

Report on the 2011 archaeological excavations at Klipdrift Shelter southern Cape, South Africa and update on current research with regards to the Klipdrift site and materials

Report compiled for Heritage Western Cape by:

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PROGRESS REPORT FOR THE PERIOD February 2011-October 2011

Introduction

This report relates to two permits issued by Heritage Western Cape according to Reference numbers:

- 1. No. 2010/06/001**
- 2. No. 2011/03/001**

On 24 August 2010 an excavation permit (2010/06/001) was issued. We chose to limit the excavation in 2011 to the quadrates and units listed in Table 1 and Figure 1. This permit is valid until 24 August 2013. On 3 March 2011 a permit (2011/03/001) for speleothem analysis was issued. This permit is valid until 3 March 2014.

This report discusses excavation progress during the 2011 excavation season related to the above permits. A progress report for the 2010 season has already been submitted and processed by HWC. A list of ongoing analytical projects on the excavated material from the Klipdrift excavation since 2010 are also provided.

Research on the lithics have revealed a typical Howiesons Poort assemblage and results from dating of the site will expand on current debate about the origins of modern human behaviour. This means that the Klipdrift Shelter results will contribute significantly to how the Middle Stone Age (MSA) in southern Africa is interpreted.

PERSONNEL PRESENT AT EXCAVATION - 2011

Directors of excavations / excavators

AHKR Institute, University of Bergen, Norway

Institute for Human Evolution, University of the Witwatersrand, Johannesburg, South Africa

Prof Christopher Henshilwood

Dr Karen van Niekerk

Excavators

Dr Sarah Wurz

PhD candidates, Institute for Human Evolution, University of the Witwatersrand, Johannesburg, South Africa

Jane Noah

Riaan Rifkin

Masters students, AHKR Institute, University of Bergen, Norway

Magnus Haaland,

Nikolai Tallaksen

Cornelia Albrektsen

Potberg House, De Hoop Nature Reserve

Institute for Human Evolution, University of the Witwatersrand, Johannesburg, South Africa

Curation Manager: Petro Keene

Laboratory technician: Samantha Mienies

Sorter, casual staff: Leonard Lekas

Housekeeper: Marilyn Fielies

Participating Researchers

1. University of Bordeaux, France

Contributing Researcher

Prof Francesco d'Errico

2. University of Bergen, Norway

Research on speleothem analysis

Prof Stein-Erik Lauritzen,

3. University of Royal Holloway, United Kingdom

Optically Stimulated Luminescence Dating

Dr Simon Armitage

4. University of Tübingen, Germany

Human Remains Analysis

Dr. Katerina Havarti

Klipdrift Shelter

Site location and immediate surroundings

Klipdrift Shelter is situated in the De Hoop Nature Reserve on Portion 20 of farm 516, Swellendam district.

The Klipdrift Cave complex is located in a steep quartzite cliff ($34^{\circ}27.0963'S$ $20^{\circ}43.4582'E$) about 500 m west of the De Hoop Noetsie Trail huts (Figs 1 & 2). The cave is divided into a western and eastern section with the west forming a cave and the east a shelter (Fig. 3). Considerable effort and expense went into installing site platforms and security to ensure the safety of the excavation team.



Figure 1. Satellite photograph showing the location of the Klipdrift Cave complex

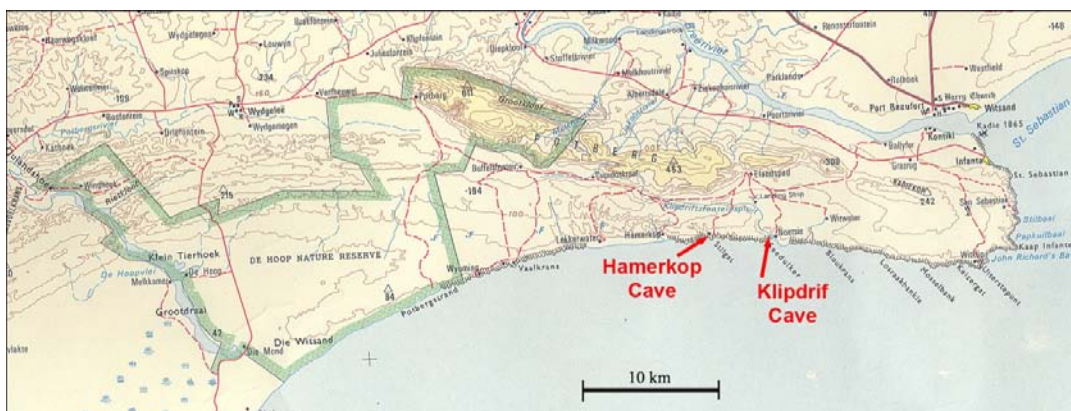


Figure 2. Map of De Hoop Nature Reserve indicating the location of Klipdrift and Hamerkop Caves.



Figure 3. Klipdrif Cave complex showing western and eastern sections (Klipdrift Shelter is in the eastern section)



Figure 4. View from the cave complex to the south east

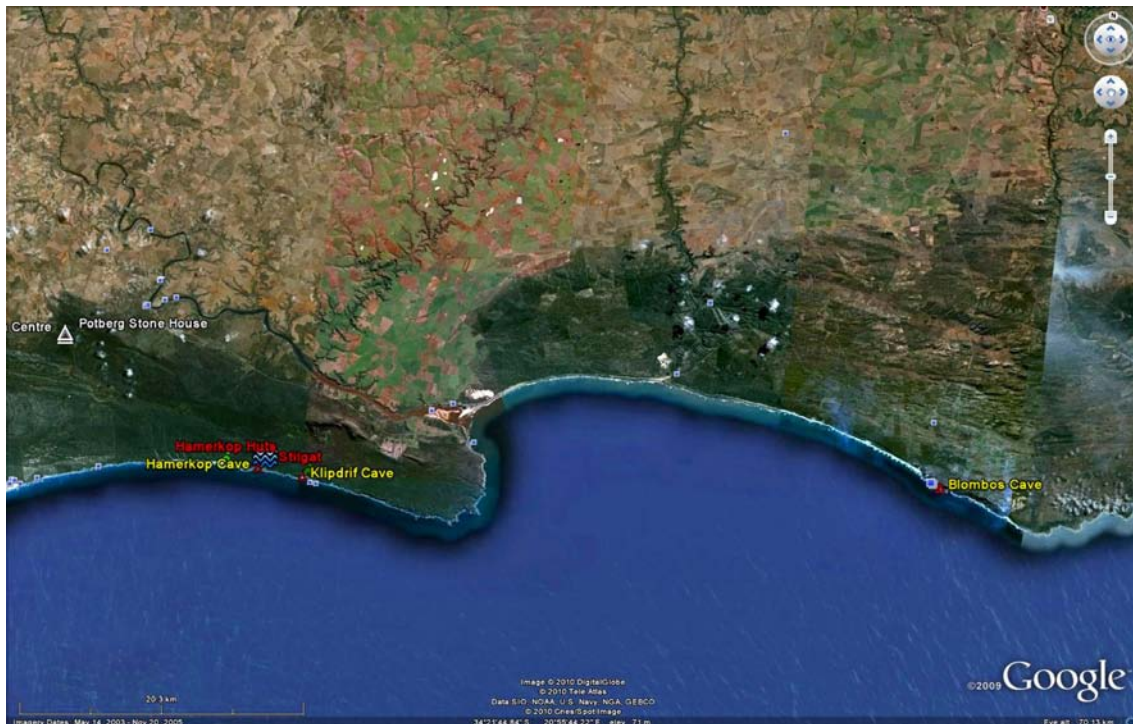


Figure 5. Location of Klipdrif Caves in relation to the position of Blombos Cave

The Klipdrif Cave complex is a single wave cut platform with a quartzite promontory in the centre (Fig. 3). Just below the site is a quartzite cobble beach and the general area is characterized by a rocky shoreline with few sandy beaches in the vicinity (Fig. 4). The Klipdriffonteinspruit stream lies about 200 m east of the cave complex. Blombos Cave is located 45 km ESE (Fig. 5). The Klipdrif Cave complex has been undercut on the seaward edge by raised sea levels during the mid-Holocene. Originally, the talus in front of these caves extended to the south east for about 100 m at a slope of about 30°. Remnants of this deposit are visible in the cliff face to the east of the site. The undercut archaeological deposits were clearly visible in the present talus sloping at more than 60°.

The deposits in Klipdrif Shelter consist of a very dense shell midden, especially to the west. The surface of this deposit in the west is extremely steep at the back of the cave. Ashy sediments were exposed on the surface and towards the rear. Bone fragments and shellfish littered the surface of the cave. Klipdrif Shelter contains deposits from the Middle Stone Age.

Project description and motivation

In the De Hoop excavation and palaeoenvironmental reconstruction project, new methodology and field research is being applied (in accordance with the goals projected for the next five years) to test the hypothesis that key cultural developments and discontinuities associated with early *H. sapiens* may be related to climatic variability. The Klipdrif Shelter site is located in an area associated with the earliest development of *H. sapiens* behaviour (Fig 2 & 5). The following research strategies are being implemented:

- Innovative methods to the analysis of early symbolic and complex material culture of *H. sapiens*, including abstract engravings, pigments, personal ornaments and stylised bone tools will be applied.

- Reconstruction of climate, vegetation, and fire regime changes in southern Africa for the target periods by combining the analysis of multiple proxies from marine and terrestrial archives with high resolution palaeoclimatic simulations.
- Incorporating archaeological and palaeoclimatic data into a novel bio-computational architecture (Genetic Algorithm for Rule Set Prediction: GARP) that allows for the reconstruction, quantification and comparison of the ecological niches exploited by human populations within each climatic phase.

Excavation Method

The excavations were carried out by a multi-disciplinary team led by Christopher Henshilwood and post-docs/staff, Karen van Niekerk and Sarah Wurz. The surface area of the Klipdrift Shelter was divided into square metre units (PAY, PAZ, PBB, PBA/PBB, PBC, PBD, PBE, PCA, PCA/PCB, PCB, PDA, PDB, PDC, PDD) and further subdivided into 0.5 m quadrates(a-d).

Different stratigraphic units were identified based on texture, composition, colour, thickness and features. Excavation was conducted by brush or trowel following individual strata or layers. The term “layer” describes a single stratum that accumulated through natural and/or human deposition. Counts of buckets of deposit provide a measure of volume excavated. All plotted pieces were individually bagged, labelled and numbered according to square, unit and artefact category as well as entered on the site record form and systematically 3D plotted on a Trimble Total station. Recovered deposits were sieved through both 1.5 and 3.0 mm meshes. The plotted data included ostrich eggshell, stone artefacts, bone, ochre and features. A photographic record is kept of all surfaces before excavation and the context of any special finds. Soil, dating and other samples were systematically collected during excavation.

Coarse fraction material is washed and material sorted at the Potberg House, De Hoop during the excavation season. The remaining material is being sorted at the lab at 167 Buitenkant Street, Gardens, Cape Town.

A full set of records, field notes, and data sheets of the plotted material, is currently housed at the laboratory at 167 Buitenkant Street, Gardens, Cape Town, and will ultimately be archived at the IZIKO South African Museum (Cape Town). All the records and excavation data for the 2010-2011 excavation seasons are available to Heritage Western Cape upon request. Raw data sets are being processed within the scope of individual research projects that form part of the larger Klipdrift Shelter complex project and some results are available in the listed published material. All the recovered material will be curated at the Iziko South African Museum, Cape Town.

Below is a summary report on excavation dates, squares and stratigraphic levels excavated during the 2011 season. Excavated materials include lithic, ochre, ostrich eggshell, faunal and shellfish remains. This represents the bulk of excavated material. Features such as hearths and areas covered with ochre are also recorded and described.

Klipdrift Cave Complex: Excavated areas

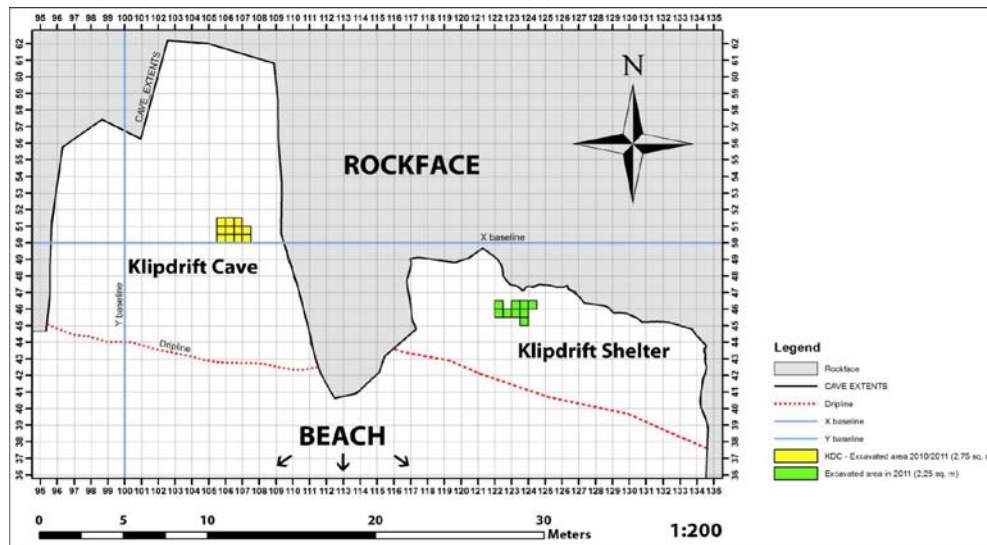


Figure 6. Klipdrift Cave & Klipdrift Shelter Complex, Excavated area: 2010/2011 and Klipdrift Shelter Excavated area: 2011

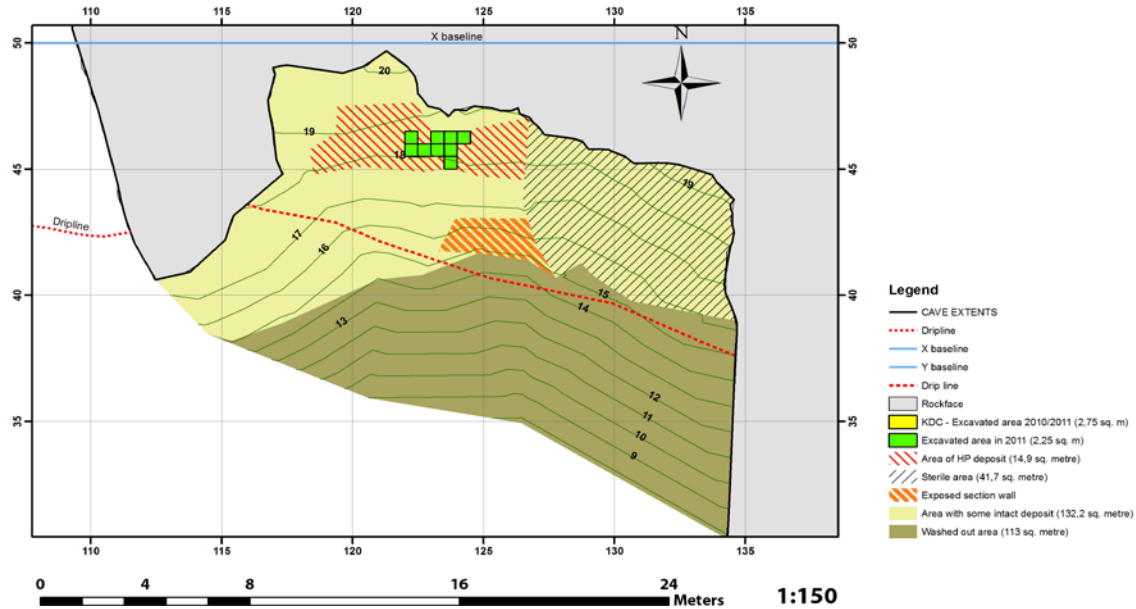


Figure 7. Klipdrift Shelter Site Map

Units and Quadrates excavated

Table 1 lists the Units and Quadrates excavated in the 2011 field seasons. The 2011 excavation season was conducted between 02 February 2011 and 15 March 2011. The units below were excavated from 21 February 2011 until 9 March 2011.

Table 1

Unit	Quadrat
PAY	R28c, R29d, R30c
PAZ	S29c, R29d, R30c
PBB	S29b
PBA/PBB	S28a, S28b (test section S29a), R28c, R29c, R29d, R30c
PBC	S28a, S28b, S29b, R28c R29c, R29d, R30c
PBD	S28b, S28a, S29b, R28c, R29c, R30c, R29d
PBE	S28a, S28b, S29b, R29d
PCA	S28a, S28b, S28a, S29b, R29d
PCA PCB	S29d
PCB	S29b, R29d
PDA	S29b, S29d
PDB	S29b, S28a
PDC	S29b
PDD	S29b
PDE	

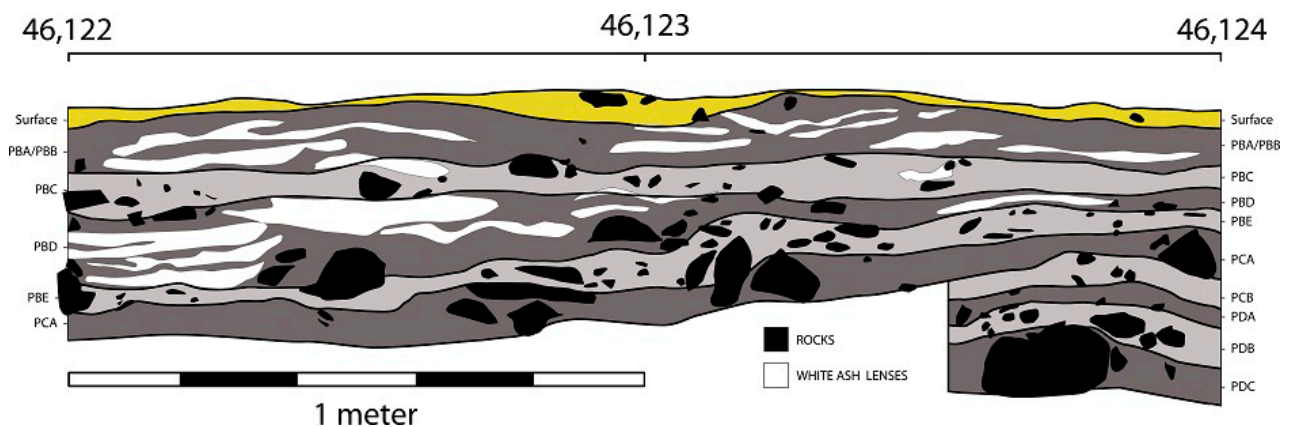


Figure 8. Stratigraphy: North section (Klipdrift Shelter, 2011)

Overview and Material Recovered

Excavation started on 21 February 2011 in S29b in layer PBB. There may have been a small upper layer in this quadrat (PAZ) but it could not be distinguished from PBB clearly and was therefore included in the PBB unit.

Description of soil layers

The soil layers were interspersed with layers of varying consistency; black and sticky in parts; grey clay-like layers and also consisted of dense white ash as in the matrix of unit PBB. There were loose light soils as well as sticky layers underneath the ashy layers. The layers contained several shells, mostly broken and numerous lithics. Bone was present but generally poorly preserved and unidentifiable. Ostrich eggshell was found frequently, many pieces were burnt and there were some with incisions and possible modifications. There were many burnt patches of charcoal and several small flecks of ochre in the deposit as well as yellow pigment. Red ochre smears and layers were present.

KLIPDRIFT SHELTER FEBRUARY-MARCH 2011 EXCAVATION

Squares and Quadrates excavated, 2011

Unit PAY (Quadrat R28c)

The unit seemed to be sterile with several big chunks of quartzite (roofspall) and a burrow in the middle of the south section of the quad as well as in the north east section.

Towards the base of the unit large MSA-like blades (few) and pointed flakes (few) were associated with the typical silcrete flakes and blades of the Howiesons Poort. A rib bone intact (but in 4 pieces) was found in good condition. A few ostrich eggshell pieces were found. There was no shellfish in this unit.

Unit PAY (Quadrat R29d)

This surface unit was removed as PAZ initially and was a light clayish surface unit with some lithics and bone. There was substantial amounts of natural quartzite debitage from the cave walls/roofs and a single charcoal patch within the unit. No shell was found. The unit was later named PAY.

Unit PAY (Quadrat R30c)

This was a site surface unit with few lithics. The surface was uneven with much spall.

Unit PAZ (Quadrat S29c)

The unit consisted of a light-coloured sandy soil containing very many small chips of quartzite roofspall, as well as larger pieces. It was similar to PAY but slightly darker and a little bit more consolidated. In the centre and towards the east there was a thick white ashy layer, somewhat cemented in the middle. Some lithics, a few *Dinopanax gigas* and one *Perna perna* was found. Few flecks of ochre were present. The base of the unit (PBA/PBB) consisted of a darker, sticky black soil which seemed to contain several burnt *Dinopanax gigas*.

Unit PAZ (Quadrat R29d)

This unit consisted of a dark brown crumbly matrix. There were many *Dinoplax gigas* shells, few others. Mostly silcrete, some quartz and quartzite pieces were found. There were substantial amounts of angular quartzite spall from the roof/ back wall. There were some burnt/decomposed bone patches (one sample was taken). The unit had some ostrich eggshell fragments and flaked pieces.

Unit PBA PBB (Quadrante S28a)

Excavation of PBA started by removing the top 10cm of soil. A small seed (?) was found, but it was unclear whether this was fresh or not. The unit contained predominantly quartz artefacts found in an ashy layer. A hearth occurred and at the top of the hearth, *Dinoplax gigas* was evident. Some ostrich eggshell was found, only at the top, approximately (at least) 3 truncated layers above the base of PBA which were alternating dark and ashy, some possibly belonging together. Quartz plotted artefacts were all from the ashy layer. Two large quartzite flakes were possibly associated with one another.

When approaching the bottom of PBA, some of the shellfish recovered seemed to be appearing from the layer below. Occurrences of *Turbo sarmaticus* sherds seem to support this as these were not observed before this stage. Ostrich eggshell pieces were only discovered at the beginning of excavating PBA, none were seen later on. PBA was changed to PBA/PBB as in quadrante S28b. Interdigitized patches of ash and charcoal occurred, but not in quadrante 28a.

Unit PBA PBB (Quadrante S28b)

This was an ash layer that was limited to the east north east half and it contained some very poorly preserved burnt bone. Many pieces of quartz were found within the ash part of the hearth. The unit consisted of multiple lenses (ie. very thin layers) of ash and dark "sticky" layers.

It was not possible to confidently distinguish between PBA and what was being taken as PBB in S29b (the test section S29a lies between S28b & S29b). The layer below PBB was however clear in both quads and therefore it was decided to name this material PBA/PBB. There was considerable "draping" of the small white and black layers, ie. they were not laying flat, and seemed to slope upwards towards the west.

The unit did not extend over the whole quad due to truncation. The unit base, PBC, contained considerably more shellfish and the soil was a reddish brown, although the very top also had sticky black soil adhering to it, but was loose.

Unit PBB (Quadrante S29b)

This quadrant had brown, sandy surface soil with ashy black soil just under the surface and was very sticky and consolidated. The unit also consisted of a white ash layer and was sticky. The base of the unit was clearly defined by transition to dark, almost black, sandy soil. The unit only covered the northern 1/3 of the quadrant.

Unit PBA PBB (Quadrante S28c)

The top of unit PBA/PBB seemed to be a hearth of which most of the ash was destroyed by the rockfall of PAY. The first shell was found in this unit. In the north east corner, on the

second burnt layer, 6 cm from the top, was an ashy concentration that may have been a hearth extending into the adjacent squares.

Engraved ostrich eggshell was plotted and another (partly burnt) was found in the north eastern corner. The unit had several ashy patches under the two burnt layers, but not as in a typical hearth.

In the north west section (7cm below PAY) a hearth was evident, slightly below the hearth in the north east section. The third burnt layer was not as uniform as the two preceding ones - it started approximately 9cm below PAY in the eastern section. Three operculum occurred just above the third burnt layer. At the base, several blocky large stones which caused "burrows" were found.

Unit PBA/ PBB (Quadrant R29c)

PBA/PBB is a thick unit consisting of alternating black (very sticky-perhaps burnt) and grey-white (ash, also very sticky) layers. The individual layers were generally rather thin (<1cm thick). It contained a large amount of quartz artefacts and few silcrete and quartzite, although the quartzite might be under-represented in the plotted finds as most of the quartzite was coarse. There were several <10cm quartzite roofspall pieces. *Dinoplax gigas* (burnt black) was the most common shellfish species, and there were some fragments of *Cymbula oculus*, *Turbo sarmaticus* (especially near the base), *Haliotis midae* and a few columellae and fragments of *Burnupena*. One or two *Perna perna* were found. Bone was present but generally poorly preserved, although a few intact pieces were recovered, including a large tooth and some bone conglomerate. A fragment of cut-marked bone was found in this quadrant. A few pieces of ochre were plotted and some pieces were too fragmented to recover. A quartzite roofspall, black, covered in ochre on one facet, might have functioned as a grinder (plotted). Broken stalagmite was found (approximately 3cm) and is potentially useful for U-series dating.

Many pieces of ostrich eggshell were recovered, none with obvious anthropogenic modifications, but closer inspection via microscope might reveal some modification. Most of the ostrich eggshell was burnt. Some waterworn pebbles were present. The base of the unit (PBC) consisted of a light, orangey loose, sand with very many *Dinoplax gigas* valves that were orange in colour (some of these orange-coloured *Dinoplax gigas* were evident in the PBA/PBB bucket). It was clear along the north, north east, east, south east and south, but less clear in the south west, west, and north west where it was dark black (possibly burnt), but contained the same large amount of orange *Dinoplax gigas*.

Unit PBA/ PBB (Quadrant R29d)

This appeared to be a hearth as it was a mix of grey hard ash and fine grey soil and white ash. *Dinoplax gigas* shells were present in the hearth and had a sticky appearance. *Haliotis midae* shell fragments and *Turbo sarmaticus* shell fragments were found.

Unit PBA/ PBB (Quadrant R30c)

This unit had numerous ostrich eggshell as well as silcrete and quartz lithics. Some fragmented shell was present in the unit. There is a clear transition to the lighter PBC unit. It appeared very thin in the B corner and sloped towards the west and north western edges.

Unit PBC (Quadrant S28a)

The top of the surface PBC clearly contrasted with PBA/PBB. The colour was reddish and the soil was loose and packed with shell. There was an ashy patch (approx. 2cm deep) in the southern part (southern part of the top half of the full square). The ashy patch was part of a hearth that from south to north (as the one in PBA/PBB) in this square, dipped. The base of the unit was associated with large quartzite artefacts. Only one piece of ostrich eggshell (incised) was found in this unit.

This unit in S28a was rather small. One ochre crayon was found. Very little bone was found intact. In the eastern section, a large stone and large quartzite artefacts were removed that might have been part of the hearth or they may have been intrusive into the hearth.

Unit PBC (Quadrant S28b)

Some of the *Dinoplax gigas* were articulated in situ. Shellfish finds included *Turbo sarmaticus*, *Haliotis midae*, *Cymbula oculus* and *Burnupena*. A small piece of ostrich eggshell with a scratch mark (unplotted) was found. Small coarse quartzite grains appeared in the lower part of the unit, probably from decomposed roofspall. Small flecks of ochre were present in the deposit, which were not recoverable. Root etching was evident on some of the bone.

This unit was reddish-yellow in colour with loose soil containing several shells and lithics. The soil became more coarse with many tiny chips of coarse quartzite, probably from roofspall. One small ostrich eggshell piece with possible cut marks was found and one potentially very large tortoise femur (if identified correctly). The unit did not extend all the way to the south due to truncation. Some large quartzite roofspall pieces and several small ones were present in the layer.

The unit below (PBD) consisted of white ash forming a mound towards the west which extended into the adjacent S28a and was probably the main part of the hearth. It sloped down steeply towards the north. Some tiny silcrete bladelets were found in PBC. Bone was not well preserved and mostly completely fragmented.

Unit PBC (Quadrant S29b)

This unit contained large amounts of comminuted bone and shell. Finds included numerous burnt bone, *Haliotis midae*, *Cymbula granatina*, a quartz segment piece with ochre, engraved ostrich eggshell, a quartzite grindstone and numerous lithics. A soil sample was taken. The unit base was black, burnt and sticky with few lithics visible.

Unit PBC (Quadrant R28c)

There were many blocks at the interface of PBC and PBD.

This was a loose, crumbly red/yellow deposit with a large variety of shell species. In the north western, north eastern section, the soil was burnt and ashy, (especially in the north eastern section). *Dinoplax gigas* was predominant among the shell species in the layer and were generally quite large. Almost none had been charred black despite the presence of charcoal. Some of the larger bone fragments were however blackened. Even when the soil became more black with charcoal (and ash as well), the *Dinoplax gigas* almost always

retained an orange colour and remained relatively intact. Few *Turbo sarmaticus opercula* were found and some appeared charred.

Unit PBC (Quadrant R29c)

The unit consisted of a relatively light, loose, sandy soil that became darker lower down. The unit contained a large variety and amount of shellfish and quartz artefacts, almost no silcrete (1 blade not plotted) and a few quartzite pieces. Along the northern section of the quadrant, there was a patch of soil which appeared to contain ochre (a sample was taken) and shellfish. Some of the *Dinoplax gigas* was articulated *in situ*.

Shellfish species (mostly poorly preserved) consisted of *Dinoplax gigas*, *Perna perna*, *Burnupena*, *Haliotis midae*, *Cymbula oculus*, *Turbo sarmaticus (opercula)* and *Scutellastra argenvilleae*. The shellfish condition was poor, especially the *Haliotis midae* and *Turbo sarmaticus*. (No *Cymbula granatina* were found in this layer during excavation, but were found during sorting of the shell in the laboratory. This shell species was however common in R30c). Three *Haliotis midae* shells nested inside each other along the northern section were found. Bone, shell and lithics were found often cemented together. It appeared as if the quartz in this unit was more glassy than in PBA/PBB. A charcoal sample as well as a yellow pigment sample was taken in the eastern section of the quadrant for AMS dating.

The base of the unit consisted of a thick, grey ashy layer in the north east, east, south east as well as in the north west. It was less obvious in the south west. It dipped down steeply in the north west and sloped upwards towards the north east. Below the ash layer, the soil was light in colour and loose and contained many quartzite chips. There was a burnt patch with charcoal and yellow pigment along the eastern section. Some bone was present, most also in poor condition. Very little ostrich eggshell (3 pieces) occurred.

Unit PBC (Quadrant R29d)

This was a shell-rich layer with a large variety of species. One large intact *Haliotis midae* was found along the edge of the southern section. There were occurrences of engraved ostrich eggshell. The soil was generally not very consolidated and was a lightish yellow to grey colour. The soil contained a lot of broken shell fragments, numerous lithics, mostly quartz and some silcrete blades.

Unit PBC (Quadrant R30c)

This unit was marked by the sudden appearance of *Dinoplax gigas* shells, much lighter in colour, perhaps not burnt. There were numerous fine quartzite flakes, with shellfish species, *Scutellastra granatina* and *Haliotis midae*.

Unit PBD (Quadrant S28b)

This unit had a thick layer containing alternating white ash and black lenses (with thick white ash in the north east corner). There was a red ochre layer within it which covered the whole square. Another white ash layer extended over the unit which was thicker (approximately by 1cm) along the southern end and a very thin sticky black layer below the ash. A soil sample was taken from the white ash layer and also included a general sample. Directly below the white ash was an ochre smear and below the ochre, a thin very sticky pitch black layer. The yellow pigment layer appeared to be above the red ochre layer in the south east corner. A

sample of a small piece of yellow pigment was taken from the south east corner. A cutting was taken of the ochre within the layer and the white ash that occurred below it.

Very many lithics most in silcrete occurred. Some shellfish, mostly in poor condition was often found in pockets between rocks, some totally burnt grey/calced. The base of the unit was very clear and contained a large number of quartzite roofspall blocks. The sediment below this was yellow-coloured and loose. Two medium-sized quartzite slabs were found within and on top of the ochre layer. The slab found within the ochre layer had both red and yellow pigment on it. Midway along the eastern section was a small patch of silcrete flakes, chips and a bladelet all from the same core.

Shellfish species included *Cymbula granatina*, *Perna perna*, *Burnupena* and small fragments of *Cymbula oculus*. There were lots of burnt *Dinoplax gigas* including some pockets of relatively unburnt shell across the square with very few *Turbo sarmaticus*. Some of the *Dinoplax gigas* was articulated. Tortoise bone was found. There was an intensely burnt patch of greyish shellfish in the centre of the northern section of the quadrant and next to it there appeared to be a smear of ochre over approximately 10 cm of the surface.

Unit PBD (Quadrant S28a)

The first hearth in PBD was approx. 20mm deep. This unit also consisted of black and ashy layers which were thin. They were not hearths but perhaps associated with hearths. Blocks and large artefacts obscured the relationship between the hearths and these thinner layers. Underneath the ash and hearths there was very little shell.

An ochre crayon (plotted as KB 348) was found in the second hearth. In the north and north west section there were several large flakes and pieces of quartzite. The shell was broken, but not burnt. The shell occurred in pockets of the thick black layers. Large quartzite blocks were found with plant root imprints on their surface.

Unit PBD (Quadrant S29b)

The unit had sticky soil with a black surface, (dark, burnt) and few lithics were visible. Finds included several small silcrete chips and flakes and several lithics covered with ochre; one very small hammerstone pebble with peckings (20mm); few whole silcrete blades; a silcrete scraper and also engraved ostrich eggshell.

Unit PBD (Quadrant R28c)

The first 4cm of this quadrant had alternating patches of black cemented soil, grey "clay" and looser dark soil. Mainly silcrete pieces were found, with shell in this top part that was sparse, broken and brittle. Some smaller rocks and quartzite slabs occurred below this set of sediments and underneath this was shell of much better preservational status. Two complete but very fragile *Haliotis midae* were found.

Unit PBD (Quadrant R29c)

Shell species found during excavation in this unit contained *Cymbula granatina*, *Turbo sarmaticus* with *opercula* (sorting in the laboratory showed many more species, namely: *Haliotis midae*, *Dinoplax gigas*, *Scutellastra argenvillei*, *Diloma sinensis* and *Donax serra*). A yellow pigment sample and white ash sample was taken.

Unit PBD (Quadrante R30c)

There were several ochre/shell associations with no pigments fairing in the surrounding area. The unit was patched with *Haliotis midae*. There was a large ochre patch in the south east corner of the unit.

Unit PBD (Quadrante R29d)

This was a grey-black unit with white speckled appearance and small shell fragments with many fragmented *Haliotis midae* shell fragments. The quadrant was rich in lithics. Some engraved ostrich eggshell occurred.

Unit PBE

Unit PBE was rich in stone artefacts with a very high frequency of well-made samples. The lithics consisted of many small silcrete flakes, blades, quartz and quartzite flakes and blades. Silcrete blades were found with scraping, backing, notching and retouch. Masters student, Nikolai Rypdal Tallaksen has analysed the lithics from this unit (refer below).

Unit PBE (Quadrante S28a)

The surface had a light yellow layer with small quartzite inclusions. There was very little shell in the layer and also very little bone. There was a dark, patch of ashy soil in the east-south east. In the yellow part with the dark soil, a very high frequency of well-made artefacts was found with scraping, backing, notching and retouch. Ostrich eggshell (incised and not incised) was also found here as well as a possible retouched piece. It was decided to include the dark part of this layer in PCA, therefore PBE may have been overdug into PCA.

Unit PBE (Quadrante S28b)

The quadrante consisted of loose gravel-like yellowish soil with lots of quartzite chips. A red patch (ochre smearish) in the south east quarter of the quad lay on top of a number of quartzite roofspall above the yellowish sandy matrix. There were also quartzite spall blocks over the rest of the quad. Some small patches of the bright yellow pigment also occurred in the red area. This may have come from inclusions in the quartzite roofspall as it was also evident in the cave walls. Directly below the yellow loose soil was a layer of very sticky grey soil. The base of the unit (surface PCA) consisted of a greyish burnt-looking clayey soil, very sticky and compact, particularly in the south.

Unit PBE (Quadrante S29b)

The surface was brown with a hue of red. There were a lot of cominuted shellfish visible on the surface almost yellow in some parts. The unit was not burnt and seemed to be rich in artefacts. There seemed to be a pattern with small (30cm diameter) hearths, basin-shaped.

Unit PBE (Quadrante R29d)

The unit was rich in fine ochre particles. Some may have derived from burnt decomposing quartzite. There was very little cultural material and the unit contained mostly angular quartzite spall chunks.

Unit PCA (Quadrante S28a)

This was the first unit in this quad to be excavated stratigraphically as the material above was dug in spits as a test pit. Material from the northern $\pm 20\text{cm}$ of the test pit (dug to fit the quad into the grid) was separated into the top layers: PBA -> PBD and the bottom of PBE and some PCA. Some of the material (of PCA) was removed along with the test pit therefore there was not much of this unit left. The soil was sticky grey/black with very many large quartzite roofspall blocks all over the surface with deposit lying in between them in pockets. The unit base consisted of mostly lighter soil where visible between the spall blocks. It appeared that PCB might only be present in the E section with a layer of black below it. Neither PCB nor PDA were found in S28 a and it appeared that PDB lay directly below PCA. Therefore both PCB and PDA pinched out in either S29a (looked likely for PCB) or S28b. As both of these units (as well as PBE) did not contain much material and were mostly sterile, it was decided to stop excavation in this quad at this stage. The base of the unit was not scanned due to the uncertainty about what units the base consisted of. No artefacts were visible on the surface. Some pieces of burnt ochre were found.

Unit PCA (Quadrant S28b)

The surface of this quadrant was mostly level but sloped slightly to the north west where a small ridge mound was situated (due to overdigging in S28a) and a rock was found there. The soil was light grey and extremely sticky, like clay. Approximately in the middle of the quadrant two lithics were found lying quite sharply downwards from south to north west (the opposite angle of the surface slope). Below the grey clay it was uniformly black over the whole quadrant. A few waterworn pebbles occurred. The black layer was thick and very sticky. Pockets of shellfish were found all over the quad, mostly *Turbo sarmaticus* shell and several *operculum*, particularly in the eastern part. Some bone was present, but very burnt and in poor condition.

The unit base contained many large and medium pieces of roofspall with a lesser yellowy brown sandy soil in-between. This was a very thick unit. The shell was also poorly preserved. Some small pieces of ochre and a piece of shale were found. There were two patches of very burnt manganese/specularite (these were plotted). Some of the silcrete blades appeared somewhat larger than those recovered in the overlying layers and some of the quartz pieces also appeared bigger.

Unit PCA (Quadrant S28a)

The surface of PCA was irregular and dark with few large blocks protruding. In the north eastern section there was possibly the remains of a hearth that already commenced in PBE. There were many artefacts in the top section of PCA, but a grey, sticky clay occurred between the big blocks. There were a few artefacts in the clay. Low quantities of shell occurred. Bone was present, but most of it was completely disintegrated. This unit was draped over large blocks.

Unit PCA (Quadrant S29b)

The surface was medium brown with a lot of what seemed to be roofspall (big chunks of quartzite). PCA is the first unit that extended to the whole of the quadrant. The base of the unit was covered by big quartzite slabs and chunks, some clay-like ash and loose soil in-between.

Unit PCA (Quadrant R29d)

This was a yellowish grey brown unit. The surface contained large quartzite chunks with some ochre nodules. *Turbo sarmaticus* and *Dinoplax gigas* shells, some *Haliotis midae* occurred. There was very little ostrich eggshell. The surface of the next unit (PCB) was covered by rock spall-quartzite and was lighter brown in appearance.

Unit PCA PCB (Quadrant S29d)

This was a truncated unit and covered a small area (approximately 10-15cm of the northern edge of the square).

Unit PCB (Quadrant S29b)

The unit surface was covered by big roofspall slabs. The soil below was very sticky and ashy. The thickness of the unit was highly variable due to the removal of rocks. There was good preservation of *Turbo sarmaticus*.

Unit PCB (Quadrant R29d)

This unit consisted of a very broken loose surface with large/small angular quartzite spall. The soil was a light brown/yellow sandy matrix. This was a low density unit with few lithics. The PCB hearth was confined to 10-15cm at the edge of the square, mostly in the south east corner. There was no hearth beyond this, towards the north, only spall and loose sand.

Unit PDA (Quadrant S29b)

The surface was ashy, hard and consolidated with charcoal (possibly a hearth). The soils were grey, very clayish and compacted, and grey just below the rocks in PCB. The quadrant sloped towards the north west due to rock removals. Two mysterious holes were encountered (photo taken) with very few artefacts in the ashy layer. There were a few shellfish (*Turbo sarmaticus*, *Haliotis midae*) with some unburnt and fragmented bones. There were quite a few large rock chunks, 15-20cm (debris). A few pieces of ostrich eggshell were found and might belong to the unit below.

The unit base consisted of light/medium brown, crumbly unconsolidated soil. There was no charcoal or ash visible and the base was apparently sterile, but there were numerous roofspall inclusions.

Unit PDB (Quadrant S29b)

The surface was light/medium brown/grey, crumbly, unconsolidated soil with numerous medium-sized roofspall inclusions. There was no charcoal or ash visible. From the surface it was apparently sterile. The small amount of deposit became visible after some digging: lithics, *Scutellastra argenvilleae* and fauna were found.

The unit base consisted of hard consolidated ash, grey/black with charcoal. This was named PDC and was clearly different from PDB. The hearth that separated PDA and PDC was clearly visible in the section. A lot of angular quartzite block occurred.

Unit PDB (Quadrant S28a)

The surface of PCB was full of large blocks. The surface of PCB was actually the surface of PDB. In this quadrant there was no PCB and PDA. There was largely sterile brown sand underneath the blocks and it contained some microfauna.

Unit PDC (Quadrant S29b)

The surface was hard, consolidated, ashy-grey/black with charcoal and was clearly different from PDB. It contained a lot of angular quartzite blocks. It was very rocky with large amounts of small quartzite roofspall and sporadic findings of fragmented shellfish, namely, *Dinoplax gigas*, *Turbo sarmaticus*, *Scutellastra argenvillae*, *Cymbula oculus*, *Diloma sinensis*. A quartzite convergent blade was found.

The unit base consisted of loamy, light brown soil with some charcoal inclusions.

Unit PDD (Quadrant S29b)

This was a sterile unit except for 2 lithics and one shellfish.

The *Unit PBE* lithics recovered during the 2011 season are included in the research of N Rypdal-Tallaksen in preparation for the Masters thesis.

Research on lithics from Unit PBE, comments by N Rypdal-Tallaksen, October 2011:

The sediments from PBE has a high density of lithics, 3821 in total.

The most common raw material is quartzite (37.7%) followed by quartz (37.6%) and silcrete (24.5 %), other raw materials like: calcrite, quartz crystal, chert and hornfels were found, but was limited to single occurrences (in total 0.2%).

Most of the lithics excavated consisted of chips, chunks, trimming flakes and flake fragments. There was also quite a large amount of flakes, blades and blade fragments. Most of the debitage appeared to be consistent with blade and bladelet production (personal observation).

The total amount of retouched tools in PBE was 28, of these the majority are notched pieces (54% n15), followed by generally marginal retouched pieces (14% n4), notched and generally retouched (11% n3), backed pieces (11% n3), notched and backed (7% n2) and one scaled piece (4%).

There were also five cores in the sample (3 in silcrete and 2 in quartz), all of which are blade or bladelet cores.

Some of the tool descriptions might contrast slightly with those recorded in the field as they have changed through the analysis.

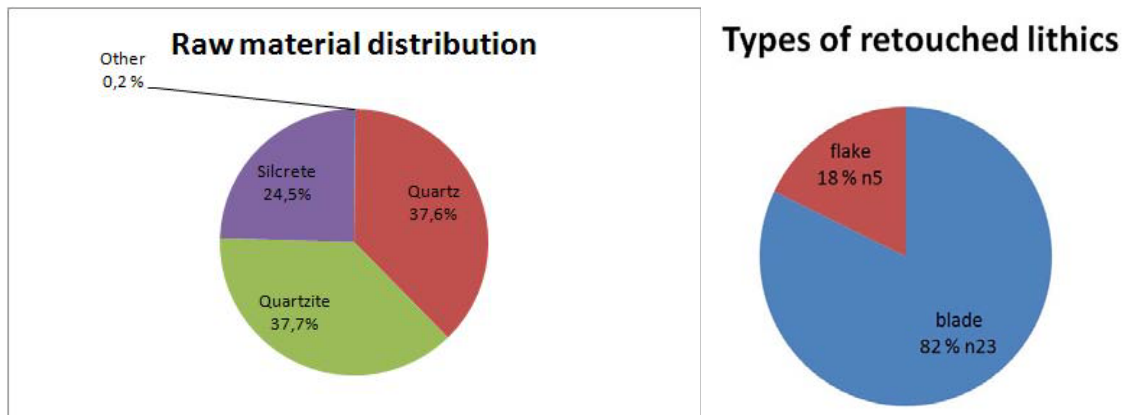


Fig. 9. Unit PBE, lithics: Raw material distribution / types of lithics

Shellfish

Shellfish included *Turbo sarmaticus*, *Dinoplax gigas*, *Haliotis midae*, *Cymbula oculus*, *Perna perna*, *Burnupena cincta*, *Haliotis midae*, *Scutellastra argenvillei*, *Cymbula granatina* and fragments of barnacle.

In units PBA, PBB *Dinoplax gigas* (burnt black) was the most common shellfish species, and there were some fragments of *Cymbula oculus*, *Turbo sarmaticus* especially near the base *Haliotis midae*, few columellae and fragments of *Burnupena*. Predominant in the layers were *Turbo sarmaticus*, (broken), *Dinoplax gigas*, some orange in colour and *Haliotis midae*, also broken.

PBC was a shell-rich layer with a large variety of species, very broken especially *Turbo sarmaticus*. A complete *Haliotis midae* was also found. This unit was marked by a sudden appearance of *Dinoplax gigas* shells that were generally quite large. Three *Haliotis* shells were found nested inside each other. Some shellfish, mostly in poor condition were often found in pockets between rocks, some totally burnt grey and calcified.

Fauna

Bone was not well preserved and mostly completely fragmented and burnt. Few intact pieces were recovered. One included a large tooth and a find of bone conglomerate.

Of interest in unit PBA/PBB, cut-marked bone was found (fragment). Some tortoise bone and one potentially very large tortoise femur was also found in this unit (if correctly identified).

Stalagmite

Broken stalagmite found in PBA/PBB (R29c) (c. 3cm) is potentially useful for U-series dating.

Ochre

Ochre seems to have been widely utilized as most units contained pieces of ochre (60 were plotted) and several units had ochre smears. In unit PBD there were several ochre/shell associations with no pigments fairing in surrounding areas. The ochre was spread all over the square and several lithics were found covered with ochre. One ochre crayon was found in unit PBC and an ochre crayon also found in the second hearth. A quartzite artefact (from the black roofspall) covered in ochre on one facet, might have functioned as a grinder (plotted).

A feature of PBE was the ochre floor. It consisted of a layer of burnt ochre, mainly small pieces and lithics covered in ochre. The ochre unit probably lay below PBE as PBE was slightly overdug in the east and this exposed the ochre. Some small patches of the bright yellow pigment also occurred in the red area and this may have come from inclusions in the quartzite roofspall.

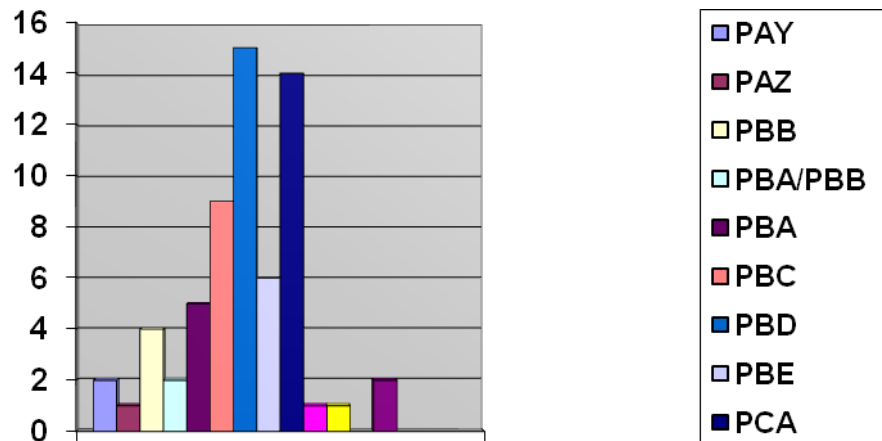


Figure 10. Plotted ochre: amount of ochre per unit

Ostrich eggshell

Many pieces of ostrich eggshell were recovered and numerous were burnt. Some ostrich eggshell appeared in ashy layers. Engraved ostrich eggshell was found, some with obvious anthropogenic modifications. A possible retouched piece was found.

Hearths

There were multiple lenses (ie. very thin layers) of ash and dark "sticky" layers. The top of PBA/PBB (R28c) seemed to be a hearth of which most of the ash was destroyed by the rockfall of PAY. The first hearth in PBD was approx. 20mm deep and PCA was a dark hearthy unit.

It is possible that some of the quartzite slabs in PDA served as hearth stones as they lay directly below the PDA hearth. PDA was a low density unit for shellfish and lithics and was basically a large hearth. PDC was identified on the basis of a dark, hearthy surface that was very sticky.

Charcoal

A PBC charcoal sample was taken (KB 1849 O3) for AMS dating in the eastern section.

