ECONOMIC AND CULTURAL DIVERSITY OF HOLOCENE STONE AGE PEOPLE INTHE COASTAL GARCIA STATE TOREST, SOUTHERN CATE



0/2/079/14

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10 December 1993

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Dear Chris

REPORT ON EXCAVATIONS: GARCIA STATE FOREST

Thank you very much for your second annual report on the progress to date on your PhD project in the Garcia State Forest.

The Council would like to thank you for your co-operation in sending the report on time and extends good wishes for the successful completion of your thesis.

Yours sincerely

for DIRECTOR
JD/jd

copy: NMC Regional Manager: Western Cape

PART 1: OBJECTIVES, SURVEY AND EXCAVATION METHODOLOGY

Research Objectives

The project's objectives are to examine the economic and cultural diversity of Holocene Later Stone Age people on a section of the southern Cape coast. Central to the study is the excavation and analysis of a suite of sites that fall within a 10 sq. km coastal area. Site selection criteria are listed below. Interpretation is based on an analysis of the excavated assemblages, and on inter-site temporal and spatial diversity. An integral part of the programme is a comparison of data from analogous sites previously excavated in the southern Cape.

Survey Methods and Site Selection

During 1990 and 1991 a 60 km section of the southern Cape coastline, between the Breede River in the West and Still Bay in the East, was surveyed for sites (Fig. 1). An additional coastal section of approximately 10 km, situated west of the Breede River and within the De Hoop Nature Reserve was also inspected in 1991.

Open, cave and shelter sites are scattered over much of this coastline. Critical elements of site selection are:

- (i) Location: Sites should fall within a 10 sq. km radius, and be located on or near the coast. This provides a spatial control over the likely extent of a common foraging zone and enhances the comparability of inter-site data. Open and cave or shelter sites were required to obtain variability.
- (iii) Number: Enough sites were needed to demonstrate diversity, but not more than could be excavated or analysed in the time available; a sampling strategy for each site would determine the size of the excavation.
- (iii) Content: Part of the assemblage was to be in situ; it had to be judged to be homogeneous; the effects of diagenesis needed consideration?
- (iv) Age: A cross-section of Holocene sites was required for excavation; exposed lithics, particularly in open sites, would aid initial dating estimates; estimated dates for material from a 1m deep test pit, excavated at Blombos Cave (GSF 8) in June 1992, were available.

Garcia State Forest (GSF), a small nature reserve in the southern Cape, was selected (Fig. 1 & Fig. 2). Located at 34°25'S and 21°3'E, it extends 3.5 km along the coast and 1.2 km inland. Nelson Bay Cave lies approximately 200 km to the East; Byneskranskop and Die Kelders 200 km west.



In September 1991, 21 LSA sites and 1 possible MSA site were recorded in a survey of GSF. Nine sites were chosen for excavation; 3 are situated on the seaward side of the coastal cliffs and comprise 1 cave, 1 shelter and 1 open midden; 6 open sites are in the dunes on the elevated coastal foreland, less than 1.2 km from the coast (Fig. 2).

Excavation Methodology

During October 1992 the 9 sites selected were surveyed, measured and drawn. Where practicable, the extent of *in situ* deposit and of talus material was noted for each site, the area to be excavated was established, and base lines fixed.

Excavations at GSF commenced in early November, 1992. A grid of 1m x 1m squares was established at a site be excavated. During excavation, features such as hearths were mapped in a horizontal and vertical plane. At five sites, GSF1-5, the deposit seldom exceeded 5 cm in depth; each assemblage was considered to be an homogenous single occupation unit. Four sites, GSF 6-9, had multiple episode deposits and were excavated in individual, stratigraphic units; exposed sections were plotted. Samples of shell or charcoal were taken *in situ* from all sites for radiocarbon dating; soils were also sampled. Site notes were kept, slides taken and the progress of each excavation recorded on videotape.

Recovered material was sieved in a 1.5 mm sieve. Some elementary sorting of shell, bone and stone took place on site; generally the unsorted, sieved, residue was bagged for later sorting and analysis in the laboratory.

Excavations at all nine sites were complete by the end of February 1993. A total of 140 sq. m, comprising 66 individual units, was excavated. The gross mass of recovered material, after sieving, was 1425 kg, comprising in broad categories: Shell, 662 kg; stone 366 kg; residue 296 kg; bone 90 kg; ostrich egg shell and other 11 kg.



PART 2: SITE DESCRIPTIONS

Site locations are given in Fig. 2.

Radiocarbon dates are listed in Table 1 & Fig. 3.

GSF 1

The full extent of this site is not calculable as a 1.5 m layer of dune sand covers the surface; an estimate is 20 m x 10 m. The underlying matrix is dune sand; beneath this is a hard calcretised surface. At the southern edge of the dune, heavily brecciated sections of deposit have been undercut by wind action, exposing the site boundary.

A hammer and chisel were necessary to extricate 2 sq. m of deposit; hours were spent in the laboratory mechanically separating the components. Characteristics of this site are: Good preservation; an extremely dense, brecciated assemblage, around 15 cm thick, containing marine shell, bovid and tortoise bone, ostrich egg shell (OES) and stone, mainly fine grained silcrete. Formal lithic tools, such as scrapers and segments, are numerous. It is the oldest LSA site excavated in GSF.

GSF 2

Situated 1.2 km from the sea, the site extends for around 200 sq. m. A forestry track cuts through the site dividing the *in situ* deposit; all 16 sq. m of *in situ* deposit was excavated and kept for analysis. Talus material makes up the balance of the site. A 15m x 2 m transect of the talus was excavated. All stone and bone from the talus were retained; the residue was re-deposited on site.

The *in situ* material was lightly brecciated, 5-15 cm thick, and dense in parts. Assemblage components include marine shell, bovid and tortoise bone, OES and stone, mainly silcrete and guartzite. Formal tools and cultural artefacts are present.

GSF 3

Located 500 m from the sea and within the GSF dune field, the entire surface of the site has been exposed by erosion. Three discrete areas of dense *in situ* deposit containing shell, bovid and tortoise bone, OES, silcrete and quartzite in a medium density breccia, cover 55 sq. m. A further 100 sq. m of thinly dispersed shell and stone is talus scatter. Three blocks of 8 sq. m each were selected for excavation. The central block lay in a grey, ashy matrix, possibly a hearth area. Due to its nomogeneity and depth the whole assemblage is regarded as part of a single occupational episode.



GSF 4

GSF 4 is the largest site in GSF, covering 2,500 sq. m. Wind and water action have exposed most of the site's surface. An *in situ* deposit of 400 sq. m, 5-10 cm thick, is underlain by a grey to black humic matrix. White, aeolian dune sand underlies the remaining 2,100 sq. m of talus scatter. Principal components of the site are marine shell and stone, predominantly silcrete and some quartzite. Microlithic backed scrapers and segments in silcrete are ubiquitous across the whole site. Intra-site spatial patterning suggests that the assemblage may be part of a single occupational episode, or of repeated use within a relatively short time. The homogeneity of the deposit, excavated across 58 sq. m, may help resolve this issue.

GSF 5

Mostly a thin scatter of exposed shell, almost exclusively *T. sarmaticus* and *P. tabularis*, and some stone, extending for 550 sq. m delimits this site. Situated in a dune field it is 900 m from the sea. At the site centre, 18 sq. m of the densest deposit was excavated. A number of quartzite hammer stones and anvils and a dense concentration of *P.tabularis* and broken *T.sarmaticus* shells characterise this assemblage. Curiously, *T.sarmaticus* opercula, evident in abundance at other sites, are almost absent from GSF 5. Formal tools are very scarce. A preliminary interpretation suggests this to be a shellfish processing site.

GSF 6

Situated on a rocky coastal promontory, GSF 6 is a large shell midden covering 400 sq. m. The site has been repeatedly re-used; mainly it seems as a marine shellfish dump. Because of the density of the deposit a 25 cm x 25 cm area was sampled. Stratigraphic excavation yielded 12 discrete depositional episodes in a 1.3 m section, underlain by sterile aeolian dune sand. Marine shellfish are the major component of GSF 6 with small quantities of fish bone and stone. The lowest lens is radiocarbon dated at 3550 BP.

GSF 7

GSF 7 is located within the dune fields, 500 m from the sea. The extent of the site could not be determined due to a cover of more than 1.5 m of dune sand. At its southern end a section of the site is exposed and eroded, resulting in 20 sc. m of fairly dense talus scatter. Nine sq. m of the site was exposed for excavation. The upper layer YSL, was enclosed in a dune sand matrix. Beneath YSL lay a dense, black humic layer containing pockets of shell, bovid and tortoise bone, fish and stone. The underlying 30 cm contained 3 stratigraphic layers, HL1, HL2, HL3; 3

squares were excavated. Adzes in silcrete dominate the formal tools, suggesting a wooded environment. Sediment samples indicate a high level of humic material within the lower levels.

GSF 8

LSA Layers

GSF 8, or Blombos Cave, is a solution cavity in a calcrete coastal cliff. Elevated at 34.5 m asl, it lies 50 m from the sea. The floor area is 45 sq. m, with a variable roof height of between 1-1.5m.

In July 1991 a test pit of 1 sq. m was stratigraphically excavated to a depth of 1 m. A further 3 sq. m was excavated in November 1992. In total, 38 units were removed as discrete stratigraphic entities; later these were allocated to 11 individual layers (Table 2).

An upper layer, Coke, was radiocarbon dated on charcoal to 290 BP and the lowest, deposit bearing LSA layer, MC IV, to 1840 BP.

Due to the percolation of calcium rich ground water and the presence of halites, bone and organic materials are excellently preserved. Many of the lower layers, particularly 4 & 5, are characterised by dense deposits of mammal and fish bone, marine shell, hearths, quartzite, quartz and some silcrete. Cultural artefacts in OES and bone are present, but few formal stone tools. A small number of pottery sherds were recovered.

Blombos Cave is the only site at GSF with evidence of domestication. Cranial bone of *Ovis aries* was recovered in Layers MC I, II, III & IV. An associated date of 1840 BP in Layer 5 is one of the earliest for sheep at the Cape.

MSA Layers

The LSA layers at the cave are underlain by a relatively sterile layer of aeolian dune sand. Directly below this, MSA bearing deposit occurs. Although the MSA is not an integral part of the objectives of this thesis, it was decided to excavate a test section of the assemblage. Five MSA layers containing 12 stratigraphically distinct lenses were removed in a 20 cm deep section. All layers contain a variety of bifacial points, finely worked, pressure flaked, and mainly in silcrete, but also in quartzite and quartz. These bifacials bear a striking resemblance to those of the Upper Palaeolithic Solutrean. Unifacial points, end and side scrapers and blades are also present

The MSA Still Bay Industry was first described in the 1930's by C.H. Heese (1933) after surface finds of the artefacts at the type site. Volman (1981) suggests the Still Bay may be a variant of the MSA 2 phase that dates to around 80,000-100,000 years. Application has been made to obtain ESR dates for the Still Bay layers.

Two other excavated sites at the Cape are known to contain Still Bay type implements; one is a recent excavation in the western Cape; the other a Cape Peninsula site dug in the 1940's. No organic materials were recovered at either site. Preservation of organics in the MSA layers at GSF 8 is good. The presence of marine shellfish, fish and seals suggests the site was occupied during the Last Interglacial; a detailed offshore study is to be done of coastal bathymetry to determine the proximity of the present coastline to the sea during the Late Pleistocene. Other identified taxa include rhino, hippo, baboon and a range of bovids. A single worked bone point and a possible hippo canine scraper have been identified. Further excavation of the MSA layers at GSF 8 will form part of a post-doctoral programme.

GSF 9

Elevated at 25m asl, the GSF 9 shelter is located in a calcarenite cliff, 40 m from the sea. The deposit extends over little more than the 8 sq. m that was excavated. Six discrete units were identified at GSF 9 and each is regarded as a depositional episode occurring within a single visit. The main feature is a large hearth, 10-15 cm deep, extending over 6 sq. m. Dense deposits of shellfish, in particular *Oxystele* and *Turbo*, are found in and around the hearth. Species recovered include dolphins, seals and a range of bovids. The presence of 2 barnacles, *Coronula diadema*, found only on cetaceans, suggests that whale meat was brought to the site. Quartz is ubiquitous, but formal tools are rare. A small number of pottery sherds are present.

PART 3: ANALYSIS METHODOLOGY

Shellfish

All the recovered shellfish were retained. In the field lab they were sorted in bulk according to site, square and unit, packaged and weighed. The taxonomic identification of each whole shell or fragment took place at the UCT lab. MNI's for each species were calculated; the mass for each species per square or unit was established; more than 8,000 shells were measured.

Thirteen species of edible shellfish were identified. *Turbo sarmaticus* are the most numerous and found at all the sites. More than 3,500 measurements were taken of *Turbo* opercula and shells. Of the 8 species of edible *Patella* recovered, *P. longicosta*, *P.cochlear* and *P.oculus* are most common. More than 2,500 *Patella* shells were measured.

More than 20 species of small shellfish are also present. Some are probably incidental, brought in with other marine foods; others, such as *Nassarius kraussianus*, an estuarine mollusc, may have been used for decorative purposes

Mammals, Fish, Birds, Reptiles, Microfauna

Animal bone from each site was sorted by square and unit, then weighed.

Mammal bone was separated into cranial and post-cranial bone. Due to time restrictions, identification to taxa was carried out on cranial elements only, using the comparative collection at the SA Museum. The method adopted was considered adequate to produce a representative sample (Milo pers. comm.) MNI's & NISP's were established using Richard Klein's Faunal Analysis program.

Fish bone was sorted to species and body parts by Cedric Poggenpoel at UCT. Key cranial and post-cranial elements determined the MNI's for fish.

Bird identification is by Graham Avery at the SA Museum.

Tortoise carapace bone, per square or unit, was weighed. Limb bones were used for taxonomic identification of species. Tortoise size is based on humeri widths; these allow for inter-site size comparisons.

The identification of snakes was carried out by the Herpetology Department at the SA Museum.

Microfauna were identified by Margaret Avery at the SA Museum who also provided palaeoenvironmental information.



Cultural Artefacts

Stone

The classification scheme for lithic artefacts devised by J. Deacon (1984:370-409) for the southern Cape, has been followed.

All the recovered stone was separated to type, form and raw material. Three categories of type are employed: Waste; Modified Utilised; Formal. All formal tools were measured according to length, width and height; also to plan form and retouch position as devised by H. J. Deacon (1976) and J. Deacon (1984). The principal raw materials recovered at GSF are quartzite, quartz and silcrete; chert, chalcedony, agate and crypto-crystalline rock are present in small quantities. Ochre is found at most sites, occasionally in pencil form but mostly as chunks. Manganese dioxide nodules occurred at two sites.

Bone and Shell Artefacts

Other cultural artefacts were separated by raw material, namely marine shell, OES and bone; and by type, such as beads, awls and tubes. All artefacts were measured and a selection drawn. The widths and hole diameters of OES beads, found at all sites, were measured.

Pottery

Each pottery sherd was recorded according to mass; finish (burnished, unburnished, with or without ochre); temper (quartz, grass); part (rim, etc.) and thickness.

PART 4: INTERPRETATION

The interpretation of the data concentrates on two factors, economic diversity and cultural diversity. Material from environmental and ecological, historical and social sources is to be integrated in the discussion.

This section provides a brief summary of only the main issues to be discussed in the thesis. Data from purely descriptive chapters, for instance environmental and historical, have been excluded.

Spatial and temporal factors limit the projects objectives. For instance, do inter-site comparisons relate to equivalent bits of behaviour?; how representative are the selected sites of Holocene variability, given the limitations imposed by variable and limited preservation, the area chosen for survey, the number of sites selected, the percentage of each site excavated, and the time differences between sites?

Inter-site temporal variations do place limitations on inter-assemblage comparability. Attempting to remedy this by excavating more sites is beyond the scope and budget of this project. Additionally, further sites would be situated well outside GSF boundaries and this would detract from the project's objective of restricting the size of the study area.

The principal indicators of economic and cultural variability at GSF are the contemporary physical remains. Sites chosen for excavation at GSF are considered to best represent those surveyed along this coast. The sample excavated from each site is considered representative of that whole site, considering time and budgetary restraints.

Criteria for choosing the elements from recovered assemblages for inter-site comparison are: Representation at all sites; durability; sample size. Shellfish and stone artefacts best fit these criteria and form the principal components of the comparative study. Other factors contributing to an analysis of variability include: Shell and bone cultural artefacts; terrestrial and marine animals; domesticated animals; site location and size; seasonality; dating; palaeoenvironment and palaeovegetation.



Economic Diversity Shellfish

A range of shellfish is comprehensively represented at all 9 sites, and is a principal component for examining economic diversity.

The shellfish study is aimed at discerning any trends that reflect past choices, given a probable constancy in the physiography of the coast exploited; also in the marine taxa available during the Mid/Late Holocene.

A brief summary of the main factors for consideration includes:

Inter-site variability relating to species, shell size, shell mass; the effect of tides and season on accessibility to inter-tidal zones and taxa; optimal foraging considerations which will include transport decisions relating to distance, mass, kilojoule returns, site location and proximity to shell beds; the site density of species per sq. m; the identification of processing sites; the recognition of choice - is it feasible?; the impact of predation on choice and size - is it recognisable and/or measurable?; the impact of ecological change and environmental change on shellfish availability; changes in taxa relative to changes in cooking technology.

Shellfish data from other coastal sites in the southern Cape will be integrated.

Shellfish and Seasonality

Data from stable oxygen isotopes, derived from *P. tabularis* shells, and possibly *T. sarmaticus* opercula, will be used to determine the season of occupation at GSF sites. Prof. N. Shackleton will supervise this work at the Godwin Laboratory in 1993/4.

Factors for consideration include the relationship of shellfish variables to season of occupation, and the establishment of an optimal and/or preferred period for coastal resource utilisation. Derivation of a seasonal temperature curve for sea water from oxygen isotopes may be used for ecological modelling. In the case of the MSA site it may indicate glacial or inter-glacial conditions, from which an estimated date of occupation may be derived.

Mammals, Fish, Birds, Reptiles

A diverse range of animals, along with shellfish, is present in some of the GSF assemblages. However, the variation in bone preservation between sites excludes the possibility of comprehensive inter-site faunal comparisons.



Data on animals, particularly from GSF 8 and GSF 9, and to a lesser extent from GSF 7, nevertheless provides a guide to the species that were exploited.

The presence of seals, dolphins, whales, sea birds and fish highlights the importance, and diversity, of exploited coastal resources.

The species of fish present are useful indicators of the various fishing methods in use, for instance nets, lines or traps.

Terrestrial mammal data, available for a 3,000 year period, indicates variation in choice; moreover hunting skill. The role of small animals present in the deposits, such as *Procavia capensis*, *Bathyergus suillus* and *Chersina angulata* will be examined. Seasonality data for GSF 8 has been derived from *P. capensis* tooth eruption patterns. Observations of patterned burning on *B .suillus* mandibles and premaxilla indicate human exploitation.

Domesticated animals

The presence of sheep in the lower LSA levels at GSF 8, radiocarbon dated at 1840 BP, reflects a changing economy in the region after the arrival of pastoralism. It raises the questions: Were the inhabitants of GSF 8 Khoi or San, hunter gatherers or pastoralists, or both?; compared to pre-pastoral sites what economic changes are present in the assemblage at GSF 8, and possibly GSF 9, which reflect the arrival of pastoralism and the interaction between foragers and herders?

Cultural Diversity

Cultural diversity at GSF is best reflected by artefacts in stone, bone, shell, and to a lesser extent, pottery. Economic diversity data, for instance on shellfish, may also reflect cultural diversity. Integration of some aspects of these data sets will be investigated.

Stone Artefacts

Being the best preserved cultural artefacts, they are one of the principal measures of cultural and/ or behavioural diversity at GSF. Inter-site comparisons include an examination of the proportions of waste, modified utilised and formal tools; type, form and raw materials; size, retouch position and raw material of formal tools; ontogenetic, and form and function, modelling. Inter-regional lithics data will form an integral part of the diversity study; particular attention will be paid to studying the conformity of the GSF assemblages to the typical Wilton and Pottery Wilton models suggested for the Southern and Eastern Cape (cf. Deacon 1972; Deacon 1984).



Bone and Shell Artefacts

Spatial and temporal variations will be charted for bone and shell artefacts and interregional comparisons made. The size of OES beads may reflect the social identity of Khoi or San. Data on OES beads from other Cape sites will be used to test this model.

Pottery

The obvious contrast is between the sites in the pre and post 2,000 BP period. All the later sites contain pottery, none of the earlier. The choice of shellfish in later sites may reflect the influence of different cooking methods using pottery, that is boiling as opposed to baking, and this will be examined.

Dating

GSF dates are listed in Table 1 & Fig. 2

Radiocarbon dates on fifteen shell and charcoal samples from GSF sites, were obtained from the CSIR, Pretoria. Radiocarbon dates from marine shell have been corrected for apparent age of sea water. Final calibrated dates for all sites are supplied by Dr. Vogel, CSIR, Pretoria.

Two Ovis aries bones have been submitted to the Oxford Accelerator Centre for dating.

Additionally, first order radiocarbon dates will be obtained for each of the sites at GSF and for the undated cave layers. This work will be carried out under the supervision of Prof. Vita-Finzi at University College, London in early 1994.

Application was made to the Oxford Accelerator Centre to date two shell samples from the MSA layers at GSF 8 but was not accepted.

Palaeovegetation

Charcoal samples extracted from hearths at various GSF sites are to be submitted to Dr. C. Cartwright, British Museum, for analysis. Identifying the taxa used for firewood provides an insight into the palaeovegetation of the GSF dune fields.

Thesis write-up and Submission of First Draft

A relatively detailed chapter outline of the thesis has been submitted, for consideration, to Dr. G. Bailey and Dr. T. Whitelaw. A working outline will be complete by mid-December 1993.



The analysis of all the material from GSF sites is complete and has been captured on data forms. Transfer of this data to spreadsheets for statistical analyses will be completed by December 1993.

Isotopic and first-order dating analysis will be completed by April/May 1994.

The majority of the research for the historical chapter, as well the extraction of data from inter-regional site reports and papers, and the sections on physiography, geology and paleoenvironments, is complete.

Write-up of the first draft of the thesis will begin in January 1994 and will be submitted for comment by end July 1994.



Garcia State Forest Project

Radiocarbon Dates

Site	Lay -er	Unit	Sq.	Ref. No.	Dating Material	14C Age BP	±	1 Sigma	Calib- rated Date	1 Sigma	BC/ AD
GSF 1			B1	Pta-6177	Shell	6960	70	5437	5363	5308	BC
GSF 2			13	Pta-6181	Shell (6740	70	5230	5198	5123	80
GSF 3			B2	Pta-6180	Shell (5960	70	4361	4322	4241	BC
GSF 4			DB21	Pta-6176	Shell (5680	70	4046	3985	3942	A
GSF 5			C2	Pta-6182	Shell (5520	70	3928	3802	3751	BC
GSF 6		HBL		Pta-6178	Shell (4070	60	2064	1981	1899	
GSF 7		YSL HL3	B2 B2	Pta-6179 Pta-6183	Shell (3110 3170	50 25	835 888	801 846	776 826	BC
GSF 8	5 5 5 5 5	MC IV MC IV MC IV MC IV Coke	E4 E4 E4 E4 E4	Pta-6185 Pta-6175 Pta-6246 Pta-6247 Pta-6184	Charcoal (Shell Shell Shell Charcoal (1840 2400 2280 2340 290	50 40 50 50 20	135 27 84 84 1548	225 74 133 133 1651	254 115 198 198 1657	AD AD AD AD
GSF 9		ОН ОН	A2 A2	Pta-6187 Pta-6248	Charcoal Shell	480	45 50	1426 1462	1443 1493	1461 1531	A.C.

C-14 half-life used is 5568 years. Ages are corrected for variations in isotope fractionation and shell dates are corrected for apparent age of sea water. Age calibrated for southern hemisphere with the Pretoria programme (Talma & Vogel 1992). The calibrated date is the most probable calendar date, with 1 sigma dates also listed. Dates are supplied by the CSIR, Pretoria.

Table 1: Garcia State Forest: Radiocarbon dates.



Garcia State Forest Project

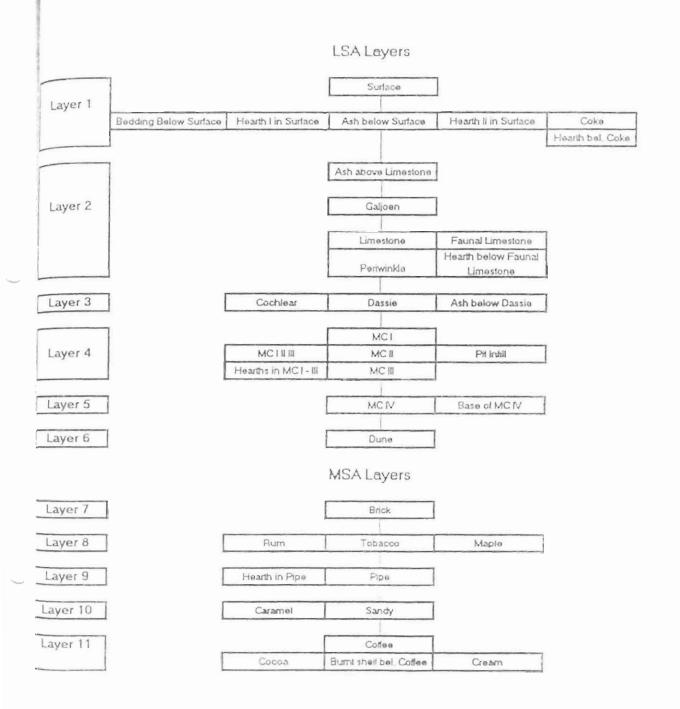
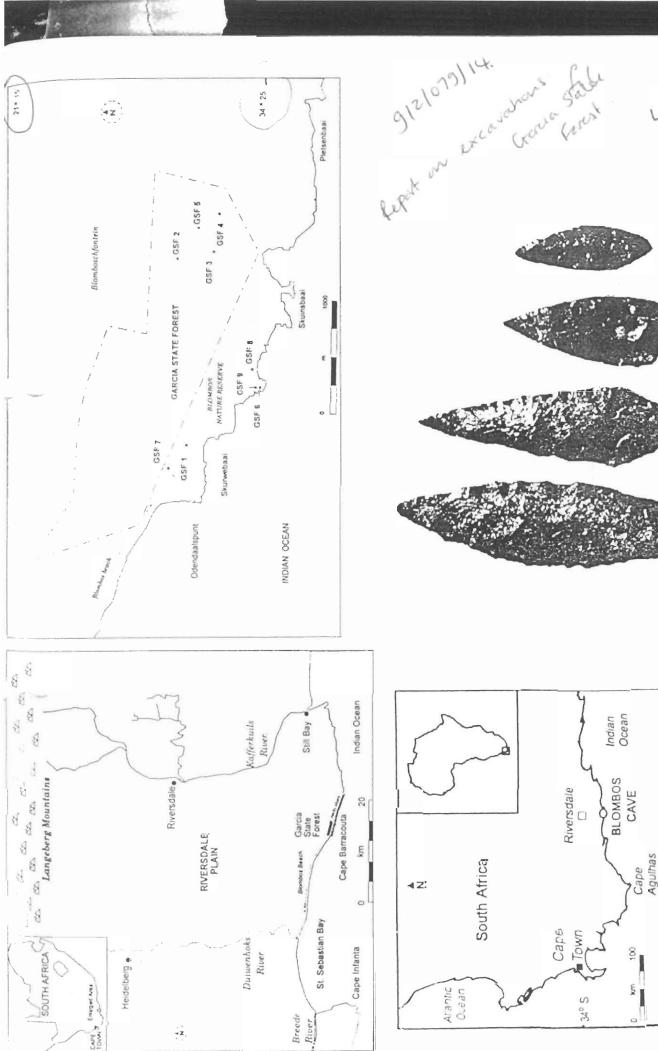


Table 2: GSF 8 - Cave Matrix of LSA & MSA Layers





Kaarte met verlof van dr. C.S. Henshifwood, Tweesydige 'Stilbaai' klippunte uit BONE ARTEFACTS FROM THE MIDDLE STONE AGE AT BLOMBOS CAVE, SOUTHERN CAPE, SOUTH AFRICA deur Christopher Henshilwood en Judith Sealy.

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