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Report on the 2007-2010 archaeological excavations at Blombos Cave, southern Cape, South Africa and update on current research with regards to the Blombos site and materials.

Report compiled for Heritage Western Cape by:

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BLOMBOS CAVE

PROGRESS REPORT FOR THE PERIOD APRIL 2007 TO APRIL 2010

Introduction

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

1. **No. 2007/03/APM 003, HWC REF. No. C13/3/6/2/111/1/1/C21 PERMIT 2007-03-003**
2. **No. 2010/02/APM 001 HWC REF No. HM/EDEN/HESSEQUA/JONGENSFONTEIN/BLOMBOS CAVE PROJECT PERMIT 2010-02-001**

On 22 March 2007 a permit (# 2007-03-003) was issued to excavate the M3 phase in Squares E5/6; F5/6; G5/6; H5/6 and I5/6 at Blombos Cave (BBC). An extension for the permit (#2010-02-001) was issued on 25 February 2010 to further excavate at Blombos Cave.

This report discusses excavation progress during the 2008, 2009 and 2010 excavation seasons related to the above permits. A progress report for the 2007 season has already been submitted and processed by HWC.

A list of ongoing analytical projects on the excavated material and scientific publications/dissertations/theses on material from Blombos excavation since 2005 are also provided. Results from the site significantly contribute to current debate about the origins of modern human behaviour. This means that Blombos Cave has a prominent place in how the Middle Stone Age is viewed, and how we interpret behavioural evolution over the past 150 ka. The publication section is therefore divided into two sections, one representing recent analytical results, and one focussed on the bigger picture. We trust the material presented here will illustrate the importance of sustained excavation and research at Blombos Cave.

General background to excavation methods followed at Blombos Cave

Blombos Cave (34˚ 25'S, 21˚13'E, Figure 1) is situated in a steep cliff, 100 m from the Indian Ocean and 34.5m above modern sea level. The sediments of the cave were well protected as the cave elevation sheltered it from erosion by the high sea level stands during Marine Isotope Stage 5e and MIS 1. The cave is situated in the calcified sediments of the Tertiary Wankoe Formation, which contributes to the good preservation of faunal and human remains recovered from the site.

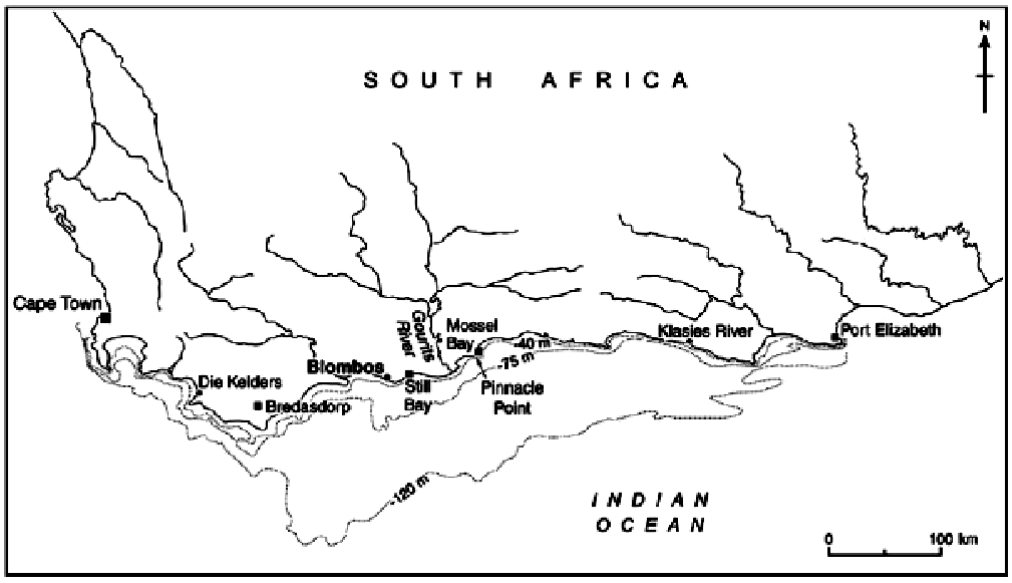

Figure 1. Map showing the location of Blombos Cave

Systematic excavation and analyses of the MSA layers at Blombos commenced in 1992 and is ongoing. The MSA at BBC occur below LSA layers in the small cave and extend into a recently-discovered antechamber. The MSA layers are divided into three phases, M1, M2 and M3 and each comprise a number of discrete layers or units (Figure 2). These phases have been dated using a number of methods, including thermoluminescence (TL), optically stimulated luminescence (OSL) and electron spin resonance (ESR).

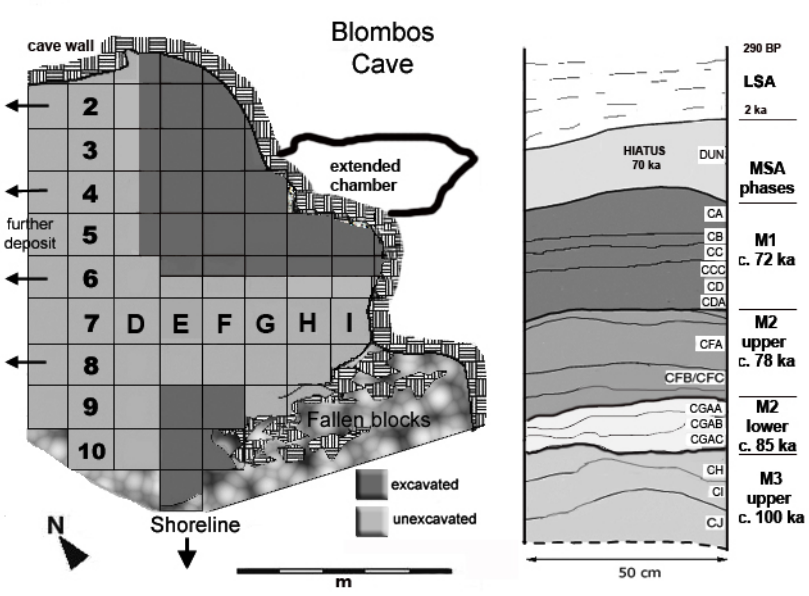

Figure 2. Blombos Cave floor plan

Excavation methods follow those described in previous reports submitted to Heritage Western Cape. It follows the standard Best Practice for Middle Stone Age and Middle Palaeolithic excavations. The surface of Blombos Cave is divided into square metres (D-H), and further subdivided into 0.5m quadrates (a-d) as shown in Figure 2. Different units are identified, based on texture, composition, colour, thickness and features.

Excavations proceeded with brush or small trowel. Counts of buckets of deposit provide a measure of volume excavated. All objects larger than 15 mm, with the exception of non-countable shellfish and bone fragments, are plotted by measuring the x, y and z coordinates. Vertical z measurements are taken with the use of a water-level system and height determined relative to the datum point established prior to excavation. All plotted pieces are individually bagged, labelled and numbered according to square, unit and artefact category, as well as entered on the site record form and plotted on graph paper for that specific unit and square. Material smaller than 15 mm is wet sieved, through 3mm and 1.5 mm screens, and dried. The coarse fraction (>3mm) material is sorted on-site into the various artefactual categories. A photographic record is kept of all surfaces before excavation and the context of any special finds. Soil, dating and other samples are systematically collected during excavation.

A full set of records, field notes, and data sheets of the plotted material, is currently housed at the African Heritage Research Institute (167 Buitenkant Street, Gardens, Cape Town), but will ultimately be archived at the IZIKO Museum (Cape Town). All the records and excavation data for the 2008-2010 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 Blombos project, and some results are available in the listed published material. Below we report on excavation dates, squares and stratigraphic levels excavated during the 2008-2010 seasons.

Squares and Quadrates excavated 2008-2010

Table 1 lists the Units and Quadrates excavated in the 2008-2010 field seasons. The 2008 excavation season was conducted between 12-02-2008 and 14-03-2008. Quadrates in squares E5/6, F5/6, G5/6 and H5/6 were excavated (Fig. 2, Table 1). Stratigraphic levels below CK were excavated in F5/6, G6 and H5/6. In order to excavate E5/6 several large rocks and disturbed sediment (4 buckets labelled LSA/MSA mix) had to be removed. The rocks had to be fractured before removal using Katrock® to fill drilled holes. A small amount of sediment was also removed from D5, using standard methods of excavation and recording, in order to stabilise the sections. The 2009 excavation season was conducted between 22-02-2009 and 30-03-2009. Quadrates in squares E5/6 and F5/6 were excavated (Fig. 2, Table 1). Stratigraphic levels below CI were excavated in E5/6, F5/6 and G6. The 2010 excavation season was conducted between 24-3-2010 and 30.04.2010. Quadrates in squares F6d, G6c, G6d and H6c were excavated (Figure 2, Table 1).

The excavated materials include lithic, ochre, faunal, fish and shellfish remains and this represents the bulk of excavated material. Features such as hearths and areas covered with ochre are also recorded and described

Table 1: Units by Quadrate excavated between 2008 and 2010

(Ÿ=2008 , Ɵ=2009, Δ=2010)

		D5a	D5b	D5c	D5d	E5a	E5b	E5c	E5d	E6a	E6b	F5c	F5d	F6a	F6b	F6d	G6a	G6b	G6c	G6d	H5c	H5d	H6a	H6b	H6c
M1	DUN															Δ			Δ	Δ					Δ
	CA	Ÿ	Ÿ	Ÿ	Ÿ											Δ			Δ	Δ					Δ
	CB	Ÿ	Ÿ	Ÿ	Ÿ											Δ			Δ	Δ					Δ
	CC	Ÿ	Ÿ	Ÿ	Ÿ											Δ			Δ	Δ					Δ
	CCC															Δ			Δ	Δ					Δ
	CD															Δ			Δ	Δ					Δ
	CDA															Δ									
	CDB															Δ			Δ	Δ					Δ
M2 Upper	CFA															Δ			Δ	Δ					Δ
	CF(h)															Δ									
	CF (h1)															Δ									
	CFB/CFC															Δ			Δ	Δ					Δ
	CFD															Δ			Δ	Δ					
M2 Lower	CGAA																			Δ					Δ
	CGAB																			Δ					Δ
	CGAB h1 (hearth)																			Δ					Δ
	CGAC																								
M3	CH																			Δ					Δ
	CIA							Ÿ		Ÿ	Ÿ									Δ					Δ
	CIB					Ÿ	Ÿ	Ÿ	Ÿ	Ÿ	Ÿ									Δ					
	Burrow in CIB								Ÿ																
	CIBhearth1							Ÿ Ɵ	Ÿ Ɵ	Ɵ	Ɵ														
	CIBh1 Burrow 2										Ɵ														
	CJ								Ÿ																
	CJh1 (n)								Ɵ	Ɵ	Ɵ														
	CJ hiatus										Ɵ														
	CJh2										Ɵ														
	CJh2 burrow											Ɵ													
	CK (n)																								
	CL (n)														Ÿ										
	CM (n)											Ɵ	Ÿ	Ɵ	Ÿ							Ÿ		Ÿ	
	CN (n)											Ɵ		Ɵ											
	CN/CO (n)												Ÿ		Ÿ							Ÿ		Ÿ	
	CO (n)											Ɵ		Ɵ											
	CP (n)													Ɵ	Ÿ		Ÿ	Ÿ				Ÿ		Ÿ	
	CPA											Ɵ	Ÿ	Ɵ	Ÿ Ɵ		Ÿ Ɵ	Ÿ				Ÿ Ɵ		Ÿ	
	CQ (n)																							Ÿ	
	CQ hiatus 1														Ɵ		Ÿ	Ÿ				Ÿ		Ÿ	
	CQB (n)																					Ÿ		Ÿ	
	CQ hearth																				Ÿ	Ÿ	Ÿ	Ÿ	
	CQC (n)																				Ÿ	Ÿ	Ÿ	Ÿ	
	CQD (n)																						Ÿ		

Dating 2008 - 2010

During the 2008 excavation season Dr. Chantal Tribolo selected 24 lithics which will be used for thermoluminescence dating, in addition to previously selected lithic samples (14) from the 2007 excavation season. The lithics are from units CJh2, CIB, CIBhearth1 and CL, all in the M3 phase.

In the 2008 season Professor Stein-Erik Lauritzen, Geo-Sciences, University of Bergen, Norway, selected 5 samples of flowstones from units CQhiatus 1(n) (from squares G6a and G6b) and a shelf below CQB (n) (square H6b) to perform Uranium-Thorium dating. Application for dating permits will be sent to HWC separately. When/if permits have been granted, results will be published in due course.

In 2009 and 2010 OSL dating samples were collected by Dr Zenobia Jacobs from:

- BBC 09-1 (F6a) calcrete layer between CQB & CQC
- BBC 09-2 (F5d) calcrete layer between CQB & CQC
- BBC 09-3 (H6a) calcrete layer between CR & CS
- BBC 09-4 (H6b) calcrete layer between CR & CS
- BBC 09-5 (I6a) calcrete layer at unit CS
- BBC 09-6 (I6b) calcrete layer at unit CS
- BBC10-01 (H6d) CA
- BBC10-02 (H6d) CC
- BBC10-03 (H6d) CD
- BBC10-04 (H6d) CFA
- BBC10-05 (H6d) CFB/CGC
- BBC10-06 (H6d) CFB/CFC
- BBC10-07 (H6d) CGAA
- BBC10-08 (H6d) CGAA
- BBC10-09 Red/brown sand at top Inside chamber
- BBC10-10 Olive green/yellow sand in middle Inside chamber
- BBC10-11 Dark red/brown sand at base Inside chamber

Dr Jacobs (pers.comm. 2008) also reported on new preliminary results, as yet unpublished, obtained from previous OSL samples (Table 2).

Table 2: New preliminary OSL ages for the M3 Layers from Blombos Cave

Layer	Quadrate	Age (ka)	Weighted mean (ka)
CH	F6c	96 ± 3	
CH/CIA	F6d		
CH/CI	I4c	99 ± 5	
CIB	G6c	101 ± 4	
CIB	F6c	100 ± 4	99.7 ± 4.3
CIB	F6d		
CIBh1	D5d	98 ± 4	
CJ	H5b	97 ± 4	99.4 ± 5.4
CJ	F6d	101 ± 5	
CJ	H5b	100 ± 5	
CJ		97 ± 6	
CJ		100 ± 3	
CJ		102 ± 5	
CJh1	G6c	98 ± 10	
CJ(h1)	F6d	97 ± 5	
CL	G6d	99 ± 4	
CO	G6d		
Upper CP sterile	G6b	99 ± 3	
CP/CQA	G6d	109 ± 4	109.0 ± 5.9
CP/CQA	G6d	110 ± 6	
CP/CQA	G6c	109 ± 4	
Between CQB and CQC	H6b	118 ± 7	
CQC	I6b	128 ± 5	

Plotted artefacts

The details of the plotted lithics, bone, OES and ochre are listed below. These tables do not include the pieces sorted in the field after washing of the sediment. It is likely that material from this process will expand these lists, especially the small lithic and faunal elements.

LITHICS

Table 3: Assemblage composition of the plotted lithics from the M3 phase excavated in 2008 (MRP= miscellaneous retouched piece)

	Silcrete	Quartzite	Quartz	CCS	Hornfels	Other	TOTAL
Manuport	1						1
Grindstone			4				4
Core	10	1	14				25
Chunk	41	42	116				199
Flake	410	57	117				584
Cortical flake/blade							
Blade	38	13	5				56
Bladelet							
Denticulate							
Bifacial (or part thereof)							
Scraper							
Reamer							
Conglomerate/Cluster	1		6				7
Unifacial							
Utilized							
MRP							
Adze							
Ochre covered							
Chip cluster							
Total	501	113	262				876

Table 4: Assemblage composition of the plotted lithics from the M3 phase in excavated in 2009

	Silcrete	Quartzite	Quartz	CCS	Total
Manuport		1			1
Grindstone		3			3
Core	9	1	8		18
Chunk	201	85	149		435
Flake	427	96	111	7	641
Cortical flake	4	3	4	1	12
Blade	68	15	14	1	98
Bladelet	5	2	1		8
Denticulate		1	2		3
Bifacial (or part thereof)					
Scraper					
Reamer			1		1
Ochre covered		1	5		6
Chip cluster	1		1		2
Conglomerate			1		1
TOTAL	715	208	297	9	1229

Tables 3 and 4 show that silcrete is the raw material used most intensively in the M3, followed by quartzite and quartz. The retouched component in the plotted lithics is very small, with denticulates the most frequent type. There are more flakes than blades recorded and cores and chunks are important elements identified that will lead to information on the technological know-how of the people who occupied the cave.

Lithics of the M3 phase are analysed by Dr Sarah Wurz as part of Project 9. These results will allow the comparison of the M3 lithics phase with other MIS 5 assemblages from Klasies River, Pinnacle Point, Ysterfontein 1 and Cave of Hearths to improve understanding of this rather neglected Late Pleistocene technological phase.

Table 5: Assemblage composition of the plotted lithics from the M1 phase excavated in 2010

	Silcrete	Quartzite	Quartz	CCS	Hornfels	Other	TOTAL
Manuport			*1*			*1*	*2*
Grinding stone		*1*					*1*
Core	*12*	*6*	*1*				*19*
Chunk	*74*	*64*	*65*		*1*		*204*
Flake	*331*	*84*	*68*	*1*	*1*		*485*
Cortical flake/blade	*9*	*2*	*2*				*13*
Blade	*26*	*11*	*11*		*1*		*49*
Bladelet							
Denticulate	*3*		*5*				*8*
Bifacial (or part thereof)	*25*	*5*	*3*				*33*
Scraper	*7*						*7*
Reamer							
Conglomerate/Cluster			*1*			*6*	*7*
Unifacial			*1*				*1*
Utilized	*2*		*4*				*6*
MRP	*6*	*2*	*1*				*9*
Adze	*1*						*1*
Ochre covered							
Chip cluster	*3*						*3*
Total	*496*	*175*	*163*	*1*	*3*	*7*	*845*

The M1 lithic assemblage excavated in 2010 is characterised by a larger raw material and typological inventory than for example the M3 phase, as is evident when Tables 3 and 4 are compared with Table 5. Further analysis of the non-retouched component of the Still Bay phase would add to knowledge on the technological steps followed in producing the blanks for the Still Bay bifacial points. This would add a valuable perspective to the pioneering results recently published on the production process of bifacial points from Blombos Cave (Mourre *et al.* 2010). The lithics are studied in collaboration with researchers from the University of Colorado, Toulouse and Witwatersrand (Projects 3 and 9). Mr J Pargeter has submitted his MSc thesis on lithics from Blombos Cave in January 2011.

OCHRE

Ochre seems to have been widely utilized as most units contain pieces of ochre (Table 6) and several units had ochre smears. Many stone tools have residues of ochre on the platforms, dorsal and ventral surfaces

Table 6: Plotted ochre (n) from the 2008-2010 seasons

	2008	2009	2010
Ochre	*46*	*68*	*25*
Ochre Fragments		*2*	*1*
Ochre Flake		*1*	
Ochre Chunk	*5*	*8*	*5*
Ground ochre		*2*	
Ochre grinder fragment		*1*	
Ochre crayon		*1*	*2*
Ochre marked		*1*	*2*
Ochre degraded/unconsolidated		*2*	
Ochre, marine			*1*
Shale ochre			*1*
Total	*51*	*86*	*37*

Blombos Cave is almost synonymous with ochre utilization in the Middle Stone Age. Apart from the ochres with the geometric patterns from the Still Bay phase and the patterned engraved ochres from all three phases (Henshilwood *et al.* 2002; 2009) there are also numerous ochre elements that indicate grinding and colouring processing activities. This aspect is investigated by "Project 1" (See Page 13) and 7 in collaboration with experts from the University of Bordeaux and Bergen. Mr Riaan Rifkin is analysing the ochre from Blombos Cave for his PhD thesis.

FAUNA

Apart from small bone fragments all identifiable bones were plotted and individually bagged during excavation (Table 7). Micromammal remains were found in most of the excavated units and quadrates. The micromammals recovered from the 2008 excavation are analysed by Turid Hillestad Nel (University of Bergen) as a part of her PhD thesis (Project 8). Project 4 is about the species representation, seasonality and some taphonomic aspects of the fauna undertaken in collaboration with Dr S Badenhorst of the Ditsong National Museum of Natural History. Mr J Reynard has submitted his MSc degree in June on the taphonomy of the long bone fragments of the Still Bay phases. Dr G Dusseldorp has published on the faunal exploitation at Blombos Cave. Project 5 focuses on a broader perspective on taphonomic factors affecting faunal remains and a paper on this topic was recently published by Thompson & Henshilwood (2011). Project 6 investigates the bone tools from Blombos Cave and Mr J Bradfield received his MSc degree on this topic with distinction from Wits in 2010.

Table 7: Plotted faunal elements from the 2008-2010 excavations

	2008	2009	2010
Bone	30	8	40
Bone chip	2		
Bone fragments	2	9	5
Cranial fragments			2
Jaw fragment		4	
Articular end			5
Articular surface			1
B. Suillus mandible		1	2
Carnivore			1
Seal bone			2
Snake bone			1
Bird bone		4	3
Fused vertebrae bird?	1		
Fish	1		
Turtle			1
Jaw			1
Jaw with teeth	1		1
Mandible	5	2	2
Bovid mandible			1
Carnivore mandible			1
Antelope mandible			1
Mandible fragment			3
meta carpal/tarsal?	3		
Foot element		1	
Articulated longbone			1
Bone knuckle			1
Long bone		1	10
Long bone fagment		5	
Patella		1	
Small bovid tarsal		1	
Phalange		1	
Teeth		4	9
Tooth, incisor			1
Bovid tooth		1	
Hippo tooth			1
Molerat teeth	1		
Seal tooth			2
Carnivore teeth		1	
Horn core	1		
Tortoise plastron	1		
Scapula	2		3
Skull piece	1		
Teeth	7		1
Ulna			
vertebrae	1	1	2
Snake vertebrae			18
Fish vertebrae			5
Burnt bone	2	2	3
Cut-marked bone		1	1
Worked bone		1	
Bone flake			1
Longbone shaft fragment with marks			1
Longbone shaft fragment, percussion marks?			2
Bone tool?			1
Bone tool, point			2
Ground bone			1
Total	61	49	139

SHELLFISH & FISH

Shellfish occur in high densities in the upper M3 units such as CIB and CIBh1, but are less common in the lower units. It is possible that visits to the cave were transient/brief, as the units in the lower M3 phase are not as thick as some of the later MSA units. Shellfish preservation in the M3 was generally poor, and much of the recovered shell was fragmented, particularly in units CIB and CIBh1. It is possible that the rocks which had fallen on top of the units in this area of the cave and which were removed in the beginning of the excavation season were the cause of the poor preservation.

Units CIB and CIBhearth1 contained various Patella species (mainly *S. argenvillei* and *C. oculus*) which were covered in ochre. It seems that the occupants of the cave might have used the ridges on the outside of the shells to grind the ochre pieces.

Some of the *Turbo sarmaticus* opercula in the M3 show edge damage, possibly incurred when the opercula were removed from the shell before cooking. Similar damage is also observed on opercula from the LSA levels at the site as well as the M1 and M2 phases of the MSA. Ms Cornelia Albrektsen from the University of Bergen is studying aspects of shellfish processing during the MSA at BBC for her Master's thesis.

Project 10 entails a study of changes in shellfish subsistence adaptations through time at BBC and Klasies River and the application of optimal foraging theory to the data. A paper has been submitted to Quaternary International (Langejans *et al*).

The fish remains from both the LSA and MSA of BBC have been analysed and compared in terms of taphonomy and species composition as part of K. van Niekerk's PhD thesis (Project 11).

OSTRICH EGGSHELL AND SHELL BEADS

In 2008 3 OES pieces and in 2009 10 OES pieces were plotted. In the excavation of the Still Bay M1 layers in 2010 53 pieces of OES were plotted in addition to one *Nassarius kraussianus* bead and 1 perforated shell.

Intensive analysis of the Nassarius beads and associated material is ongoing, through Project 2, in collaboration with scholars from the University of Bordeaux, Nanterre and Bergen. The taphonomy of the beads have been studied and the results will be published within the next year.

Projects relating to the Blombos Material.

Projects relating to the excavated material from Blombos are listed below:

1. Blombos Cave Project: Middle Stone Age chemists: Ochre processing and storage at 100 ka in South Africa

Principle researchers

Prof C.S. Henshilwood (Wits)

Prof F. d'Errico (Univ Bordeaux, France & Honorary Professor, Wits Institute for Human Evolution)

Dr K. van Niekerk (Univ. of Bergen)

Collaborative researchers

Dr Y. Coquinot (Musee d'Louvre, Paris, France)

Dr M. Menu (Musee d'Louvre, Paris, France)

Dr R. Garcia Moreno (Univ. Bordeaux)

Dr Z. Jacobs (Wollongong Univ., Australia)

Prof. S-E. Lauritzen (Univ. of Bergen, Norway)

Result: A paper on the results of this research has been submitted to the journal Science and is currently under review.

2. The use of personal ornamentation with particular reference to *Nassarius kraussianu*s beads in the Middle Stone Age at Blombos Cave

Principle researchers

Prof C.S. Henshilwood (Wits)

Prof F. d'Errico (Univ. Bordeaux, France & Honorary Professor, Wits Institute for Human Evolution)

Collaborative researchers

Dr M. Vanhaeren (Univ. Nanterre, Paris, France)

Dr K. van Niekerk (Univ. Bergen)

Result: In 2010 a number of experiments were undertaken to determine burning patterns on *Nassarius* beads. The results suggest that deliberate burning to change the colour of the beads was carried out by MSA people at Blombos. The paper is almost complete and will be submitted to the Journal of Human Evolution in 2011.

3. Analysis of bifacial point production during the Still Bay (75 ka) and the use of heating and pressure flaking

Principle researchers

Prof C. S. Henshilwood (Wits)

Dr P. Villa (Univ. Colorado, USA, Wits associate)

Dr V. Mourre (Univ. Toulouse, France)

Result: Mourre, V., Villa, P. & Henshilwood, C. 2010. Early Use of Pressure Flaking on Lithic Artifacts at Blombos Cave, South Africa. Science, 330: 659-662.

Villa, P., Soressi, M., Henshilwood, C.S. & Mourre, V. 2009. The Still Bay points of Blombos Cave (South Africa). Journal of Archaeological Science 36 (2): 441-460.

4. Analysis of the fauna from Blombos Cave

Principle researchers

Prof C.S. Henshilwood (Wits)

Dr S. Badenhorst (Ditsong National Museum of Natural History)

Collaborative researchers

Dr K. van Niekerk

Dr G. Dusseldorp (Chair funded Post Doc)

Student projects

J. Reynard, MSc (Wits chair funded Masters, supervised by Henshilwood & Badenhorst)

*Result*s

Reynard.J. M.Sc thesis submitted to Wits in June 2011

Badenhorst, S., Henshilwood, C.S., van Niekerk, K.L. (in prep.). Seasonality and human occupation at Blombos Cave in the Middle Stone Age: Evidence from rock hyrax (Procavia capensis) remains. Journal of Archaeological Science.

5. Analysis of taphonomic factors affecting faunal remains and their interpretation

Principle researchers

Prof C.S. Henshilwood (Wits)

Dr J. Thompson (Univ. Queensland, Australia)

Result: Thompson, J. & Henshilwood, C. S. 2011. Taphonomic analysis of the Middle Stone Age larger mammal faunal assemblage from Blombos Cave, southern Cape, South Africa. Journal of Human Evolution.

Thompson, J., Faith, T. & Henshilwood, C.S. (submitted). Seasonal exploitation of neonate blue antelope (Hippotragus leucophaeus) during the Middle Stone Age at Blombos Cave, South Africa: implications for modern human origins. Journal of Human Evolution.

6. Analysis of the bone tools from the LSA & MSA levels at Blombos Cave and other sites in the southern Cape

Principle researchers

Prof C.S. Henshilwood (Wits)

Prof. F. D'Errico (University of Bordeaux, France

Students

J. Bradfield, (chair funded, supervised by Henshilwood & Lombard)

Results

J. Bradfield. MSc 2010. MSc, Wits

d'Errico, F. & Henshilwood, C.S. 2007. Additional evidence for bone technology in the southern African Middle Stone Age. Journal of Human Evolution 52:142-163.

7. The symbolic and practical use of ochre

Principle researchers

Prof C.S. Henshilwood (Wits, Uni Bergen)

Prof F. d'Errico (Univ Bordeaux, Wits)

Collaborative researchers

Dr I. Watts

Dr M. Menu (Louvre)

Student projects

R. Rifkin, PhD (Wits) (Chair funded, supervised by Henshilwood & d'Errico)

Results

Henshilwood, C.S., d' Errico, F. & Watts, I. 2009. Engraved ochres from the Middle Stone Age levels at Blombos Cave, South Africa. Journal of Human Evolution 57, 27-47.

Henshilwood, C. & d'Errico, F. (in press). Ochre as a media for symbolic expression during the southern Africa Middle Stone Age: examining the evidence from the Western Cape, South Africa. In: (eds. Henshilwood, C and d'Errico, F), Homo symbolicus: The dawn of language, imagination and spirituality. Amsterdam: Benjamins.

Rifkin, R.F. submitted. An experimental assessment of the efficacy of red ochre as an ingredient in prehistoric hide tanning technologies. African Archaeological Review.

Rifkin, R. Submitted. Processing ochre in the Middle Stone Age: Testing the inference of prehistoric behaviours from actualistically derived experimental data. Journal of Anthropological Archaeology.

d'Errico, F., Garcia Moreno, R., Rifkin, R. Submitted. Technological, elemental and colorimetric analysis of an engraved ochre fragment from the Middle Stone Age levels of Klasies River Cave 1, South Africa. Journal of Archaeological Science

8. Palaeoclimate, age and modern human behaviour

Principle researchers

Prof C.S. Henshilwood (Wits, Uni Bergen)

Prof S-E. Lauritzen (Uni Bergen)

Collaborative researchers

Dr Z. Jacobs (Uni Wollongong)

Dr B. Chase (Uni Bergen)

Student projects

T. Hillestad-Nel, PhD (Uni Bergen, supervised by Henshilwood)

J. Noah, MSc (Wits, supervised by Henshilwood & Lauritzen)

9. Various approaches to lithic analysis

Principle researchers

Prof C.S. Henshilwood (Wits, Uni Bergen)

Dr M. Lombard (University of Johannesburg)

Dr S. Wurz (Wits)

Dr Paola Villa (Uni Colorado)

Student projects

J. Pargeter, MSc (Wits, supervised by Henshilwood & Lombard)

Results

Pargeter. J. MSc thesis submitted in March 2011.

Villa, P., Soressi, M., Henshilwood, C.S. & Mourre, V. 2009. The Still Bay points of Blombos Cave (South Africa). Journal of Archaeological Science 36 (2): 441-460.

10. Shellfish analysis

Langejans, G.H.J., van Niekerk, K.L, Dusseldorp, G.L. and Thackeray F. (submitted) Middle Stone Age shellfish exploitation: Indications for mass collecting at Blombos Cave and Klasies River, South Africa. Quaternary International

11. Fish remains from Blombos Cave

Principle researcher

Dr K. van Niekerk (Uni Bergen)

Result: The analysis of the fish bone from the LSA and MSA of BBC formed part of Dr van Niekerk's PhD thesis. She graduated in June 2011.

12. Theoretical perspectives on the Middle Stone Age: Origins of language and symbolism

Principle researchers

Prof C.S. Henshilwood (Wits, Uni Bergen)

Dr B. Dubreuil (Univ Montreal, Canada)

Prof. F. D'Errico(Univ Bordeaux, France)

Student projects

May Sviland (Uni. Bergen, supervised by Henshilwood)

Results

Dubreuil, B. & Henshilwood, C. S. (in press). Archeology, symbolism, and the evolution of language. In: (eds. Lefebvre, C.) 'On the Origin of Language', Cognitive Science Institute, l'Université du Québec à Montréal.

d'Errico, F. & Henshilwood, C. (in press). A discontinuous scenario for the origins of symbolic material culture. In: (eds. Henshilwood, C and d'Errico, F), Homo symbolicus: The dawn of language, imagination and spirituality. Amsterdam: Benjamins.

Henshilwood, C. S. & Dubreuil, B. 2011. The Still Bay and Howiesons Poort, 77 - 59 ka: Perspective-taking and the evolution of the modern human mind during the African Middle Stone Age. Current Anthropology. 52 (3): 361-400.

d'Errico, F., Vanhaeren, M., Henshilwood, C., Lawson, G., Maureille, B., Gambier, D., Tillier, A. Soressi, M & van Niekerk, K. 2009. From the origin of language to the diversification of languages: What can archaeology and palaeoanthropology say? In F. d'Errico & J.-M. Hombert (eds.), Becoming Eloquent: Advances in the emergence of language, human cognition, and modern cultures. Amsterdam: John Benjamins Publishing Company: 13-68.

Henshilwood, C.S. 2009. The origins of symbolism, spirituality & shamans: exploring Middle Stone Age material culture in South Africa. In Becoming human: innovation in prehistoric material and spiritual cultures, (eds. C. Renfrew & I. Morley), Cambridge, Cambridge University Press: 29-49.

Henshilwood, C.S. & Dubreuil, B. 2009. Reading the artefacts: Gleaning language skills from the Middle Stone Age in southern Africa. In: (eds. R. Botha & C. Knight), The Cradle of Language, Oxford: Oxford University Press: 41-60 .

Henshilwood, C.S. 2007. Fully symbolic sapiens behaviour: Innovation in the Middle Stone Age at Blombos Cave, South Africa. In: Rethinking the Human Revolution: New Behavioural and Biological Perspectives on the Origins and Dispersal of Modern Humans,. (eds.C. Stringer & P. Mellars), MacDonald Institute Research Monograph series: Cambridge, University of Cambridge Press: 123-132 1.

Blombos Cave Scientific Publications

Since the last report to Heritage Western Cape a number of analytical results and interpretative manuscripts have been published by members of the Blombos research team, some relating to material excavated from the M3 context directly related to permit (# 2007-03-003), and some reporting on previously excavated material. Several graduate student projects were also completed.

This section first lists publications based on analytical results; followed by publications of a more theoretical nature, or those that include Blombos as part of a broader thematic approach.

Lastly completed dissertations/theses are listed. PDF files of almost all the listed work are available to Heritage Western Cape upon request. However, considering the size of some of the files, we aim to produce a DVD with a full anthology of Blombos publications, dissertations and theses, which will be made available to Heritage Western Cape as part of our reporting requirements in due course.

Peer Reviewed: Published analytical results for BBC since 2007

Thompson, J. & Henshilwood, C.S. 2011. Taphonomic analysis of the Middle Stone Age larger mammal faunal assemblage from Blombos Cave, southern Cape, South Africa. *Journal of Human Evolution*.60:746-767.

Mourre, V., Villa, P. & Henshilwood, C. 2010. Early Use of Pressure Flaking on Lithic Artifacts at Blombos Cave, South Africa. *Science*, 330: 659-662.

Henshilwood, C.S., d'Errico, F. & Watts, I. 2009. Engraved ochres from the Middle Stone Age levels at Blombos Cave, South Africa. *Journal of Human Evolution* 57:27-47.

Villa, P., Soressi, M. Henshilwood, C.S. & Mourre, V. 2009. The Still Bay points of Blombos Cave (South Africa). *Journal of Archaeological Science* 36:441-460.

Henshilwood, C. S. 2008. Holocene prehistory of the southern Cape, South Africa: excavations atBlombos Cave and the Blombosfontein Nature Reserve. BAR S1860, Cambridge: *CambridgeMonographs in African Archaeology* 75:1- 171.

Nel, Turid Hillestad. 2007. Middle Stone Age palaeoenvironments: A study of faunal material from Blombos Cave, southern Cape, South Africa. Nyame akuma. Vol. 68: 52-61

d'Errico, F. & Henshilwood, C.S. 2007. Additional evidence for bone technology in the south African Middle Stone Age. *Journal of Human Evolution* 52:142-163.

Lombard, M. 2007. Evidence for change in Middle Stone Age hunting behaviour at Blombos Cave: results of a macrofracture analysis. *South African Archaeological Bulletin* 62:62-7.

Peer Reviewed published/in press theoretical and broad interpretative contributions since 2007 in association with the Wits SARChI chair held by Henshilwood

Henshilwood, C.S. & Lombard, M. in press. Becoming human: archaeology of the sub-Saharan Middle Stone Age In: Renfrew, C. & Bahn, P. (eds) *The Cambridge World Prehistory*. Cambridge University Press: Cambridge.

Henshilwood, C.S. (submitted). The Still Bay and Howiesons Poort: 'Palaeolithic' techno-traditions in southern Africa. Journal of World Prehistory.

Lombard, M. in press. Hunter-gatherers in southern Africa before 20,000 years ago. In: Mitchell, P. & Lane, P. (eds) *Oxford handbook of African Archaeology*. Oxford University Press: Oxford.

Dusseldorp, G. In Press Tracking the influence of Middle Stone Age technological change on modern human hunting strategies, Quaternary International. 2011.

Dusseldorp, G. In press (published online) Studying Pleistocene dietary habits: Combining isotopic and archaeozoological analyses, Journal of Archaeological Method and Theory. DOI: 10.1007/s10816-010-9099-3

Henshilwood, C. S. & Dubreuil, B. 2011. The Still Bay and Howiesons Poort, 77 - 59 ka: perspective-taking and the evolution of the modern human mind during the African Middle Stone Age. *Current Anthropology*. 52 (3): 361-400.

d'Errico, F., Vanhaeren, M., Henshilwood, C., Lawson, G., Maureille, B., Gambier, D., Chase, B. 2010. South African palaeoenvironments during marine oxygen isotope stage 4: a context for the Howiesons Poort and Still Bay industries. Journal of Archaeological Science, 37 (6): 1359-1366.

Lombard, M. & Parsons, I. 2010. Fact or fiction? Technological and behavioural reversal after 60 ka in southern Africa. *South African Archaeological Bulletin* 65: 224–228.

Dusseldorp, G. 2010. Prey choice during the South African Middle Stone Age: Avoiding dangerous prey or maximising returns, African Archaeological Review, 27: 107-133.

Watts, I. 2009. Red ochre, body painting, and language: interpreting the Blombos ochre. In: Botha, R. & Knight, C. (eds) *The cradle of language.* Oxford: Oxford University Press: 62-92.

d'Errico, F., Vanhaeren, M., Henshilwood, C., Lawson, G., Maureille, B., Gambier, D., Tillier, A. Soressi, M & van Niekerk, K. 2009. From the origin of language to the diversification of languages: What can archaeology and palaeoanthropology say? In (eds. F. d'Errico & J.-M. Hombert), Becoming Eloquent: Advances in the emergence of language, human cognition, and modern cultures. Amsterdam: John Benjamins :13-68.

Henshilwood, C.S. 2009. The origins of symbolism, spirituality & shamans: exploring Middle Stone Age material culture in South Africa. In (eds. C. Renfrew & I. Morley), Becoming human: innovation in prehistoric material and spiritual cultures. Cambridge, Cambridge University Press: 29-49.

Henshilwood, C.S. & Dubreuil, B. 2009. Reading the artefacts: Gleaning language skills from the Middle Stone Age in southern Africa. In: (eds. R. Botha & C. Knight), The Cradle of Language. Oxford: Oxford University Press: 41-60 .

Henshilwood, C.S. 2009. The origins of symbolism, spirituality & shamans: exploring Middle Stone Age material culture in South Africa. In: Renfrew, C. & Morley, I (eds) *Becoming human:innovation in prehistoric material and spiritual cultures*. Cambridge, Cambridge University Press:29-49.

Tillier, A.Soressi, M. & van Niekerk, K. 2009. From the origin of language to the diversification of languages: What can archaeology and palaeoanthropology say? In: d'Errico, F. & Hombert, JM. (eds) *Becoming eloquent: advances in the emergence of language, human cognition, and modern cultures*. Amsterdam: John Benjamins Publishing Company:13-67.

Henshilwood, C.S. & Dubreuil, B. 2009. Reading the artefacts: Gleaning language skills from the Middle Stone Age in southern Africa. In: Botha, R. & Knight, C. (eds) *The Cradle of Language.* Oxford: Oxford University Press:41-60.

Jacobs, Z. & Roberts R.G. 2008. Testing times: old and new chronologies for the Howieson's Poort and Still Bay Industries in environmental context. *South African Archaeological Society Goodwin Series* 10:9-34.

Lombard, M. 2008. From testing times to high resolution: the Late Pleistocene Middle Stone Age of South Africa and beyond. *South African Archaeological Society Goodwin Series* 10:180-188.

Lombard, M. and J.L. Clark. 2008. Variability and change in Middle Stone Age hunting behaviour: aspects from the lithic and faunal records. In Badenhorst, S., Mitchell, P. & Driver, J.C. (eds) People, places and animals of Africa: essays in honour of Ina Plug. *British Archaeological Reports International Series* 1849. Oxford: Archaeopress:46-56.

Henshilwood, C.S. 2008. Winds of change: palaeoenvironments, material culture and human behaviour in the Late Pleistocene (c. 77 – 48 ka) in the Western Cape Province, South Africa. *South African Archaeological Society Goodwin volume* 10:35-51.

Henshilwood, C.S. 2007. Fully symbolic Sapiens behaviour: innovations in the Middle Stone age at Blombos Cave, South Africa. In: Mellars, P., Boyle, K., Bar-Yosef O. & Stringer, C. (eds) *Rethinking the revolution: new behavioural and biological perspectives on the origin and dispersal of modern humans*. Cambridge: McDonald Institute Monographs:123-132.

Henshilwood, C.S. 2007. Fully symbolic sapiens behaviour: Innovation in the Middle Stone Age at Blombos Cave, South Africa. In (eds.C. Stringer & P. Mellars), Rethinking the Human Revolution:

New Behavioural and Biological Perspectives on the Origins and Dispersal of Modern Humans. MacDonald Institute Research Monograph series: Cambridge, University of Cambridge Press: 123-132 1.

Student theses and dissertations since 2007

Pargeter, J. Submitted for examination. Interpretative tools for studying changes in Stone Age hunting technologies: replication studies, macrofracture analyses and morphometric measurements. Master's Dissertation: University of the Witwatersrand.

Reynard, J. Submitted for examination. An analysis of the unidentified long bone fragments from the Middle Stone Age Still Bay layers at Blombos Cave, southern Africa, South Africa. Master's Dissertation: University of the Witwatersrand.

Van Niekerk, K.L. 2011. Marine fish exploitation during the Middle and Later Stone Age of South Africa. PhD thesis, University of Cape Town.

Noah, J. 2010. Palaeoenvironmental reconstruction using speleothems in De Hoop Nature Reserve, southern Cape, South Africa. Master's Dissertation: University of the Witwatersrand.

Bradfield, J. 2010. The Evolution of bone points as hunting weapons in South Africa. Master's Dissertation: University of the Witwatersrand

Hayes, E: 2010. Extending the chronology for Blombos Cave, South Africa: further evidence for the origins of modern human behaviour. Honours dissertation: University of Wollongong

Vibe, I. 2007. San Personal Ornaments from the Later Stone Age at Blombos Cave and Blomboschfontein, Southern Cape, South Africa. Masters Dissertation: University of Bergen.

Strandman, H. 2007. Indicators of stress: evidence from the Later Stone Age layers at Blombos Cave, southern Cape, South Africa. Masters Dissertation: University of Oslo.

Student theses and dissertations in progress

Albrektsen, C. In progress. Changes in procurement and processing strategies of shellfish during the Middle Stone Age at the southern Cape, South Africa. Master's dissertation. University of Bergen.

Haaland, M. In progress. Intra-site spatial analysis of the Still Bay levels in Blombos Cave, South Africa: a GIS approach. Master's dissertation. University of Bergen

Taerud, H. In progress. Microstratigraphic analysis of sediments from Blombos Cave. University of Bergen

Rifkin, R. In Progress. Trends in the use of pigments from Middle and Later Stone Age contexts of the south-eastern Cape, South Africa. Doctoral Thesis: University of the Witwatersrand.

Conferences

Invited Presentations 2007-2011 (Henshilwood et al)

1. Henshilwood, C.S. & d'Errico, F. 2010. Tracing the evolution of symbolically mediated behaviours within variable environments in Europe and southern Africa. Invited lecture presented at the Cape Nature Biodiversity Review 2010, Driftsands Nature Reserve Conference Centre, Cape Town, 9th November.

2. Henshilwood, C.S. 2010. Attracting Global talent – A South African Perspective. European Parliament Hearing on Science and Technology Cooperation with South Africa, European Parliament, Brussels, 17th November.

3. Henshilwood, C.S. & Lauritzen, S. 2010. The Origins of Modern Human Behaviour. Dating human occupations and reconstructing the palaeoenvironment in the Middle Stone Age, southern Cape, South Africa. National Research Foundation/Norwegian Research Council, South Africa – Norway Programme of Research Cooperation Conference, Kameeldrift, South Africa, 21st September.

4. Henshilwood, C. & Dubreuil, B. 2010. Language and Material Culture : Relating the Middle Stone Age in southern Africa to the origins of language. Summer Institute Conference 'On the Origin of Language' held at the Cognitive Science Institute, l'Université du Québec, Montréal, 21st - 30th June 2010.

5. Henshilwood, C.S. 2009. Continuity or discontinuity? Symbolically mediated behaviours in the Still Bay and Howiesons Poort Industries of southern Africa - and beyond. Invited lecture at the Max Planck Institute for Evolutionary Anthropology, Leipzig, 19th May, 2009.

6. Henshilwood, C.S. 2009. The Origins of Modern Human Behaviour The Howiesons Poort, Still Bay and beyond. Invited lecture by the Hessequa Archaeological Society, Still Bay, South Africa, March 21st, 2009.

7. d'Errico, F & Henshilwood, C. 2008. Les ocres gravées de Blombos Cave (Afrique du Sud) : découverte d'une tradition symbolique qui remonte à 140 00 BP. Représentations préhistoriques. Images du sens.Paris, Musée de l'Homme, 19-21 June, 2008.

8. Henshilwood, C. S. 2008. The origins of modern humans and human behaviour in the Hessequa Region, southern Cape. Invited lecture held at the Hessequa Municipality, Riversdale, at the invitation of the Premier of the Western Cape, Ebrahim Rasool and the Mayor of the Hessequa Region, Chris Taute.

9. Henshilwood, C.S. 2007. Knowledge & politics: a report on an african archaeology initiative Norway – South Africa : 2002 – 2007. First Annual SANORD Centre Conference:"Higher Education, Research and Development:Shifting Challenges and Opportunities" , Cape Town, 5-7 December, 2007.

10. Henshilwood, C.S. 2007. Rethinking the human revolution: The role of southern Africa in the behavioral evolution of Homo sapiens. Distinguished Alumni Lecture, Faculty of Science, University of Cape Town, 19th September, 2007.

11. Henshilwood, C.S. 2007. The origins of language and symbolism in Africa. Friends of the Iziko, South African Museum. Invited Public lecture, Cape Town, South Africa

Conferences (Henshilwood et al)

1. Daniau, A. Sánchez Goñi, M.F., Henshilwood, Ch., d'Errico, F., C.S., 2011. The use of fire for ecosystem management: tracking the emergence of the modernity in Southern Africa. INQUA, Berne. 21st – 30 July 2011. Poster

2. d'Errico, F., Henshilwood, C.S., Garcia Moreno, R., Rifkin, R.F., Van Niekerk, K., Rosso, D. 2011. The emergence of symbolic material cultures in Africa and Europe. Preliminary results of an ongoing ERC funded interdisciplinary research project. Centre National de Préhistoire, Périgueux Centre National de Préhistoire, Périgueux.

3. Mourre, M. Villa, P. & Henshilwood, C.S. 2010. Early Use of Pressure-Flaking on Lithic Artifacts at Blombos Cave, South Africa (a report on research published in Science), October 29, 2010, Origins Center, University of the Witwatersrand.

4. Faith, T & Henshilwood, C.S. 2010. Seasonal exploitation of neonate blue antelope (Hippotragus leucophaeus) during the Middle Stone Age at Blombos Cave, South Africa: implications for modern human origins. 11th International Council for Archaeozoology, Paris, 23-28 August 2010

5. d'Errico, F. Garcia Moreno, R., Henshilwood, C.S., Rifkin, R.F., Soressi, M., Queffelec, A., Rosso, D. 2010. Matières colorants préhistoriques: Nouvelles avancées méthodologiques et interpretative Journées scientifiques organisées dans le cadre du GdR 3174 ChimARC à proximité du site de Régismont-le-Haut (Hérault) 2 Septembre 2010

6. d'Errico, F., Garcia Moreno, R., Henshilwood, C.S., Vanhaeren, M., Rifkin, R.F, Queffelec, A., Rosso, D. 2010. L'utilisation des matières colorantes dans le contexte du débat sur l'origine de la modernité culturelle. Journée Pigments, Org. Martine Regert, Regismont-le-Haut, France

7. d'Errico, F., Henshilwood, C.S., Vanhaeren, M., Backwell, L., Garcia Moreno, R. Rifkin, R.F. 2010. The origin of symbolic material culture. Models, methods, data, and research perspectives. Pleistocene Art of the World, IFRAO Congress, Tarascon-sur-Ariege and Foix, France.

8. d'Errico, F. & Henshilwood, C.S., F. 2009. Origins of symbolically mediated behavior. From antagonistic scenarios to a unified research strategy. Paper presented at the international conference "Homo symbolicus: the dawn of language, imagination, and spirituality" organised by Henshilwood & d'Errico and held at the Commodore hotel, Cape Town, 16 – 19th January 2009

9. Henshilwood, C.S. & d'Errico, F. 2009. Ochre as a media for symbolic expression during the Southern Africa Middle Stone Age: examining the evidence from the Western Cape, South Africa. Paper presented at the international conference "Homo symbolicus: the dawn of language, imagination, and spirituality" organised by Henshilwood & d'Errico and held at the Commodore hotel, Cape Town, 16 – 19th January 2009.

10. d'Errico, F. & Henshilwood, C. 2008. Les ocres gravées de Blombos Cave (Afrique du Sud) : découverte d'une tradition symbolique qui remonte à 140 00 BP. Représentations préhistoriques. Images du sens.Paris, Musée de l'Homme, 19-21 June, 2008.

11. Villa, P., Soressi, M., Henshilwood, C. S. & Mourre, V. 2008. The Still Bay Points of Blombos Cave (South Africa). Paleoanthropology Society Conference, Vancouver, B.C., Canada: 25–26 March.

12. Henshilwood, C.S. & van Niekerk, K. 2008. The > 100 ka levels at Blombos Cave, southern Cape: an update on recent and older excavations at the site. Paper presented at the Association of South African Professional Archaeologists, University of Cape Town, 27th March 2008.

13. Henshilwood, C.S. 2008. The >100 ka levels at Blombos Cave, southern Cape: early pointers to modern human cognition? Paper presented at the Society for Africanist Archaeologists Conference, Frankfurt, Germany, 7th – 11th September.

14. Henshilwood, C.S. 2008. The origins of modern human behaviour and its implications for the European archaeological record. Invited paper at the University of Bergen, Norway.

15. Villa, P., Henshilwood, C. S. & Mourre, V. 2008. The Still Bay Points of Blombos Cave (South Africa). Paleoanthropology Society Conference, Vancouver, B.C., Canada: 25–26 March.

Workshops

A two week workshop was held in Cape Town during January, 2008 and was attended by d'Errico (France), Henshilwood, van Niekerk (SA) and Vanhaeren (France). A detailed analysis of shells and beads was carried out at Iziko SA Museum and a report has been compiled. A number of papers are expected to follow in the near future

A 3 week workshop was held at the University of Bordeaux 1, France in June, 2008. The workshop was attended by d'Errico (France), Henshilwood, van Niekerk (SA) and Vanhaeren (France). The purpose of the workshop was the analysis of collected *Nassarius kraussianus* material and an examination of the recently excavated ochres from the > 100 ka levels at Blombos Cave.

Workshop held at the Louvre laboratories, Paris, France with Michel Menu, the director, in June. This has led to the submission of a paper to Science in July 2011.