

Bir Tarfawi Site Analysis

The BirTarfawi during the time of the Middle Paleolithic was a landscape containing permanent lakes. These lakes were fed by rainfall, 500 mm annual, and were sometimes connected by a regional drainage system. Tool assemblages found show a very low index from the Levallois Workshop, and an emphasis on the Mousterian Group. Sites here are important because they show the reactions of early humans in response to changing environment. There are also numerous single-use sites that were used for tool preparation, food preparation, and possible hunting or scavenging. Bir Tarfawi has been the subject of several investigations in recent history. Substantial work was done in the site in 1973 and 1974. In 1986 research concerning the Middle Paleolithic the Combined Prehistoric Expedition conducted archaeology of Tarfawi. Mishandling of some of the artifacts found at various sites within the Tarfawi area has resulted in uncertainty of their original location. Early archeological teams also blasted through upper layers of stone deposits in some parts of ancient lakes, in hopes of reaching the earliest level of lakebed. This inhibits the overall understanding of lake episode age.

Bir Tarfawi is located in Northern Africa. It is found in the Eastern Sahara of southwest Egypt. Tarfawi and Sahara East, a neighboring archeological site, are the most prominent of several deflational basins cut into the upper beds of the Basal sands and gravels (Hietala and Applegate, 552). It is a modern depression of Quaternary sands and gravels, resting atop an older depression cut into Nubia sandstone. The date of the original depression is not known, but evidence found in the area places it in the Middle Pleistocene. The Bir Tarfawi basin measures 13 km north-south and 3 km east-west (Wendorf, Close, Schild, 50). This depression has a long stratigraphic sequence showing a series of wet periods separated by arid episodes of varying magnitude.

Some of the techniques used to obtain dates are experimental, and none give entirely consistent results. Methods that were used to date sediments at Tarfawi are uranium-series; electron spin resonance (ESR); thermo luminescence (TL) of unburned detrital sediments and burned material; optically stimulated luminescence; and amino acid racemization in ostrich eggshell. So far, the optical technique provides the most internally consistent suite of dates for Tarfawi (Hietala and Applegate, 560). Racemization analyses of eggshell from E-88-1 (Section BT-B) indicate a maximal age of 175 ka. Tarfawi sites have been placed into

time periods based on an independent model for the chronology of the Lower and Middle Paleolithic wet phases in the Eastern Sahara. Tarfawi Middle Paleolithic lakes must date to wet periods before both of the Late Pleistocene Nilotic alluviations, and before the end of the Nilotic Middle Paleolithic (Hietala and Applegate, 558). Radiocarbon dating placed the younger alluviation to about 20 - 12.5 ka. Radiocarbon and TL analysis determined that the Late Middle Paleolithic alluviation lasted from about 60 ka to 40 ka. Therefore, the last pre-Holocene wet episode in Egypt was 60 ka. This information is used to date the several layers of lakebed found in Tarfawi. Dating is also found by comparing tools found at Tarfawi with those found in other parts of Africa. Late and Final Acheulean tools have been found around 230 ka, which is believed to be the beginning of the Middle Paleolithic, or Middle Stone Age, in Africa. The Paleo-environment at Tarfawi was much different than that found today. It is believed that the Acheulean and Middle Paleolithic lakes found in two depressions were simultaneous responses to changes in the local environment (Hietala and Applegate, 552). These lakes dried completely on at least three occasions. There were at least five Mid-Paleolithic lacustrine phases. The last four phases took place in the same basins. The earliest phase occurred in the White Lakes, a separate and higher basin. The White Lakes have been tested for age estimates, but the results are inconclusive.

The separation between the first and last four phases indicates a great change in the period of aridity between the second and fifth lakes (Hietala and Applegate, 554). The White Lakes are considered older than the Sand Pan lakes because the deflation of Tarfawi White Lake basins cut down 2 m. below that of the Sand Pan. The Sand Pan Lake was a small seasonal lake fed by local rainfall. Shallow tributaries drained the surrounding plain and entered the central part of the basin. Rainfall during this time is believed to have been less than 200 mm and greater than 50 mm. Seasonal rainfall is indicated by the lack of water sediments or chemical sedimentation. The lake probably existed around 175 ka, and is probably younger.

There are four episodes of lacustrine sedimentation, separated by periods of aridity that represent phases in the same lake. The separate lake phases at Tarfawi are referred to as Grey Lakes 1-3 and Green Lake. Grey 1 is 100 m in diameter. Numerous dates for this lake period have been found, ranging from 120 ka - 140 ka. Dates around 130 ka are most commonly accepted. Site BT-14 is located on this lake. Here, bones and

artifacts occur throughout the sands, indicating that the lake was seasonal and was reduced to a very small pool in the dry season (Hietala and Applegate, 555). In phase Grey 2 swamps were fed by rising groundwater and local rainfall. Waterholes at BS-12 suggest that during one season of the year even the deepest parts of the basin were dry. High levels of lacustrine deposits indicate that in this phase the lakes of Tarfawi and Sahara East may have been connected. Dates for Grey 2 are inconsistent.

Grey 3 is smaller than the preceding phase. Gravely sands were washed into the lake by local rainfall. Tests run on ostracods suggest a presence of saline in the lake. Dates were not found for this phase. The Green Lake phase contained a lake that was 1.5 - 2 m. higher than basin depths reached in earlier phases. In some areas depths of 244 m. were reached. Most deposits are either silts or sandy silts. Soil development in deep parts of the basin indicates that the lakes were seasonally dry. The Green Lake existed during the last Mid-Paleolithic wet phase in the Eastern Sahara, which took place before 60 ka.

The largest faunal assemblage comes from BT-14, of the Grey 1 phase. It includes the white rhinoceros, wild ass, warthog, a large giraffe, giant buffalo, various antelopes, and gazelles. Turtles, crocodiles, brown hare, porcupine, wildcat, jackal, and varieties of hyena were also found. Rodents and birds found in the area indicate a surrounding landscape of wooded savanna. It is not possible to distinguish between natural and human-caused deaths, or to distinguish between human hunting and scavenging. Bones were found mixed with Middle Paleolithic artifacts. Artifacts were found around every major cluster of bones at site BT-14 (Hietala and Applegate, 557).

It is commonly found that the higher the likelihood of repeated occupations, the less the likelihood of obtaining discrete spatial information concerning the behavior of occupants (550). The sites at Tarfawi have been found to be either single-use sites, or single-use sites that have been used multiple times. It is presumed that all sites were day-sites only. The tools found at Tarfawi have been described as flakes, unretouched non-Levallois flakes, and tools, unretouched Levallois flakes. The tools found are on average very small for the two sites in the latest period. Sites E-86-2 and E-87-2 indicate increased core and tool curation in the later period, as there is a correlation between smaller tool-sizes and high flake: core ratios. Sites that are close to the center of a small lake, such as those found during Grey Phase 1-3) were covered with

washed in sandy material. This led to good bone preservation. The need for water and the fluctuations in the level of the lakes ensured a seasonally variable exploitation system. Water was available only in lakes, which made Tarfawi a popular place for animals and people alike. Deposits of quartzitic sandstone are available 3 km east of Tarfawi. Most of the tools found were made using quartzitic sandstone and rare quartz. The only non-local stone that is represented is basalt, the nearest source of which is 50 km east. Although evidence supports that stones were carried between sites, the absence of foreign materials indicates that stones were not carried over long distances.

Sites that were probably used when lake-levels were seasonally high are all dominated by denticulates. The consistent association of these tools to beach sites indicates that plant processing was a major activity during the Middle Paleolithic. The absence of animal bone and the stress on denticulates could mean that plant foods were the most important part of the diet in the months after rainfall. The Mousterian Group can be found in assemblages at E-87-5, BT-14, and E-87-3. Side scrapers and Mousterian points are the most common types of tools found in these exposed lakebeds. This might mean that most tools were brought to sites as struck flakes or finished retouched tools, with specific tasks for which they were prepared. The emphasis on denticulates, and grinding-stones found at BT-14, suggest the importance of collection and processing of plant-foods. However, the association of denticulates with animal carcasses suggests that these tools were used as butchery tools as well as for plant processing. The spatial distribution of flakes compared to tools infers that tools were made and then removed from the location to conduct a job. Tools have been found near their fitting flakes, an example of one-time tool use.

Wendorf, Close and Schild 1897 "Recent work on the Middle Palaeolithic of the eastern Sahara". *The African Archaeological Review* 5, 49 - 63.

Hietala and Applegate (chapter 37) and Wendorf, Schild and Close (chapter 38). *Egypt During the Last Interglacial*.