

The First Political System and the Empathy/Fact Relationship

Introduction

The idea of the political system is well established in political science. In this essay I will rely on the time-honored definition given by former American Political Science Association president, David Easton.¹ Easton's theory is that, out of all the behavior of people in a society, particular patterns of social interactions can be observed and identified as "political behavior." Individual and group activity becomes "political" when it is undertaken in relation to "the authoritative allocation of values for a society." In short, "politics," in Easton's interpretive framework, is the decision making process for establishing and enforcing public policy. Unlike Aristotle, the "father of political science," Easton's focus is not on the form of government a society has, such as democracy, oligarchy, or monarchy, but on the *actual behavior* of groups and individuals. That behavior is what forms the system.

For Easton, the dynamic process of political behavior inevitably follows a systematic pattern. No matter what society one is observing, whether high-tech, low-tech, north, south, east, or west, "political behavior" produces the pattern of the political system. That is, there are 1) "inputs," in the form of demands for particular policies, or member support or disapproval for the governing regime as shown, for instance in polling or letter writing. There are 2) "conversions," or the

¹ Easton was APSA president from 1968 to 1969. His primary works explaining his theory are, 1953, 1965a, and 1965b. Some of the chief misunderstandings of Easton's theory of the political system are criticized in Kelleher 2017.

government's policy making process, whether in response to inputs or on its own initiative. 3) "outputs," or the actual policies, legislation, and implementation that comes out of the conversion process; and, 4) "feedback," negative or positive, from the members of the political system, whether the public or interested elites. This self-reflective dynamic takes place in 5) an "environment," including natural and cultural conditions.

Political behavior, producing the pattern of the political system, can be seen taking place right now, all over the world. Not only are people in China, Russia, and the United States busily creating their political systems, but so are all the 193 member nations of the United Nations.² Indeed, folks in such societies as the Maasai tribe in east central Africa, the Iroquois Confederacy in North America, and the Yanomami in the northern Amazon, are doing likewise.³

Of course, all this political behavior, happening right now, did not just "pop" into existence. Because society is an event that has emerged in the course of evolution, political behavior, too, emerged at some point in evolution. My quest, in this essay, will be to try and find the very first pattern of political behavior in the long stretch of evolution. That is, the first patterns of behavior

² See the United Nations "about" webpage at, <https://www.un.org/en/about-un/>.

³ Writing a literature review in the late 1950s, Easton observed that the field of "political anthropology," applying his conception of the political system, "does not yet exist and will not exist until a great many conceptual problems are solved." (1959, 210) Assessing whether that is still true is beyond the scope of the instant essay, but see Arnoff and Kubik 2013.

to rise to the level of a “political system” – the common ancestor which all contemporary political systems replicate.

We will see that to understand the origins of the first political system, we must venture into the far distant past of human ancestry, way beyond the invention of written records over 5000 years ago. Indeed, we will go well past the time when *Homo sapiens* emerged in evolution, roughly two hundred thousand years ago⁴ and examine the ways our pre-human, hominid, ancestors lived.

While this project is intended to shed new light on one of the core concepts in contemporary political science, the political system, I will draw upon the knowledge, and empathic wisdom, of such other sciences as archaeology, paleoanthropology, animal breeding, population genetics, and prehistory.

⁴ The broad consensus among scientists is that *Homo sapiens* emerged in the region of east Africa between 150,000 and 200,000 years ago. But opinion is not unanimous as to either time or place. Arguments have been made that *Homo sapiens* first emerged in Europe, or North Africa, or Asia, or in these and other places both independently and simultaneously – the “multiregional theory.” Skull and bone fragments recently found in Morocco are said to show *Homo sapiens* evolved over 300,000 years ago. But DNA tests have not been run on those skeletal remains. For a review of the issues, with links, see Callaway 2017. Fortunately, political science does not have to either settle this debate or await its settlement before presenting the evidence for the origins of the first political system. (As we will see, *Homo sapiens* inherited the first political system from their hominid ancestors.)

Glynn Isaac's Food Sharing Model

One area of the world intensively studied by scientists seeking to learn how pre-humans lived is that section of the Great Rift Valley running through eastern Africa. For our purposes, by far the most significant of the reported research is that by the late Harvard archaeologist, Glynn Isaac (1978). He, along with Richard Leakey (1979), son of famed paleontologists Mary and Louis Leakey (1971), excavated several sites in the Koobi Fora region on the northeastern shore of Lake Turkana, Kenya. As Mary and Louis Leakey had earlier found in the Olduvai Gorge area of Tanzania, the Koobi Fora sites were rich in ancient pre-human remains, and hints about their behavior. (1978, 94). Isaac wrote of the discoveries he and his research team had made, not only to report the facts, but to interpret them. His most provocative thesis, and crucial to our concerns, is his “food sharing model” of how early pre-human hominids lived in these several scattered sites of east Africa. The time frame for these sites was generally from 2.5 to 1.5mya (“million years ago”). Isaac sees the sites as indicating a critical moment in the evolution of human behavior. And, as I will argue, this “food sharing” moment was also key to the emergence of the first political system.

As in Olduvai Gorge, different types of sites were found at Koobi Fora. Some had only stone tools. Some had stone tools and the bones of “a single large animal” (1978, 95f). Others had stone tools and the bones of “several different animal species” (1978, 95). The first type of site may have been a kind of “factory,” where hominids gathered simply to make stone tools, which they did by smashing one rock against another (1978, 99). The second type of site may have

been one which stone tools were brought to for the purpose of cutting up the carcass of an animal too large to be moved elsewhere. For instance, one site had stone tools, but only the bones of a hippopotamus (1978, 96). The third type of site has both stone tools and the bones from a variety of animals, such as the leg bones of antelopes, and bones from the whole carcasses of smaller wild life.

Isaac bases his food sharing model on these eastern African discoveries. He imaginatively interprets the implications of these excavations for the probable behavior of the hominids that created the sites. For his food sharing model, the evidence of stone tools associated with a variety of animal bones suggests that hominids repeatedly, and I would add, intentionally, brought their stone tools and meat bearing animal carcasses and body parts to a mutually agreed upon place for the purpose of cutting up the meat and sharing it with one another. Isaac refers to such places as “home bases.” If true, this behavior shows, among other things, a significant degree of planning depth and communication. While there may have been other types, or breeds, of hominid living in eastern Africa during this period, Isaac suggests that the food sharing ones “were directly ancestral to modern man” (1978, 96).

Isaac’s image of hominid behavior has numerous implications, and raises many questions, some of which Isaac addresses. For example, did these pre-human hominids obtain their meat by hunting, or scavenging? Did they have a division of labor? If so, how was it, and other social relations, organized and maintained? What language skills did they have?

Meat Eating Hunters

The site with the hippopotamus bones raises a contentious issue. That is whether the hominids hunted down and killed the animal, or “came upon it dead” (1978, 96-97). Isaac finds the evidence unclear either way. However, he does not see these hominids as the ferocious hunters of popular mythology. “Given the low level of stone technology in evidence. I am inclined to suspect scavenging rather than hunting” (1978, 97, cf. 102). Indeed, with little more than rocks and clubs in hand, the hominids of this period, which were under five feet tall, would have had to come in so close to a large animal, like a huge hippo. that they would have run a high risk of being bitten and stomped to death, while inflicting only minor injuries on the beast. Hence, “it seems less reasonable to assume that protohumans, armed primitively if at all, would be particularly effective hunters” (1978, 102). They may have hunted, or trapped, smaller animals, around the size of a small pig, “but the flesh of larger animals was probably available only through scavenging” (1978, 104. For a recent study in agreement see O’Connell et al. 2002).

Articulating the Food Sharing Model

Isaac notes that “we know for a fact that somewhere along the line in the evolution of human behavior two patterns became established: food-sharing and a division of labor” (1978, 100). However, Isaac is less certain about what other forms of behavior, belong in his food sharing model. He understood that his food sharing model is not a fully articulated paradigm of hominid behavior, and he expected succeeding researchers to work on filling out the model. While there were still many unknowns for him, he suggests that it might be helpful to consider the behavior of contemporary apes, especially the chimpanzee, and that of “hunter-gatherer” groups still living in Africa (1978, 93). Perhaps these comparisons can serve as a useful aid in imagining what sorts of behavior went into the making of the sites excavated in eastern Africa.

Isaac's Comparisons

First among Isaac's comparisons is the obvious fact that humans are bipedal, and can carry things even as they walk long distances. Hunter-gatherers use containers, such as trays, baskets, and bags, to increase the amounts of items they can carry. Upright walking and containers facilitate food sharing. Chimps, in contrast, are primarily knuckle walkers, and do not use devices for carrying. Carrying things by hand any substantial distance is too difficult for them as knuckle walkers (1978, 90).

Chimpanzee Food Sharing

From the point of view of the food sharing model, a very significant distinction between primate and hunter-gatherer behavior becomes apparent. That is, the individual primate is primarily a self-feeding forager. With few exceptions, such as maternal behavior, while feeding and moving about as a group, the mature individual primate is responsible for his or her food acquisition. In contrast, for most hunter-gatherers, "the acquisition of food is a corporate responsibility" (1978, 92). Unlike primates, hunter-gatherers commonly share food within their group as a central part of their "primary subsistence adaptation" (1978, 90, 92). "Food is exchanged between adults, and it is shared between adults and juveniles" (1978, 92).

While hunter-gatherers share all types of food, "Vegetable foods, which are the great apes' principal diet, are not shared and are almost invariably consumed by each individual on the spot." (1978, 93). Also, like other primates, chimps only "occasionally feed on meat." When a male hunts down a monkey, other chimps become excited and beg for a portion. Isaac calls this

“scrounging.” The male might parcel out pieces, but generally does this strategically. He either rewards allied males or buys favor with females. As Isaac comments, this behavior “falls far short of active sharing” (1978, 92).⁵ Thus, because food sharing is quite marginal for primate survival, perhaps the behavior of hunter-gatherers is more indicative of how the food sharing hominids lived.⁶

Projection

Isaac does not claim that any of the examples of our hunter-gatherer cohorts was the way the food sharing hominids actually behaved. As he noted, “one must strongly resist the temptation to project too much of ourselves into the past.” After all, “the hominid life systems of two million years ago have no living counterparts” (1978, 104). Instead, the items on his list are intended to be hypotheses made “explicit so that [they] can be tested and revised” (1978, 108, cf. 101f).

Isaac in a Larger Context

Having sketched out Isaac’s model for the hominid way of life, I will discuss some of the reactions to it by succeeding scientists. As we will see, some of them doubt the model’s efficacy, while others offer more constructive criticisms and insights both to clarify it and to amplify it. This discussion will show how and why Isaac’s food sharing model is the foundation for our explanation of the emergence of the first political system.

⁵ For a more recent account of chimp food sharing, see de Waal, ed. 2001, Chapter Four.

⁶ Kelleher 2016 examines de Waal’s claims (at 1998) for chimp “political” behavior, and finds that this does not rise to the level of a political system, as defined by Easton.

But first I will address some preliminary questions about hominid life prior to the period Isaac models. For instance, how did hominids live *before* at least some of them became food sharers? Was it like their primate cousins, as self-feeding foragers? If so, how and why did the hominids of Isaac's model become food sharers? How was the transition to the food sharing way of life accomplished?

The Split

Isaac recognizes that the story of how food sharing came about for the hominids he studied begins with the initial divergence from a common ancestor to both the chimpanzee lineage and the hominid lineage. (1978, 94). He points out that experts disagree as to the exact time frame in which this speciation event took place. Besides differences of professional opinion, different methods for estimating the time frame can lead to vastly different numbers. Isaac notes that it "is not yet established beyond doubt whether the divergence occurred a mere five to six million years ago, as [some scientists] argue on biochemical grounds, or 15 to 20 million years ago, as many paleontologists believe on the grounds of fossil evidence." (1978, 93).

But since Isaac made that observation, in the early 1970s, more of a consensus has developed among the scientists who have studied the matter. While far from having an exact measure, the

weight of opinion among paleoanthropologists, geneticists, and other scientists is that this split, or divergence, falls between five and seven million years ago.⁷

One reason for this broad spread of time from the last common ancestor to the appearance of the hominid species is that the speciation process generally does not happen overnight. In this case, the process likely took place gradually, over millions of years, and it was far from a uniform progression.⁸ Paleontologists have discovered the bones of many types of hominids. These findings form a spotty mosaic of new variants appearing here and there, rather than a clear course of development towards a particular end. The hominid type that Isaac depicts in his food sharing model is but one piece of that mosaic.

Let us suppose, then, that the split in the course of evolution between chimps and hominids began roughly 6mya. Suppose we also agree with Isaac that by 2mya food sharing was “already part of a novel adaptive strategy” for at least one group of hominids (1978, 94). One challenge for interpretation is, then, to try to explain what likely happened in the four million years between Point A (when the split began) and Point B (when food sharing hominids emerged). In the following paragraphs, I will take on that challenge.

⁷ For an example of the disagreement between geneticists compare Patterson 2006 and Barton 2006.

⁸ The cartoonish image of a neat progression from a monkey evolving into an American businessman carrying his briefcase has probably done more harm than good for the understanding of human evolution.

Speciation and Sexual Selection

Different forms of life generally develop out of a process of speciation. Typically, in an animal species, for instance, some members of a group within a species become geographically separated from their breeding community. The members of the separated group become reproductively isolated from their kind. Of course, members of the separated group continue inter-breeding. Genetic mutations occur in all populations, and when this happens in an isolated group, a mutation can become a characteristic of the group.

Perhaps a mutation gives some adaptive advantage to the members of the group. For example, the giraffe's long neck enables it to reach nutritious leaves and fruits high in the trees, as well as see potential predators in the grass and bushes. Members of the species with shorter necks had less access to the nutritious food, and were less able to see approaching predators. As shorter neck individuals were eliminated, the former mutation for growing a long neck became a fixed characteristic in the species by a process of natural selection.

But a genetic mutation can also become fixed in the genome of a species by another route; that is, sexual selection. Darwin's favorite example of this process is the multi-colored, wonderfully patterned tail feathers of the peacock (or male pea) (1871, 126f). Suppose a group of ground feeding fowls had become reproductively isolated from its fellows. Among them a mutation for colored feathers in the tail of a male fowl appeared at random, and some of the females felt especially attracted to him as a lover. Some of the male offspring of his mating partners would have inherited the gene for colored feathers in their tails, and some females would have inherited

the propensity to find such males irresistible. An upward spiral began, and eventually the current patterning became fixed in the genome of the species (Darwin 1871, Fisher 1930).

Last Common Ancestor

There are no fossil specimens of the last common ancestor to the chimpanzees and the hominids. But scientists seem to generally agree it was a gibbon-like creature. While some members of the species may have lived in Eurasia, others lived in east Africa. Indeed, the consensus of opinion is that the split took place in the Great Rift Valley, in eastern Africa. Since all primates, including chimpanzees, live as self-feeding foragers, it is likely that prior to the split this is how our last common ancestor was adapted to its environment (Isaac 1978). The creature probably preferred to dwell and forage in trees, with occasional forays on to *terra firma*. It was likely able to stand upright on tree limbs and on the ground. But it probably lacked the vertical backbone needed for regular upright walking. Perhaps it was around two feet tall, weighing up to 25 pounds (Nengo 2017).

Becoming reproductively isolated from this common stock, ancestors to the chimps began their trajectory of evolution, and ancestors to the hominids went their way. Both lineages grew physically, and both adapted to more ground living than their common ancestor. But the chimps have remained relatively attached to the trees, while the hominids became wholly ground dwellers. As Isaac noted, the chimps evolved up to the level of knuckle walking on the ground, while hominids developed skeletal structures adapted to exclusive upright walking. Along the way, individual hominids began sharing food more often than their primate relatives. One question left unanswered by Isaac is as to how this food sharing behavior could have begun?

The Start of Food Sharing

One way food sharing could have begun is that within at least one group of hominids a genetic mutation for a food sharing propensity began to appear. Because of Isaac's work, we know where this mutation leads. Isaac wondered how natural selection could have favored the development of this hominid characteristic. But he admits this "puzzle" stymied him (1978, 93-94). Perhaps he was stuck because he was asking the wrong question, or looking in the wrong places. He did not consider that food sharing was clearly not necessary for the survival of the hominid species. Those creatures could have gone on for as long as the chimps, and other primates, have, living as self-feeding foragers. So, contrary to Isaac's presupposition, the food sharing characteristic is not likely the result of natural selection. Most likely, the genetic basis for the food sharing propensity became fixed in this hominid's genome by sexual selection.

Because some hominids became food sharers, it is likely that a genetic based mating preference for individuals who shared food developed among the ancestors of those hominids. As we have seen, female peacocks probably developed a sexual preference for peacocks with beautiful plumage. However, Darwin's example of the peacocks assumes a male genetic lead, and a responsive attraction developing in the females. But the implication of a male initiator, and a relatively passive female response, is not a necessary, nor a proven, scientific principle. Sexual selection can entail a complex mix of motivations, as it fixes a characteristic in the genome of a species. An individual, whether male or female, could have both a propensity for food sharing, and a sexual attraction to those other hominids who display it, without one always being the initiator and the other always the responder.

Imagine a band of hominids self-feeding as they roam about their foraging range. A female finds a grub with a delightful flavor. She's never had one like this before. She picks up another one and offers it to a male acquaintance from her group, who happens to be foraging near her. Members of groups share life together. Her gesture is simply a continuation of that process, an expression of comradery. She need not have any self-interested ulterior motive, or scheme. Perhaps without words, she just gestures that he try it, simply because as a fellow creature he might like it, too.

Sharing this dining pleasure adds to the quality of their common bond as members of the same band. Also, generally, to share food requires physical proximity. Add all this together, and the next step is highly likely. The genetic proclivities entailed in this scenario are those for offering to share food, those for the receptivity to such an offer, and the mysterious complex of genetic codes resulting in sexual attraction.

Variations on this "girl meets boy" story would have had to have been repeated many times, over perhaps scores of generations, as a necessary step towards the end result that Isaac discusses. Gradually, these hominids bred themselves into creatures with a propensity for food sharing. As the process unfolded, there would have been interbreeding bands of hominids who, of necessity, continued to live primarily as self-feeding foragers, but also increasingly sharing food, because their inner desire to share food was in a genetic spiral due to their sexual preferences.

As their desire to share food increased, so would their alertness for opportunities to do so. As creatures who live by self-feeding while they forage, sharing opportunities are limited by the necessity to sit and chew the foods each feeds himself or herself. Chewing some raw foods can be more time consuming than chewing soft foods, or cooked foods. Since they did not have cooking, as yet, time spent chewing one's own food would cut down the time available for sharing, even if they wanted to share more. Food sharing has another practical limit within the forager social organization. Chaos would ensue if each forager always fed another, rather than himself or herself. So food sharing would have to be an incidental activity within the self-feeding way of life. To become exclusively food sharing would require transitioning to another form of social organization.

An Emergent Culture

As we all know, along their evolutionary way, hominids invented stone tools. Among other things, some stone tools could be used for preparing raw food to make it easier to chew. Tough tubers dug from the ground could be sliced, and the pieces pounded to soften them. Some hominids likely saw this as an opportunity for sharing. With tools, one band member could slice and pound turnips, while other members brought in some berries and insects, perhaps on bark trays. Such events were probably intermittent prior to becoming socially organized for the food sharing way of life. This occasional sharing is how a nascent division of labor, to facilitate food sharing, likely emerged in the hominid cultures that were taking shape along the Great Rift Valley in eastern Africa.

Mating preferences would have intensified this cultural trend. Selfish, non-cooperators were likely considered less desirable by both sexes. One tension involved in this transition is that self-feeding is *ipso facto* a selfish act, and it requires almost no cooperation. So the transition to a more cooperative culture would probably have involved considerable frustration and some conflict. Those with the stronger desire for cooperation so as to share food would have had to form their own bands. Either they were driven out by the more selfish creatures, or they formed norms of their own, and banished the violators.

Hominid Social Organization

Isaac speculates that just as primates, as well as hunter-gatherers, pay much attention to social relations and hierarchies, so too the hominids of Koobi Fora and Olduvai Gorge were surely concerned with “the fine adjustment of social relations,” particularly in the allocation of labor tasks and shares of food (1978, 106). However, as Isaac suggests, little or nothing is known about the social organization, much less the politics, of the hominids who achieved the level of civilization displayed by the sites he and others have examined. That is one gap in his model this essay proposes to fill.

Critiques of Isaac

In the field of hominid studies, Isaac’s thesis that early hominids eventually transitioned from a self-feeding foraging way of life to a food sharing way of life is generally not in dispute.

However, some of the concepts in his food sharing model have been critically examined by subsequent experts. His concept of the “home base,” for instance, has drawn quite a bit of attention.

The archaeologist, Lewis Binford (1981, 2014), was strongly skeptical about Isaac's theories of hominid behavior. For Binford, the interpretations of the associations of bones and stones proposed by Isaac, the Leakeys, and others, were accepted too uncritically. He doubted that any inferences about hominid behavior were warranted by the sites, except that hominids were probably there, but only as scavengers for morsels of uneaten meat and the marrow in bones left by animals (2014, 282, 296).

In his view, Isaac's inferences about "home bases" improperly suggests long occupancy in places that may actually be only aggregates of refuse left behind, mostly by animals, over very long periods of time (2014, 296.) He suspects that notions about hominids "carrying food home" to share with their families are "wildly inaccurate," mere "myth making," and "just-so stories" (2014, 282, 251, 291). Binford makes fun of Isaac's model by presenting an exaggerated caricature of it as "a kind of middle class genteel protohuman who shared his food, took care of his family, and was on his way to being emotionally and intellectually human" (2014, 295f). Incidentally, Binford also rejects Robert Ardrey's widely read "fanciful" theory of early hominids as "killer apes." On this point, Binford agrees with Isaac that a careful scrutiny of the accepted evidence shows that our distant hominid ancestors in Africa probably did little or no hunting. For Binford, hunting as a regular practice likely began only after the bow and arrow made it safer to do so (2014, 296).

In line with the methods of positivistic natural science, Binford shatters to take any but the most cautious steps of inference beyond describing what is visible to the eye of the excavator in

hominid studies. For example, “bone 21 was found lying six inches from stone 43,” etc.

Presumably, Binford’s method would exclude empathic interpretations of hominid feelings and intentions. He does acknowledge that it is proper to ask what generated the conditions observed and described, but students of hominid life must “employ a reliable methodology for giving meanings to these facts as a way of gaining some idea if the conjectured past is anything like that past as in fact it occurred” (2014, 250).⁹ Binford’s critiques had the fortunate effect of prompting other experts in the field to take a closer look at Isaac’s concepts

Potts on Home Bases

As we have seen, Isaac offered his interpretations of the sites at Koobi Fora and Olduvai Gorge as hypotheses which he invited other scholars of the subject matter to test. Indeed, just a few years later, one such scholar, Richard Potts (1984), took up that task. After scrutinizing the

⁹ For interpretivists, “that past as in fact it occurred” cannot be known. Only interpretations of the past can be known. These derive their validity from the consensus of the informed community. Binford’s positivism would also find it difficult to acknowledge that pre-human hominids were sentient beings, and he would therefore be sceptical that the feelings or motivations of such distant creatures could ever be known. Indeed, in the extreme, as the old joke goes, one positivist in a lab would stare at his colleague and wonder if he is sentient. Rejecting positivist dogmatics, empathy must assume that genetically close living organisms have a similar consciousness and some similarities of emotions and experience. This point is further argued by biologist, Marc Bekoff 2013. Cf. Low 2012. Also see, “Animal Consciousness.” https://en.wikipedia.org/wiki/Animal_consciousness

evidence acquired by the excavators of these sites, Potts challenged some of the elements of Isaac's food sharing model.¹⁰ In particular, like Binford, Potts argued that the characterization of these sites as "home bases" was unjustified. But Potts aimed to improve the model, not to reject it.

While Potts agreed with Isaac that observations of contemporary hunter-gatherer life could have some heuristic value for interpreting hominid behavior, he was stricter than Isaac in his insistence that neither the behavior of contemporary hunter-gatherers nor that of contemporary primates serves well as "a modern analogue" for explaining the activities of those early hominids (Potts 1984, 347, 339f; 1988, 8). Because times change, interpretation "requires an open mind to *uniqueness* in the activity of early hominids" (1984, 347 italics added). In his view, unlike Binford, the evidence does show that "hominids played an important role in the formation" of at least some of the sites under study (1984, 343). The problem, then, is to try to understand what kind of activities went on at these sites (1984, 343). If the early hominids were not making "home bases," then what were they doing? (1984, 342-343)

The popular image of the contemporary hunter-gatherer home base generally entails an encampment, with huts, campfires, and inhabitants sharing food and taking care of their young, elderly, etc. Potts notes while this picture is not always accurate, and rarely an analogue to early hominid life, it entails "two important aspects: the sharing of food, and the safety offered by a

¹⁰ While Potts focuses on Olduvai Gorge and does not discuss evidence from Koobi Fora, as Isaac did, Potts's arguments are not undermined by the omission.

protected base camp” (1984, 340). Isaac’s model only incorporated the first of these aspects, but does not consider the role of safety in interpreting hominid behavior. Surely, those hominids were constantly vigilant for their safety. Thus, by including the role of fear in hominid behavior, Potts offers a more empathic corrective to Isaac’s food sharing model.

Stressing the element of safety, Potts revises Isaac’s interpretation of the east African sites. Potts envisions three primary places involved in the hominid meat eating behavior. The first is the kill site; that is, the place where carrion is left behind by four legged predators. Potts, like Isaac, suggests that meat from big animals was likely obtained from kill sites. As these hominids were as yet unable to bring down large prey, maybe the meat was scavenged after the killer ate its fill and abandoned the rest, or maybe the hominids scared it off.

Aside from the kill site, Potts distinguishes the worksite, where the meat is taken from the kill site for butchering. The third place, away from the worksite, was where the band of hominids could safely eat the meat, and probably other foods, together.

Generally, the kill site would not be a safe place for the hominids to carve up their carrion. The lions, hyenas, or other large carnivore that made the kill might return and pounce upon one of the comparatively petite hominids. Hominids were also vulnerable to those smaller predators that travelled in packs, such as the African wild dogs. Such animals in the area may have heard the sounds of the kill, or have seen circling vultures, just as the scavenging hominids likely did, and also sought out the place as an opportunity for food. Thus, it would be unwise to linger in such

an area. (Perhaps the hippo site, mentioned by Isaac, required the hominid meat cutters to stay in one place for longer than usual because there would have been so much meat to cut.)

The worksites are known to have a variety of stone tools that can be used for cutting, scraping, chopping, and cobble stones to use to knock sharp flakes off other stones. The early hominids could not carry all this equipment with them as they roamed in their core areas engaged in self-feeding foraging. So as a matter of convenience they would have a variety of worksites scattered around their foraging range. In this scenario, while foraging, a hominid would only have to carry one sharp stone flake for cutting. Those cutting implements would be useful for butchering carcasses, as well as for carving digging sticks, and for cutting vines, branches, and opening plant based foods, such as tubers dug out of the ground and too tough to bite into. When the hominids came across a fresh kill, they could quickly cut off large chunks and carry these to the cache of stone tools for further working. Potts finds that there is “no evidence that whole or nearly whole carcasses were transported to the [prehistoric] sites. Instead, it is primarily limb bones” (1984, 344).

But even these worksites were dangerous places for those who stayed too long. The smell of blood would surely have attracted hungry predators. Potts notes that the Olduvai sites have the bones of many smaller carnivores and those of some large ones as well. This suggests that large ones may have killed small ones, and even vice versa, at the spot where hominids had been working on their treasures of meat. Indeed, some hominid bones have also been found at the worksites. That means they probably died there. One hominid skull was found with scratches of carnivore teeth marks on it (1984, 344).

Thus, the better part of valor would have been to cut off chunks of meat and pass them out quickly so the band members could carry their share away from that space to another area where it would be safer to sit and munch on their prize. And, as I mentioned above, chewing raw foods requires a long time. So sitting and eating at either a kill site or a butchering site for the time required to chew their raw food would be extremely risky.

We see, then, that taking a more empathic view can change the meaning of the evidence. Now Isaac and the Leakeys can be understood as having excavated *worksites*, rather than “home bases.” Considering the need of the hominids for more personal safety, Potts proposes the existence of a safer place in which to eat their common meal. If such an inferred place is factually correct, then the meaning of the sites Isaac called “home bases” requires rethinking.

Stone tools may not have been needed at the safe consumption sites. The raw meat was likely carried to the site by hand, perhaps on a bed of leaves, or on a bark tray. Plant food to share was also likely carried by the same type of degradable material. In this scenario, the bones and stone tools left at the worksites are the only artefacts that survived two million years of weathering.

The third place, where the shared food was safely consumed, has left no such enduring artifacts.

Social Life

Isaac’s home base model envisions both a division of labor and hominids engaged in socializing during their communal feast. While Potts agrees that a cooperative ad hoc division of labor must have occurred at the Olduvai worksites, in his view, “it is not possible to assume that food-

sharing [as in a common meal] ... occurred at the early sites at Olduvai. The available evidence suggests that hominids would have minimized the time spent at these sites, rather than having used them as the primary focus of social activity” (1984, 344-345). In other words, these worksites were not picnic areas, but more like crime scenes at which the time spent there is kept as brief as possible. Potts concludes that “the concentration of bones and stone tools do not represent fully formed campsites but an antecedent to them” (1984, 338).

Thus, we can imagine that when a recently killed hefty antelope carcass was discovered, a few members of the band would quickly cut off the meatiest sections, such as the legs, sides, and rump. They might have taken out inner parts as well. A cleaned stomach or bladder could be converted into a water jug. Perhaps they prized the heart or liver. They may have stripped off the hide to make carrying devices, bedding, or clothes. Potts speculates that sinew may have been cut out, presumably for later use as a kind of string (1984, 345).

Each of the strongest hominids would carry a hunk of meat to the nearest stone tool cache. There the meat would be carved into smaller chunks for distribution among the band members. While the butchers were at work, other band members might be busy gathering additional plant based foods in the anticipation of sharing these with the meat cutters. Then all would come together in a temporary campsite a safe distance from the worksite for a festive common meal. I imagine that the communal act of sharing food would likely have replicated in each band member the joyful experience of the original act of food sharing.

Yet, even the places where the hominids ate together were not “home bases.” A day or two later, when the meat was gone, hominid life would have returned to “normal.” That is, necessity would send them back to the old ways of self-feeding foraging with sharing as a convivial, but non-essential, activity. The division of labor that once served festive food sharing so well would dissolve until needed again.

Those hominids of 2mya could not stay in one place for long, both because they had to continually find fresh sources of plant based food, and so as to keep one step ahead of prowling predators. Nor would there have been the cultivation of a complex or sophisticated social life outside of that which is possible for bands of foragers perpetually on the go. Infants and children would have to be brought along. As a practical matter, it seems likely that any injured, ill, or infirm band members would have to keep up, or be left to die. That is what foraging primates do.

Stages in the use of Fire

Potts concludes that what Isaac called “home bases” were actually early stages in “a hypothetical course for the development of modern [hunter-gatherer style] home bases” (1984, 346). In his view, to become a safe place for food sharing, social life, child rearing, etc., hominids needed, among other things, “the controlled use of fire” (1984, 346). While modern hunter-gatherers process animal parts extensively, such as the San of Botswana boiling meat and bones, the old hominid sites “show no evidence of the complete processing of meat or bone” (1984, 344). Indeed, Potts notes that there is no evidence of fire use at these sites from 2mya; “Olduvai hominids lived, evidently, without fire” (1984, 344).

As I will discuss later, the knowledge of fire making was still a long way off. But once discovered, the knowledge of how to start and use campfires enabled the establishment of a regular division of labor, and facilitated the cultivation of the social, and political, activities that have developed in such home bases as those among contemporary hunter-gatherers. Informed by Potts's insights, we can understand that the sites Isaac referenced mark a transition period from self-feeding foragers, occasionally sharing food, to an eventual food sharing way of life in home bases. The latter, as we will see, is a necessary, but not quite sufficient, condition for the development of the first political system.

Rolland on Home Bases

As we have seen, scientists such as Binford and Potts have criticized Isaac's characterization of the two million year old sites in east Africa as "home bases." Yet another expert in the field, Nicolas Rolland (2004), has joined what he calls the "intense debates and diverging conclusions" about the existence and nature of such home bases (2004, 262-263). He is especially concerned with "arguments about whether earlier Lower Paleolithic occurrences (such as at Olduvai Gorge ...) could be distinguished ... from pongid nesting sites; or that spatially fixed resource defended focal sites represented actual forerunners of Paleolithic home bases" (2004, 263 inner citations omitted).

Rolland, who is sensitive to the idea that hominid studies begin with the split, focuses on the evolutionary trends that follow thereafter in an effort to understand when hominid campsites can appropriately be deemed "home bases." He finds that along this evolutionary path there are several "emergent bio-behavioral traits that separated at a very early stage of evolution (between

6 and 4mya) [sic] ancient hominids from extant and, probably, all other fossil primate species” (2004, 259-260f).

Over this long stretch of time, these traits included bipedalism, an increasing taste for meat protein, increased tool making with stone and other materials such as wood and bone, and an increasingly complex exploitation of natural resources beyond mere foraging. In his view, these “traits contributed in making various aspects of hominid lifeways a unique adaptive niche that was increasingly divergent from those of their primate relatives, with the consequence that some of their behaviors become archaeologically more identifiable” (2004, 260-261).

Rolland finds that for their first few million years, the original hominids likely foraged in the day light hours, and then found a safe area in which to curl up and sleep when darkness came, just as contemporary primates do (2004. 262, 263). There may have been times when they tarried for a few days, in what Rolland calls “high biomass settings,” before moving on. If so, this behavior would be less of a home base, and more analogous to “pongid nesting sites” (2004, 263).

A Safe Place to Sleep

Rolland, like Potts, incorporates an empathic understanding of the role fear likely played in hominid behavior. Also in agreement with Potts that the early hominids must have separated their eating place from their worksite, Rolland adds another possible fact. By the time the hominids had learned to butcher and eat meat in separate places, roughly 2mya, they would also have learned, possibly the hard way, that sleeping in the same place where they ate meat was also unsafe. The odor of the meat and bones and of the blood in the ground could attract

carnivores, which might prey on a sleeping hominid. Therefore, on the occasions when they had meat, they likely ate it in one place, and then moved away from there to another place to sleep. Thus, besides the kill site and worksite mentioned by Isaac, and the eating area that Potts suggested was separated from the worksite, Rolland adds a fourth important place to the early hominid way of life – safe sleeping areas. At this stage in their development, then, those hominids had no place to call “home.” They were always on the move.

The Punctuated Evolution of Fire Use

Like Potts, in Rolland’s view, the time when hominids acquired the mastery of fire marked the turning point in “the shift from a core area system [of foraging] to a home base system” (2004, 259). While hominids may have taken advantage of fires caused by nature, like foraging for cooked plants and animals in burn areas, a time came when they learned to start their own fires at will. After this, they were able to form home bases. Because, as I mentioned above, home base living is a necessary, albeit not sufficient, condition for the emergence of the first political system, establishing where and when the regular use of campfires began will provide political science a clear idea of the origins of the first political system.

From Africa, through the Levant, into Europe, Eurasia, Australia, and China evidence has been found of the regular use of fire as the foundation for home base living. But this probably did not become a part of the hominid way of life all over the world all at once. Instead, the practice more likely emerged in different times and places as “a punctuated event” (2004, 256, 259, 253). Thus, a “major, multistage transformation separated higher primate single-night or shorter duration nonrecurrent nesting sites from the fixed-point recurrent Paleolithic home bases of hominids”

(2004, 260-261). Aware that opinions differ, Rolland finds that “there is secure evidence for anthropogenic fire clusters by later Middle Pleistocene times (400- 350kya)” (2004, 252, 253, 259, 270).¹¹ Indeed, he adds, that actual home base sites begin appearing in the record “around 400kya,” in the same time range as the regular use of fire (2004, 270).¹²

Finding Hearths

Identifying campfire-centered home bases requires painstaking, expert excavation. According to Rolland, the best evidence of regular fire use is spaces that were clearly designed for the use of fire. These can include a circle of stone, a dugout, a concentration of ashes or charcoal, burnt bones or stones, patches of burnt soil, or other indications of hearths (2004, 263). One challenge for researchers is to distinguish between deliberate behavior and the natural occurrences of fire, such as a burnt tree trunk left by a wild fire. Wind and rushing water can put items together which give the false appearance of deliberate fire use.

Rolland reports that at least 60 sites with probable evidence of deliberate fire use have been found (2004, Table 3). These sites range from east Africa, China and other places in Asia, and in both western and eastern Europe. He notes that the places that have been excavated most thoroughly, for example France, have the higher numbers of sites with probable evidence of regular fire use in the range of from 350-400kya. Further excavations will likely uncover other

¹¹ Here, Rolland stretches the meaning of “anthropogenic” to include pre-human hominids.

¹² In accord: Gowlett and Wrangham 2013, Gowlett 2016; Roebroeks and Villa 2011; Wrangham and Carmody 2010; Wrangham 2009, 2017.

places in the world with persuasive evidence of controlled fire use. Precise times for the first use of fire at will are unlikely to ever be known because of the ambiguity of the evidence. Rolland discounts the speculations that such fire use became a regular practice prior to the period he mentions. “It is noteworthy that few, if any, of the best known Lower Paleolithic occurrences older than 500-600kya from Africa, Asia, or especially Europe contain unambiguous anthropogenic fire traces (such as ashes, charcoal, burnt bones or stones, or hearths)” (2004, 253).

Home Base Culture

Hominid life, in Rolland’s view, then, was probably sustained by self-feeding foraging from the time of the split, roughly 6mya, until they learned to master fire, as recently as 400kya. In other words, the transition from self-feeding foraging to a fully food sharing way of life spanned about five and one half million years. The move from the temporary sites of 2mya, discussed by Isaac and Potts, took nearly another one and a half million years to become true home bases.

With good reason, then, Rolland declares this fire centered home base living to be “an adaptive breakthrough” (2004, 270). Thereafter, the evidence of hominid fire use, and their numerous and varied other artifacts, “reveal an accelerating dependence on a richer, more specialized cultural ‘margin’” (2004, 270). For example, of the four types of places that distinguished hominid life prior to the mastery of fire – kill site, worksite, eating site, and sleeping site – the latter three would be merged into the home base.

Because campfires served as a deterrent to predator invasions of hominid encampments, the hominids could eat meat, when they had it, in the same campsite where they slept. Campfires would enable the hominids to stay up after dark, rather than retiring at dusk (2004, 264). Hence, notes Rolland, the “shift to home bases entailed a major reorganization of the day and night arrangement of ancient hominid lifeways, and thereby a further divergence from pongid or ground-living primates' land use patterns” (2004, 264). Among other things, socializing around the campfire likely enhanced bonding, and facilitated language use and other skills (2004, 250). Hunting may have increased as a consequence of home base living. The home base provides a center of operations for strategic planning, a work place where community synergies can increase the sophistication of tools and weaponry, and campfires raise the value of fresh meat for cooking.

The Theory of Hominid Nature

While Rolland does not explicitly discuss the theory of the hominid self-bred food sharing nature offered here, he agreed with Isaac's understanding of the hominids as more prone to share food than other creatures. Rolland's observations make it clear that the home base provided enormously expanded opportunities for a creature that desired to share food. His research shows that home bases would tend to be “sites strategically located for resource exploitation by local groups of food-sharing foragers” (2004, 262). He writes that by the Middle Paleolithic (around 400kya), the home base was well on its way to becoming “the place where animal and vegetal foods are introduced, *shared*, and consumed” (2004, 263 italics added).

Home bases would also have become “a setting favoring the transmission of knowledge and behaviors through prolonged learning by the young of shared and transmitted technical, socio-economic, and cognitive repertoires necessary for ensuring group survival” (2004, 263). Home bases would also provide for the “protection of juvenile and defenseless individuals against natural elements and predation” (2004, 263).

Constructing the First Political System

To call the first home bases, as did Rolland, “an adaptive breakthrough,” seems to me to be an understatement. This was a monumental achievement, five and a half million years in the making. Without the founding of the first home bases, society, organized beyond the primate level, would probably never have happened. This accomplishment was due, in large part, to the hominid self-bred desire to share food. Without that desire, none of them would have recognized, much less seized, the opportunity the mastery of fire had given them. Creating the first home base enabled an incomparable revolutionary change from primate level self-feeding foraging to a fully food sharing civilization.

The first home base was little more than a campfire around which pre-human creatures sat and ate the food items they had brought in to share together. There was likely some lag of time from when they learned to start a fire at will, and when they learned to use it for cooking. Before then, they would have munched on raw food in the glow and safety of the fire. Already, however, they would have had a division of labor without which the home base could not survive.

Self-feeding foragers need almost no supervision, or leadership, to carry on in their way of life. The chimpanzee Alpha male does little more than protect his harem, break up fights, and decide when it is time for the troop to move along within their territory (de Waal 1998, 168-188). But for a home base to continue as a reliable, life sustaining institution, deliberate measures must be taken to maintain and preserve it. There must be a division of labor consisting of defined tasks, carried out on a regular basis. Without that, hominid life would revert back to the primate level. Those hominids had to somehow decide, in the words of Harold Lasswell (1936), “who gets what, when, and how?”

What, then, was the political culture like for the hominids who achieved the formation of the first home bases, and found ways to sustain them? What kind of rules would likely be made by a creature with a strong desire to share food with his fellows? And how were such rules likely enforced? It is, of course, in the making and enforcing of such rules that the first political system arises of necessity.

One principle of interpretation to apply in this case, is that the rules these hominids made were probably reflections of their nature. We have seen that in the five and a half million years since the split, at least one lineage of hominid persisted in the practice of preferring food sharing individuals for mating. This was probably far from a uniform practice, but more like a slight tendency gradually increasing over that long stretch of time. But after the first home bases were fashioned so as to further food sharing, the importance of the former tendency would likely have become a principle of guidance in the selection of mating partners.

The clear function of this principle would be to reproduce offspring who, when mature, would have a desire to share food as a central aspect of their character. Without the continuous birthing of individuals of such character, the home base social organization would be much more difficult to achieve, and would be unlikely to persist. Thus, another principle of interpretation is that creatures with a strong desire to share food will probably be very cooperative in coordinating their behavior to satisfy that end. The individualism and immediate gratification practiced by self-feeding foragers would not likely have lent itself to fashioning the high degrees of social organization required for home base living.

Self-feeding foragers have no reason to build a campfire. They simply move about consuming the raw food they acquire by their own efforts. But without a campfire, a home base could not be set up as the central gathering place for food sharing creatures. Thus, rules must be made on this account. Specific tasks had to be performed regularly to keep the campfire burning. The one who takes on the responsibility to start the fire must stay there and tend to it. Such individuals must forego foraging while trusting others to bring in food to share with them. New fuel, and in the right amount, must continually be fed the fire to keep it burning. Other band members must go out and find the right kind of fuel, gather it, and carry it back in a timely fashion. They, too, must forego self-feeding foraging. Even before cooking, these tasks had to be carried out so as to have a campfire.

At this point, then, the hominids are steeped in a condition where values must be allocated. If food sharing is valued, then a specific division of labor, far beyond self-feeding, is indispensable. The decisions must be made as to which individuals, or small groups, will do what tasks.

Therefore, a clear, policy making and enforcement process must be instituted which would be accepted as authoritative by at least the greater part of the band, if not the whole. For the first time in the history of the universe, all sorts of political lessons would have to be learned by these relatively small brained hominids. How could this first political system have functioned?

More than likely, authority was vested in some of the elders of the band. Each child would have grown up depending upon the guidance of their elders, and have learned to trust their judgment. The elders would likely have conferred with one another as to the basic tasks that were necessary to continue the food sharing way of life. Although lacking sophisticated language, and the capacity for highly abstract thought, they would have understood that they had a common desire to live in a food sharing community, and they would have learned, perhaps with some trial and error, what sorts of practical actions were necessary to achieve their shared purpose.

Because their characters were naturally oriented towards sharing food, it seems safe to assume they shared political authority as well. Class domination seems highly unlikely in this stage of history. Class domination requires ownership and control of the means of production by a few, who can compel the many to serve them. But these were probably not the conditions of the first hominids living in home bases for the purpose of sharing food. Political authority was probably widely shared. To this day, contemporary hunter-gatherers are largely egalitarian (von Rueden, 2014; Service 1975; Boehm 1993).

As Potts noted, caches of stone tools were left in places around the hominid foraging range. They were in use for many years, and sat there for millions of years. Various bands and succeeding

generations likely used these tools as needed, and left them in place, where they could be used again. This strongly suggests an absence of any ego-centric belief in the abstract notion of “private property.” In other words, the pro-group, selfless ethic of sharing probably extended to tools, food, and political authority.

After conferring about what work needs to be done, the elders may have asked for volunteers, or else assigned tasks. They would have known which individuals were best suited to do the various kinds of work. Those who were best able to start campfires would likely be assigned that task. There is no reason to suppose that a male would be any more able than a female to be in charge of starting and maintaining a fire. Indeed, while women were surely capable of hunting and gathering tasks, those who were mothers with dependent children might have been the best choice for managing the campfire during the day. Perhaps in the evenings they would have participated in the discussions about the future needs of the community, such as what the needs were for keeping up the fires. The elders would have to assign the tasks of gathering firewood and other combustible material to specific individuals. If there were 50 members of a band, they surely needed more than one campfire for heat, light, and later, cooking.

While some types of produce can be stored in the ground, or in baskets, other types of food are more perishable, particularly meat. The elders would have to be informed about inventories. So that everyone did not go out in the morning and start collecting the same kind of unneeded foods, work assignments would have to be made on the bases of community need and individual ability

to complete the tasks. Some would chop wood, others carry water. Perhaps they followed the principle of “from each according to his ability, to each according to his need.”¹³

How would a community of creatures whose nature it is to want to share food with one another likely enforce the authoritative allocation of tasks and values? Would these hominids be more likely to form a dictatorship based on force and violence, or more likely to use shame and moral suasion to enforce order? I lean towards the latter interpretation.¹⁴

Also, there would have been other situations in which enforcement would be required. Since different work groups and individuals would be bringing in a variety of food items for the community to share, how would disputes over who gets what, when, and how much, be settled?

¹³ Karl Marx’s term “Primitive Communism” seems an apt appellation for the food sharing model.

¹⁴ While all the experts I rely on reject the “Killer Ape” theory of hominid nature (as popularized by Ardrey 1961), in the field of hominid studies a few dramatists keep it alive in various forms. Gintis 2000, 2019 speculates that because every hominid had his own “lethal weapons” with which to slay individuals seeking the Alpha position, their political organizations were egalitarian and cooperation was based on a kind of Hobbesian social contract, stemming from mutual fear. Wrangham 1996, much more of a showman, fantasizes that after learning to cook, hominid males brutally enslaved their women, like a gang of sociopathic Alley Oops.

Besides the problems of distributive justice, there were likely issues of criminal justice. Suppose bullying, rape, or murder occurred? Depending on the problem, a range of techniques were likely employed. Perhaps perpetual freeloaders, serious nuisances, and violent offenders would be banished. These creatures, like all social animals, probably had to find ways to deal with disturbances of the peace due to flare-ups of strong emotions like resentment, jealousy, and murderous rage.

If these were the kinds of issues hominids had to deal with in the first campfire-centered home bases, before they learned about regular cooking, then they surely had to continue finding ways to keep order after cooking began. Peacefully parceling out chunks of roasted meat to hungry hominids after a hard day's work, was surely a challenge to their political ingenuity.¹⁵

As the authorities made policy for the whole band, they would have received feedback regarding the success and wisdom of their decisions. Were they assigning a sufficient number of helpers to

¹⁵ Wrangham (2017) has another, perhaps more realistic, proposal. He argues that after cooking became a regular practice, pre-humans evolved to become physiologically dependent upon having cooked food in their diet, and *Homo sapiens* have inherited that dependency. He argues that modern humans cannot survive on a diet of only raw food. If this is true, then a political system dedicated to preserving the cooked food way of life, including its entire supply chain, is now essential to the survival of the species. Returning back to self-feeding foraging on raw foods in the woodlands and savannas of Africa is not an option for humanity, as it once was to the early hominids.

the fire keeping moms? Did the older children they sent out for water need more adult protection? In order to keep the peace, and assure the persistence of their way of life, they would have probably made the necessary adjustments in response to the input from members of the community. While we cannot know the specifics of what they did, we do know that they were able to manage their political challenges. Their way of life was successful for hundreds of thousands of years leading up to the Agricultural Revolution, beginning roughly 10-12kya. Indeed, the whole history of human civilization emerged out of the political system first forged by these food sharing hominids.

Although these hominids had long been mating with partners selected, at least in part, for their food sharing qualities, reproduction is not always uniform. That is, while a male and female might both have the dominant genes for food sharing, and behave accordingly, one or both might have recessive genes carried over from the selfish days of self-feeding foraging. Thus, it would have regularly happened that some offspring would grow to become more selfish than their brothers and sisters. This fact of population genetics would ensure, along with the necessities of life, that an effective political system for the authoritative allocation of values and enforcement of rules would continue to be necessary.

Conclusion - the Loss of Selflessness

In the modern world of 193 nations in the United Nations, one might reasonably suspect that at least in some of these nations, the genetic sequence favoring food sharing behavior has lost its efficacy, and the desire to live to share food has faded from the psychology of the folks living in such places. Be that as it may, the political system – that is, the authoritative allocation of values

for a society – has carried over despite the changes in the underlying political environment. Indeed, the old hominid-made institution has proven so adaptable that some four hundred thousand years after its creation, it is flourishing.

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