. The correspondence is not exact, but zebra and warthog (both grazers) only occur at the very base of, or below, Layer XIII. The longer seasonal signature hypothesised earlier and the higher artefact densities characterising Phase B further support this interpretation.

That fish remained important relative to hunted game even after warmer conditions returned indicates, however, that changes in the Likoaeng sequence must be situated in the broader context of hunter-gatherer settlement-subsistence strategies. One starting point is to consider the *quantity* of fish procured. Within Phase C, Layer III, for instance, boasts at least 153 individual fish in the excavated sample. Taking into account the greater size of some specimens and known angling records, this equates to  $\geq 393\text{kg}$  of fish, most of which would have been consumable as meat. Comparable calculations for earlier occupations within the same phase yield estimates of 402kg for Layer V and 1118kg for Layer VII/IX. Since not all the site was excavated and most fish remains could not be identified, each of these occupation episodes likely witnessed the capture of well over a tonne of fish.

A partial explanation of this focus surely lies in the fact that spawning is relatively predictable in both time and space. Moreover, spring is often a difficult time for hunter-gatherers: plant foods are still few and most game is in poor condition after the winter. The attractions of an alternative resource rich in fat and protein are obvious. Acknowledging that fish might have been preserved beyond our excavation area, we nevertheless emphasise that no trace of smoking pits or drying racks was found, that all skeletal elements (including intermusculars, typically lost in filleting) were recovered and that much of the fish bone is burnt, suggesting on-site consumption. We therefore suggest that it was the predictability of spawning runs and the quantity of food obtainable from them that encouraged occupation of Likoaeng, and could have provided a focus for temporary aggregations involving not just it, but perhaps also as yet unexcavated rockshelters immediately downstream. To develop this

argument — and to explain why Likoaeng was not occupied more continuously than seems to have been the case — demands observations from many more sites and construction of a robust understanding of settlement and subsistence at the *regional* scale. For the moment we note that site aspect, temperature and catchment all support the notion that, of the area's two largest rockshelters, Sehonghong was best suited for summer occupation (directly indicated by the presence of summer-only plants), Melikane for winter use (Carter 1978). Open-air fishing camps like Likoaeng could have formed another part of the seasonal round, one in which people had to arrive *before* the fish they planned to intercept and in enough time to prepare the necessary traps or weaponry. Such 'tooling-up' could also partly explain the large mammal element of the site's fauna, hunted, snared and consumed before spawning began. Alternatively, we might extrapolate from ethnographically observed gendered labour divisions (Lee 1979: 207, 261) to envisage adult men hunting and trapping game at the same time as women, the elderly and perhaps children focused on gathering the spawning fish.

The emphasis on fish, if only as a seasonal resource within a larger regional round, fits with the peak in fishing that marks the last 2000 years in the much longer sequence from Sehonghong Shelter, just 3km away (Plug & Mitchell 2008a). Together, the two sites could perhaps reinforce the case for intensified late Holocene forager use of freshwater resources in southern Africa (Hall 1988; Mazel 1989). However, at Sehonghong terrestrial game clearly always contributed the bulk of the meat consumed, even when, as in the last two millennia, fish exceed mammals in NISP counts. More interestingly, additional peaks of fish exploitation there around 20 000 and 12 200 BP suggest that arguments for unidirectional change in the use of this food source should be treated with caution.

We develop this point further with reference to the domestic livestock from Phase D (Layer I). In one sense, the iron objects and Early Iron Age sherd found there merely confirm the antiquity of interaction between highland foragers and farming communities east of the uKhahlamba-Drakensberg escarpment. The livestock, on the other hand, almost certainly had an Iron Age source, but Likoaeng's distance from the closest contemporary farming settlements ( $\geq 100$ –150km and over a 3000m-high escarpment) and the equitable relations thought to have prevailed between agropastoralists and foragers in the first millennium AD (Mazel 1989), argue against explaining them in terms of raiding, seasonal herding for patrons or bridewealth payments. Alternative explanations that might attribute Phase D to farming or pastoralist communities are even less attractive: the stone and bone artefacts are completely consistent with a hunter-gatherer association (Mitchell 2009a), while none of the ceramics convincingly recall wares associated with herders elsewhere in southern Africa and Likoaeng lies, in any case, way beyond their known distribution (cf. Mitchell 2002; Sadr 2008).

Instead, we suggest that the sheep and cattle present at Likoaeng reflect a situation in which some late first millennium AD foragers acquired livestock and successfully integrated them into their own economy, an argument developed previously by Sadr (2003) for South Africa's Western Cape Province. Likoaeng alone cannot establish how extensive such integration may have been in highland Lesotho. Conservatively, it may reflect a short-lived phenomenon involving just a few animals, though this would require us to have dug literally in the right place. Alternatively, it may be the tip of the proverbial iceberg since as yet undated livestock

also feature in nearby sequences from Sehonghong (Plug & Mitchell 2008b) and Pitsaneng (Hobart 2004). For the moment, we note that the highly ephemeral nature of the Phase D occupation compared to those beneath it fits a different use of the site, geared not to extended aggregation around seasonally available fish runs, but perhaps more attuned to the demands of mobile stock.

## Conclusions

Archaeological sites cover a wide spectrum of depositional conditions from high-resolution deposits that may record a single event to palimpsests of poorer spatio-temporal resolution that represent repeated use over longer periods of time. The latter are generally more common, especially in rockshelters. While often dismissed as sources of information about details of social organisation, their palimpsest qualities may themselves provide insights into certain types of social processes that would not otherwise be apparent (Bailey & Galanidou 2009). Equally, high-resolution deposits may record types of activities and patterns of social organisation that would otherwise elude archaeological detection. These are more likely to come from open-air locations where overprinting effects are less apparent (because sites were often less repeatedly used) and people could organise their activities free from the constraints imposed by rockshelter walls. Dunefield Midden near South Africa's Atlantic coast is a classic instance (Parkington *et al.* 2009), while on a smaller scale Likoeng offers comparable opportunities in the interior of the sub-continent.

Likoeng is also important in other ways: the temporal resolution that it offers for understanding change in post-classic Wilton artefact assemblages, the evidence for intensive fishing activity that, we argue, provided opportunities for settlement, and possibly aggregation, around a predictable resource at an otherwise testing time of year, and the surprise of its domestic livestock in a region where such animals were previously thought to be nineteenth-century introductions. Above all, it shows us that open-air sites with good faunal preservation do exist in the southern African interior, that they were sometimes repeatedly occupied, and that they can overturn assessments of regional settlement history based on rockshelter excavations alone (cf. Mitchell & Vogel 1994). Clearly, an open-air, out-of-doors, beyond the drip-line perspective is required. While its discovery was serendipitous and its own particular configuration of resources, location and sedimentary history may be unusual, Likoeng can surely not be the only location able to provide such a viewpoint. A resurgence of dam-building projects in Lesotho (Arthur & Mitchell 2010; Arthur *et al.* in press), plans for which include drowning the very stretch of the Senqu where Likoeng is located (Mitchell 2005), makes careful searching of comparable riverine settings a priority for future fieldwork.

Likoeng also underlines the importance of recognising that the past was not simply a preparation for the present. Though frequently identified (e.g. Lourandos 1997), directional change in the archaeological record (including arguments for hunter-gatherer intensification) may often only reflect improving preservation conditions (Bird & Frankel 1991). More generally, as Rowley-Conwy (2001) observes, there are many instances of hunter-gatherer societies changing toward *less complex* levels of social integration, and African archaeology as a whole increasingly questions the universal validity of one-way, neo-evolutionary models

(McIntosh 1999; Stahl 2005). The difficulty of reading Likoang's focus on fishing as evidence of intensified use of aquatic resources, a late first-millennium AD presence of domestic livestock in highland Lesotho that overturns assumptions that their (re-)acquisition by Maloti-Drakensberg Bushmen was a purely nineteenth-century phenomenon (Challis 2008), and the evidence for many other changes in regional hunter-gatherer material culture, subsistence and belief over the past 2000 years (Mitchell 2009b) collectively reinforce the case for questioning unilinear cultural trajectories among southern African hunter-gatherers and for recognising that all ethnographies describe historically specific contexts that demand archaeological interrogation. Echoing the well-known Kalahari debate (Wilmsen & Denbow 1990), the importance of this conclusion for highland Lesotho, the *only* area of southern Africa to have produced direct, verbatim explanations of Bushman paintings when their production was still ongoing, is obvious. The continued employment of such observations to explain Bushman rock art across the sub-continent will now need to take on board the historical constitution of the ethnographic and ethnohistoric record that Likoang and other archaeological excavations in the Maloti-Drakensberg region are beginning to reveal.

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## References

- ARBOUSSET, T. & F. DAUMAS. 1968. *Narrative of an exploratory tour to the northeast of the Cape of Good Hope*. Cape Town: Struik.
- ARTINGTON, A.A., J.L. RALL, M.J. KENNARD & B.J. PUSEY. 2003. Environmental flow requirements of fish in Lesotho rivers using the drift methodology. *River Research Applications* 19: 641–66.
- ARTHUR, C. & P.J. MITCHELL. 2010. The archaeology of the Metolong Dam, Lesotho: a preliminary assessment. *Antiquity* 84. Available at: <http://www.antiquity.ac.uk/projgall/mitchell325/> (accessed 11 May 2011).
- ARTHUR, C., M. MOHAPI & P.J. MITCHELL. In press. The Metolong Cultural Resource Management Project: a case study in African CRM. *Conservation and Management of Archaeological Sites*.
- BAILEY, G.N. & N. GALANIDOU. 2009. Caves, palimpsests and dwelling spaces: examples from the Upper Palaeolithic of south-east Europe. *World Archaeology* 41: 215–24.
- BARTRAM, L., E.M. KROLL & H.T. BUNN. 1991. Variability in camp structure and bone food refuse patterning at Kua San hunter-gatherer camps, in E.M. Kroll & T.D. Price (ed.) *The interpretation of archaeological spatial patterning*: 77–148. New York: Plenum.
- BIRD, C.F.M. & D. FRANKEL. 1991. Problems in constructing a prehistoric regional sequence: Holocene south-east Australia. *World Archaeology* 23: 179–92.
- CARTER, P.L. 1978. The prehistory of eastern Lesotho. Unpublished PhD dissertation, University of Cambridge.
- CHALLIS, W. 2008. The impact of the horse on the Ama Tola 'Bushmen': new identity in the Maloti-Drakensberg mountains of southern Africa. Unpublished DPhil dissertation, University of Oxford.
- CHALLIS, W., P.J. MITCHELL & J. ORTON. 2008. Fishing in the rain: control of rain-making and aquatic resources at a previously undescribed rock art site in highland Lesotho. *Journal of African Archaeology* 6: 203–218.



- HALL, S.L. 1988. Settlement and subsistence developments during the Later Stone Age in the Lower Fish River Basin, Eastern Cape. *Palaeoecology of Africa* 19: 221–32.
- HAYDEN, B. 1990. Nimrods, piscators, pluckers and planters: the emergence of food production. *Journal of Anthropological Archaeology* 9: 31–69.
- HOBART, J.H. 2004. Pitsaneng: evidence for a neolithic Lesotho? *Before Farming* 2004/4 article 4.
- JERARDINO, A. 1995. Late Holocene Neoglacial episodes in southern South America and southern Africa: a comparison. *The Holocene* 5: 361–8.
- JERARDINO, A. & R. YATES. 1997. Excavations at Mike Taylor's Midden: a summary report and implications for a re-characterisation of megamiddens. *South African Archaeological Bulletin* 52: 43–61.
- LEE, R.B. 1979. *The !Kung San: men, women and work in a foraging society*. Cambridge: Cambridge University Press.
- 2003. *The Dobe Jul'hoansi*. Toronto: Thomson Learning.
- LEWIS-WILLIAMS, J.D. 2003. *Images of mystery: rock art of the Drakensberg*. Cape Town: Double Storey.
- LOURANDOS, H. 1997. *Continent of hunter-gatherers: new perspectives in Australian prehistory*. Cambridge: Cambridge University Press.
- MAZEL, A.D. 1989. People making history: the last ten thousand years of hunter-gatherer communities in the Thukela Basin. *Natal Museum Journal of Humanities* 1: 1–168.
- MCCORMAC, F.G., A.G. HOGG, P.G. BLACKWELL, C.E. BUCK, T.F.G. HIGHAM & P.J. REIMER. 2004. SHCal04 Southern hemisphere calibration 0–11.0 cal kyr BP. *Radiocarbon* 46: 1087–1092.
- MCINTOSH, S.K. (ed.) 1999. *Beyond chiefdoms: alternative pathways to complexity in Africa*. Cambridge: Cambridge University Press.
- MITCHELL, P.J. 2002. *The archaeology of southern Africa*. Cambridge: Cambridge University Press.
- 2005. Archaeological resource management in Lesotho: thoughts on its past record, present situation and future prospects, in N. Finneran (ed.) *Safeguarding Africa's archaeological past: selected papers from a workshop held at the School of Oriental and African Studies, University of London, 2001* (British Archaeological Reports international series 1454): 37–46. Oxford: Archaeopress.
- 2009a. The flaked stone artefact assemblages from Likoaeng: a late Holocene sequence in highland Lesotho and its regional context. *Southern African Humanities* 21: 117–56.
- 2009b. Hunter-gatherers and farmers: some implications of 2000 years of interaction in the Maloti-Drakensberg region of southern Africa. *Senri Ethnological Studies* 73: 15–46.
- MITCHELL, P.J. & J.C. VOGEL. 1994. New radiocarbon dates from Sehonghong rock-shelter, Lesotho. *South African Journal of Science* 90: 380–88.
- MITCHELL, P.J., I. PLUG & G.N. BAILEY. 2006. Spatial patterning and site occupation at Likoaeng, an open air hunter-gatherer campsite in the Lesotho highlands, southern Africa. *Archaeological Papers of the American Anthropological Association* 16: 81–94.
- MITCHELL, P.J., I. PLUG, G.N. BAILEY & S. WOODBORNE. 2008. Bringing the Kalahari debate to the mountains: late first millennium AD hunter-gatherer/farmer interaction in highland Lesotho. *Before Farming* 2008/2 article 4.
- PARKER, A.G., J.A. LEE THORP & P.J. MITCHELL. 2011. Late Holocene Neoglacial conditions from the Lesotho highlands, southern Africa: phytolith and stable carbon isotope evidence from the archaeological site of Likoaeng. *Proceedings of the Geologists' Association* 122: 201–211.
- PARKINGTON, J.E., J.W. FISHER & T.W.W. TONNER. 2009. 'The fires are constant, the shelters are whims': a feature map of Later Stone Age campsites at the Dunefield Midden site, Western Cape Province, South Africa. *South African Archaeological Bulletin* 64: 104–121.
- PLUG, I. & P.J. MITCHELL 2008a. Fishing in the Lesotho highlands: 26,000 years of fish exploitation, with special reference to Sehonghong Shelter. *Journal of African Archaeology* 6: 33–55.
- 2008b. Sehonghong: hunter-gatherer utilization of animal resources in the highlands of Lesotho. *Annals of the Transvaal Museum* 45: 1–23.
- PLUG, I., P.J. MITCHELL & G.N. BAILEY. 2003. Animal remains from Likoaeng: a post-classic Wilton open air fishing campsite on the Senqu River, Lesotho. *South African Journal of Science* 99: 143–52.
- 2010. Late Holocene fishing strategies in southern Africa as seen from Likoaeng, highland Lesotho. *Journal of Archaeological Science* 37: 3111–23.
- ROWLEY-CONWY, P. 2001. Time, change and the archaeology of hunter-gatherers: how original is the 'original affluent society?', in C. Panter-Brick, R.H. Layton & P. Rowley-Conwy (ed.) *Hunter-gatherers: an interdisciplinary perspective*: 39–72. Cambridge: Cambridge University Press.
- SADR, K. 2003. The Neolithic of southern Africa. *Journal of African History* 44: 195–209.
- 2008. An ageless view of first millennium AD southern African ceramics. *Journal of African Archaeology* 6: 103–130.
- SAMPSON, C.G. 1985. Atlas of Stone Age settlement in the Seacow Valley. *Memoirs of the National Museum (Bloemfontein)* 20: 1–116.
- SKELTON, P. 2001. *The freshwater fishes of southern Africa*. Cape Town: Struik.

- SMITS, L.G.A. 1973. Rock painting sites in the Upper Senqu valley, Lesotho. *South African Archaeological Bulletin* 28: 32–8.
- SPIELMANN, K.A. & J.F. EDER. 1994. Hunters and farmers: then and now. *Annual Review of Anthropology* 23: 303–323.
- STAHL, A.B. 2005. Introduction: changing perspectives on Africa's pasts, in A.B. Stahl (ed.) *African archaeology: a critical introduction*: 1–23. Oxford: Blackwell.
- STOW, G.W. 1905. *The native races of South Africa*. Cape Town: Struik.
- VINNICOMBE, P. 2009. Basotho oral knowledge: the last Bushman inhabitants of the Mashai District, Lesotho, in P.J. Mitchell & B.W. Smith (ed.) *The eland's people: new perspectives in the rock art of the Maloti-Drakensberg Bushmen*: 165–91. Johannesburg: Witwatersrand University Press.
- VOGEL, J.C., A. FULS & R.P. ELLIS. 1978. The geographical distribution of Kranz grasses in South Africa. *South African Journal of Science* 74: 209–215.
- WILMSEN, E.N & J.R. DENBOW. 1990. Paradigmatic history of San-speaking peoples and current attempts at revision. *Current Anthropology* 31: 489–524.
- WOODBURN, J. 1982. Egalitarian societies. *Man* 17: 431–51.
- YELLEN, J.E. 1977. *Archaeological approaches to the present: models for reconstructing the past*. New York: Academic Press.