

**Eidos** volume 4  
no. 1 (2020)

A JOURNAL FOR  
PHILOSOPHY  
OF CULTURE

DOI:10.14394/eidos.jpc.2020.0007

Noa Gedi  
Faculty of Humanities  
Tel Aviv University, Israel  
<https://orcid.org/0000-0001-6494-6354>

Yigal Elam  
The Multidisciplinary Studies Program  
Sapir Academic College, Israel

## The Artificial Enclave: Redefining Culture

### Abstract

This article offers a new definition of culture which hinges on what we consider to be its most distinctive feature, namely its artificiality. Our definition enables us to resolve some of the main issues and controversies involved in the concept of culture and its course of development. We argue that the large human brain played a revolutionary role in inverting the course of natural adaptation of the human species. This dramatic turnabout allowed humans to set their own conditions of existence in their created environment; and one which unlike nature they were able to shape and dominate. We demonstrate the crucial part of language not merely in communication but in forming a web of meaningful symbols which gave rise to the human spiritual or metaphysical world. We depict human society as an unparalleled elaborate web of relationships which gave hominids an advantage over other species from the very beginning.

### Keywords:

brain, environment, evolution, inverse adaptation, society, symbols, tools.

## 1. Introduction

We begin this treatise on culture with a general outline which we believe will give the reader a clear view of the scope and essence of our thesis. Two major problems come to the fore in almost all discussions about culture. The first has to do with the differentiation between culture and nature, otherwise known as the nature-culture divide, which to our mind has hardly been fully clarified. Blurring the line of demarcation between culture and nature, or the divide between human and nonhuman, has become a prominent trend since the nineties in numerous publications in cultural anthropology and environmental sociology and philosophy, as well as various researches in zoology and primatology, which endorse the idea of animal culture.<sup>1</sup> The second revolves around the question of whether all seemingly different human cultures are but different manifestations of the same phenomenon. We believe this question can be resolved by examining whether different cultures exhibit the same fundamental constituents.

If we look at the vast inventory of definitions, most of which can be found in Kroeber and Kluckhohn,<sup>2</sup> and attempt to narrow down what has been typically associated with the term “culture” to the most basic and distinct categories we arrive at this division: society, language, and tools. It should be noted that by society we do not mean just any aggregation of particulars of a given species, but any aggregation which maintains complex relationships between its members. Also, by language we do not simply mean any system of signs that is used for communication but rather a system of symbols which constitute the building blocks of mental representation. Tools, in our view, refer only to external objects which serve to extend physical capabilities beyond biological constraints; and their employment, furthermore, allows modifications to other external objects and to the conditions of the immediate environment. These three categories we recognize as the identifying marks of culture. In our mind, the fact that every culture is reducible to these three essential elements – and no culture on earth lacks any of them – means that there is a common uniform substructure to cultural diversity.

Since we observe the presence of these core elements in animals as well, it would seem reasonable to assume that there is also animal culture. Indeed, there is extensive research in the last few decades which controversially suggests that the real difference between human culture and animal culture is merely that of degree or of the content of their respective repertoire.<sup>3</sup> How we define culture will bear directly on the question of whether or not culture is uniquely human but, as biological anthropologist William McGrew remarked, “investigators of other species must walk the line between anthropomorphism and anthropocentrism.”<sup>4</sup> However even if we conceded that culture has its origin in biology it would still be impossible to deny the essential difference between human and animal culture. For *somehow*, humans succeeded in developing social bonds that stretched far beyond blood relations and was based on custom. *Somehow* humans succeeded in developing not just a sign-system for communication but a very elaborate symbolic language. And *somehow* humans succeeded in producing and improving – even inventing their tools – and not just settle for what was naturally available. Only in a very wide and loose but also rather contrived manner the term “culture” can be attached to animals – especially those that appear to manifest social traits. David

---

1) Latour, *We Have Never Been Modern*, chapter 4. See also Grey, “Anthropocentrism and Deep Ecology,” 463–475; Soper, *What Is Nature?*; Goldman and Schurman, “Closing the ‘Great Divide,’” 563–584; Pinker, *The Language Instinct*; Nettle, “Beyond Nature versus Culture,” 223–240; Pilgrim and Pretty, *Nature and Culture*; Descola, *Beyond Nature and Culture*.

2) Kroeber and Kluckhohn, *Culture: A Critical Review of Concepts and Definitions*.

3) See Laland and Galef, *The Question of Animal Culture*.

4) McGrew, “Culture in Nonhuman Primates?,” 301–328.

and Ann Premack argued against the tendency of psychologists and biologists to attribute human cultural capacities to animals.<sup>5</sup>

Customs, symbols and human-made tools: all these were inventions which introduced an artificial dimension into the natural environment inhabited by our ancestors. These artificial constructs, says John Bonner, cannot be explained by genetic inheritance or natural selection.<sup>6</sup> The only difference between “cultural evolution” which is “the transfer of information by behavioral means,” and “*genetical evolution*” which is “information passed by the direct inheritance of genes,” is, according to Bonner, the “mode of transmission of the information.”<sup>7</sup> While he refrains from addressing “the old intractable question of nature versus nurture,” Bonner nonetheless asserts that “many features of our culture are new and do not find a counterpart in more lowly animals.”<sup>8</sup> By means of these constructs humans were able to exceed their biology, forming intricate social communities, creating imaginary entities, and interfering with nature. The pace and scope of change and innovation effected by humans of the earliest known societies outstretched any known changes in the realm of animals; whether or not these changes or innovations “flow” through genetic transmission of information or through social learning.<sup>9</sup>

The most conspicuous and significant feature of culture is its artificiality. The creation of something artificial within the realm of nature, something that is not the product of a biological evolutionary process, certainly marked a turning point in the history of the universe. How could this have happened? It could only be related to the emergence of a brain in live creatures. This evolutionary development brought into play an element which proved to be game-changing; enabling organisms to not just follow their natural instincts, but to incorporate calculation and planning into their behavior.

The primary role of natural selection and of adaptation in the evolution of all living creatures (including humans) cannot be gainsaid. Yet, we hold that the appearance of hominids with a larger brain, culminating in the thirteen hundred cubic centimeter brain of *Homo sapiens*, was of paramount significance and ushered in the creation of an artificial environment encroaching on the natural environment. This of course did not happen all of a sudden. The development of culture advanced in parallel to the gradual growth of the hominid’s brain in a slow evolutionary process stretching back at least two million years.<sup>10</sup> Once this process was set in motion, the course of hominoid evolutionary adaptation started to shift: instead of being fully adapted to their natural surroundings hominids began introducing changes into these surroundings – adapting them to their needs. This turnabout of the direction of adaptation through continual changes of the natural environment should be identified with the beginnings of human culture.

## 2. The Origins of Human Culture

Once culture appears, the intriguing question arises how the relation between culture and nature should be formulated. Obviously, under our interpretation the development of culture is at the expense of nature. The more it expands and appropriates, the more it withdraws nature backward, so to speak. Strictly speaking, culture directly effects humans alone; indirectly it affects nature in that it reduces the scope of its impact on humans.

---

5) Premack and Premack, “Why Animals Have Neither Culture nor History,” 350–365.

6) Bonner, *The Evolution of Culture in Animals*, 3–4.

7) *Ibid.*, 9.

8) *Ibid.*, 180.

9) See Ramsey, “What is Animal Culture?” 345–353.

10) See Klein, *The Human Career*.

Culture is itself a result of changing the natural environment: the land which was part of nature becomes the domain of culture. From that moment on the cultural domain becomes separate from nature although it is still situated within nature. In that sense alone, we contend one may speak of the effect of culture on nature. Changing nature under the impact of culture implies the reduction of nature and the ecological destruction of the natural environment. However, both empirically and conceptually there is no cultured nature; there is either culture or nature. Green spaces such as parks, gardens, or natural reservoirs are no longer a part of nature but a part of culture.

Any attempt to formulate a theory about the cultural evolution of humankind tackles a serious difficulty; one due to the uncertainty encompassing the timetable of human evolution and human culture. Estimates regarding things like the control of fire, or the appearance of hunter gatherer societies, or the great migration from Africa remain highly conjectural and keep changing with new fossil and artifact discoveries. There is nonetheless a general agreement among scientists about the essentials; namely, the phases of human evolution and the fundamental components of human culture – which seems to us sufficient for proposing such a theory.

According to what archeologists, paleontologists, anthropologists, and biologists tell us, at some point (whether a million or only half a million years ago) the human species emerged on the face of earth. These humans were preceded by a long line of humanoid species, starting with the Australopithecus some three or four million years ago, whose significant distinguishing features were bipedalism and a somewhat more neuronally developed brain. Ian Tattersall rather inconclusively suggests that the formation of the species had been accomplished not just by gradual evolution but by saltation too. Saltation involves an interruption in the continuous evolutionary process and the appearance or the rise of some unexpected factor which radically effects changes in the natural environment. The best example is, according to him, the appearance of *Homo sapiens* “who is truly a new influence on the landscape, and is not simply an extrapolation of what went before.”<sup>11</sup> We hold that the appearance of *Homo sapiens* should rather be associated with the haphazard evolution of a brain in organisms, from fruit-flies to mammals, culminating in the human brain. We identify the very appearance of a brain in live creatures as a revolutionary factor which had been implanted in the thick of nature. After it gradually tripled its size the human brain evinced a capability of calculating and devising survival tactics beyond the dictates of genetics; in fact, it played a subversive role inside the machinery of evolution.

Its enormous capacity of storing and elaborating on inflowing information, as well as the capacity to imagine states of affairs and contrive plans and strategies outside the dictates of nature, dramatically reduced *Homo sapiens*' dependence on genetic evolution. In their groundbreaking experiments, using fMRI methods to scan the cortex, Stanislas Dehaene and his team of researchers have shown that the human brain forms a restless and autonomous realm which “dominates over external excitation. As a result our brain is never passively submitted to its environment but generates its own stochastic patterns of activity.”<sup>12</sup> The unmistakable sign of becoming more independent are the changes humans introduced into their environment. This in fact meant that humans were changing the direction of adaptation from being adapted to nature to adapting the natural environment to human needs.

The passage of humans from an adaptive to an active mode of transforming the environment must have been gradual but incessant. While we find animal-made forms of habitation such as termite's nests, bird nests, beehives and beaver dams, the fact that these seemingly artificial habitations remained unchanged throughout the ages suggests that they should rather be related to genetic inheritance. Humans on the other hand introduced endless modifications not only into their various habitations but into all areas of their life. At a certain point

---

11) Tattersall, “The Case for Saltational Events in Human Evolution,” 58.

12) Dehaene, *Consciousness and the Brain*, 189.

humans must have become aware of the meaning of their modifications. As a consequence, their endeavors became deliberate and goal-oriented; aimed at taking control over the environment.

All things that comprise the vast inventory of culture, contemporary and archaic, are human inventions. As such, they beg the question of their purpose and function. Surveying the inventory of culture quickly discloses its original objective: to provide the means and methods with which humans could overcome their natural deficiencies, gain dominance over other species, be largely spared from the perils of nature, reduce their dependence on nature, and even gain some control over it.

Once we acknowledge that all manifestations of human culture throughout history share the same basic ingredients – complex social formation, sophisticated means of communication (language), and ingenious tools – deciding in favor of a unified evolutionary rather than a diffused relativist approach becomes ineluctable. The classic debate in cultural anthropology between the relativist and the evolutionary approach – namely, whether culture is a multifarious phenomenon comprised of a variety of specimens which must be dealt with separately; each as a unique, incomparable being, or whether a common basic paradigm underlies all diversities of culture – may never be decided.<sup>13</sup> With the ethical challenges and political predicaments we face in the multicultural world of today, cultural relativism becomes even more controversial.<sup>14</sup> Cultures have always differed in terms of the degree of elaboration of their shared components but, no matter what differences kept them apart, all cultures bear the same identification marks.

Like fish unaware of the existence of water, anthropologists swim from culture to culture interpreting through universal human metaculture. Metaculture informs their every thought, but they have not yet noticed its existence... . When anthropologists go to other cultures, the experience of variation awakens them to things they have previously taken for granted in their own culture.<sup>15</sup>

This “metaculture” is the subject of our essay.

### 3. The Artificiality of Culture

A significant turning point was reached when *Homo erectus* acquired control over fire somewhere between seven hundred and fifty thousand to one and a half million years ago. This feat entirely altered the position in nature of early humans; they obviously embarked upon a deliberate effort to improve their conditions of life. Or as Richard Carp put it: “[fire] enabled *Homo erectus* to reverse nature... . Once and for all it separated hominids from an order of dark and light, cold and hot that had existed since before life evolved.”<sup>16</sup> Humans clothed themselves, improved their dwellings, and devised tools for diversified functions. Very soon they were engaged in satisfying their ever expanding needs beyond the bare necessities of existence. These needs were no longer related to natural conditions but rather to those of the new artificial environment which was more conducive to a relatively secure and comfortable life. Modern consumer society may be seen as the apex of this process. No known human society or culture, including those that were nearest to nature, ever existed in complete harmony with nature or was content with what nature had to offer. Even the most primordial societies never lived without some kind of protective barriers. These barriers meant setting up a partition between humans and nature.

---

13) See Boas, *The Mind of the Primitive Man*; Herskovits, *Man and His Works*; Kroeber, *The Nature of Culture*; White, *The Evolution of Culture*.

14) See Edgerton, *Sick Societies*. See also Dahre, “Searching for a Middle Ground,” 611–628.

15) Tooby and Cosmides, “The Psychological Foundations of Culture,” 92.

16) Carp, “Perception and Material Culture,” 278.

We propose to identify the new artificial environment with “culture.” Properly defined human culture is the artificial environment created by humans and comprising all human inventions – material and spiritual. We offer this definition for the following reasons: first, it emphasizes the main feature of human culture, namely, its artificiality. Second, it covers all aspects and manifestations of human culture (from tools and artifacts to customs, institutions, beliefs and arts). Third, it encompasses the early stages of the human modificatory approach to their surroundings and is applicable to all forms and kinds of culture. Finally, the strongest argument perhaps for the “environmental” definition of culture is the fact that in their daily life nowadays humans are globally far more conditioned by the artificial environment they had created rather than by nature. “Human beings do not live in nature, they live in culture.”<sup>17</sup> The effect of living in artificial environments is far reaching to the extent of causing genetic mutations as a result of adaptation to the new cultural conditions. For example, the lactase gene was detected mainly but not exclusively in Europeans, and is considered “to be advantageous in agro-pastoral populations where milk is a major staple of adult diet.”<sup>18</sup>

If nature encompasses all existing entities, animate and inanimate, then culture, which comprises everything artificial, should be considered an altogether different and separate kind of environment. We may symbolize it in the following manner:  $C$  (culture) =  $AE$  (artificial environment). The formula represents the conjunction of environment and artificiality in the same manner that water is symbolized as  $H_2O$ .

The process of expropriating segments of the immediate natural environment was slow and protracted; it culminated in the transition to a sedentary mode of life which included the domestication of wild plants and animals, the amalgamation of tribes, and the rise of city-states. The hunter-gatherer culture was replaced through what is known as the “Neolithic Revolution,” some fifteen thousand to twelve thousand years ago, by an agrarian culture. It is no coincidence that the etymological root of the word “culture” is the Latin verb *colere*, meaning cultivating or improving the soil. Cultivation meant fundamentally changing a given state of nature so as to create the conditions for growing plants that provide food. Cicero applied the term *colere* metaphorically to the cultivation of the soul and the mental capacities of humankind: *cultura animi*.<sup>19</sup>

Even the biblical myth of the Garden of Eden demonstrates our point about the new culture that arose in what Gordon Childe coined as the “Neolithic revolution.”<sup>20</sup> The mythical *Gan Eden* is not an integral part of nature but rather an enclosure isolated from the surrounding wilderness. The prehistoric root of the English word “garden” and all parallels in Indo-European languages means *enclosure*.<sup>21</sup> The Acadian origin of the Hebrew word *gan* (garden) means a protected place. The garden is a lot expropriated from nature to be cultivated and maintained by Man.<sup>22</sup> After their expulsion, Adam and Eve apparently were demoted to a destitute life in the wild. Their descendants, however, proved to be very resourceful in coping with nature. It was said of Cain that he constructed a city. Subsequent generations, according to the biblical narrative, invented metal forging and art. Under this interpretation the myth discloses two fundamental and interconnected functions of the artificial environment: protection from nature, on the one hand, and control of everything within the boundaries of the cultivated area, on the other hand.

---

17) Neumann, “Biology and Culture,” 322.

18) Hancock et al., “Adaptations to New Environments in Humans,” 2460.

19) Cicero, *Cicero’s Tusculan Disputations*, “Book 2,” §13

20) Childe, *Man Makes Himself*.

21) See Watkins, *The American Heritage Dictionary of Indo-European Roots*.

22) *Genesis* 1: 26–28.

#### 4. The Primary Realization of Culture – Society

Culture in its embryonic form was, according to our view, already embodied in the earliest social formations. For Durkheim culture represented the collective consciousness that secured social cohesion.<sup>23</sup> It is reasonable to assume that the first phase of culture was the appearance of bands of *hunter-gatherer* hominids in the open savannahs of Africa. These hominids (*Homo erectus* or even *Homo habilis*) formed cohesive little groups benefiting from incomparable close-packed mutual relationships due, first and foremost, to their brain's capability to handle about one hundred fifty relationships (Dunbar's number) – which is three times the amount attributed to chimpanzees.<sup>24</sup> Human interactions formed an intricate *web of relationships* – as a result of the increasing capacity of the human brain to contain a growing amount of information – which was far richer and thicker than what we find in non-human societies. This of course enormously enhanced the capabilities of cooperation amongst the members of the hominoid group and increased their chances against the big predators in the open.

Thanks to concerted efforts, the ancestors of prehistoric humans completed the passage from sheltering in the woods to the open savannahs of Africa. Out in the open prairie, armed with stone-axes, stone-tipped spears and clubs, a consolidated group of hunters who learned to collaborate and practice calculated and disciplined hunting tactics had an advantage over other predators who failed to acquire such a high level of social collaboration. Opting for open grounds has always been the hallmark of tribes or peoples that adopted fighting techniques based on fast movement, skilled maneuvering and superior weapons.

The coordinated efforts of many large-brained individuals capable of independent thought, within a social framework, proved to be much more inventive and efficient than the uniform efforts of the seemingly social formations shaped by genetics in the animal world. While in the context of a beehive, for example, the functions and division of work are decided genetically and by chemical stimuli affected by the aggregate community of bees; in the primate societies of the big apes obvious individuality is demonstrated by the complex relationships each member of the group is involved in or even by the mere capability to manage communication between individuals of the group.<sup>25</sup>

Human society is ostensibly an aggregate of individuals and individuality attains its meaning in the context of social relationships. Conceptually, one implies the other. Surely in the case of human society each is a prerequisite of the other. If this characterization applies also to the social life of primates and certain kinds of mammals (like elephants, for example), it should nonetheless be acknowledged that when compared to the complexity of human social life, there is definitely an enormous difference in degree. As a *web of relationships*, human society formed a distinct and cohesive entity. Furthermore, the internal social dynamics within it far exceeded any activity on the outside. The resources of human individuals were primarily invested in the group on which they depended for survival. This mindful investment in the social construct led to the development and consolidation of customs, norms, and institutions. With these the identification of society as the primary realization of culture becomes evident. In other words, society is culture incarnate; an artificial environment wholly shaped and controlled by its human members.

According to our interpretation, every culture may be seen as a closed circle whose supreme motivation becomes that of preserving balance and stability within its boundaries. This is a *sine qua non* of achieving control. The crucial role and main function of customs and traditions within any society is to sustain social balance and stability. The social status quo would be disrupted mainly because of an external pressure, such

---

23) See Giddens, *Emile Durkheim*, 123–40.

24) See Dunbar, "Coevolution of Neocortical Size," 681–94. See also Dunbar, Gamble, and Gowlett, *Thinking Big*.

25) Bonner, *The Evolution of Culture in Animals*, 159.

as an intrusion of nomad tribes into the sphere of a sedentary culture. This became quite common after the onset of the Neolithic age as part of the settlement process when different competing groups flocked to the same habitats, mainly to river basins, and later when permanent settlements became the targets of onslaughts and invasions by nomadic tribes.

With the transition from the nomadic to the sedentary phase human territoriality takes a turn that will change the whole course of human cultural development. Nomadic culture was *exclusive* in the sense that the social group was confined to tribe members related by blood, but also in the sense of unwillingness to suffer the presence of rival or competing groups in their space. The passage to sedentary mode of life had far-reaching consequences. The territorial factor became extremely more significant. Territory became a platform upon which various social groups would unite. It extended the limits of society beyond those of the tribe, bringing in other groups that amalgamated and formed a larger collective. The tribal custom, which had been confined to members of the tribe (related by blood) only, was replaced by the *law of the land* which applied to all the people inhabiting the land and to all things existing within its boundaries. The leadership of the tribe was replaced by a new institution, that of the sovereign or the ruler of the land. This was a rule by law which was *all inclusive*. This principle of rule over people by means of the law of the land appears in Hammurabi Code from the eighteenth century before common era, which though not the earliest is the most extensive compilation of ancient laws.<sup>26</sup>

The ruler as a sovereign may be considered as the first manifestation of government. There was no government in nomadic culture; this institution makes its first appearance with the sovereign and is entirely different from tribal leadership. While the authority of leadership was personal and grounded in custom or tradition, the authority of government was ordained and sanctified by law. This development of institutionalization took place in all other areas of social activity as well: in administration, in army, in worship, and in commerce. The palace, the citadel, the temple, and the marketplace were the main institutions around which the city was formed. They all enabled government to exercise its authority. Thus the city was in essence a state, a city-state.

To this day the city and the state represent the highest degree of social organization. This can be evidenced by the fact that since their appearance these structures have not been superseded. Thus, while society or sociability may be considered almost a natural human preference, the considerable effort invested by humans in refining their social organization testifies to its paramount cultural significance. Ibn Khaldūn, the great Muslim scholar of the fourteenth century, essentially subjected culture to the service of social grouping, anticipating by about five-hundred years the findings of modern western scholars, with his observation that “human beings have to dwell in common and settle together in cities and hamlets for the comforts of companionship and for the satisfaction of human need.”<sup>27</sup> Moreover, the development of social institutions governed by law no doubt represents an upgrade in the artificiality of culture. Within the artificial enclave they created, humans behave in accordance with their own positive law which is binding even when it runs counter to human nature.

## 5. Language: Between Communication and Representation

Among members of all species, including plants, there is some form of communication which is in essence the transference of messages by means of signs.<sup>28</sup> However, human language is symbolic. While signs exhibit a one-to-one relationship with the things they denote, symbols, once they are formed as representations they are independent

---

26) Harper, *The Code of Hammurabi King of Babylon about 2250 B.C.*

27) Ibn Khaldūn, *The Muqaddimah: An Introduction to History.*

28) See Davies, *Plant Hormones, Biosynthesis, Signal Transduction, Action.*



mental elements. Symbols can be invoked at will, arranged in various and numerous compositions and arrays. According to primatologist Carel van Schaik, “symbols are a special class of signal variants, in that their meaning is completely arbitrary and geographically variable.”<sup>29</sup> Words are symbols which enable us to both entertain images and thoughts inside our head and to carry or communicate these images and thoughts to others.

Interaction within a human community involves sophisticated messages that contain all sorts of descriptions of actions and intentions, of thoughts and feelings, of times and places, of circumstances and situations. However, providing symbolic expression for internal images is perhaps even more significant because this realm of symbols constitutes our mental world or our consciousness.

According to extensive and systematic experiments conducted by Stanislas Dehaene and his research team with fMRI (functional magnetic resonance imaging), images of the outside world are created and stored either consciously or subconsciously in the brain which may be resembled to a “neuronal workspace.”<sup>30</sup> The brain then treats these images and symbols as discrete entities that can interact and combine with each other, thus forming new images and new symbols which represent them. Both these images and symbols can be retrieved and reshuffled, in whole or in part, in endless combinations or syntheses. The brain becomes a hectic internal factory for free mental creations which exist in their own right. It operates as a huge autonomous workshop. It is here that a “compositional language of thought” is created. In fact, claims Dehaene, “language evolved as a representational device rather than a communication system.”<sup>31</sup> Steven Pinker, although he shares with Dehaene Chomsky’s theory of innateness, rather believes that language evolved as “a biological adaptation to communicate information.” He argues that “people know how to talk in more or less the sense that spiders know how to spin webs” and “spiders spin spider webs because they have spider brains,” yet admits that “the first steps toward human language are a mystery.”<sup>32</sup> Guy Deutscher thinks it is unlikely “that specific features in the structure of language are pre-wired in the brain if they could have developed only ‘recently,’ (say within the last 100,000 years).”<sup>33</sup> He prefers to call language “mankind’s greatest invention.”<sup>34</sup>

Either way with the advent of symbols a new dimension had been added to the realm of human experience: an imaginary world of creatures – demons, spirits, and forces beyond the world of phenomena. These fictitious creatures were not just products of wild imagination; in many cases they represented abstract entities – groups, relationships, norms, values, organizations, institutions. Myth, religion, poetry, art and philosophy would subsequently thrive in this spiritual domain which constituted a free playground of meanings, a creative workshop of ideas and concepts no longer conditioned by the physical world. According to Dehaene, there is neurobiological evidence to suggest that “the human neuronal workspace system may possess unique adaptations to the internal manipulations of compositional thoughts and beliefs” which manifest in “our uncanny ability for introspection and self-oriented thinking, detached from the external world.”<sup>35</sup> These symbols have become live entities: rituals were held around them, sorcery was enacted on them and through them in order to influence the world of phenomena. What Clifford Geertz noted about religious symbols: “dramatized in rituals or related in myths,” namely that they can “store” meanings, is in fact true for all symbols.<sup>36</sup>

---

29) van Schaik, “Animal Culture.”

30) Dehaene, *Consciousness and the Brain*, 156.

31) *Ibid.*, 251.

32) Pinker, *The Language Instinct*, 5, 362.

33) Deutscher, *The Unfolding of Language*, 16–17.

34) *Ibid.*, 19.

35) Dehaene, *Consciousness and the Brain*, 252.

36) Geertz, *The Interpretation of Cultures*, 127.

We recognize here the same pattern we have observed, concerning the reversal of the course of human adaptation, recurring in the brain itself. The symbols, which originated with sensory stimuli flowing from the external physical world, serve in turn to affect phenomena in the external world. That is to say, human behavior is affected by the mental images produced in the brain which are then employed in their dealings with the world around them. In other words, these images or symbols take precedence as the guiding principles of human behavior. It is according to them that humans construct and design their tools, their lodgings, their clothing, their decorations, but also their social formations and practices – and just about everything they create.

Culture has been as effective as nature in deciding the evolution of humankind. Gregory Cochran and Henry Harpending claim that social scientists are wrong to assume that human genetic evolution had stopped some one hundred thousand or fifty thousand years ago with the appearance of human culture, for not only did it not stop working but, as a matter of fact, has been accelerated.<sup>37</sup> From our point of view, the crucial point is that culture had encroached upon nature and usurped its place as the main setup of coercive conditions and constraints on humankind. Similarly, the evolution of the human descended larynx may also be attributed to genetic evolution under the impact of culture or rather the new demands imposed by societal requirements and conditions. It allowed our species to produce more complex and richer sounds compared to other mammals, including emotional tone of voice,<sup>38</sup> to expand immensely the inventory of words, and to refine their verbal accounts not only of the world around them but also of their inner conscious world. The ability to articulate their inner world no doubt enhanced and enriched communication between humans and thereby also their inter-personal relations. Both language and the descended larynx probably developed simultaneously, and they must have been prompted by the prerequisites of the social condition, adapting to the exigencies of human social existence rather than to those of nature.

Symbols can be loaded with any meaning and due to their infinite versatility they prove to be the best vehicles of representation. Symbols at any level, starting with words, are representations. Symbols do not require any resemblance in form or in content to the things they represent; they are for the most part arbitrary. The flag, for example, is a symbol of a state in much the same way that the totem served as a symbol of a tribe. In and of itself, the flag has no special meaning but when attached to the state it becomes meaningful as its symbolic representation. Saluting the flag means honoring that state and violating the flag means dishonoring that state.

The institution of the totem, prevalent among tribal cultures, offers a perfect paradigm of the functional dimension of symbols. The contesting views among anthropologists about the function of the totem – whether it served to reconcile nature and society,<sup>39</sup> or whether it marks the origin of religion,<sup>40</sup> or even the social introduction of exogamy<sup>41</sup> – we deem as mere byproducts or secondary effects of the totem. We are convinced that the primary role of the totem had been to provide identity to the human group. It seems more likely that the totem functioned primarily as an anchor of identity and as a linkage between humans and nature within the framework of culture. Early humans determined their individual identity primarily through affiliation with a group – the family, the kin, and later the tribe. Yet the question remained as to how the identity of the group was determined. According to anthropological reports the group in various parts of the world was associated

---

37) Cochran and Harpending, *The 10,000 Year Explosion*, 1–5.

38) Pinker, *The Language Instinct*, 159–160.

39) See McLennan, “The Worship of Animals and Plants,” 407–427, 562–582., See also; Smith, *Lectures on the Religion of the Semites.*, and Lévi-Strauss, *Totemism*.

40) See Malinowski, *Magic, Science and Religion*. See also Evans-Prichard, *Nuer Religion.*, and Durkheim, *The Elementary Forms of the Religious Life*.

41) See Fraser, *Totemism and Exogamy*; Barnard, “Modern Hunter-Gatherers and Early Symbolic Culture,” 50–68.

with either an animal or a plant or with some natural component of the surrounding landscape – a mountain, a ridge, a river, a waterhole, a tree or a grove – conceived as the totem of the group. The fact that the totem was composed of natural elements is meaningful: Since culture involved a process of disengagement from nature, it sounds quite reasonable that humans were seeking, either consciously or unconsciously, to reconnect with it by attributing their origins to natural phenomena. The primary role of the myth was to explain or corroborate this affinity between the human and the natural by providing a historical backstory of the association between the social group and its totem. The myth is not a causal explanation; it is a descriptive historical story. As cultural creations, both totem and myth rather expressed human fear of detachment from their natural origin and a way to forge anew the lost immediacy in their relation with nature around them.

## 6. Tools and Artifacts

We do not possess empirical findings with which to reconstruct either the beginnings of human society or the early use of symbols. As Nancy Tanner phrased it, “social action is not preserved in the fossil record: language, mother love, environmental lore, kinship systems, faith, and children games do not fossilize.”<sup>42</sup> The most ancient symbolic artifacts in our possession, such as cave drawings and figurines, do not go back more than forty thousand years;<sup>43</sup> but obviously under our theory, human society and the use of symbols began much earlier. An engraving of some abstract form on a stone flake was found in Blombos Cave (South Africa), and dated seventy-three thousand years ago.<sup>44</sup>

The archeological evidence regarding tool production offers concrete testament to the antiquity of human culture. Originally, tools were physical objects the use of which enhanced and extended the natural capabilities of their users. The use of tools, presumably beginning some two and a half million years ago, not only dramatically changed humans’ chances of survival in their natural surroundings, but was a landmark in the long protracted evolution of human culture. The considerable efforts humans invested in the production and design of tools, and the drive to improve them, is a clear sign of their conscious use of tools and their awareness of the decisive advantage their tools furnished them with. It is common knowledge that some animals (like certain birds and primates) use natural tools to solve problems.<sup>45</sup> However, their use is very limited compared even to the versatile use performed by early hominids. Even if we concede that the difference between animals and humans is a matter of degree, the gap in their respective power of invention and combinatorial ability – as well as motivation, is so huge that there is hardly any room for comparison. The crucial difference from the outset was the fact that these early humans were dedicated to improving their tools and eventually to manufacturing tools out of raw natural materials. At the very far end of the continuous effort of tool-production, itself the product of human ingenuity and relentless drive for improvement, we have a fearsome technology that threatens to override its human users. It is a long way from lithic tools but, in retrospective and perhaps paradoxically, we now possess tools that can destroy almost everything including us, their inventors.

Tools were the means by which hominids started introducing changes into their natural environment and adapting it to their needs. The beginnings were meager but very significant. With the aid of their primitive stone and bone tools – clubs, knives, axes, needles, hooks – humans extended and enhanced their impact on their surroundings far beyond their physical capabilities. They raised themselves to the top of the food chain

---

42) Tanner, *On Becoming Human*, 9.

43) See Pike et al., “U-Series dating of Paleolithic art in 11 caves in Spain,” 1409–13.

44) See Henshilwood et al., “Emergence of Modern Human Behavior,” 1278–1280.

45) see Shumaker et al., *Animal Tool Behavior*.

and became the most efficient predator in nature, driving away all other competitors from their living space. They built their own habitats; improved and reinforced them. They clothed themselves with the skins and furs of the animals they hunted. They learned to control and even to generate fire. They cut and scraped the flesh and skin of their hunted animals. With these devices they succeeded to mitigate the harsh impact of climate and were able to expand their living space and embark on long cruises in search of better localities.

The fact that humans became less affected by climate conditions led to the migrations of *Homo erectus* from Africa to the Middle East, Asia, and Europe. It is probable that the initiative behind these very early migrations was the steady growth of humanoid populations and the increase in haphazard hostile encounters between wandering groups of hunter-gatherers. The encounters between competing human societies seized focus and became more threatening and fateful than the encounter with nature.

When exactly had the stage begun in which small groups of “hunter-gatherers” were wandering across the open prairie in search of food? Or when had that stage begun in which humans found shelter in large caves, like those on Mt. Carmel, which according to findings there were populated already two hundred and fifty thousand or perhaps five hundred thousand years ago?<sup>46</sup> On whichever model we select to base our description of the beginnings of culture – on the hunter-gatherer model or on the Paleolithic cave one – it is conceivable that the first significant tactical step taken by *Homo habilis*, or by *Homo erectus* or by *Homo naledi* (discovered in 2013 in a cave in South Africa) was finding a shelter from the wrath of nature and from lurking predators. It is likely that the use of caves began concurrently with the undertaking of hunting excursions in the open savannah.

By tracking down stone tools of antiquity, researchers were able to recreate a time table of culture – the Paleolithic age (the ancient or early stone age, over two and a half million to two hundred and fifty thousand years ago), the Mesolithic age (the middle stone age, two hundred and fifty thousand to ten thousand years ago), and the Neolithic age (the late stone age, ten thousand to five thousand years ago). This timetable, which is determined by distinct changes in stone processing, is very crude. In the passage to the metal ages (copper, bronze and iron) we witness superb precision, refined execution, and high diversification of the new artifacts, especially in ornaments.

Based on findings of flint deposits and numerous splinters in sites older than two and a half million years, which may suggest surplus production exceeding the needs of a small hunting group – what archeologists call “lithic industries”<sup>47</sup> – it is plausible though hardly imaginable, that barter trade had taken place even at this early phase. Such a high level of production must have involved transmission and sharing of knowledge by means of basic apprenticeship practices through demonstration and imitation. Procedures like these, which could only take place within a rather well-organized social group, demonstrate an impressive level of cultural development.

One cannot but wonder at the slow pace of the technological development from the lithic to the metal era that dragged along hundreds of thousands of years, especially when compared to the burst of creativity manifested by humankind in the last five thousand years. Lévi-Strauss expressed the same puzzlement with regard to the thousands of years of “stagnation” that separated the Neolithic revolution from contemporary science.<sup>48</sup> We tend, as part of our endeavor to make sense of the past to interpret it in terms of the present. We are inclined to identify cultural development with the distinct characteristics of modern culture, most notably with fast changes. Indeed, change itself has become a constitutive principle of modern culture and remains so to this day. This obviously was not characteristic of premodern times. The fact that in prehistory the pace of

---

46) Weinstein-Evron et al., “Spatial Organization of Natufian el-Wad Through Time,” 88–106.

47) See Phillipson, “Aksumite Lithic Industries,” 49–63. See also Arthur J. Jelinek, *Neanderthal Lithic Industries at La Quina*.

48) Lévi-Strauss, *The Savage Mind*, 10.

development was incredibly slow indicates that the motivation behind culture was not originally and essentially an ambition to expand but, on the contrary, a will to create a closed, protected, and controllable domain. Accordingly, preference was given to rules and to tradition and every proposal to renew or change the rules was seen as a threat to the whole structure.

## 7. Between Culture and Civilization

“Culture” and “civilization” are often applied as interchangeable terms. According to Terry Eagleton they, “originally meant much the same thing,”<sup>49</sup> but in modern times these terms were, “actually viewed as opposites.” Yet as the etymology of civilization (*civitas, civis*) indicates, the term relates to the city-state and hence denotes an advanced stage in the development of culture. While culture originally thrived within the bounds of the tribe, civilization originated in the complex, dynamic and interactive reality of the city, which had broken through the confines of the closed, conservative culture of the tribe. From its inception, the city attracted traders, craftsmen, immigrants and refugees from various tribes. It was a relatively open, all-embracing domain. The original tribal core which founded the city incorporated populations of foreigners who became integrated into the urban texture. The social complexity characteristic of city-population was bound up with the multitude of cultural functions the city offered as a military stronghold and a center of governance and administration, of religion and commerce. In modern scholarship the city has been widely acknowledged by historians and sociologists as a major site of cultural development, starting with Georg Simmel’s pioneering work,<sup>50</sup> and continuing with later urban scholars such as Robert Park, Louis Wirth or Lewis Mumford.<sup>51</sup> From the beginning, the city seems to have absorbed those who outgrew the more traditional and limited tribal or rural communities: outsiders – or those who were expelled and sought asylum from blood vengeance.

Furthermore, the city-state, as a convergence of power, tended to expand spatially and become an empire. The empire, as the Latin term *imperium* from which it is derived suggests, was mainly concerned with exercising control over its periphery and over other city-states.<sup>52</sup> As the great eastern empires of Egypt, Assyria, Babylon and Persia, and later Rome demonstrated, the imperial space was in no way culturally homogenous. The Greek city-states, with the exception of Athens which was the most developed and imperialistic, were unique in that they did not expand beyond their borders but initiated the founding of independent daughter city-states.<sup>53</sup> The result was the creation of a civilizational Hellenic space spanning from the shores of Turkey (Ionia) to those of France (Gaul). Ironically, where they lacked in imperial rule they benefitted through exercising a global cultural impact.

From the ancient *polis* to the modern *megalopolis*, the city scene epitomized the cultural process of disassociation from nature and the creation of an artificial environment. While the village or the countryside kept their ties with nature and were always conceived as being close to nature, the city was indisputably an utterly artificial structure. With all the services and functions and variety it has to offer, the city has always served as the center of the whole cultural space. In modern times, with the joint processes of industrialization and urbanization, the city has become the predominant mode of life, encompassing almost all aspects of the artificial environment as culture. The fact that some cultures have not undergone these transitions at all, and some

---

49) Eagleton, *Culture*, 4.

50) Simmel, “The Metropolis and Mental Life,” 409–424.

51) See Park, “The City,” 577–612; Wirth, “Urbanism as a Way of Life,” 1–24; Mumford, *The City in History*.

52) Howe, *Empire*, 13–14.

53) See Hansen, *Polis*.

remained to this day in a traditional way of life (tribal, non-urban), is not incongruent with our main paradigm for the analysis of cultural development. Archaic prehistoric cultures as well as contemporary traditional societies demonstrate the basic constituents we specified and the same basic rationale of creating an artificial enclave within nature, even when they appear to maintain a more relaxed or intimate equilibrium with their natural environment.

## 8. Conclusion

- 1) All human cultures share a common infrastructure. Culture, everywhere and at every phase, manifests itself in three basic and distinct domains: society, language, and tools (technology).
- 2) Human culture is in effect a human-made Artificial Environment, incorporating all human creations ( $C=AE$ ).
- 3) By means of introducing changes into their immediate natural surroundings, humans were able to create an expropriated, protected and controlled enclave within nature.
- 4) The prime catalyst for all changes in the natural environment and for the creation of the artificial environment has been the large human brain.
- 5) The emergence of a brain in organisms, the apex of which is the human brain, was a game-changer in the history of evolution.
- 6) Due to their large brain, humans succeeded in changing the direction of natural adaptation – from being adapted to nature to adapting nature to human needs.
- 7) The first concretization of culture is society as a *web of relationships* between human individuals.
- 8) The intricate human social setup is sustained by symbolic language which forms a self-contained *web of meanings*.
- 9) As representations of images, thoughts, and fictitious entities, symbols gave birth to the creation of a whole mental world comprised of myth and religion, art and literature, philosophy and science.
- 10) With the transition to settlements and the development of cities and states, culture reached the phase of *civilization*.

On a final note, the present phase of culture – the Information Age, further exemplifies our thesis about the central importance of the concept of artificiality for understanding the phenomenon of culture. Cyberspace is the new artificial enclave within an already artificial environment. With digital technology which took over every aspect and domain of human life we have become twice removed from the natural environment. Human-nature interface has been replaced by human-machine interface. That we live today in digital culture means that we switched from the primary artificial environment (culture) to cyber environment. This switch suggests the prioritization of tools or technology as the paramount element of culture. In terms of our model it implies an upset of balance between all three constituents – the social, the mental, and the technological – in favor of the latter. Culture had begun with human capability to create an artificial environment within nature and thus to affect the course of human evolution. The possibility of creating, by means of technology, virtual environments that will constitute an *alternative* to the real environment – both natural and cultural – looms as a very disturbing prospect.

Bibliography:

- Barnard, Alan. "Modern Hunter-Gatherers and Early Symbolic Culture." In *The Evolution of Culture: An Interdisciplinary View*, edited by Robin Ian MacDonald, Chris Knight, and Camilla Power, 50–68. New Brunswick: Rutgers University Press, 1999.
- Boas, Franz. *The Mind of the Primitive Man*. New York: The Macmillan Company, 1911.
- Bonner, John Tyler. *The Evolution of Culture in Animals*. Princeton: Princeton University Press, 1989.
- Carp, Richard M. "Perception and Material Culture: Historical and Cross-Cultural Perspectives." *Historical Reflections/Réflexions Historiques* 23, no. 3 (Fall 1997): 269–300. <http://www.jstor.org/stable/41299096>.
- Childe, Gordon. *Man Makes Himself*. London: Watts & Co, 1936.
- Cicero. "II. On Bearing Pain." In *Cicero's Tusculan Disputations* translated by Andrew P. Peabody, 89–135. Boston: Little & Brown, 1886. <https://www.john-uebersax.com/plato/pain.htm#1>.
- Cochran, Gregory, and Henry Harpending. *The 10,000 Year Explosion: How Civilization Accelerated Human Evolution*. New York: Basic Books, 2009.
- Dahre, Ulf Johansson. "Searching for a Middle Ground: Anthropologists and the Debate on the Universalism and the Cultural Relativism of Human Rights." *The International Journal of Human Rights* 21, no. 5 (2017): 611–628. <https://doi.org/10.1080/13642987.2017.1290930>.
- Davies, Peter J., ed. *Plant Hormones, Biosynthesis, Signal Transduction, Action*. 3<sup>rd</sup> ed. Dordrecht: Kluwer Academic Publishers, 2004.
- Dehaene, Stanislas. *Consciousness and the Brain: Deciphering How the Brain Codes our Thoughts*. New York: Penguin Books, 2014.
- Descola, Philippe. *Beyond Nature and Culture*. Chicago and London: The University of Chicago Press, 2013.
- Deutscher, Guy. *The Unfolding of Language: An Evolutionary Tour of Mankind's Greatest Invention*. New York: Henry Holt and Company, 2005.
- Dunbar, R. I. M. "Coevolution of Neocortical Size, Group Size and Language in Humans." *Behavioral and Brain Sciences* 16, no. 4 (1993): 681–94. <https://doi.org/10.1017/S0140525X00032325>.
- Dunbar, Robin, Clive Gamble, and John Gowlett. *Thinking Big: How the Evolution of Social Life Shaped the Human Mind*. London: Thames and Hudson Ltd, 2014.
- Durkheim, Émile. *The Elementary Forms of the Religious Life*. London: George Allen & Unwin Ltd, 1964.
- Eagleton, Terry. *Culture*. London: Yale University Press, 2016.
- Edgerton, Robert B. *Sick Societies: Challenging the Myth of Primitive Harmony*. New York: Free Press, 1992.
- Evans-Prichard, Edward E. *Nuer Religion*. New York: Oxford University Press, 1956.
- Fraser, James George. *Totemism and Exogamy: A Treatise on Certain Early Forms of Superstition and Society*. London: Macmillan and Co., Limited, 1935.
- Geertz, Clifford. *The Interpretation of Cultures: Selected Essays*. New York: Basic Books, 1973.
- Giddens, Anthony, ed. *Emile Durkheim: Selected Writings*. New York: Cambridge University Press, 1972.

- Goldman, Michael, and Rachel A. Schurman. "Closing the 'Great Divide': New Social Theory on Society and Nature." *Annual Review of Sociology* 26, (2000): 563–584. <https://doi.org/10.1146/annurev.soc.26.1.563>.
- Grey, William. "Anthropocentrism and Deep Ecology." *Australasian Journal of Philosophy* 71, no. 4 (1993): 463–475. <https://doi.org/10.1080/00048409312345442>.
- Harper, Francis Robert, ed. *The Code of Hammurabi King of Babylon about 2250 B.C. Autographed Text Transliteration Translation Glossary Index of Subjects Lists of Proper Names Signs Numerals Corrections and Erasures with Map Frontispiece and Photograph of Text*. Chicago: University of Chicago Press, 1904. <https://oll.libertyfund.org/titles/1276>. <https://doi.org/10.2307/1323443>.
- Hancock, Angela M., Gorika Alkorta-Aranburu, David B. Witonsky, and Anna Di Rienzo. "Adaptations to New Environments in Humans: The Role of Subtle Allele Frequency Shifts." *Philosophical Transactions of the Royal Society B: Biological Sciences* 365, no. 1552 (2010): 2459–468. <https://doi.org/10.1098/rstb.2010.0032>.
- Hansen Mogens Herman. *Polis: An Introduction to the Ancient Greek City-State*. New York: Oxford University Press, 2006.
- Henshilwood, Christopher S., Francesco d'Errico, Royden Yates, Zenobia Jacobs, Chantal Tribolo, Geoff A. T. Duller, Norbert Mercier, *et al.* "Emergence of Modern Human Behavior: Middle Stone Age Engravings from South Africa." *Science* 295, no. 5558 (2002): 1278–1280. <https://doi.org/10.1126/science.1067575>.
- Herskovits, Melville J. *Man and His Works*. New York: Alfred A. Knopf, Inc., 1948.
- Howe, Stephen. *Empire: A Very Short Introduction*. Oxford, New York: Oxford University Press, 2002. <https://doi.org/10.1093/actrade/9780192802231.001.0001>.
- Ibn Khaldūn, 'Abd al-Rahman. *The Muqaddimah: An Introduction to History* Book 1. Translated by Franz Rosenthal. New York: Pantheon Books, 1958.
- Jelinek, Arthur J. *Neanderthal Lithic Industries at La Quina*. Tucson: University of Arizona Press, 2013.
- Klein, Richard G. *The Human Career, Human Biological and Cultural Origins*, 3<sup>rd</sup> ed. Chicago: University of Chicago Press, 2009. <https://doi.org/10.7208/chicago/9780226027524.001.0001>.
- Kroeber Alfred Louis. *The Nature of Culture*. Chicago: University of Chicago Press, 1952.
- and Clyde Kluckhohn. *Culture: A Critical Review of Concepts and Definitions*. Cambridge: The Museum, 1952.
- Laland, Kevin N., and Bennett G. Galef, eds. *The Question of Animal Culture*. Cambridge and London: Harvard University Press, 2009.
- Latour, Bruno. "Relativism." In *We Have Never Been Modern*. Translated by Catherine Porter, 91–129. Cambridge: Harvard University Press, 1993.
- Lévi-Strauss, Claude. *Totemism*. Translated by Rodney Needham. London: Merlin Press Ltd, 1964.
- . *The Savage Mind*. Chicago: University of Chicago Press, 1966.
- Malinowski, Bronislaw. *Magic, Science and Religion*. Garden City: Doubleday, 1954.
- McGrew, William C. "Culture in Nonhuman Primates?" *Annual Review of Anthropology* 27, no. 1 (2003): 301–328. <https://doi.org/10.1146/annurev.anthro.27.1.301>.



- McLennan, F. J. "The Worship of Animals and Plants." *Fortnightly Review* 6 (1869); two parts – Part I: "Totems and Totemism," 407–427; Part II: "Totem-gods among the Ancients" 562–582 – Part II (concluded), "Totem-gods among the Ancients." *Fortnightly Review* 7 (1870): 194–216.
- Mumford, Lewis. *The City in History: Its Origins, Its Transformations, and Its Prospects*. New York: Harcourt, Brace & World, Inc., 1961.
- Nettle, Daniel. "Beyond Nature versus Culture: Cultural Variation as an Evolved Characteristic." *Journal of the Royal Anthropological Institute* 15, (2009): 223–240. <https://doi.org/10.1111/j.1467-9655.2009.01561.x>.
- Neumann, Joseph. "Biology and Culture." *Journal of Life Sciences* 7, no. 3 (2013): 322–332.
- Phillipson, Laurel. "Akumite Lithic Industries." *African Archaeological Review* 17, no. 2 (2000): 49–63. <https://doi.org/10.1023/A:1006600324970>.
- Park, Robert E. "The City: Suggestions for the Investigation of Human Behavior in the City Environment." *The American Journal of Sociology* XX, no. 5 (March 1915): 577–612. <https://doi.org/10.1086/212433>.
- Pike, Alistair et al. "U-Series dating of Paleolithic art in 11 caves in Spain." *Science* 336, no. 6087 (June, 2012): 1409–13. <https://doi.org/10.1126/science.1219957>.
- Pilgrim, Sarah, and Jules Pretty, eds. *Nature and Culture: Rebuilding Lost Connections*. London: Earthscan, 2010. <https://doi.org/10.4324/9781849776455>.
- Pinker, Steven. *The Language Instinct: How the Mind Creates Language*. New York: Harper-Perennial, 2000.
- Premack, David, and Ann J. Premack. "Why Animals Have Neither Culture nor History." In *Companion Encyclopedia of Anthropology*, edited by Tim Ingold, 350–365. London and New York: Routledge, 2002.
- Ramsey, Grant. "What is Animal Culture?" In *Routledge Companion to the Philosophy of Animal Minds*, edited by Kristin Andrews, and Jacob Beck, 345–353. New York: Routledge Press, 2017. <https://doi.org/10.4324/9781315742250-33>.
- van Schaik, Carl. "Animal Culture: How Much Culture is There in Nature and What is it About?" *Semiotix* 14, January 2009. <https://semioticon.com/sx-old-issues/semiotix14/sem-14-03.html>.
- Shumaker, Robert W., Kristina R. Walkup, and Benjamin B. Beck, *Animal Tool Behavior: The Use and Manufacture of Tools by Animals*. Rev. Ed. Baltimore: The John Hopkins University Press, 2011.
- Smith, Robertson W. *Lectures on the Religion of the Semites, First Series, The Fundamental Institutions*. London: A. & C. Black [1889], 1901. [http://digitalassets.lib.berkeley.edu/main/b22240089\\_B000893311.pdf](http://digitalassets.lib.berkeley.edu/main/b22240089_B000893311.pdf).
- Soper, Kate. *What Is Nature? Culture, Politics and the Non-Human*. Oxford: Wiley-Blackwell, 1995.
- Tanner, Nancy Makepeace. *On Becoming Human*. Cambridge: Cambridge University Press, 1981.
- Tattersall, Ian. "The Case for Saltational Events in Human Evolution." In *The Speciation of Homo Sapiens*, edited by T. J. Crow, 49–59. Oxford, New York: Oxford University Press, 2002.
- Tooby, John, and Leda Cosmides. "The Psychological Foundations of Culture." In *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*, edited by J. Barkow, L. Cosmides and J. Tooby, 19–136. New York: Oxford University Press, 1992.
- Watkins, Calvert. *The American Heritage Dictionary of Indo-European Roots*, 2<sup>nd</sup> ed. Boston and New York: Houghton Mifflin Company, 2000.

Weinstein-Evron, Mina, Daniel Kaufman, and Reuven Yeshurun. "Spatial Organization of Natufian el-Wad Through Time: Combining the Results of Past and Present Excavations." In *Natufian Foragers in the Levant: Terminal Pleistocene Social Changes in Western Asia*, edited by Ofer Bar-Yosef and François Raymond Valla, 88–106. Ann Arbor, Mich.: International Monographs in Prehistory, 2013. [https://www.researchgate.net/publication/284342606\\_Spatial\\_organization\\_of\\_Natufian\\_el-Wad\\_through\\_time\\_Combining\\_the\\_results\\_of\\_past\\_and\\_present\\_excavations](https://www.researchgate.net/publication/284342606_Spatial_organization_of_Natufian_el-Wad_through_time_Combining_the_results_of_past_and_present_excavations). <https://doi.org/10.2307/j.ctv8bt33h.13>.

Wirth, Louis. "Urbanism as a Way of Life." *American Journal of Sociology* 44, no. 1 (1938): 1–24. <http://www.jstor.org/stable/2768119>. <https://doi.org/10.1086/217913>.

White, Leslie A. *The Evolution of Culture: The Development of Civilization to the Fall of Rome*, New York: McGraw-Hill Book Company, INC, 1959.

Simmel, Georg. "The Metropolis and Mental Life." In *The Sociology of Georg Simmel*, edited and translated by Kurt H. Wolff, 409–424. New York: Free Press, 1950.