BIOLOGY IN ENGLISH

Biocultural evolution began with *Homo*

Culture encompasses human activities and products that are passed on from one generation to another outside of direct biological inheritance. *Homo habilis* (and *H. rudolfensis*) could make the simplest of stone tools, called *Oldowan tools* after a location in Africa where the tools were first found. The main (core) tool could have been used for hammering, chopping, and digging. A flake tool was a type of knife sharp enough to scrape away hide and remove meat from bones. The diet of *H. habilis* most likely consisted of collected plants, but they probably had the opportunity to eat meat scavenged from kills abandoned by lions, leopards, and other large predators in Africa.

H. erectus, who lived in Eurasia, also made stone tools, but the flakes were sharper and had straighter edges. They are called *Acheulian tools* after the name of the french location where they were first found. Their so-called multipurpose handaxes were large flakes with an elongated oval shape, a pointed end, and sharp edges on the sides. Supposedly they were hand-held, but no one knows for sure. *H. erectus* also made the same core and flake tools as *H. habilis*. In addition, *H. erectus* could have also made many other implements out of wood or bone and even grass, which can be twisted together to make string and rope. Excavation of *H. erectus* campsites dated 400 000 years ago have uncovered literally tens of thousands of tools.

H. erectus, like *H. habilis*, also gathered plants as food. However, *H. erectus* may have harvested large fields of wild plants that were growing naturally. The members of this species were not master hunters, but aside from scavenging meat, they could have hunted a bit. Bones of all sorts of animals litter the areas where they lived. Apparently, they ate pigs, sheep, rhinoceroses, buffalo, deer and many other smaller animals.

H. erectus, who lived during the last Ice Age, moved northward. No wonder *H. erectus* is believed to have used fire. A campfire would have protected them from wild beasts and kept them warm at night, and the ability to cook would have made meat easier to eat. Plants can't provide much food in the dead of winter in northern climates, and so meat must have become a substantial part of the diet. It's even possible that the campsites of *H. erectus* were «home bases» where the women stayed behind with the children while the men went out to hunt. If so, these people may have been the first **hunter-gatherers** (**figure 1**), that is, they hunted animals and gathered plants. This was a successful way of life that caused the hominid populations to increase from a few thousand australopithecines in Africa 2 MYA to hundreds of thousands of *H. erectus* by 3 MYA. The hunting and gathering way of life doesn't permit a population explosion, however. Children have to be carried long distances, and the men were frequently not around to father children.

Hunting does most likely encourage the development and spread of culture between individuals and generations. Those who could speak a language would have been able to cooperate better as they hunted and even as they sought places to gather food. Among animals, only humans have a complex language that allows them to communicate their experiences symbolically. Words stand for objects and events that can be pictured in the mind. The cultural achievements of *H. erectus* essentially began a new phase of human evolution, called **biocultural evolution**, in which natural selection is influenced by cultural achievements rather than by anatomic phenotype. *H. erectus* succeeded in new, colder environments because these individuals occupied caves, used fire, and became more capable of obtaining and eating meat as a substantial part of their diet.

ANSWER

What great advantages did early humans obtain from toolmaking?

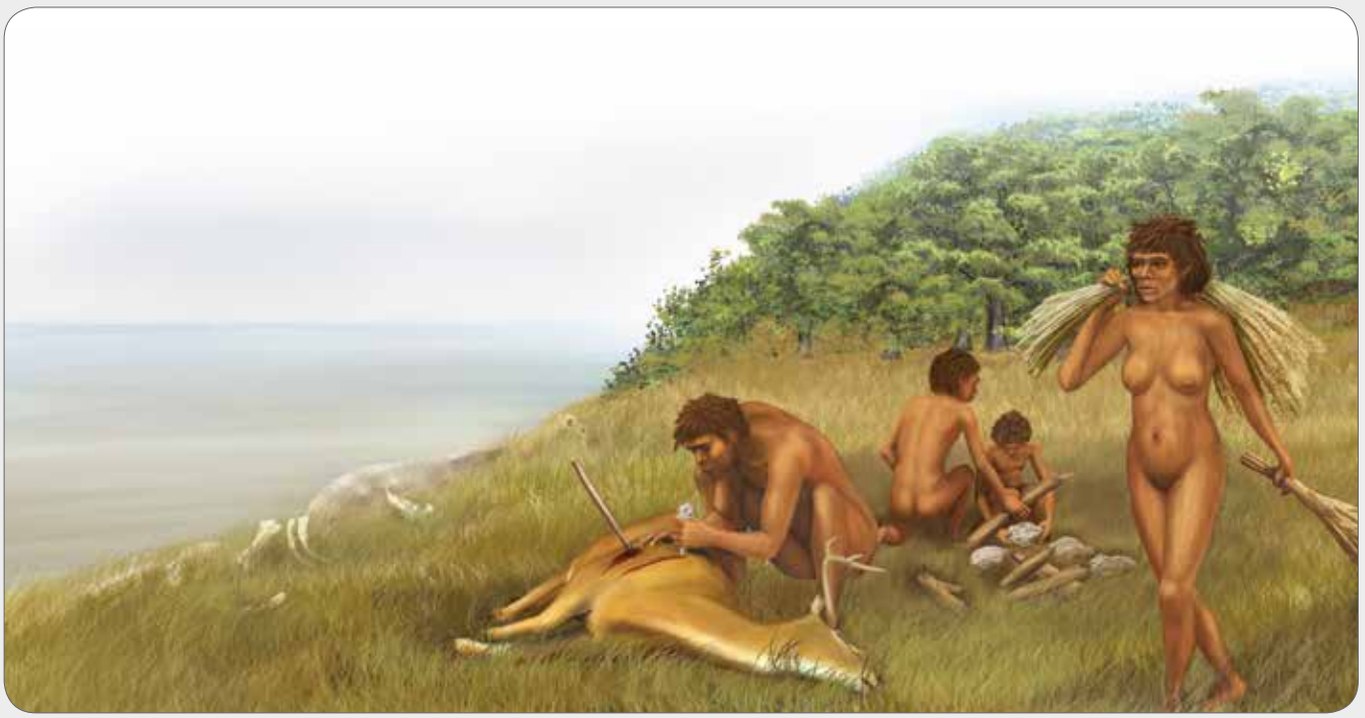

Figure 1 The *Homo erectus* people may have been hunter-gatherers.