

Planning Ahead: Requirement for Moral Accountability

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One of the most fascinating apologetical issues concerns the place of fossil hominids in Christian theology. The command given to Adam by God, not to eat the fruit presupposes a certain ability to understand and prepare for the future. The prohibition required an ability to see the connection between future consequences and actions taken now. Adam needed to be able to plan not to eat the fruit as a step in obtaining God's gift of life and in avoiding the alternative, death. This ability is a prerequisite for accountability before God. Adam also had to possess an ability to keep the prohibition in mind for a long period of time, remembering it before, during and after his more mundane tasks. Maintaining a long term goal in mind while other activities are carried out requires that Adam be able to engage in a long sequence of steps leading to a particular outcome. If, like a child, he was unable to remember or maintain this long sequence of steps, then it would be difficult to hold him accountable. Mankind is capable of remembering very long sequences of steps toward a given goal; chimpanzees are not. The longest sequence of steps engaged in by chimpanzees in the wild may be that seen in termite fishing. The sequence consists of only 5 steps: pick twig, remove leaves, stick twig in termite nest, remove stick and lick termites off stick. Anthropological evidence can shed light on the ability of hominids to engage in multistep actions and actions requiring long memory and thus by implication can illuminate the time at which mankind was theoretically capable of moral accountability. Whether he was accountable is another question.

Given the generally accepted understanding that Adam and Eve must be the progenitors of the entire human race, and the general understanding that they had to live relatively recently (less than 100,000 years), there is a strong pressure on Christian apologists to seek solutions which disconnect anatomically modern humans from the preceding hominids. This is accomplished either via a separate creation for anatomically modern man¹ or the insertion of the spiritual element into a pre-existing hominid, either anatomically modern² or an animal-like hominid. However, anthropological data clearly indicate that ancient hominids were mentally capable of planning for the future and holding important tasks in long term memory for the past two million years. Thus if one of the above theological positions is true it means that the ability to understand and plan for the future are not unique to theologically defined mankind. This piece will not discuss the archeological evidence for spirituality in fossil man as that was covered elsewhere.³ This paper will examine mental capabilities of foresight and planning which are prerequisites for obeying God's commands.

Fire

One of the hallmarks of mankind is his use of fire. No other animal uses or controls fire. The maintenance of fire requires an ability to plan ahead and an ability to remember a complex sequence of actions. Fire may even require language.⁴ Animals simply do not possess these abilities.

Fire has two uses within primitive human cultures: cooking and the deterrence of predators. Many of the plants eaten by technologically-primitive man are toxic in the uncooked state. Yams, a food staple for many peoples, contain toxins that are used to immobilize monkeys, poison fish and birds and to kill head lice and *Macrozamia*, a cycad, must be carefully prepared to remove both a nerve toxin and an extremely powerful cancer causing agent.⁵ Yet if cooked, the toxins are destroyed and a hearty meal can be eaten. If the fire is for the purpose of deterring predators, it must be placed at the proper location and continually stoked. During the use of fire for cooking, one must know the sequence of steps involved in food preparation which may be many: finding the plant and processing the material (pounding, soaking, kneading etc.). Before the food could be cooked, a unique sequence of steps for the creation of fire must be performed. Prior to the invention of

ceramics there are two likely means of cooking. Vegetables could be impaled on a stick and roasted marshmallow-style. Alternatively rocks could be heated, placed in a previously prepared pit after which, the food would be placed on the rocks and covered with soil. All these procedures must be maintained in memory as one mentally calculates how long the previously collected wood will last before it is burned up, remember where there are excellent sources of wood, which woods burn best (green or dry), depart at the proper time for gathering the wood, and return before the fire goes out. He must also understand that the wood must be put on the fire and that correct distances for optimal burning must be maintained between large logs. If they didn't know how to make fire, they had to know and remember another sequence of steps for the maintenance of the fire. This often involves careful treatment of embers such as wrapping them in green leaves and carrying them in special containers. The number of sequential steps above are more than a chimpanzee is able to accomplish and among animals he is one of the best at remembering sequential steps.⁶ Clearly, the use and maintenance of fire requires essentially modern planning abilities which would also suffice for enabling the fire user to understand moral commands.

Twenty years ago it was believed that mankind's use and control of fire began around 500,000 years ago. But starting in the 1980's discoveries at Chesowanja, Kenya, at Swartkrans, South Africa and other sites revealed the use of fire much earlier. Gowlett lists several of these ancient sites.⁷ These are:

Site	Date
Vertesszollos, Hungary	166,000- 250,000
Terra Amata, France	300,000- 375,000
Ologesailie, Kenya	375,000- 460,000
l'Escaie, France	450,000- 550,000
Zhoukoudian, China	450,000- 550,000
Gadeb, Ethiopia	1,125,000-1,200,000
Yuanmou, China	1,210,000-1,300,000
Karari Escarpment, Kenya	1,375,000-1,460,000
Chesowanja, Kenya	1,375,000-1,460,000
Swartkrans, South Africa	1,600,000

Although controversial⁸, at Chesowanja, Kenya, there is evidence of the control of fire in the form of a hearth, an arrangement of stones surrounding the fire which resembles those found at much later sites. The clay was burnt and the mineralogical changes in the clay indicate a normal campfire temperature of 400-600 o C.⁹

While it is not out of the range of possibilities that the burnt material was due to a wild fire, such fires are of short duration and are unlikely to have baked the clay in the fashion seen at Chesowanja.¹⁰ And the Swartkrans site is widely accepted as evidence of fire use.

Why is this important? Because as Gowlett says:

"If the use of fire goes back to the Lower Pleistocene (over 1 million years), as seems likely, it can be argued that our ancestors had already achieved a basically human character: but this view will be hotly debated for some time to come."¹¹

Why then is there hostility to the idea of early fire among some archaeologists? One view is that fire use represents a considerable mental advance over stone tool manufacture, and that it must therefore be expected at a later stage. Holders of this opinion are unwilling to postulate the use of fire at any time earlier than is actually proven. But it seems likely that early humans beings who were skilled in stone tool manufacture and use would have a similar familiarity with wood (although it is never preserved).¹²

While the wood itself is never preserved, evidence of woodworking goes back at least as far as the earliest evidence of fire. Lawrence Keeley studied the microscopic wear on stone tools from the 1.5 MYR site of Koobi Fora and concluded that the tools were used to cut wood.¹³ What exactly was being done with the wood is unknown, but fire certainly can't be out of the question.

Huts

There is another, typically human use for the wood cut by hominids a million and a half years ago which illustrates a greater ability to plan than animals. They seem to have been making huts similar in form to those made by many modern hunter-gatherers. The activity of hut making requires a long sequence of steps which animals would be unable to mimic. The maker must go through the multitudinous steps of making the hand-ax whose simplest form requires at least 25 carefully placed blows.¹⁴

Then she must have a mental set of plans in her mind as she goes to chop down the appropriate saplings with the previously made stone tool. Then she must gather the appropriate material for covering the frame of the hut. This type of activity is different from nest construction seen in animals in two ways. Mankind is not running on instinct and animals do not use modified tools in the construction of their nests.¹⁵

While the earliest dated evidence of huts is controversial and most likely will remain so, the evidence is accumulating that hut-making was a common activity at this time. The earliest one was discovered by Mary Leakey at the DK site in Olduvai Gorge, dated 1.8 MYR ago.¹⁶ She found a circular pattern of stones, 12 feet in diameter resembling what is left from modern nomadic huts. At Melka Konture, Ethiopia, the living level was strewn with tools except for a cleared area 8 feet in diameter. In this region the surface was slightly raised above the rest of the area. Once again a few stone piles remained suggesting the presence of poles.¹⁷ Gowlett states:

"Ethiopia has a major share of early sites for, in addition to Hadar, there are other important sequences at Melka Konture, and Gadeb. Melka Konture has a number of different levels ranging from Developed Oldowan through to Late Acheulean. On one site, aged about 1.5 million years, there are indications of a cleared area, probably lying within a wind-break, and the excavator, Jean Chavaillon, suspects that fire was in use."¹⁸

At other, younger sites there is proof of the construction of habitations. At Bilzingsleben, Germany, the remains of three huts were found along with paved social areas.¹⁹ At the Neanderthal site of Grotte-du-Lazaret, a line of post holes marked the boundaries of a tent or habitation and *Homo erectus* and/or *Homo heidelbergensis*²⁰ was also making post holes for their habitations.²¹ The abbreviated list of hut sites is shown below.

Site/hominid	Age BP
Neanderthals	
Arcy-sur-Cure	40,000 ²²
La Baume Peyrards	80,000 ²³
Grotte-du-Lazaret	150,000 ²⁴
<i>H. erectus</i>/<i>H. Heidelbergensis</i>	
Terra Amata	350-400,000 ²⁵
Bilzingsleben, German 3 huts	300-400,000 ²⁶
<i>H. erectus</i>	
Melka Konture	1,500,000 ²⁷
Olduvai, DK1	1,800,000 ²⁸

Transport of Stone Tools

Probably the best evidence for future planning by hominids in the time period between 1 and 2 million years is that evidenced by the distance certain tools were carried. The distance that an object is carried for use elsewhere is a measure of the temporal planning range. Today humans transport oil for weeks on end across the oceans for use elsewhere. We plan projects that take decades to complete, like the aqueduct being tunneled under New York City or the construction of a cathedral. Primitive societies do not engage in planning on this

scale. Most of their planning is of a more limited temporal range, yet this is not due to an innate difference in planning abilities. It is due to the lack of opportunity to display their already existing talent.

Animals, like chimpanzees do not plan activities more than 20-30 minutes in advance. Chimpanzees use stone pounders to open up coula and panda nuts. The maximum distance a chimpanzee has been observed carrying a stone for this purpose is about half a kilometer. Given that it takes no more than 20 minutes to walk this distance, this represents the proven length of time that chimpanzees are capable of advanced planning. Humans on the other hand can plan days ahead. Dean Falk writes:

"Of course, humans are the supreme planners. A chimpanzee can hold on-line the location of previously stored food and go for it when permitted to do so. However, Savage-Rumbaugh tells us that unlike humans, chimpanzees have difficulty attending to more than one task at a time, do not plan much ahead, and seem to have no concept of death (perhaps the ultimate in planning ahead)".²⁹

Over the past 1.5 million years, mankind appears to have been able to plan actions days in advance. Two hundred thousand years ago a man in England manufactured a stone hand ax in such a way that he avoided destroying a beautifully preserved fossil lying on the stone's surface. The finished product displayed the fossil on the center of the hand-ax as if it were a blazon. We know one other thing about this hand ax. The nearest source for rocks with that particular fossil was 193 km distant.³⁰ The owner carefully managed the carrying of this object over that distance which, assuming a straight-line rapid walking rate of 30 km per day gives evidence of advanced planning 6 days in advance at least. Each morning he had to remember to pick the object up and carry it with him. This is much greater planning ability than possessed by chimps, but these six days represent the minimum planning time of which he was capable.

Other evidence of the foresight abilities of ancient hominids comes from the 1.2 MYR old archeological site of Gadeb, Ethiopia.³¹ Homo erectus carried a rare obsidian hand-ax at least 100 km from its nearest source to the plains of Gadeb. Once again, assuming a forced march, this implies a temporal planning range of at least 4 days. Why would they carry heavy rocks 100 kilometers?³² Obsidian can be fashioned into a very sharp tool where as the local Gadeb stones create poorer cutting edges. Given this, the one can reasonably postulate a reason for erectus to engage in this hard work.

One final evidence of planning ahead among ancient hominids comes from the Neanderthal site at Shanidar Cave, Iraq. Some modern cultures tie the heads of infants to boards in order to shape the skull to some preconceived vision of beauty. The fashioning of the skull by head-binding is a process that takes several years of effort. Native American societies flattened the heads of freemen but not their slaves. Both boards and sandbags were used to shape the crania.³³ One cannot immediately see the benefits (in perceived beauty). Neanderthals at Shanidar (50,000 years ago) engaged in head-binding and thus proved that they were capable of planning several years ahead.³⁴ Tattersall notes: There's also other possible evidence of 'modern' behavior from Shanidar. A couple of crania from the site may have been artificially deformed by binding the head when the individuals were young, a practice otherwise unknown except among modern people.³⁵

Conclusion

The demonstrable planning depth of the fossil hominids is clearly within the range of modern man and not within the range of the chimpanzee or other non-sentient beings. Clearly hominids as long ago as 1.5 million years ago, had the capability to have understood God's command not to eat of the fruit of the Tree of Knowledge of Good and Evil. To consider the members of the genus Homo as little more than bipedal animals, as some apologists have suggested, seriously underestimates their observed capabilities.³⁶

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