5 Food Resources and Human Evolution

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Introduction

The human journey from forager to producer is a long one, encompassing nearly two million years of human prehistory. In some respects the development may be considered a retrograde one; a move away from seasonal to market forces, from seasonal abundance of a limited range of goods in the gathering of which all members of society played a part, at the expense of sporadic intensity of effort for maybe 2-4 hours a day, to an economy requiring the application of labour at any time during 24/7 by a workforce engaged in producing seasonal surpluses that supported increasingly specialist trades making goods that the primary food producers had no time to manufacture for themselves.

There were a number of factors in a fluctuating environment that exercised a powerful influence on the history of economic evolution. The most important were major oscillations in climate that periodically rendered parts of the globe inhospitable to human settlement either through flooding as sea levels rose with warmer global temperatures, or through the formation of ice caps across the continents, with a consequent drop in sea levels, exposing more of the land mass but equally making many of the northern parts of Europe, for instance, uninhabitable. The time span of these glacial and interglacial periods is indicated in the Timeline (Figure 5.1, p. 112)

The effect of these oscillations on human demography was crucial, since the availability and range of resources changed with the advance and retreat of the ice and it was the resources for subsistence that determined the size of animal or human population a given area of land within a region was able to support.

The early hominid record

> "And God said, Behold, I have given you every herb bearing seed which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed: to you it shall be for meat. And to every beast of the earth, and to every fowl of the air, and to every thing that creepeth upon the earth, wherein there is life, I have given every green herb for meat:
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> And God said, Let us make Man in our own image, after our likeness: And let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle and over all the earth, and over every creeping thing that creepeth upon the earth."
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> *Genesis Chap. 1. 26. & 29-30*

Hominid records take the 21st century research archaeologist back to around 2 million years before the present day and, if recent discoveries are authenticated, possibly more. All we have from the earliest phases of human development are intermittent bone deposits revealing the taphonomy of what happened to them and the relationships between predators and their prey – who hunted whom for food and who ate it. There is no question of studying their 'balanced diet' because the evidence for organic materials does not survive, but in many circumstances, especially in very dry climatic zones or in calcareous soils, bones of animals are preserved. It is clear in tracing the development of hominid species from their primate origins that dietary staples changed with climate. As the environment became more arid, there was a decrease of fruit bearing trees and permanent woodland during the mid Miocene, c. 15-8 million years ago. The early hominid species of Africa and Europe changed from a diet mainly of fruit to a greater dependence on leaves and roots. Evidence for this change may be traced in the development of dental adaptations to a change of diet (Klein, 1989). At the same time, with the reduction in the level of forest cover, they began to walk upright in the more open landscape. This in itself had its effect on foraging strategies.

Fossils discovered mainly in south and east Africa, originating around 4 million years ago but concentrated within a period 1.2 - 0.7 million years, include a number of species of Australopithecines and from 1 million years two species of hominid, *Homo erectus* and *H. habilis* evolved. These species were bipedal, walking upright and capable of running, although still agile tree climbers.

The most famous sequence of these fossil hominids was researched during the second and third quarters of the 20th century by the Leakey family and others in the ancient lake beds of the Olduvai gorge, Laetoli and Koobi Fora in northern Tanzania. Work on the teeth of *Australopithecus robustus* and *A. boisie* indicates that these hominids were largely vegetarian needing to chew their way through

considerable quantities of low calorie fruits, roots and leaves. His more gracile cousin, A. africanus, a group that included the well-known 'Lucy', was more eclectic, taking eggs, lizards and small mammals for food; and tooth wear on both *Homo habilis* and *H. erectus* indicates that they were becoming increasingly carnivorous.

Since they did not have the large canines for tearing at animal carcases and meat of other primates, these early hominids made and used stone tools of increasing sophistication for cutting, scraping, hammering and making further tools from wood or bone, in ways that facilitated the economic use of the resources available. Wear analysis on the tools can indicate quite clearly the use to which they have been put, and development of the tool types also gives a clue as to the development of resource utilisation. In the ascending lake beds, at Olduvai, was found a progression from simple unifacial tools, 'choppers' to bifacial, 'chopping tools' to complex handaxes of what is known as Acheulean type. In any form these are the best instruments for butchery and it is thought that their evolution may indicate the increasing importance of animals in the diet.

It is clear from cut marks on the bones found in the Olduvai studies, notably at muscle attachment points, and from wear analysis on the stone tools that meat was being taken for food, but there are also signs of scavenging of the carcases killed by other predators, as happens amongst the Hadza hunters of northern Tanzania at the present day (O'Connell *et. al*., 1988). Nevertheless, although the level of predation vs. scavenging by these hominids is still controversial, there is no doubt that a proportion of their nourishment was still gathered from roots and, seasonally, from fruits and shoots. Traditionally, gathering has been regarded as the role of the female members of many more recent hunter-gatherer groups.

There is also the evidence throughout the Palaeolithic, the period of the old stone age, for other animal predators and scavengers, like hyenas, both attacking hominids and consuming them and/or using their habitation sites, sometimes on the basis of seasonal exchange of occupation, especially where the habitat is a cave.

Evidence of controlled, as opposed to wild, natural fires was seen at the Olduvai Gorge sites and other east African sites in a context characterised by Acheulean handaxes dateable to around 500,000 years ago (Harris and Isaacs, 1976). This matches the earliest dates for man-made fires in both China at Zhoukoudian Cave and in Europe. However, the making of fires or burnt bone does not necessarily predicate cooking. Mammal bone, in particular, is an excellent fuel, with a high calorific value on account of its fat and collagen content and originally, the need for warmth may have been a primary purpose for making fire, more than for cooking.

The European scene

In Europe the Pleistocene is marked by a series of major climate oscillations between stages of warm temperate and cold periods when ice covered large areas of northern Europe, making much of the continent inhospitable to both man and animals, and much of the evolution and progress of hominid settlement is a consequence of the need to adapt to the demands of these fluctuations and the changes in the physical environment.

It is worth noting that climate change was an important long term feature of the Palaeolithic period. It manifests itself in major fluctuations in annual mean temperature lasting anything between tens of thousands of years and a few hundreds of years. During the warm phases, known as interglacial periods, the typical large herbivorous mammals grazing the land would have been the elephant, rhinoceros, and occasionally, a species of hippopotamus, red deer, various species of fallow deer, cattle and bison; but always horse, usually the heavy horse, *Equus caballus*. Predators included lion, sometimes the cave lion, bear and most important as an intruder or neighbour in cave occupation sites, hyena.

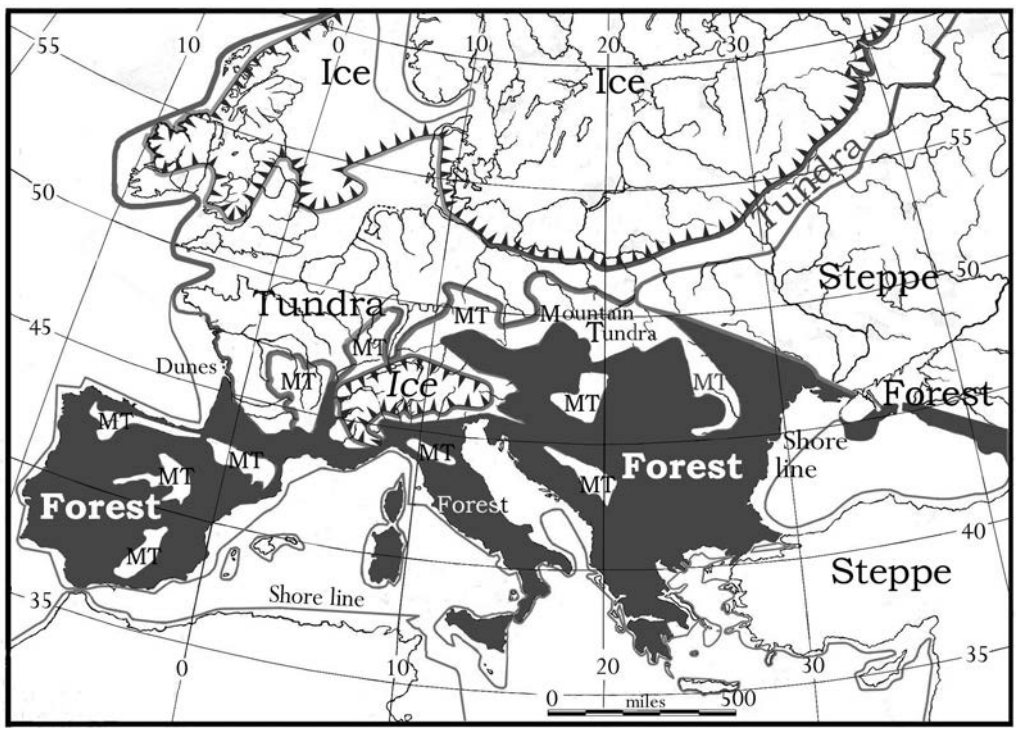

Figure 5.1: LGL extent of European ice cover and vegetation zones

The onset of colder climatic conditions not only caused a change in the animal fauna but also made considerable changes in the human demographic, especially