

An Acheulian industry within the raised beach complex of the CDM concession area, S. W. Africa (Namibia)*

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Summary: An Acheulian industry was located within a calcrete deposit capping the older raised beach deposits on the coast of the CDM diamond concession area. Early Stone Age artefacts without bifaces occurred within exposed, patinated and calcreted storm beach cobble crests of the 8 m 'C'-Beach. A flake industry, probably of an industry transitional between the Early and Middle Stone Age, was found within the younger 'B'-Beach deposits. Middle Stone Age assemblages were located within aeolian sands overlying the calcrete and the raised beach deposits. The Acheulian industry may be compared typologically with earlier Acheulian sites from East Africa. It is suggested here that the 8 m 'C'-Beach at CDM is of late Lower or early Middle Pleistocene age.

In March 1982 M. Shackley (1980) reported an Acheulian industry associated with *Elephas recki* in the Namib desert. An Acheulian assemblage was located by the writer a few hundred kilometres south of 'Namib IV' in the concession area of the Consolidated Diamond Mines, Diamond Area 1 (Fig. 1), for which the writer was working at that same time.

A succession of raised diamondiferous beaches, which reflect a succession of marine transgressions and regressions, were exposed by the diamond operation along the coast (Fig. 2). They are divided into a 'younger complex', of Beaches 'A', 'B' and 'C' which contain a modern cold water fauna, and an 'older complex' of Beaches 'D', 'E' and 'F' containing a warm water fossil fauna (Stocken, manuscr., Carrington 1970). The levels of the lower, younger beach deposits remain consistent throughout their extent and they have elevations of 2,4 and 8 m above mean sea level for the 'A', 'B' and 'C' Beaches respectively. The elevations of the upper, older beaches do not remain constant, as they have suffered a slight tilting to the north. The 'E'-Beach has an elevation of 15 m above mean sea level and the 'F'-Beach of approximately 20 – 22 m in the southern 'Gemsbok' area, whereas in 'Affenrucken', 80 km to the north of the Orange River mouth, the 'F'-Beach stands only 9 m above mean sea level.

An extensive calcrete crust of a thickness of 0.5 – 1.0 m developed over the older beach complex and affected also the 'C'-Beach, whereas no calcrete has formed above the younger 'A' and 'B'-Beaches.

The Acheulian artefacts were embedded within the upper part of the calcrete crust (Fig. 2). Mining operations have destroyed most of the original sites, but several artefact localities could be found *in situ*. However, the majority of artefacts were collected from the mining dumps. Most of these carry calcrete patches adhering to their surfaces, indicating their original position within the calcrete.

The calcrete forms a straight, even surface above the deposits of the older beaches. The calcrete has not only affected the marine gravel and sand deposits but also a thin colluvial and residual veneer of aeolian

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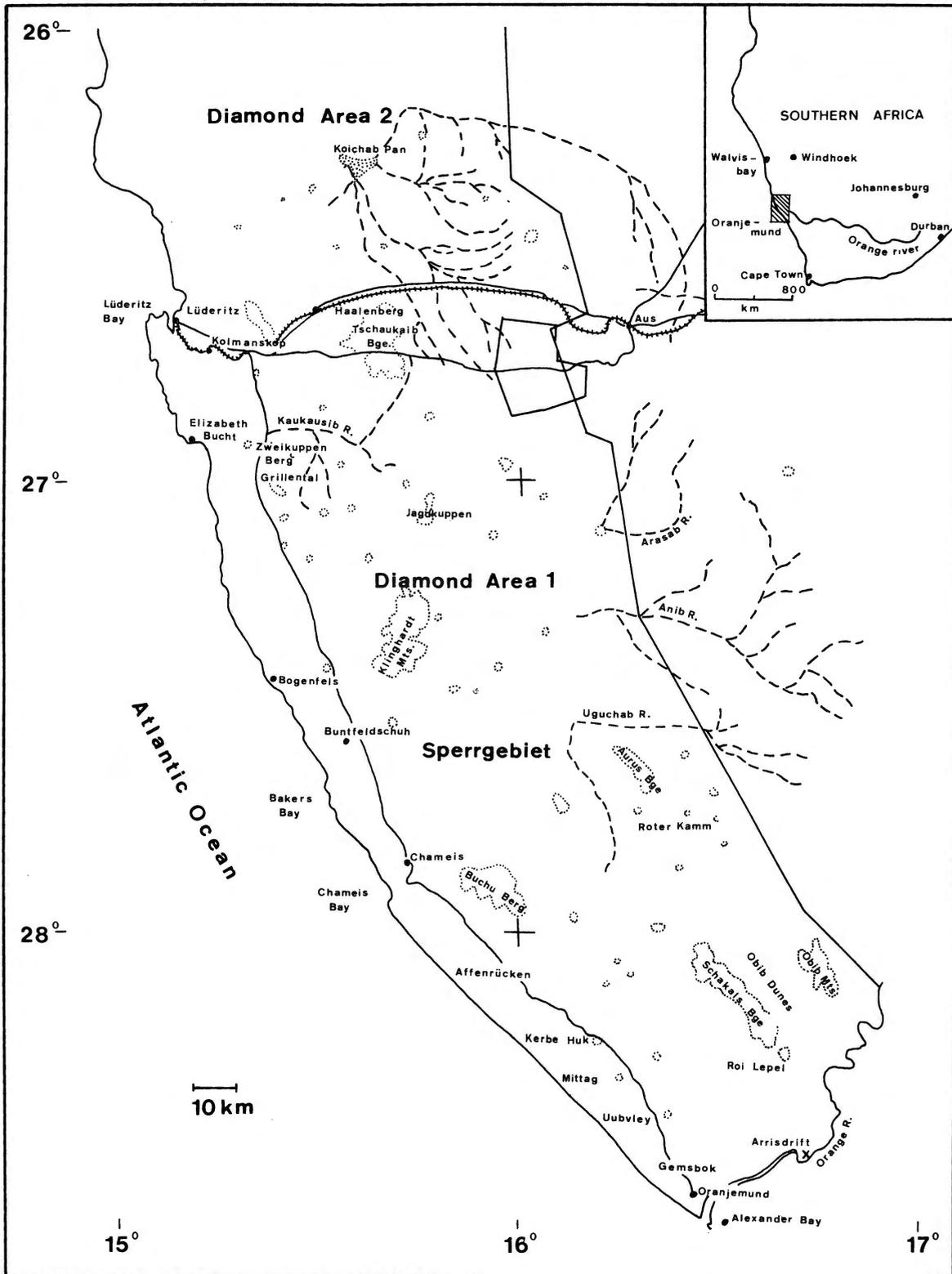


Fig. 1. Map of the „sperrgebiet“ of CDM.

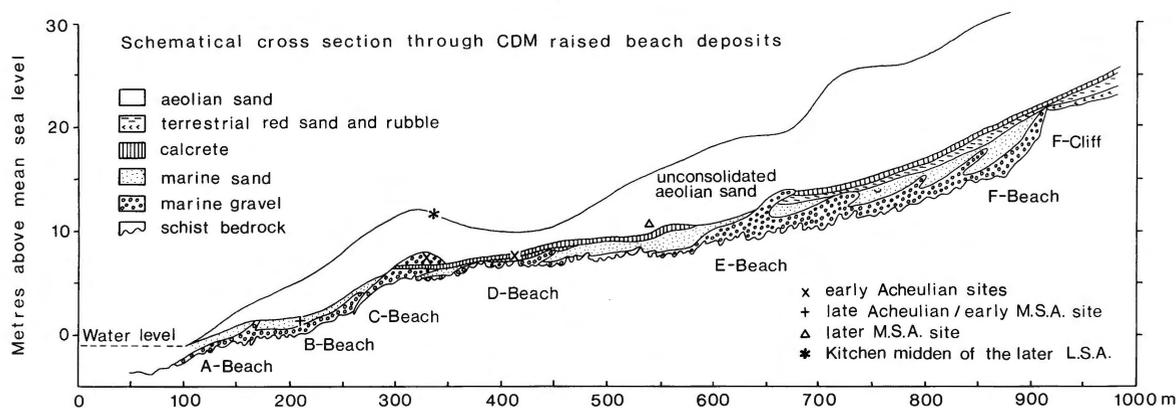


Fig. 2. Crosssection through CDM raised beach complex.

sand and rubbly debris overlying the marine sediments. The artefacts are mainly contained in this rubbly strata. A large amount of calcified casts of the landsnail *Trigonephrus* is in association with the artefacts in the upper calcrete crust and testifies to the area being a dry, sandy desert surface. On this surface Acheulian man lived in the triangle between the river and the coast. Unconsolidated dune sands cover everywhere the ancient calcrete land surface.

Early Stone Age artefacts without bifaces have been found within the storm beach crests of the 8 m 'C'-Beach. These crests are patinated in the exposed upper portion and calcreted in the lower part; the artefacts contained in the deposit show the same weathering effect. Most of the artefacts are patinated and derive from the upper 40 cm of the cobble deposit. The analysis of the flake assemblage in the cobble gravel has shown that in spite of the absence of bifaces no apparent differences can be found between the flakes from the cobble crests and those from the calcrete. However, the amount of dorsal cortex is high and there is a high percentage of cortex platforms amongst the flakes from the cobble crests. It is assumed, therefore, that the two samples constitute different activity patterns of the same industry complex rather than two independent industries. The cruder non-biface containing sample from the crests seems to constitute the remains of manufacturing debris on the cobble exposures, whereas the artefacts from the calcrete (Fig. 3, 4) appear to belong to living sites on the land surfaces beyond the storm beach crests.

The occurrences of Acheulian artefacts were richest in the southernmost part of the 'Sperrgebiet' in the mining area of 'Gemsbok' just north of the mouth of the Orange River near Oranjemund (Fig. 1). The Orange River is a large perennial river which must have served as a permanent water source to the Acheulian people. The density of artefact localities decreases northwards from the river mouth. The northernmost Acheulian handaxes were found in mega-trenches U60 and U80 in the 'Uubvley' mining area, 26 and 28 km north of the Orange River mouth. It may be the case that Acheulian man did not venture far into the interior of the desert away from the permanent source of water of the river.

The movement to the coast of the people responsible for the 'Gemsbok' Acheulian was certainly along the course of the Orange River. Localities of Acheulian artefacts occur on the cobble-covered terraces all along the Orange River from Arrisdriфт (Corvinus 1978, 1979) to Violsdriфт, more than 100 km to the east of the river mouth. Raw material was quartzite in the form of beach and river cobbles.

The artefacts in the calcrete are fresh and unabraded. Artefacts (Fig. 3, 4) comprise handaxes, cleavers, knives, scrapers, choppers and cores together with a rather undiagnostic flake assemblage.

The artefacts have been studied and analysed (Corvinus 1983). Handaxes were manufactured mainly on cobbles, very few on flakes. They show little trimming, scar counts being between 10 and 20. Means

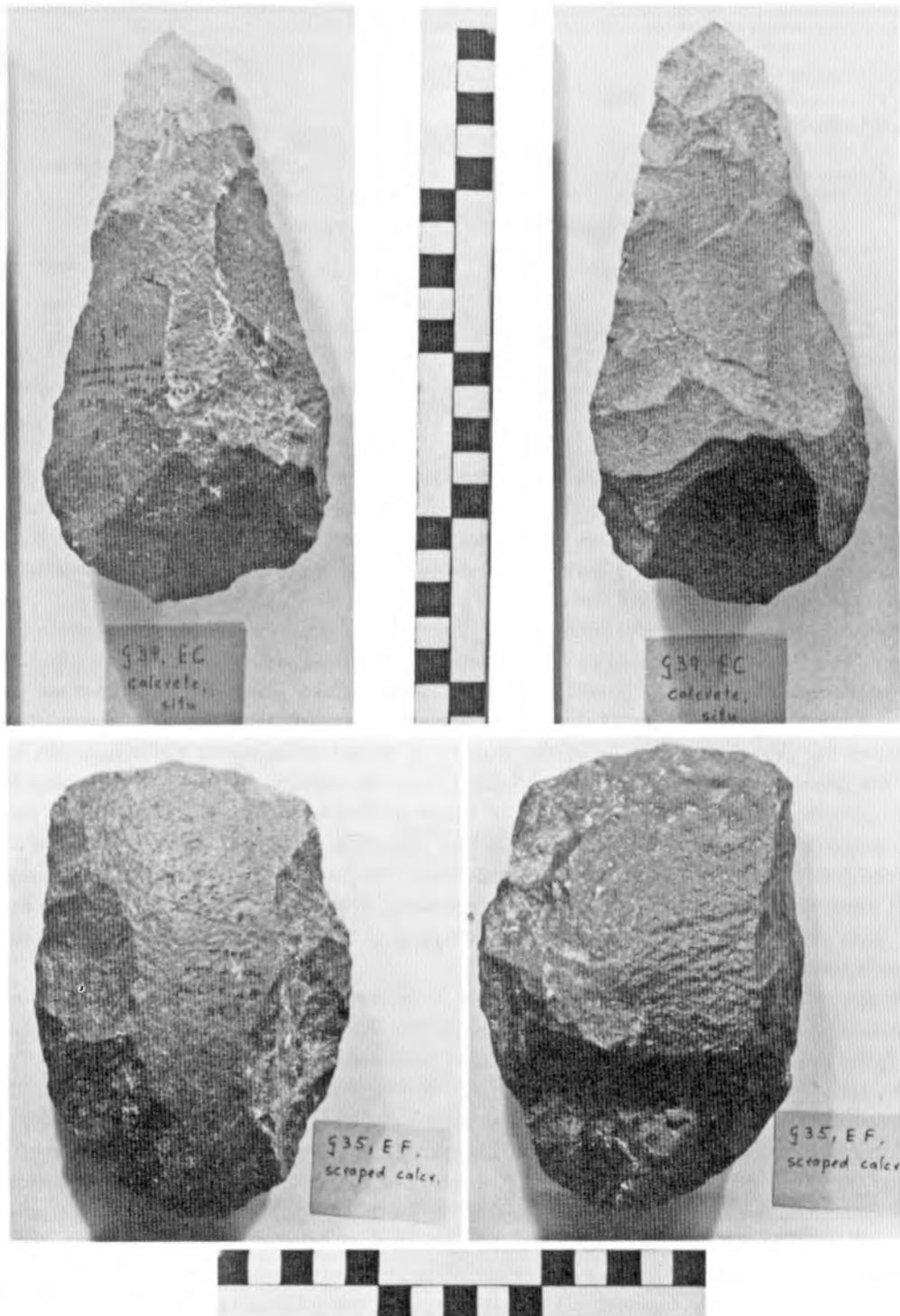


Fig. 3. Handaxe and cleaver from the calcrete *in situ*.



Fig. 4. Handaxe and cleaver from calcrete dumps.

of size vary between 140 and 160 mm, the degree of elongation between 0.56 and 0.59 and the relative thickness between 0.56 mm and 0.58 mm, indicating rather thick, elongate forms. Cleavers were made almost exclusively on cortex flakes with little secondary trimming. The cleaver edges are made by the intersection of cortex and the flake surface. Sizes of cleavers cluster around means of 140 mm, B/L ratios (elongation) around 0.68 and Th/B ratios around 0.45. Counts of scars is below 10.

The consistency of similarities of all tool measurements with data from other lower Pleistocene sites (Olduvai's upper part of Middle Bed II and Ternifine) seems to point to the possibility that the industry at CDM belongs to an early Acheulian period. Flakes have been studied in rather more detail and have been compared with Isaac's data (Isaac 1977). The B/L ratios show a bimodal curve, but end-struck flakes dominate considerably over side-struck flakes, the mean being 0.86. The mean length of flakes is 70 mm, but a slightly bimodal character with flakes larger than 100 mm is apparent. In comparison with the little data available from other Early Stone Age sites (Isaac 1977), it seems that the assemblage can best be compared with earlier Acheulian sites, such as Ternifine in North Africa and the South African sites from the Vaal River.

According to the geological evidence, it appears that the Acheulian people lived on the coast at the mouth of the Orange River during and just after the formation of the 8 m 'C'-Beach. Calcretisation, which had started earlier, cemented the artefacts embedded in the rubbly strata above the older beach deposits into the calcrete, affecting the artefact-bearing 'C'-Beach as well. Unfortunately no fossil bones were found during the extensive survey of the hundreds of mining exposures.

Very little data pertaining to the age of the Early Stone Age in South Africa are available. The Acheulian occurrences within the raised beach complex at CDM are one of the few instances where Early Stone Age artefacts have been found in stratified context and where they can be related to geological events. It is necessary to stress the importance of two recently found sites in southern Africa where Acheulian artefacts occurred in association with fossils in the calcrete. Shackley (1980) reports an Acheulian industry from the central Namib desert at Namib IV in association with Middle Pleistocene faunal remains of *Elephas recki*. The artefacts as well as the fossils seem to have been derived from a calcrete which underlies the recent dune sands. The cleaver-dominated bifacial tool kit seems to be of a different technique and character than the handaxe-dominated assemblage of the 'Gemsbok' Acheulian. While the Namib IV bifaces are mainly made from large flakes, those of the 'Gemsbok' Acheulian are made predominately on cobbles, i. e. 71 % cobble- and 23 % flake-handaxes. Another site where Acheulian handaxes have recently been discovered in association with remains of *Elephas recki* is at Kathu Pan near Kimberley in South Africa (Beaumont, personal communication). From this site Beaumont records extremely well made handaxes occurring in sinkholes in calcrete beneath 'peat' and pan deposits, where they appear together with fossil remains of *Elephas recki* and are overlain by a deposit which contains a Middle Stone Age industry. The fossils suggest again a Middle Pleistocene age (Klein, personal communication) even for so well developed an Acheulian industry. Therefore, it seems justified to suggest a late Lower or early Middle Pleistocene age for the Acheulian in the 'Gemsbok' area, considering their occurrence in the calcrete over the older beach deposits and in the 'C'-Beach and their typological similarity to early Acheulian industries from elsewhere.

Evidences of occupation of early Middle Stone Age/late Acheulian people come from lime sands overlying 'B'-Beach deposits. An extensive factory site of a silcrete-orientated flake and core-axe industry overlies the 4 m 'B'-Beach at site U186 in the Uubvley area. This indicates, together with a few silcrete handaxes found elsewhere over 'B'-Beach horizons, that the 'B'-Beach formation antedates the occupation of the U186 people and is probably older than Eemian (probably dating to oxygen-isotope stage 7).

Artefacts of a full Middle Stone Age occur on the calcrete surface below the aeolian dune sands and indicate that people of the full Middle Stone Age occupied the coast just prior to the deposition of the

aeolian sands. The 2 m 'A'-Beach marks the deposition of great quantities of marine sands, which are probably the main contributor to the aeolian sands which cover the entire coastal area. The occurrence of a later Middle Stone Age industry within the dune sands at site M177 suggests that the aeolian sand cover of the coast took place during the last glacial period, probably shortly after the formation of the 'A'-Beach. Kitchen middens of the later Late Stone Age in the late Holocene are found on the surface of the sand dunes.

It is suggested here that the coastal sand cover occurred during the last glacial and that the 2 m 'A'-Beach may be connected with the Eemian; that the 4 m 'B'-Beach is associated with the end phase of the Acheulian and the beginning of the early Middle Stone Age. The 8 m 'C'-Beach is considerably older, being contemporary or just prior to the 'Gemsbok' Acheulian which occurs in the calcrete and in the 'C'-Beach. The older beach complex is beyond the range of archaeological data, and may even date back to the later Tertiary.

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