Woodlands: New Discovery of a Small Acheulean Site in the Eastern Cape Province, Republic of South Africa

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by

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Front Cover: The obverse face (left) and reverse face (right) of Handaxe #1 from the Woodlands site.

Editor's Foreword

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Introduction

South Africa has been occupied by tool-producing hominins for at least two million years. The country occupies a pivotal place in the current discussions on both the origin of the genus *Homo* as well as its development toward becoming modern man (*Homo sapiens*) (Clark 1970; Sampson 1974; Mason 1988; Deacon 1993; Mitchell 2002; Beaumont and Vogel 2006; Barham and Mitchell 2008). Its expansive size and wide variety of environmental terrains makes it ideal for the study of the development of early hominins. This is especially true for the Eastern Cape Province (Laidler 1947; Singer and Wymer 1982; Rightmire and Deacon 2001; Marean et al. 2007; Oestmo and Wilkins 2014; Grine et al. 2017). Over the past 20 years, the author has received permission to explore a large number of farms across the Eastern Cape Province of South Africa. These farms range from near the Eastern Cape-Free State border by Aliwal North to several areas in and around Burgersdorp (12 farms), three farms near Craddock, four farms in the general vicinity of Queenstown, and two locations on the coast – one near Humansdorp and the other near East London. This led to the discovery of three Middle Stone Age sites whose lithic assemblages correspond to the transitional Fauresmith Industry as described by Herries (2011), Underhill (2011), Wilkens and Chazan (2012), and Wilkins (2013). In 2017, the author returned to the Eastern Cape to partially excavate one of the three Middle Stone Age sites, Dalmanutha (Crook 2018). During the course of this work, several discussions were held with the landowner, Mr. Bennie Lategan of Aliwal North, and his father, Mr. Ben Lategan of Burgersdorp. Mr. Lategan senior informed me that he believed there were flaked stone tools on another of his properties called Woodlands. A visit to the property during October, 2017 revealed the presence of a number of large, teardrop-shaped handaxes and large

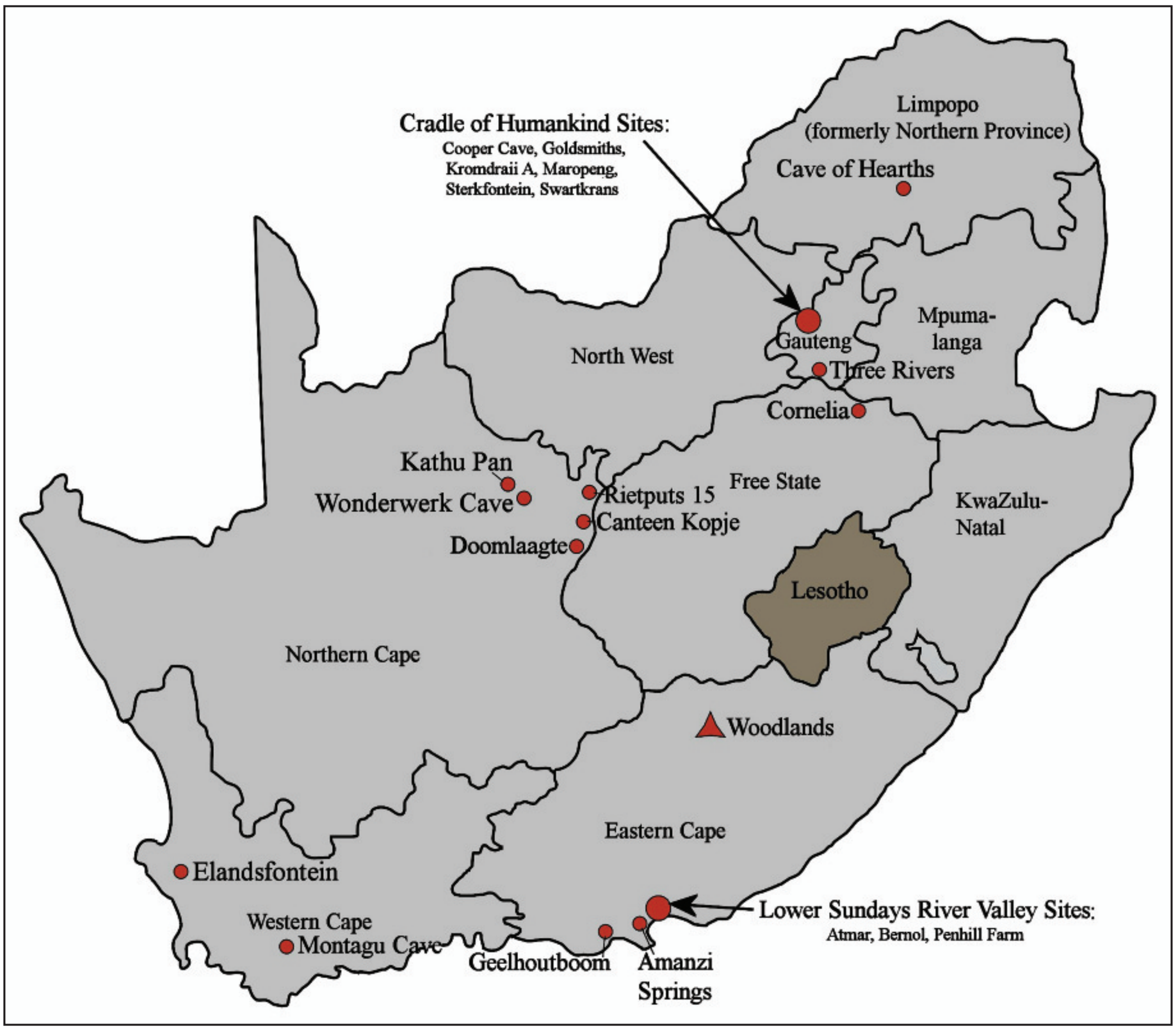

Figure 1. Location of the Woodlands site in the Eastern Cape Province as well as known Acheulean site locations in South Africa. (Map illustrated by Lance K. Trask)

worked flakes on the surface. No other artifacts such as prepared cores, blades, or Levallois points, all of which characterize the Fauresmith Industry, were found. The site thus appears to be solely an Acheulean occupation that pre-dates the advent of the Middle Stone Age. As there are only a few known Acheulean sites in the Eastern Cape Province (Inskeep 1965; Deacon 1970; Lotter and Kuman 2018), this brief paper serves to record the location of the site and its lithic assemblage.

The Woodlands Farm Site

The Woodlands Farm site lies in the north-central portion of the Eastern Cape Province of South Africa, about 8 kilometers northeast of the city of Burgersdorp (Figure 1). The site is accessed heading north out of Burgersdorp and taking the first un-named gravel road east of Provincial Route R58, the main road between Burgersdorp and Aliwal North. The Woodlands site is located about 5 km east of R58, immediately east of Stormbergspruit. Elevation at the site is approximately 4,500 feet. The site lies within a rolling hill and flat ground terrain that characterizes much of the grassland biome of the inland portions of the Eastern Cape and KwaZulu-Natal (Lubke et al. 1986).

The main part of the farm lies adjacent to the gravel road in a flat field which is cultivated in two large pivot areas (Figure 2). Total area of alfalfa cultivation on the farm is roughly 40 Ha (100 acres). The occupational area of the site is a much smaller area, roughly several hundred square feet located on the extreme western end of the farm. There is a small dirt road that leads to a storage shed about 250 meters from the gravel road. The occupational material is found adjacent to this shed along the western edge of the cultivated field. The site is fairly flat with the only significant surface features in the area being termite mounds. On the southern side of the field is a prominent basalt-capped hill with a vertical relief of about 300 meters above the surrounding terrain (Figure 3). Two hundred meters to the west of the field is a small perennial stream known locally as Stormbergspruit (Figure 4). This stream varies from as little as a few meters across north of the site to about 7 meters in width opposite the Woodlands site location. Water flows year-round and would have provided an easy and abundant source of water for the site's inhabitants.

Soil at the site is a loose gray to light gray sand (10YR 5/1 – 10YR 7/1). Shovel tests show there is very little depth component at the site with the artifact assemblage occurring basically at the surface or in the first few centimeters. A hard, light yellow-brown to pale yellow clay (2.5Y 6/3 – 2.5Y 8/3) was encountered at 10-20 cm below the surface. No artifacts were found as deep as this impermeable clay unit.

Figure 2. The Woodlands site today. Artifact accumulations were found at the edge of the field (center of photo) opposite the small barn.

Figure 3. The prominent basalt-capped mountain that lies immediately to the south of the site.

Geologic Setting

The area of the northern part of the Eastern Cape Province of South Africa lies within the major geologic feature known as the Great Karoo Basin (DuToit 1954). Rocks exposed on the surface belong to the siliciclastic Beaufort Group, which is part of the regional Permo-Triassic Karoo Super Group. The Karoo Super Group represents an immense area of deposition as rocks associated with this unit cover over 300,000 square kilometers of South Africa (DuToit 1954). Tectonically, the Karoo Basin has been interpreted as a retroarc foreland basin bounded by the Cape Fold Belt to the south. Deposition in the Karoo Basin began during the Carboniferous Period (359-299 Ma) with marine sedimentation followed successively by shallow marine, deltaic, and fluvial lacustrine deposition. The last phase, which includes sediments of low sinuosity fluvial systems, is represented by rocks of the Burgersdorp Formation.

The Burgersdorp Formation comprises the uppermost part of the Beaufort Group and consists of grayish-red and greenish-gray colored mudstones, graywackes and interbedded fine-grained sandstones (Johnson 1976). The top of the Beaufort Group marks the base of the Triassic Stormberg Group which, from the base upwards, is composed of perennial braided stream deposits (Molteno Formation), overlain by continental red beds, followed by aeolian sand deposits (Johnson 1976; Neveling et al. 2005). In the area of the Woodlands Farm site there is no evidence of red beds or aeolian sandstones, so those parts of the Stormberg Group have probably been eroded and are no longer present. As noted above, the site lies largely in unconsolidated sand. Given that the overlying material has been eroded away, the remaining sandy surface has likely been deflated resulting in the possibility of a mixing of occupational material. However, examination of the artifact assemblage collected at the site shows no other lithic technology is present other than Acheulean. Thus the assemblage is believed to represent a single occupation.

Figure 4. Stormbergspruit, the small perennial creek that flows adjacent to the Woodlands site.

Approximately 180 Ma, an extensive igneous event (the Karoo Large Igneous Complex) deposited both continental flood basalts and dikes and sills of dolerite (diabase) composition throughout the Karoo Basin. The volcanism associated with this event effectively terminated deposition of the Karoo Super Group and served to protect much of the underlying sediments of the Burgersdorp and Molteno Formations from erosion since the Early Triassic (Senger et al. 2015). These igneous rocks cap both the sediments of the Burgersdorp and Molteno Formations in the area of Woodlands Farm (the basalt-capped mountain immediately to the south of the site is a classic example of this phenomena – see Figure 2) but also have caused contact metamorphism which produced the hornfels and quartzites used by both the Early Stone Age (ESA) and Middle Stone Age (MSA) inhabitants of the region. The surface of the Woodlands site today is largely the erosional remnants of fine-grained sands, silts and clays from the Burgersdorp and Molteno Formations, occasionally capped by flood basalts from the Karoo Igneous Complex. Eroded boulders of doleritic volcanic material litter the country side as do cobbles of hornfels, quartzite, quartz, and chert. Toolstone cobbles are sporadically present but are more concentrated in the stream bed of Stormbergspruit that runs adjacent to the site.

Artifact Assemblage

A total of 11 artifacts were collected from the Woodlands site. The artifacts include four teardrop-shaped handaxes, one cleaver, five worked flakes, and one well-used hammerstone. Table 1 lists the artifacts recovered from the site by tool type and lithic rock composition. As can be seen in the table, the majority of the artifacts and all of the handaxes are made from hornfels (indurated shale). Hornfels occurs on the mountain behind the site where the caprock basalt has caused contact metamorphism with the underlying sediments of the Burgersdorp and Molteno Formations. Large cobbles of hornfels are present near the foot of the mountain and within the stream bed of Stormbergspruit immediately west of the site. The hornfels is generally black to gray-colored (7.5YR 2.5/1 Black to 7.5YR 3/1 Very Dark Gray to 7.5YR 4/1 Dark Gray), however, some of

Table 1. List of Artifacts by Lithic Composition Woodlands Site, Eastern Cape Province, South Africa

Artifact	Hornfels	Chert	Quartzite	Total
Handaxe	4	-	-	4
Cleaver	1	-	-	1
Worked Flake	4	1	-	5
Hammerstone	-	-	1	1
Total	9 (82%)	1 (9%)	1 (9%)	11

the river cobbles also have a grayish-green surface coloration (GLEY1 4/2-5/2). Other lithic materials present in the area include chert, quartz, and quartzite; the latter appears to have been used exclusively for hammerstones.

In general, the Woodlands artifact assemblage is characterized by a classic bifacial technology referred to as the Acheulean Technocomplex (Clark 1994; de la Torre 2016). The predominant artifacts present at the site are bifacially flaked handaxes coupled with large worked flakes produced in conjunction with the production of the handaxes. The four handaxes recovered from the site meet the classical definition for an Acheulean handaxe including: (1) flakes struck from opposite faces along more than two-thirds of the tool's circumference, (2) a wide base and a narrow tip created by two convergent/semiconvergent lateral sides, and (3) a maximum length greater than 80 mm (Beyon et al. 2017). Globally, Acheulean handaxes have considerable variability in length (80-180 mm) and width (50-110 mm), however, the overall proportionate shape typically fits into two general categories – ovate (widest at the middle third of the artifact) or cordate (widest at the bottom third) (Gamble and Marshall 2001; Gowlett 2006; Hosfield et al. 2018; Wynn and Gowlett 2018). Experimental studies have shown that handaxes may have even been produced to fit specific tasks and perhaps even specific genders. These studies have shown that modern females demonstrate the highest work efficiency using handaxes with maximum widths around 65mm, whereas modern men achieve peak tool use efficiency with handaxes around 90 mm in maximum width (Machin et al. 2007; Walker and Lee 2016).

Dimensions of the four handaxes plus the one cleaver from the Woodlands site are listed in Table 2. The same four handaxes are pictured in Figures 5-7. As can be seen in the photos, all of the handaxes have had extensive use which has resulted in a shortening of the artifact as well as extensive use-wear polish and/or damage, especially to the distal end (see Figure 5, Handaxe #1 and #4; Figures 6 and 7, Handaxe #1). As can be seen on the table, average length for the four bifaces is 142 mm, which is typical for extensively used Acheulean handaxes constructed from cobbles which tend to get discarded when they reach lengths approaching 140 mm (Ohel 1987; Beyin et al. 2017; Wynn and Gowlett 2018). Average maximum width is 90 mm, which is consistent with experimental evidence that the handaxes were likely constructed and used by men (Walker and Lee 2016; Hodgson 2015; Hosfield et al. 2018). The average width-to-length ratio for Acheulean handaxes worldwide is around 0.61, which is greater than large cutting tools from later periods which tend to be narrower

Table 2. Hand Axe and Cleaver Measurements (mm) Woodlands Site, Eastern Cape Province, South Africa

Artifact	Maximum Length	Maximum Width	Maximum Thickness	Lithic Material	Artifact Type
Woodlands 1	154.9	93.9	38.9	Hornfels	Hand Axe
Woodlands 2	133.3	89.1	38.4	Hornfels	Hand Axe
Woodlands 3	147.7	79.1	41	Hornfels	Hand Axe
Woodlands 4	133.1	98	37.7	Hornfels	Hand Axe
Average	*142.2*	*90*	*39*		
Woodlands 5	167.5	78.4	46.3	Hornfels	Cleaver

Figure 5. The four handaxes recovered from the Woodlands site. All are constructed from cobbles of local hornfels. The artifacts are numbered from one through four from left to right which corresponds to their number in Table 2. The reddish iron staining on some of the handaxes is from the local soil.

and thus have a much lower ratio (Pope and Watson 2006; Cannell 2015). The Woodlands handaxes have an average width-to-length ratio of 0.63 which fits well with tools from the Acheulean tradition in both Africa and Europe. Biface #4 has a slightly higher ratio but this is due to extensive resharpening which has led to a shorter, more ovate shape (see Figure 5).

Figure 6. Obverse face of Handaxe #1 from the Woodlands site. Note the large flake scars left from the original shaping of the cobble and the damage to the distal end and right lateral edge which probably led to the tool's ultimate discard. The original cobble cortex can be seen on the left proximal end.

Figure 7. Reverse face of Handaxe #1 from the Woodlands site.

As can be seen in Figure 5, all of the handaxes are made from ovoid-shaped river cobbles. No handaxes were found that were produced from large flakes. The cobbles used to make the handaxes were well selected, in that they tend to be elongated oval shapes which can provide a platform and angle for direct invasive flaking of the lateral edges. The size of the cobbles are more or less uniform and of a size that fits comfortably in the hand. The fact that all four of the handaxes, as well as the cleaver, were made from river cobbles suggests that such blanks were intentionally targeted, possibly because of their local availability in the river bed of Stormbergspruit. Flakes have been removed bifacially from the upper two-thirds of the cobble, frequently leaving the original cobble cortex on the proximal end. Hard hammer percussion was the primary method used to shape the handaxes. Creation of the working edge of the tool involved the removal of large flakes (50-80 cm) in the first series of blows, followed by removal of a shorter series of flakes to create the pointed distal end and fairly steep edges. There is a clear pattern that the average number of secondary flake scars is higher than the number of primary scars, which indicates that shaping was conducted to refine the edges than to shape the body of the artifact (Figure 8). The average number of flake scars on the handaxes (>20) is significantly greater than that on the one cleaver indicating the expediency of the latter versus the more permanent nature of the former. Handaxes 1, 2 and 4 are cordate in form (widest point at the basal third) whereas Handaxe 3 is ovate (widest in the middle third).

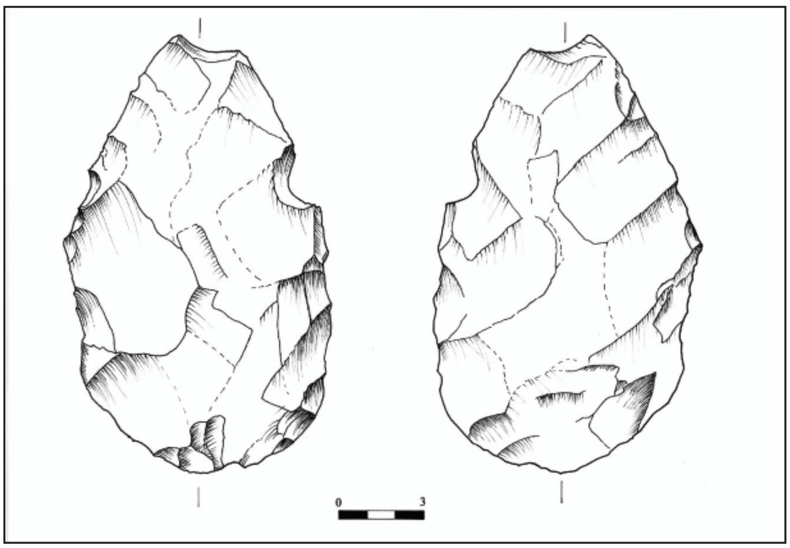

Figure 8. Illustration of obverse and reverse faces of Handaxe #1 from the Woodlands site. Note the paucity of flake scars on both faces. (Illustration by Claudia Penati)

The one cleaver recovered from the site (see Table 2, Woodlands 5) is considerably longer and thinner than any of the handaxes. This is largely due to the shape of the cobble chosen to make the tool. Cleavers resemble handaxes in that they are long and ovate in shape but unlike handaxes, they have a wide, straight cutting edge running at right angles to the axis of the tool. The cutting edge is created by a tranchet flake being struck from the primary surface to create the functional part. Cleavers are more typically made on a large flake but can be produced from a cobble. The Woodlands cleaver retains almost all of the cobble's original cortex on one face and appears to have been rapidly made as an expedient tool with a minimum of flakes removed. Handaxe #4 (see Figure 5) has also had its pointed tip removed but the flaking pattern is more consistent with an attempt to rejuvenate the tool rather than create a cleaver edge. Thus, while it might have been used after resharpening in a similar manner as a cleaver, it does not appear to have been intentionally constructed as such.

Hosefield et al. (2018) plotted over 3,000 handaxes and cleavers from several Early Stone Age sites in England. They plotted the width of the tip over the width of the middle against the width of the base over the width of the middle as an X-Y plot. What they discovered is that the overwhelming majority of the handaxes plotted in the lower left quadrant (tip and base narrower than middle) whereas most cleavers plotted in the upper left quadrant (tip wider than middle, base narrower than middle). A similar plot has been created for the five Woodlands bifaces (Figure 9). Per Hosefield et al.'s (1918) findings, the four handaxes plot well within the general handaxe range while the cleaver plots within the established range for Acheulean cleavers.

All the handaxes and the cleaver recovered from the Woodlands site show a high degree of polish, especially along the lateral edges. Microscopic examination of Handaxe #1 also shows some edge crushing on both lateral edges near the distal end. Both of these characteristics are consistent with possible use against a hard substance

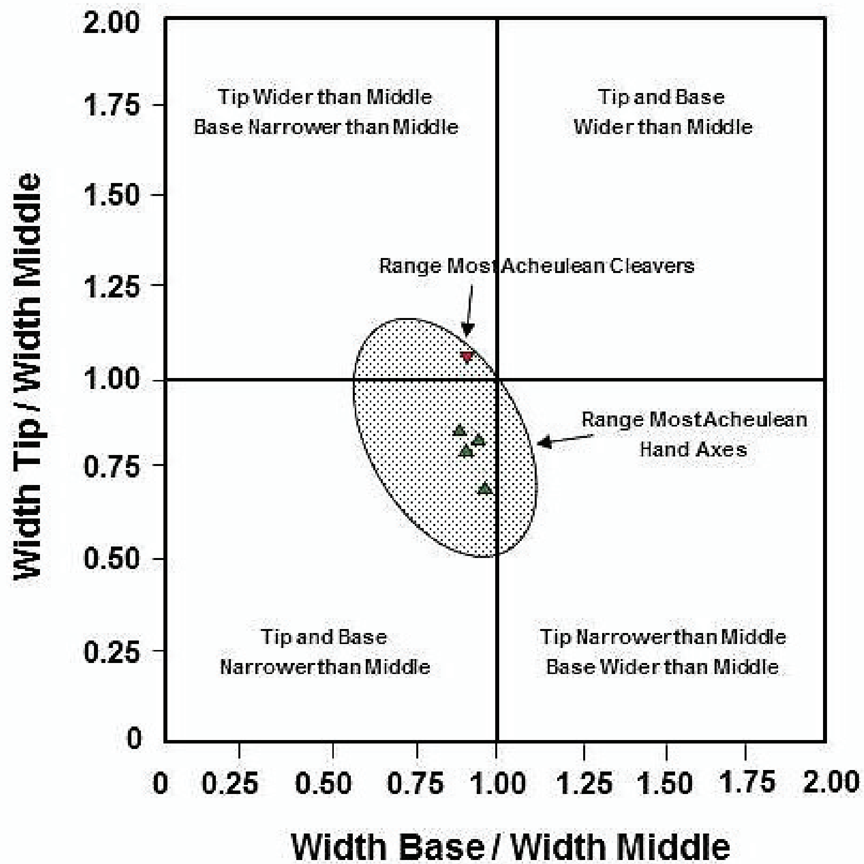

Figure 9. X-Y Plot of width of tip over width of middle vs width of base over width of middle of Woodlands handaxes and cleavers. Both types of bifaces fall within the general range of global handaxes and cleavers.

Table 3. Worked Flakes from the Woodlands Site, Eastern Cape Province, South Africa (mm)

Artifact	Maximum Length	Maximum Width	Maximum Thickness	Lithic Material
Worked Flake 1	85	44.2	13	Hornfels
Worked Flake 2	71.4	39.5	16.1	Hornfels
Worked Flake 3	92.7	46.6	15.8	Hornfels
Worked Flake 4	66.7	40.4	14.8	Hornfels
Worked Flake 5	69.7	48	14.5	Chert
Average	*77.1*	*43.7*	*14.8*	*N/A*

Figure 10. Large worked flakes from the Woodlands site, Eastern Cape Province, RSA.

such as bone and/or wood (Keeley 1980). However, their long-term exposure to the elements prevents any definitive conclusions regarding end-use wear patterns.

A total of five worked flakes were recovered in association with the handaxes. Four of these are made from the same hornfels as the large cutting tools while a fifth flake is from a yellow-brown colored chert (7.5YR 6/8) (Figure 10). This chert, like the hornfels, is present as small cobbles in the stream bed of Stormbergspruit. All five are large (>65 mm in length; average = 77 mm) and appear to be primary flakes removed from cobbles from the initial shaping of a handaxe (Table 3). All five have minor secondary flaking (unifacial and bifacial) either to create a sharper working edge or rejuvenate a worn out edge.

Lastly, a single hammerstone was recovered from a white to gray-colored quartzite. The hammerstone is palm-sized, oval in shape and displays a considerable amount of battering on the cobble's exterior cortex in several areas (Figure 11). The hammerstone is split through an internal fracture which likely resulted in its final discard (Figure 12). The origin of the quartzite, like the hornfels, appears to be local. Quartzite cobbles can be found in the small stream that runs adjacent to the site.

Figure 11. Large broken quartzite hammerstone from the Woodlands site, Eastern Cape Province, RSA. Note the heavy battering on the end facing the camera.

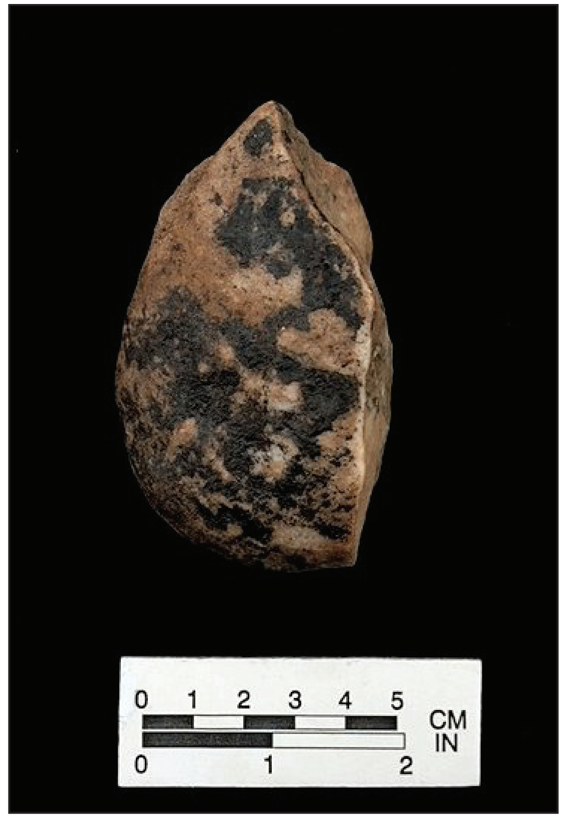

Figure 12. Broken quartzite hammerstone from the Woodlands site, Eastern Cape Province, RSA.

As noted above, the site occurs in unconsolidated soil above a harder pediment surface which introduces the possibility that the sites have been deflated over time thus resulting in a mixing of occupational material. However, since no cutting tools made from flakes or any prepared cores and blades were found at the site, it is believed there was never a younger Middle Stone Age occupation present at the site. The artifact assemblage recovered from the Woodlands Farm site is consistent with lithic assemblages from Acheulean sites found elsewhere in the southern part of South Africa. Thus it appears that the site represent a single Acheulean tradition occupation.

Conclusions and Discussion

The Woodlands Farm site appears to represent a small Acheulean occupation as has been characterized across southern Africa (Klein 2000; Mitchell 2002). While a total of only 11 artifacts have been found to date, all the major components of the tradition including large handaxes made on cobbles, cleavers, large worked flakes, and hammerstones have been recovered from the site. The presence of just one diagnostic handaxe has been cited as sufficient evidence to represent an Acheulean assemblage (Kuman 2007). The larger assemblage at the Woodlands, coupled with the complete absence of any artifacts from the later Middle Stone Age (purposefully prepared cores, Levallois blades and points, small cutting tools made on flakes), strongly supports the supposition that the site represents a single Acheulean occupation. To date, a total of 14 areas encompassing 21 sites comprise the known Acheulean occupation for South Africa (Lotter and Kuman 2018) (see Figure 1). The Woodlands Farm site adds to this total and marks the first reported Acheulean site in the northern part of the Eastern Cape Province. As such, it extends the known range for the Acheulean in the Eastern Cape and helps to fill in the gap between the known sites along the Indian Ocean coast and those in the Northern Cape near the center of the country (see Figure 1). The discovery of an Acheulean occupation in this area is not totally unexpected and is likely attributable to the author's access to substantial privately-owned acreage across the Eastern Cape Province, something not generally available to most archeologists.

The Acheulean tradition is regarded as the most significant technological development that occurred during the evolution of the Early Stone Age (Semaw et al. 2009; de la Torre 2016). The technological change from pebble choppers to the bifacial handaxe marks the beginning of the Acheulean tradition and is widely recognized as the widest spread and longest lasting lithic technology in the world (Mitchell 2002). The diagnostic teardrop-shaped Acheulean handaxe makes its appearance in East Africa about 1.79 mya and lasts for nearly 1.5 million years before finally giving way to the advent of hafting (Hosfield et al 2018).

The functional use of handaxes, and Large Cutting Tools (LCTs) in general, is a subject of some debate (Machin et al. 2007). This makes them one of the most diagnostic and yet enigmatic tools of the ESA (Wynn 1995; Lycett and von Cramon-Taubadel 2008). End-use studies have suggested that its primary use included heavy-duty butchery, digging and recovery of roots and tubers, and wood working (Kuman 2014; Diez-Martin et al. 2015). One end-use study has been conducted on two South African handaxes from Wonderwerk Cave which were shown to have wear patterns consistent with wood working (Binneman and Beaumont 1992). As mentioned above, all of the handaxes from the Woodlands site showed a high degree of polish and some edge crushing, both consistent with use on bone or wood (Keeley 1980). However, their long exposure to the elements prevents any conclusive study on end-use wear.

Stone tools are external objects that hominids (and some mammals) use to manipulate energy, modify other materials from the natural state, and insulate themselves from environmental stresses. Humans are obligatory tool users in that we cannot survive without using tools (Shea 2017). This obligatory tool use changed to habitual tool use during the Acheulean with the expansion of territories and environments being exploited. For the relatively low energy cost of carrying already prepared tools during daily foraging movements, hominins could gain energetic windfalls by being able to rapidly dismember animal carcasses to extract both meat and bone marrow (Shea 2017).

Lithic technology changes very little during the entire Acheulean, suggesting that the development of a standardized tool kit, especially with regard to their LCTs (handaxes and cleavers) (McNabb 2004; Wynn and Gowlett 2018). Between the advent of stone tools 3.3 Ma at Lomekwi (Harmand et al. 2015) and the onset of the Acheulean between 1.79-1.5 Ma, hominin tool use was for the most part ad hoc (Lombard et al. 2012). Tool use was more focused on expedient task completion rather than the features of the tool. All of this began to change with the beginning of the Acheulean and with the development of its accompanying most diagnostic LCT, the teardrop-shaped handaxe. While handaxes could be readily manufactured in a matter of minutes, as hominids began to extend their range during the Acheulean, the location and availability of suitable toolstone could not be predicted. Thus, hominids began to carry finished tools with them, not just cores to produce expedient flakes (Harris et al. 2007; Wynn and Gowlett 2018). In its most basic form and function, the Acheulean handaxe was an ergonomically guided solution to the problem of making a sturdy, hand-held tool designed to serve multiple purposes (Ohel 1987; McNabb 2004; Machin et al. 2007; Wynn and Gowlett 2018).

In considering hominid movement during the Acheulean, tying to important key resources such as water and toolstone are evident across South Africa. However, as the Acheulean progresses, there seems to be a notable increase in the size of territories over time (Clark 1994; Rogers et al. 1994; Harris et al. 2007; Lycett and von Cramon-Taubadel 2008). One reason for the geographic radiation seen in *H. ergaster* (*erectus*) is the incorporation of larger amounts of higher protein (meat) food in the diet. In can be inferred that the increased dietary requirements of these larger-brained hominids forced an increase in both home and day ranges, which then led to an increase in overall geographic range and the diversity of habitats exploited (McPherron 2000; Harris et al. 2007). With regard to the Woodlands site, both water and toolstone are immediately available which explains the plausible location of the site. Both water and raw materials in the form of river cobbles are present in the bed of Stormbergspruit adjacent to the site (see Figure 4). However, the small number of total tools recovered by the author (n = 11) supports the premise that the Woodlands site was a temporary campsite for a relatively short period of time and does not represent a more permanent occupation.

The hominid associated with the development and length of the Acheulean is *Homo erectus*, or *Homo ergaster* (known as the African *Homo erectus*) (Rightmire 1990; Klein 2000; Grine et al. 2009). The earliest appearance of Homo ergaster is in East Africa at Koobi Fora; in South Africa, *H. ergaster* has been found in direct association with Acheulean artifacts at Sterkfontein (Kuman and Clark 2000) and at Swartkraans (Pickering et al. 2012). *Homo ergaster* is credited with more human-like traits including an increase in cranial capacity and cognitive thinking, more modern body (arms and legs) proportions, an improved ability to walk and travel long distances, better adaption to heat, more complex social structures, and an enhanced ability to make and use lithic technologies (Rightmire 1990; Grine et al. 2009; Lotter and Kuman 2018). A well-preserved 1 Ma cranium from Buia in Eritrea shows an interesting mixture of both *Homo ergaster* and later *Homo sp*. traits (Abbate et al. 1998). This mixture of traits suggests that morphological similarities to our own species began to differentiate in Africa as early as 1 Ma. A key driver for initiating this evolutionary response could be the significant climate change events that took place throughout the Pleistocene epoch (Stout et al. 2015; Putt et al. 2017).

The Pleistocene Period (ca. 2.58-0.01 Ma) was the scene of dramatic climatic events across the face of the earth. It was also the period that saw the most rapid evolution among hominins leading ultimately to the development of modern humans, *Homo sapiens*. In a macro sense, geologists now divide the key evolutionary components of the Pleistocene into four sub-periods: (1) the Gelasian Stage from ca. 2.58-1.81 Ma, (2) the Calabrian Stage from ca. 1.81-0.781 Ma, (3) the Ionian Stage, from 781 ka to the beginning of the Marine Stage 5 Interglacial Period at 126 ka (beginning of the Upper Pleistocene), and (4) the Upper Pleistocene or Tarantian Stage from ca. 126 ka to the beginning of the Holocene (Ogg 2009). Dramatic climatic changes are now seen to be the catalyst for these global temporal changes. Plio-Pleistocene cooling at high latitudes occurred in a series of steps beginning with the onset of glaciation in cycles of roughly every 41 ka beginning after ca. 2.8 Ma (Cronin 2009). A further shift toward cooler conditions and higher amplitude 41 ka glacial cycles occurred after ca. 1.5-1.6 Ma, and a pronounced shift toward still higher amplitude 100 ka glacial cycles occurring after ca. 1.2-0.8 Ma (Cronin 2009). In Africa, faunal and paleoclimatic records suggest that the period between 1.2-0.8 Ma was a shift toward increasingly variable, drier conditions (savannah grasslands) that was accompanied by changes in some faunal assemblages and perhaps, speciation (deMenocal 2004). The Ionian Stage is also a period where we see a transition from the Early to the Middle Stone Age and the end of the long standing Acheulean Industry in Africa (Klein et al. 2007; Herries 2011). In Southern Africa, this period of change has typically been defined as the shift from the Acheulean handaxe tradition to one where smaller hand axes are made from flakes coupled with the use of projectile points and blades from prepared core technology; specifically the Levallois style method (Van Peer 1992; McBrearty 2003).

Almost all South African Acheulean assemblages occur within disturbed, open air locations (Lombard et al. 2012). Years of wind and rain erosion coupled with cultivation has disturbed most sites that are not protected within cave systems. As a result, the majority of sites lack any stratigraphic context (Kuman 2007). Moreover, unlike East Africa, the majority of ESA sites in South Africa contain no datable material (fauna, volcanic ash, intact stratigraphic sands). This makes developing a reliably-dated chronological sequence difficult (Lombard et al. 2012). Well-dated South African Acheulean sites are therefore few in number. This is especially true for the period between 1.3 and 0.8 Ma (Lombard et al. 2012; Kuman 2014). The Woodlands site has been subjected to many years of open-air erosion and as a consequence, dating of the occupational materials is not possible. The onset of the MSA with the beginnings of the Fauresmith Industry has now been dated to at least 542 +140/-107 ka using uranium series-ESR at Kathu Pan 1 (Porat et al. 2010). The only lithic material present at the Woodlands site belong to the Acheulean; no Fauresmith-related artifacts were found despite an extensive search. Thus the site represents an occupation that pre-dates the Fauresmith. Similar Eastern Cape Acheulean sites with predominant LCT lithic assemblages have been dated to greater than 0.6 Ma (Penhill Farm – 1.37 $\pm$ 0.16 Ma; Bernol Farm – 1.14 $\pm$ 0.20 Ma; Atmar Farm – 0.65 $\pm$ Ma) (Granger et al. 2013; Lott and Kuman 2018). It is likely that the Woodlands Farm site also fits within this range (0.65-1.4 Ma).

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