

Why Stone Tool Making and Meat Eating Were So Significant in Human Evolution

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While there is some discrepancy between anthropologists about exactly when and how the use of tools began and whether the increased brain size initiated tool making and meat eating or visa versa, it is agreed upon that tool making and meat eating were integral factor in man's evolution and dominance. Man developed a need for protein, which meat provided. This diet allowed man to become more developed. Tool making allowed more efficiency in obtaining meat for their diets and once fire was discovered, more advanced tools were made and it was possible to cook meat and vegetables, which allowed for the body to obtain the nutrients more efficiently from the food.

Early transitional humans were primarily wild plant food collectors and occasional scavengers of meat and eggs. By the time homo erectus appeared, hunting and carcass scavenging were becoming much more common. (Early Human Evolution: Early Human Culture, <http://anthro.palomar.edu>). It was hard for a primate with a humanlike digestive system to satisfy its protein requirements from available plant resources. The homo habilis had developed a requirement for protein and with their digestive system, they were not able to get that from the available plant resources. While leaves and legumes are high in protein, they contain substances that cause the proteins to pass through the body without being absorbed. Thus, in addition to plant resources available, the major new source was animal protein, which came from fatty marrow and whatever other edible leftover flesh remained in and on the bones of the dead animals. (Haviland, et al., p. 67-68).

While the early humans developed the need for meat in their diet, they lacked the teeth necessary to rip and cut the flesh of animals. Thus, it was necessary to produce tools in order to obtain and prepare the meat needed for their diet. The use of tools allowed homo habilis to change slowly from scavenger to predator.

Evidence has shown that the larger the brain size, the more sophisticated the tools were. Throughout most of the homo erectus geographic range, there is clear evidence of progressive improvement in tool making over time. The late homo erectus was able to use patterns from their predecessors guiding them in the manufacture of their artifacts. In addition, the reliance on tools increased as the implements became more useful. By 400,000 years ago, major homo erectus sites commonly had tens of thousands of stone tools. (Early Human Evolution: Early Human Culture, <http://anthro.palomar.edu>).

The first unquestionable stone tools were probably made and used by homo habilis approximately 2.5 million years ago. Their brain size was approximately 800 cubic centimeters. Homo erectus, who lived from 1.8 to .4 million years ago, had a cranial capacity of 1,000 cubic centimeters. The size and shape of their brain indicate they probably communicated with a simple language. (<http://earthlife.net>). Modern humans have an average cranial capacity of 1,400 cubic centimeters. Thus, we see that as time passed the human brain developed into larger sizes, which allowed for more advanced tool making.

In 1959 Mary Leakey found fossils in the Olduvae Gorge in Tanzania, which were dated to around 1.8 million years ago and which were associated with homo habilis. This type of tool making was named Oldowan after Olduvae Gorge. There are two main categories of tools in the Oldowan tradition. There were stone cobbles with several flakes knocked off usually at one end by heavy blows from another rock used as a hammer. This produced a jagged tool that fit easily in the hand. These “core tools” most likely functioned as hammering, chopping or digging implements. Probably the most important tools were sharp-edged stone flakes produced in the process of making the core tools. The simple flake tools were used without further modification as knives. Homo habilis continued to make and use stone tools in the Oldowan tradition for nearly a million years, but with gradual improvements. (<http://emporium.turnpike.net>)

Homo erectus, which appeared approximately 1.6 to 1.4 million years ago, had increased their skills to the point that they were making more sophisticated tools with sharper and straighter edges. Their advanced tool making tradition was called Archeulean. One of the most important of these new tools was the hand ax. They were elongated, oval shaped with one pointed end and sharp edges on the other side. Hand

axes, however, made up only a small percentage of the artifacts found at homo erectus sites. These early humans made a wide variety of stone tools that were used for processing various plant and animal materials. Their tools included choppers, cleavers, hammers, as well as flakes used as knives and scrapers.

Another major factor in the importance of the use of tools and meat eating that made it so significant to the human evolution was the use of fire. Homo erectus was the first known to use fire. This is supported by the charred bones and stones found in many of the homo erectus sites all over the world. (The Genus Homo, www.columbia.edu). Fire provided a great number of advantages, including warmth, light, safety from predators and cooked food. Fire gave early humans more control over their environment. They were able to continue activities after dark and it provided for warmth and light for cave dwelling.

Since cooking allowed humans to eat both plants and meat and to get more calories from many plants than are available when they are eaten raw, humans had access to more food than all other animals and they survived when other species starved. Access to extra calories that are not available to animals that can't cook may also explain why humans evolved with larger brains, which allowed them to dominate their environment. (Mirkin, www.drmirkin.com). The ability to modify food culturally through cooking may have paved the way for reduction in the tooth size and jaws of later fossil groups since raw food is tougher and requires more chewing.

The impact fire had on the social structure of early humans is significant. Campfires allowed for contemporary hunting and gathering societies. The use of fire for protection, tool making as well as for cooking set homo erectus on a unique evolutionary track.

While the evolution of humans from plant eaters to meat eaters and the use of fire took millions of years, it is very important to us as humans now. Proteins provided by meat helped early humans to develop and evolve with more efficient bodies. With the development of the body also came development of the brain. Brain size increased and humans became more intelligent, thus allowing for production of tools and later more advanced tool making. With the discovery of fire, even more sophisticated tools were

made and humans were able to obtain more nutrients from the food they ate, which allowed for better development of the human body and brain.

References

Haviland, et al., Cultural Anthropology-The Human Challenge, 11th Edition

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