

Three Prehistoric Inventions that Shaped Us

by

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Chapter 1. The Oldest Question: What Separates Human Beings from All Other Creatures?

Facts are ventriloquists' dummies.
Sitting on a wise man's knee they may
be made to utter words of wisdom;
elsewhere, they say nothing, or talk
nonsense, or indulge in sheer diabolism.

Aldous Huxley

1.1 Hummingbirds and Homo Sapiens

Human action can be modified to
some extent, but human nature
cannot be changed.

Abraham Lincoln

One of the jobs people need to do when they arrive for a visit to our family cottage, located on an island in a lake north of Toronto, is to clear away spiders' webs from the hummingbird feeder hanging on the front porch, take the feeder inside, wash it, refill it with hummingbird food—water with dissolved sugar—then hang it outside again. Whenever I go through that procedure (or as my wife would say, whenever I watch her doing it, from a comfortable seat in front of the computer), the same thought always occurs to me. I find myself thinking: “What a silly, unrealistic little thing that feeder is, as proved by the fact that the people who designed it apparently didn't know what

hummingbirds were like.” Let me elaborate. The feeder to which I refer is a round flat plastic object, about the size of a small bread plate, with a thin metal bar ending in a hook, rising from its center. It also has a scalloped edge that, when viewed from above, makes it look like a flower. The detachable cover on top is bright red in color, while the bottom part that holds the feed is made of clear plastic. What bothers me about this object is neither the red top (hummingbirds need bright colors in order to find the feeder and be attracted to it), nor its whimsical, flower-shaped edge. The problem is that the feeder has six evenly spaced feeding holes, each one associated with its own individual perch located along the scalloped edge. This feature strikes me as ridiculous, because it is at odds with something that anyone who watches hummingbirds feeding for more than fifteen minutes ought to know—namely, that these birds always insist on eating alone, and threaten, bully, and chase each other, until only one of them remains to have access to the food.

A couple of confessions: First, I admit that the point just mentioned is not entirely true since, on a few occasions, each lasting for at least a minute, I have been lucky enough to see two hummingbirds calmly sipping sugar water from the same feeder at the same time. My speculation about those cases (whose truth I cannot prove one way or the other) is that they involve mated pairs. Second, I also admit that I do not literally believe the individual or individuals who designed the feeder did not know anything about hummingbirds. Rather, a more likely hypothesis is that he, she, or they designed the object the way they did, in order to sell it to naïve people like me of twenty-five years ago. In other words, they made it attractive to individuals who, not yet having had a chance to observe hummingbirds up close, were not yet in a position to decide what feeder to buy, on the basis of concrete knowledge about the birds they hoped would use it. Rather, the prospective customers who were the designers’ target probably were people who would make their choice based on what

they *wanted* hummingbirds to be like. After all, as Julius Caesar used to say, “People find it easy to believe what they desire to be true.”

How is it possible to get an understanding of humming birds that is based on observation rather than desire, and which at least potentially is consistent with further scientific investigation? It seems clear to me that certain types of comparisons between these birds and other creatures do not have any scientific sense or interest. For example, my newspaper once carried a short article under the title “Mondo hummingbird,” reprinted from The Allentown (Pa.) Morning Call, in which Arlene Koch, a self-taught bird expert, described hummingbirds as rotten, nasty little creatures that only care about themselves. Furthermore, Ms. Koch was reported to say, after traveling thousands of miles from their winter havens in the south, male and female hummingbirds search each other out during the spring, whistling to each other at a level so low humans can barely perceive it. When a pair hooks up, sex lasts only a few seconds. Afterward, the male goes out to find another female, without trying to take responsibility for his offspring. Once baby hummingbirds are a couple of weeks old, their mothers kick them out of the nest. In spite of all this, however, Ms. Koch assured her readers that she loved those birds, as proved by the fact that, every year on April 15, she sets out nearly two dozen backyard feeders for them.¹

I do not think it makes literal sense to describe hummingbirds as nasty, the way Ms. Koch did, since they are not humans. It might be appropriate to say that, *if* they were humans, then they would deserve to be called rotten and nasty; but that’s a different story. In particular, hummingbirds, unlike us, are not creatures whose reproductive success depends on engaging in cooperative behavior with other members of their species, or on having stable and long lasting familial relationships. Something else that makes it misleading for Ms. Koch to think of them in human terms, is the time

¹ *The Globe and Mail*, Monday, March 20, 2006, p.A14.

scale in which they operate, which is different (faster) than ours. For instance, it is pointless to describe the sexes' few seconds of mating as stingy, unfeeling, or exploitative, since this hummingbird behavior is normal, healthy, and adequate for its biological purpose, and therefore, in this sense, counts as good. Similar remarks apply to the two weeks of maternal care hummingbird chicks receive until they are able to fly, feed, and take care of themselves. Is it sensible to describe those weeks as too brief? The right answer is: "Of course not!"

It need not be scientifically misleading to compare one species with another. For example, one can obtain a fairly accurate idea of how hummingbirds survive, reproduce, and make their living, by taking account of their special properties, organs, and behaviors—e.g. their small size, rapid flight, whirring wings, ability to hover, their long beaks and tongues, and the dates and routes of their annual migrations. Furthermore, one also can draw inferences from those features, about the historical, evolutionary, and ecological relations in which hummingbirds stand to their surroundings, including other living things. For example, evolutionary biologists say that those birds are closely related to wrens, since they and wrens evolved from a recent common ancestor. Nevertheless, hummingbirds do neither look nor act like wrens today. Presumably, therefore, there was a time at which some of their forebears (they developed in the New World, not the Old) left behind a style of life that was similar to that of present-day wrens, and moved into the new, apparently unbird-like ecological niche they now occupy, which later turned out to be extremely rich, stable, and effective. Before the time of the change, only certain insects—bees—had occupied a niche that was analogous in various ways to the one that hummingbirds now inhabit.

This point about the history of hummingbirds is fascinating to me, because it seems that something similar must have happened in the evolutionary development of our own species as well. In other words, analogous to the case of hummingbirds, it is arguably true to say that humans also

owe a great deal of their recent biological and reproductive success to the fact that some of their evolutionary forebears stumbled upon an unexpectedly fruitful means of surviving that happened to be vacant at the time it was needed.

However, a problem infects any attempt to use those birds as a pattern, guide, or model for understanding the place of our own species in the world today. The problem is that it is much easier to discover how hummingbirds are related to things around them, than to understand how humans—both those now alive, and those that preceded them in time—do and once did interact with their environment. For example, humans have an unusual combination of body features, which unites adaptive styles of life that are characteristic of creatures of quite different sorts. The biologist J.B.S. Haldane was fond of pointing out (as noted by William Calvin, 2002, p.86), that only a human can swim a mile, then run 20 miles, then climb a tree. Swimming a mile is something deer are able to do, but wolves and chimpanzees cannot. Running 20 miles is within the capability of both deer and wolves, but not of chimpanzees. And neither deer nor wolves are able to climb a tree, but chimpanzees can. A similar point also applies to various behaviors in which humans engage. Thus, behavioral ecologists distinguish between what they call “r” and “K” reproductive strategies. The first strategy is followed by animals like mice and rabbits, which breed early and often, and thereby produce large numbers of offspring that, on average, suffer high mortality. The second is followed by animals like elephants and whales, which breed later and comparatively rarely, and thus produce fewer offspring, with lower rates of mortality, because parents (or at any rate, one parent) invests a great deal of time, effort, protection, and care in the raising of each of those offspring. Which strategy does our own species follow? The answer is that humans—unlike the great majority of other animals—practice either the one or the other, depending on the particular circumstances in which they happen to find themselves at the time in question. To be more specific, most impoverished

humans who live without the benefits of modern technology are comparatively “r” in their reproductive style. But if and when their socioeconomic conditions improve, they nearly always adopt the “strategy K” in place of “r,” so their infant mortality plummets, along with the average rate at which they produce children.

Analogous to the case of hummingbirds and wrens, we cannot predict how members of our species will behave by comparing them with their closest living primate relatives—the common chimpanzees and bonobos of Africa. To consider a simple instance of this point, with few exceptions, when young common chimpanzee females come to be of breeding age, they leave the group in which they were born, and go to live with some other group of chimpanzees. But bonobos follow the opposite pattern. That is, when young bonobo males reach the age of sexual maturity, they are the ones that leave the group in which they were born, and go to live out the rest of their lives in another group of bonobos. In the case of humans, however, neither the first pattern, nor the second, is generally followed. Instead, humans have a helter-skelter of many such arrangements, in which sexually mature young females sometimes leave the family group in which they were born; sometimes young males leave their familial group; sometimes both males and females leave; and sometimes neither sex leaves.

Many attempts have been made to define humans in a way that distinguishes them from all other species. In the last few hundred years, for example, some people have proposed that humans are the only animals that speak; others have claimed they are the only animals that make and use tools. I recently read about another, similar proposal that fits in with more contemporary concerns (see *The Globe and Mail*, April 8, 2010, p.L6). This is the idea that humans are the only animals that intentionally manipulate energy. In my view, all “definitions” of the sort just mentioned are too

superficial to be of much use for my concerns in this book, since they refer to certain things humans do, rather than to underlying abilities and powers that enable and allow them to do those things.

Experts agree that the most distinctive organs human beings have are those that make up their central nervous systems, prominently including their brains. We now know (as the ancient Egyptians never did) that the human brain accomplishes many thousands, and perhaps even millions, of crucially important functions, the great majority of which are quite different from all the others. Furthermore, there is no neat way of summarizing those functions, or tying all of them together. The usual practice of speaking of the human brain as if it were a single organ is misleading, since it is more accurate to describe the brain as a very large group of different organs, whose only common feature is that they happen to be located in the same general place—namely, inside the skull. To summarize, then, it is difficult to characterize the “human niche” which, as far as we know, had no occupants on this planet, before some of our ancestors found it and moved into it. Another, related aspect of the same problem is that there also is no quick and easy means of comprehending the “human nature” that presumably enables the members of our species to survive in that niche.

(A digression: An objector might say that makers and consumers of science-fiction books and movies have no difficulty imagining other, non-human life forms, living both inside and outside of our solar system, galaxy, and universe, who or that inhabit essentially the same niche as humans. My reply is that this objection only poses an apparent rather than real difficulty, since the seemingly strange aliens that appear in books and films of that type amount to duplicate humans, who therefore merely reintroduce all the old, familiar problems that are connected with trying to understand and describe human nature, without suggesting any genuinely non-derived contrasts useful for providing instructive perspectives on our own situation. For example, no matter how exotic the appearance of extra-terrestrial heroes and monsters might be, those in English films consistently think, act, infer,

judge, and emote like Englishmen, those in American films like Americans, those in Japanese films like Japanese, and so forth. Thus, if someone really were interested in unraveling the mystery of what human nature is, he or she might make more profitable use of time if, instead of paying attention to science-fiction, he informed himself about discoveries already made about the non-human intelligence that belongs to other known terrestrial species. For instance, he might consider the cases of crows and parrots, or—perhaps even better—cephalopods like octopi, nautiluses, and squids.)

Partly because of my long-standing interest in the subject of history, I gradually have come to believe that many important elements of the nature we now possess came into existence as a result of intellectual and cultural advances made by some of our ancient ancestors. To be still more specific, I do not think it is possible to make sense of what present-day humans are like, just by paying attention to how our bodies are composed and organized, since a non-trivial number of basically important features of our nature are products of culture rather than biology. That is—as I intend to explain at greater length later—those features did not come into existence simply as a result of evolution, genes, and maturation, but largely as a result of the thinking, learning, ideas, and choices of past particular individuals.

1.2 Is there Any Such Thing as Human Nature?

An English proverb runs as follows: “The fox knows many tricks, the hedgehog only one; but it is a very good trick.” Some people interpret this as implying that hedgehogs have a nature, on the grounds that a nature is an unlearned, inherited, and instinctively automatic program of behavior, and the hedgehog’s trick of responding to every perceived attack by rolling into a ball that puts its soft, vulnerable parts on the inside, and its stiff, prickly spines on the outside, is behavior of exactly

that sort. On the other hand, those same people are inclined to deny that foxes have a nature since (1) depending on the characteristics of each situation, foxes act in a far greater number of possible ways than hedgehogs. Furthermore, (2) they apparently choose among those ways by deciding what to do in terms of certain criteria.

Some philosophers have argued on grounds similar to the point just made about foxes that there is nothing that deserves to be called “human nature.” For example, the French atheistic existentialist philosopher, Jean-Paul Sartre (see his 1948/1964, pp.122ff.), claimed that animals like streptococci, starfish, rats, hedgehogs, eagles, squids, kangaroos, and even foxes, each had a settled, predictable nature that scientific researchers could discover by observation and inference. But the same was not true of human beings, according to him, because each human was able, at every moment of his or her life, to transform himself (or at least begin to do that), in any direction, and to any degree, he chose. (Of course, this idea also presupposed that each of the humans in question was willing and able to be sufficiently brave, determined, and mentally strong to bring about the desired changes.) To summarize, Sartre believed humans had no nature, because they had absolute freedom, and that sort of freedom was incompatible with a nature.

Another way Sartre sometimes expressed roughly the same idea was to remind us that there always had to be a plan, blueprint, or essence that preceded the bringing into existence of a manufactured object like a letter opener, automobile, house, or sausage factory, since the first necessary step any would-be manufacturer would take in order to produce that item, and thus make it real, would be to consult a plan of that sort, as a means of envisaging all the proposed object’s properties. However, according to Sartre, no such plan was possible as far as human beings were concerned, because human behavior (unlike that of other creatures) was not determined either by natural or by supernatural forces. The proof for the first part of this idea, about natural forces, lay in

the perceived fact of complete human freedom. (Sartre said this freedom was “something we all feel.”) The proof for the second part, about supernatural forces, lay in the further, metaphysical fact (presumably established by scientific and historical reasoning) that there was no God, who might bring into effect a program of first planning then creating humans. Accordingly, then, (a) human beings constantly had to remake themselves, without pre-existing conception to work from, and (b) the only thing that determined what they were like at any moment was this self-envisaging and self-creative process itself. Sartre then added the further more general point that (c) human beings were unique among living creatures, and perhaps among all objects considered in general, because their existence preceded their essence.

Let me begin to criticize Sartre’s view by saying I find his idea that humans have no instincts suspiciously unscientific, because it fails to take account of many clear cases. For example, several streams of linguistic research point to the conclusion that humans could not, and do not, learn languages without the help of a large number of innate and automatic behavioral programs.² In other words, far from being free to learn anything we like, we know that inborn instincts impose severe limitations on us, as shown by the fact that there are many logically possible languages we cannot learn. Consider a simple instance. It is easy for speakers of English to form questions from statements by transposing the main verb of the statement to its beginning, and leaving an unheard “trace” in the place the verb used to occupy. Thus, we generate the question that corresponds to the descriptive statement, “Your horse is brown,” by changing the order of the words in that statement to

² Darwin in his *Descent of Man*, William James following him, and Noam Chomsky following those people in turn, almost certainly are right to say that, rather than having no inborn instincts, humans have a much greater number of them than any other known type of animal. (See Pinker, 1994, pp.20-1.)

say, “Is your horse brown?” But our brain’s organization does not allow us to form questions by the equally simple, but systematically different, method of reversing the order of the words in the original sentence. That is, an overwhelming majority of humans could not form questions from a sentence like “Your horse is brown,” by saying “Brown is horse your?” (On this subject see Pinker, 1994, Chapter 4.)

Turning now to a theory of another type, some thinkers—for example, behaviorist psychologists like B.F. Skinner—admit that humans have a nature, but deny its distinctiveness, because of what they take to be the fact that all conscious and comparatively complex creatures (including humans) determine their patterns of thinking and behaving in essentially the same way. Behaviorists believe that the most important part of the mental repertoire of every changeable and adaptable organism is the way it gathers new information. Further, they say every living thing that is capable of learning, learns only those things that lead to reward (or what some behaviorists have called “positive reinforcement”) and either ignores, or positively avoids, those things that lead to a lack of reward (“negative reinforcement”). This implies in turn that all organisms of that type must share, to one or another degree, the same character, mind, or nature. (Presumably, behaviorists consider humans to have a more developed and complete version of the common nature or “group mind” about which I now am speaking, and simpler animals less complete versions of it. Recent biologists say very simple creatures like bacteria, ants, mosquitoes, etc. do not have a nature at all, since they are automatons that never learn anything. That is, although we often observe creatures of that sort behaving in ways that seem adaptive and useful, experimental investigations have shown that everything they do is a result of programs of behavior that are rigidly determined by their genes, which therefore cannot be results of deliberations and choices. See Wilson 1978/2004, p.55-6.)

It seems to me that the truth about these matters falls somewhere between the two extremes just mentioned. Sartre's idea about human beings' having absolute freedom strikes me as an unrealistic exaggeration, inspired by nothing more than wishful thinking and a Marxist political ideology. It sometimes may be useful to affirm the "truth" of some such notion to children and other naïve and inexperienced people, as a rhetorical means of encouraging them to be more creative, ambitious, imaginative, and courageous. But this point is not nearly enough to establish the literal truth of Sartre's proposed way of describing humans. Rather, it seems clear from both science and everyday life that humans like us are partly free and partly not free. In other words, repeated observations show there are respects and situations in which we can change some of our values, habits, behavior, and attitudes, in certain directions and to some degree, just by deciding to do so; but there also are a vast number of other cases in which we cannot do that.

Similarly, I cannot convince myself that Skinner is right to suppose that simple rules of learning determine all the knowledge and behavior that belongs to conscious and adaptable creatures, and thus also define a single, overarching mind or nature that all such creatures must share. The lack of justification of such a claim is indicated by the observed fact that each animal species is "prepared" to learn some stimuli, is barred from learning others, and is neutral (i.e. has some sort of meaningful choice) with respect to still others. To illustrate what I am talking about, consider three cases mentioned by E.O. Wilson (1978/2004, p.65). According to Wilson, adult herring gulls quickly learn to recognize and distinguish their newly hatched chicks by sight, but never learn to recognize their own eggs, even though the eggs are just as visually distinct as the chicks. Again, although newborn kittens are blind, unable to walk, and nearly helpless, they possess an advanced ability to learn in respect of the few matters on which their survival depends. Thus, in less than one day, kittens learn by smell alone, to crawl to the spot where they can expect to find the

nursing mother, and learn to find its preferred nipple. Wilson also talks about the birds known as indigo buntings that migrate at night from their breeding grounds in eastern North America to their wintering grounds in South America, and take their bearings from the stars. Tests have established that those birds quickly learn the look of the circumpolar constellations (the ones surrounding the North Star), but are inhibited from learning any of the other constellations.

If human beings really were free to learn whatever they want and need to learn, then Sartre might have been right to say we have no nature. Correspondingly, if Skinner and other behaviorists were justified in supposing that humans only learn and thereby know things for which they are positively reinforced, then although humans would have a nature, it would not count as distinctive, since other conscious creatures would share that same nature as well. I propose a third case—namely, that humans' powers of learning are selective and limited, because some knowledge is given to them innately, other bits are impossible for them to acquire, and they learn still others only if and when they choose and try to learn them. Furthermore, if this third case is correct, as I believe it is, then it is appropriate to claim that human nature is relatively distinctive after all. Of course, none of this implies that humans have exactly the same set of inborn instincts as all other conscious animals. It also does not imply that every human being has the same instincts as every other human. For example, some of us are right-handed, others left-handed; some of us are able to roll r's, others of us cannot do this. Nevertheless, I believe Wilson is correct to say there is a sufficiently extensive and powerful convergence among the innate behaviors belonging to humans to justify the conclusion that we do, after all, have a shared nature distinctive to or for our species. (See Wilson 1978/2004, p.67.)

Let us end this section with a short summarizing point: It is a datum of experience that humans and other creatures each have a certain amount of freedom, expressed by their respective abilities to choose between alternative courses of action. But neither Sartre's theory of human nature,

nor Skinner's, does justice to that observation, because the first grossly exaggerates the extent of human freedom, and the second makes the mistake of underestimating humans' distinctiveness, as compared with other animals.

1.3 Humans' Mysterious transition into Modernity created conditions for them to become Sharply Different from other Organisms

The more unintelligent a man is,
the less mysterious existence
seems to him.

Arthur Schopenhauer

For thousands of years, well informed, intelligent, and sensible thinkers repeatedly have tried to understand and explain the gap that apparently divides humans from organisms of every other known type. Investigators setting out to solve that puzzle today have an advantage over people who tried to do the same thing in the past, because observational and experimental science now furnishes them with empirical data and other relevant resources that are richer, more detailed, and better confirmed than those that were available (say) to the authors of the Upanishads, to Confucius, to Heraclitus, to Aristotle, to Averroës, to Thomas Hobbes, and to Charles Darwin. In spite of that advantage, however, there still is wide disagreement about exactly what modern science has and has not succeeded in proving about this matter. In particular, some people maintain that Darwinian natural selection is the only mechanism capable of providing a legitimately scientific account of how living creatures became what they are. This methodological idea has led many of those same individuals to claim in turn that there cannot really be any fundamental differences that divides us from other living things, because of the fact that we are linked with all other animals in the same historical web that natural selection depends on and presupposes.

Biological thinkers who accept the view just mentioned sometimes try to illustrate and support it by writing papers and books bearing titles like *The Naked Ape* (Morris, 1967) and *The Third Chimpanzee* (Diamond, 1992/2006), in which they list the large number of observed biological and behavioral characteristics we share with other creatures, especially our closest living relations the African great apes, and argue that it cannot be correct to believe we differ from all other organisms in significant ways, in view of those many shared properties. For example, at one time quite a few people believed we were set apart from other creatures by virtue of the fact that humans used tools but other animals did not. However, close examination by observers showed this idea to be incorrect, since chimpanzees, gorillas, and bonobos—not to mention animals of comparatively more exotic types like crows, octopuses, and parrots—constantly make use of tools of many different sorts, like twiggy wands for extracting edible termites from nests, and hammer stones and anvils for breaking hard nuts. Similarly, some people later began to maintain that humans differ from other creatures by the fact that they typically manufacture the tools they use, while the same was not true of other animals. But this second notion also showed itself to be false, since investigators like the primatologist Jane Goodall observed such things as chimpanzees creating termite wands by stripping the leaves off flexible stems, and still other people (see Carwardine, 2005, pp.18-9) observed New Caledonian crows bending wires with their beaks to create hooks that enable them to extract food from places they otherwise could not reach.

Is it safe for us to assume that sooner or later, in a similar fashion, close observation of animals and their behavior always will be sufficient to show the falsity of each and every proposed means of setting humans apart from all other creatures? I am not convinced that the answer to this question is and must be yes. One example that undermines my confidence in accepting such a prediction is the following.

Still a third example I now want to mention is a more difficult and controversial one that continues to be debated at the present time. It is the claim that the crucial difference between humans and other organisms lies in the fact that humans are the only living creatures that can speak and make use of language. Some people—depending in an obvious fashion on precisely what they are prepared to mean by words like “speak” and “use language”—accept the truth of this idea, while others do not.

Day-to-day experience with sophisticated, syntactically organized language tempts us to suppose that it is nothing more than an ordinary, familiar, and unproblematic part of our lives. We even have grounds for claiming that language of that type has become an integral part of our present-day human nature, as shown by the fact—for example—that many and perhaps most people cannot prevent themselves from using it, or at least a simplified, “Motherese” version of it, to speak to very young babies, to pets, to animals in the zoo, to machines, and even to motionless physical objects, in spite of being aware of the fact that none of those creatures or objects is able to understand—or, in the case of the last two instances, even to hear—their words. (The case of babies is slightly less problematic than the other three, because it is clear that speaking to babies really does teach them something, if only in the sense of making them familiar with the sounds of a language they already are in the process of acquiring.) However, when we think about the historical question of how humans might have come to be able to learn and employ syntactical language in the first place, we are forced to admit that at least some things about language are unusual, strange, and difficult to understand after all. For instance, exactly how did human babies acquire the power they obviously

have now of shaping themselves and their behavior in many complicated and significant ways, just from the experience of hearing adult speech?³

Some theorists say we are able to de-mystify the question of how modern language came into existence by pointing out that there are homologies, in addition to mere analogies, between human language on one side, and communication techniques now employed by living primates that presumably are similar to other, past primates that were our ancestors on the other side. In the view of those theorists, Darwinian natural selection could have been a sufficient means by which our forebears were able to move—bit by bit and over a long period—from reliance on simple, uncomplicated, animal-like communication to the use of complex, syntactically organized, and fully fledged human language. For example, in the eighth chapter of Jared Diamond’s book, *The Third Chimpanzee*, entitled “Bridges to Human Language,” Diamond describes the warning system of vervet monkeys (pp.143ff.), of using three different grunts, barks, or coughs—one to warn of the approach of a leopard (which leads any vervets that hear it to run up into trees), a second sound to warn of a flying martial eagle (which prompts vervets to scramble down from trees), and a third sound to warn of a nearby snake (which brings vervets to stand on their hind legs and look downward and side to side to examine the ground around them). Diamond concludes that just as natural selection presumably was responsible for enabling vervets to develop this simple system of communicating, so similarly—by means of further steps of addition and elaboration of exactly the

³ Terrence Deacon once suggested—in his 1997—that language was a “virus” that had evolved in such a way as to allow it to infect children’s brains. But I do not consider this idea helpful since, rather than being a genuine explanation, it seems only to be a poetic way of restating the very point that needs to be explained.

same sort—it also could have caused our ancestors first to develop very simple forms of language, then more complex ones, and finally the kind of human language we possess at the present time.

Here a second, similar case of what I now am talking about. The biological anthropologist Barbara J. King tells us, in a lecture (number 18) on the subject of language (2002), that great apes like chimpanzees, bonobos, gorillas, and orangutans often communicate with one another by means of what she calls iconic gestures—i.e. gestures that partially mimic or illustrate the objects or actions to which they refer. For instance, if an ape infant wants to be picked up by its mother, it might signal that desire by standing in front of the mother and raising both of its arms to her. Again, if ape youngsters are playing together, and one of them (A) wants another one (B) to perform a twirling movement, the first might signal this fact to the second by holding up its hand with the fingers pointed downward and then moving that hand in a tight circle. According to King, the clear parallelism that exists between the communication behaviors of great apes and human linguistic behavior is a good means of “removing the mystery” of how some of our predecessors succeeded in developing the language we have today, because of the fact that those parallelisms are not just analogies, but also homologies. In other words, it evidently is the case that the parallelisms in question have come into existence by virtue of the historical fact that both we, and our great ape relations, have descended from a relatively recent common ancestor.

I see no reason to deny that homologies like the ones just noted between our language and the referring and communicating behavior of other living primates at least are able to *soften*, to some extent, the mysterious issue of how our ancestors began to speak. Nevertheless, I want to point out that it is not necessarily true to say that such homologies also provide a literally correct explanation of how human language originated, because it is arguably the case that any such conclusion would put more weight on the Darwinian notions of adaptation and natural selection than those notions are

rightly able to bear. Let me be still more explicit. We know from observation that it always is necessary for natural selection to run in specific, historically determined channels. A simple example of what I mean is the following. Dolphins and whales evolved from four-footed terrestrial mammals more or less like hippopotamuses. And because of that, they were not able—once they reentered a watery environment—to develop the same side-to-side motion of their sides and tails that sharks, tuna, eels, and other fish employ. Instead, it was necessary for whales to be content with an up-and-down motion of their tails as a means of driving them through the water, because of the fact that this general pattern of movement already had been determined by the particular way in which their hippopotamus-like ancestors once had moved on land. In view of the point illustrated by this case, it does not amount to a justified pattern of reasoning to claim that any and all apparent forms and instances of selection pressure, adaptation, or “helpfulness for a certain purpose” are able to push an organism in the direction of any goal that happens to strike us as being consistent with, and appropriate to, those instances. Let me mention still another fairly clear example of approximately the same point. Barbara King herself argues convincingly—following Stephen Gould—against the legitimacy of the familiar “developmental series of skeletons” that one often sees on the covers of books about human evolution (including the paperback edition of Diamond’s *The Third Chimpanzee*). The series about which I now am speaking starts on the left-hand side of the page with a hunched-over skeleton of a creature that clearly seems to be a knuckle-walking, four legged, brachiating (i.e. fitted to hang and swing from tree limbs) ape, then continues on with several progressively less stooped and more human-like skeletons, and finally ends on the right side of the page with the skeleton of a fully erect human. This picture counts as misleading, however, in view of the historical fact that humans did not evolve in a direct way from apes. Instead, both apes and humans have descended from a common ancestor that had a more generalized form. In other words,

that ancestor had characteristics that were *intermediate* in various respects between those of apes and humans. In particular, this common forebear common ancestor had limbs of a sort that might have led to the subsequent development of some descendents that were erect and bipedal creatures, and also might have led to the development of some other descendents that were brachiating quadrupeds.

By contrast, investigators of another type—including Charles Darwin himself—maintain that natural selection is only one of many principles, of quite different sorts, that play a role in the evolutionary development of organisms. This second view leaves open at least the possibility that some of the features possessed by our species might have the effect of making us fundamentally different from all other creatures, after all. The position just described is illustrated by something the linguist and philosopher Noam Chomsky said in the fairly recent past, about the development of complex language. Chomsky told a story (2000, pp.4ff.) that in some respects was scientifically fanciful since, as he admitted, there was no way of confirming it. But in spite of that fact, according to him, something like that tale probably was true. In this story, a mutation occurred, perhaps as a result of a random shower of cosmic rays, which rearranged DNA molecules in one or several of the genes carried by one of our early primate ancestors. Then, because of that mutation, roughly half the children later born of, or sired by, that ancestor acquired a certain special part and/or function of the brain that Chomsky proposed to call the language faculty (arguably located on and in the left frontal cortex; see Pinker, 1994, p.307). This faculty enabled the children just mentioned to construct, employ, and make sense of (i) phonetically correct sounds, syllables and words, and (ii) grammatically correct phrases and sentences—organized in terms of innately given hierarchical systems—in a way that no other animal had been able to do before. Thus on his view, (i) the language faculty does not belong to creatures of any other sort. Furthermore, (ii) it is something that

could not have been produced simply by means of natural selection. Still further, (iii) it was that which first brought what we now think of as fully-fledged human beings into existence.

As will become clear in Chapter 4, I do not agree with claims about the nature and history of language like the ones just mentioned. But even so, I am more sympathetic to the comparatively more imaginative conception of humans represented by the Chomskian view just mentioned than to the reductive opinions of investigators like Morris and Diamond. In particular, it is both surprising and puzzling to me that would-be investigators of human nature (Chomsky included) do not have a great deal more to say than they do, about the topics of human history and culture.

In this section, I want to discuss a mysterious situation, question, or problem connected with the history of human development, and then make a few suggestions about what scientific theorists and practitioners would have to do to discharge this mystery in a thorough and adequate fashion. An introductory statement of the problem to which I am referring is this:

It is a well-known fact that humans have a far more complex, subtle, and developed culture than animals of any other known type. For example, is it fair to say that our culture is twice as complicated as those of our closest animal relations—the common chimpanzees and bonobos of Africa? Is it fair to say it is three times as complicated? Or fifteen times? Or a thousand times? Or a million times? The answer proposed by the biologist E.O. Wilson—with which I agree—(see his 1975, p.272) is that there is no scale known to us that usefully is able to measure either the size or

the importance of this difference. In the light of that fact, I have considered it puzzling and surprising for quite a long time, that my fellow theorists have had so little to say on the subject of the ways in which human beings have been influenced and changed by their past cultural traditions.

Is it reasonable to suppose that Darwin's principle of natural selection was responsible, not only for bringing our species into existence, but also for molding the individual members of that species into the particular kind of creatures they now have become? There are quite a few widespread misunderstandings about the way natural selection works. The first thing I want to do in this section is to focus attention on two misunderstandings of that sort. The first of these (which Darwin himself firmly believed) is that natural selection always operates in ways that are gradual, orderly, and smoothly progressive. The second (which Darwin may or may not also have been inclined to accept) is that all the results of natural selection's operations have the characteristic of determinate inevitability. If both these ideas were true and correct, then one thing that presumably would follow is that there could not be any substantively important differences between ourselves on one side and the primate ancestors from whom we evolved on the other, because of the fact that we developed from those ancestors in a seamless natural process that was bound to have us as its endpoint. However, as Stephen Jay Gould pointed out, we do not have any good reasons for thinking that those claims are true, because it often happens that a certain group of organisms comes to exist as a result of a wholesale shift between one type, style, or channel of biological development and another; and shifts of this sort do not take place in a predictably determined way, but instead in a manner that is arbitrary and chancy. For instance, how did the whole primate family of mammals (to which we ourselves belong) first originate? This happened, at the date of roughly 65 million years ago, not because the proto-primates had "earned a place in the sun" by being better adapted to their

environment than their competitors. Rather, a great many competitors of the creatures who were destined to become the primates (competitors that mostly were larger than the proto-primates, and therefore more apt to die from an extended period of darkness and cold) suddenly were removed by the accident of an asteroid or comet hitting the Earth and throwing up a large cloud of dust and debris that blanketed the planet for at least a month. Even though this event had a direct and dramatic effect on the course natural selection took after it happened, it was—from the viewpoint of the organisms that were affected by it—entirely a matter of luck. In fact, it is fair to conclude that, because of the influence of events of this type (what Gould proposed to call “the wheel of fortune,” as opposed and in addition to “the wedge of progress”; see his 1993b), the existence of nearly every species on our planet must count as a certain kind of miracle.

Another mistaken assumption people sometimes make is that it is in principle possible for

Readers of novels and stories of a certain type (e.g., J.K. Rowling’s *Harry Potter and the Philosopher’s Stone*, 2000) think of unresolved mysteries as items to be enjoyed, cherished, and even celebrated. But scientists never are justified in simply accepting mysteries at face value, since one of the defining ideas of their profession is that they are obliged to do everything in their power to rationalize, account for, and thereby solve and dispel any claim, fact, or idea that at first seems mysterious. Of course, attempts to do this often have ended in failure. For example, we still have stubbornly resistant, opaque mysteries associated with the topics of the birth and death of the universe. As an illustration, consider the following assertion once made by Albert Einstein: “Once you can accept the universe as being something expanding into an infinite nothing which is

something, wearing stripes with plaid is easy.” Similarly, there are unexplained mysteries linked to present-day conceptions of matter. For instance, Richard Feynman said (1995, p.116): “Things on a very small scale behave like nothing that you have any direct experience about. They do not behave like waves, they do not behave like particles, they do not behave like clouds, or billiard balls, or weights on springs, or like anything you have ever seen.” In spite of setbacks, puzzlements, and failures of the kind just mentioned, however, scientists doggedly continue their usual practice of attempting to resolve every mystery they meet.

In this section, I want to discuss a mysterious situation, question, or problem connected with the history of human development, and then make a few suggestions about what scientific theorists and practitioners would have to do to discharge this mystery in a thorough and adequate fashion. An introductory statement of the problem to which I am referring is this: Day-to-day experience encourages us to think of sophisticated, syntactically organized language as a familiar and unproblematic part of our lives. For example, it seems true to say that language of that kind has become part of the nature we now possess, as shown by the fact that many and perhaps most people cannot prevent themselves from using it (or at least a simplified, “Motherese” version of it) to speak to very young babies, to pets, to animals in the zoo, to machines, and even to motionless physical objects, in spite of knowing that none of those creatures or objects is able to understand—or, for in the case of the last two instances, even hear—their words. (The example of babies is slightly less problematic than the other three, because speaking to them seems to teach them something, if only in the indirect sense of making them familiar with sounds of a language that they already are in the process of acquiring.) However, posing the historical question of how syntactical language first might have come into existence forces us to conclude that language of that sort also must be something that is unusual, strange, and difficult to understand. For instance, how did babies first

acquire their inborn ability to benefit from hearing adult speech? Terrence Deacon once suggested—in his book, 1997, that language was a “virus” that had evolved in such a way as to allow it to infect children’s brains. But this idea is not helpful since, rather than being a genuine explanation, it is only a poetic way of restating what needs to be explained.

Some theorists attempt to de-mystify the origin of modern language by pointing out homologies and analogies between human language on one side, and communication techniques employed by various living primates that presumably are similar to other, past primates that were our ancestors. Furthermore, many of those same theorists argue that Darwinian natural selection would have been a sufficient means of moving our forebears—bit by bit and over a long period—from reliance on simple, uncomplicated, and animal-like communication behaviors like the ones they describe, to the use of complex and fully fledged human language. For example, one instance of this strategy is found in the eighth chapter of Jared Diamond’s book, *The Third Chimpanzee* (1992/2006), entitled “Bridges to Human Language.” Diamond describes the well-known warning system employed by vervet monkeys (pp.143ff.), of using three different grunts, barks, or coughs—one to warn of the approach of a leopard (which leads any vervets that hear it to run up into trees), another to warn of a flying martial eagle (which prompts vervets to scramble down from trees), and a third to warn of a nearby snake (which brings vervets to stand on their hind legs and look downward and side to side to examine the ground around them). Diamond then says that just as natural selection was responsible for enabling vervets to develop this simple system of communicating, so similarly—by further steps of addition and elaboration—it also could have caused our ancestors first to develop very simple forms of language, then more complex ones, and finally the kind of human language we have at present.

Here is a second example: The biological anthropologist Barbara J. King tells us, in a lecture (number 18) on the subject of language (2002), that great apes like chimpanzees, bonobos, gorillas, and orangutans often communicate with one another by means of what she calls iconic gestures that partially mimic the objects or actions to which those gestures refer. For instance, an ape infant that wants to be picked up by its mother might signal this desire by standing in front of the mother and raising both its arms to her. Again, in the context of the play behavior of ape youngsters, if one of them (A) wants another one (B) to perform a twirling movement, the first might signal this fact to the second by holding up its hand and fingers and moving them in a tight circle. In King's view, taking account of the parallelism between the communication behaviors of great apes and human linguistic behavior is a good means of "removing the mystery" of how some of our predecessors developed the kind of language we have today. Furthermore, according to her, this point should be especially forceful and clear to us, because of the fact that these parallelisms are not just analogies, but also homologies. In other words, they presumably have come into existence by the historical circumstance that both we and the great apes have descended from a relatively recent common ancestor.

Even more specifically, people like Diamond and King evidently presuppose that the process of natural selection was sufficient to move our ancestors from iconic gestures like those now performed by gorillas and chimpanzees, to genuine human language.

I agree that analogies like those just noted between our language and the referring and communicating behavior characteristic of other primates at least can *soften*, to some extent, the mysterious question of how our ancestors may have begun to speak. Nevertheless, in my opinion, such analogies do not provide even the beginning of a literally correct explanation of how language originated, because any argument to show that they do so would have to put more weight on the

Darwinian notions of adaptation and natural selection than those notions are rightly able to bear. To be still more explicit, not all cases, forms, and instances of selection pressure, adaptation, or “helpfulness” towards the goal of a creature’s surviving and reproducing, are comparable with, and relevant to one another. For example, Barbara King herself convincingly argues—following Stephen Gould—against the correctness and legitimacy of the familiar “developmental series” one often sees on the covers of books about human evolution (including the paperback edition of Diamond’s *The Third Chimpanzee*). This series starts on the left-hand side of the page with the hunched-over skeleton of a creature that clearly seems to be a knuckle-walking, four legged, brachiating ape, then continues with several progressively less stooped and more human-like skeletons, and finally ends on the right side of the page with the skeleton of a fully erect human. But this picture is misleading, because humans did not evolve directly from apes. Instead, both apes and humans are descended from a relatively more generalized, common ancestor that had characteristics that were intermediate between those of apes and humans.

of how I doubt this is true, since reflection on examples makes it clear that there often are many particular channels, types, and contexts of adaptation. Furthermore, it would be wrong, in the sense of being over-optimistic, for us simply to assume that all those channels are and must be directly relevant to, and therefore comparable with, one another.

Let me mention a simple case that seems to me to be parallel with this one. Is it correct to suppose, in the way some enthusiastic people do, that if future computers can be made to be much more efficient, compact, powerful, and subtle than they are at the present time, then these machines finally will be able to reproduce human thinking in a perfect manner, and thus also will be able to occupy a respected and valuable place within human society itself? I think the answer to this

question is no, because the comparison on which it is based is mistaken and misconceived. For example, it seems to me that critics of this way of thinking are correct who propose to compare it to trying to reach the moon by climbing an apple tree.

Shifting of gears is not something that Darwin himself took very much into account. But his successors like Stephen Jay Gould did so

But is this really correct? According to Deacon, anatomy and physiology apparently show it is unlikely that animal sounds gradually could have expanded to become human language since, in the human brain, animal-like sounds are located in a different area than language. A more important point is that there are many different types of and contexts for adaptation, or in other words, helpfulness for survival and reproduction; and therefore it is misleading to any example of such a thing can be compared with any other example. “Useful how, for what, and in relation to what other considerations?” For instance, the popular picture (featured on the paperback cover of Diamond’s book) of a series of progressively more erect primate skeletons beginning with that of a hunched-over, four-legged chimpanzee, and ending with a bipedal modern human like ourselves is misleading and historically inaccurate. There were two series, one that led to chimpanzees, and another that led to modern humans; and both of those series started from the very same animal. This common

ancestor had a general or relatively unspecialized form that was capable (and that did) lead on to four-legged creatures in one direction, and to two-legged creatures in another direction.

Cf. the image of trying to reach the moon by climbing an apple tree.

Cf. the problem of the passagio for singers.

Accordingly, let us now consider critics of a Darwinian explanation of human origins.

Popper

Chomsky

The second of these finally focuses his criticism of Darwinism on the particular case of language, in a way the first does not.

Cf. “General Lee could not have descended from monkeys.”

has properties—e.g. recursion or the potentially infinite nesting of various linguistic elements like clauses or qualifiers within others—that make it radically different from everything else that exists in the natural world. Nevertheless, it seems clear that language of that sort plays a crucially important role in the lives of people like ourselves. This is shown by the fact that many, and perhaps most of us cannot prevent ourselves from speaking in complex and sophisticated language—either out loud or internally—to babies, pets, machines, and even to motionless physical objects, in ways that only would make literal sense if we were addressing adult, intelligent, and competently trained speakers of our own native tongues. Thus, how could it have been possible for past human beings ever to develop and start to employ language of that sort? Still more specifically, some critical thinkers have argued that present-day human nature and language must have developed suddenly, as a whole, in

brains that already had been prepared for them, rather than having been created in the gradual, slow, and laborious manner characteristic of Darwinian natural selection.

The point I now am discussing is part of a wider dispute about the best way to conceive of scientific investigation in general. Consider two related queries: (i) Do appeals to natural selection count as genuinely informative and explanatory statements? (ii) Can appeals of this sort can play a central role in scientific accounts of how present-day human nature began? Until quite recently, the linguist and philosopher Noam Chomsky answered no to both these questions. (The paper that announced his change of mind about some of these matters is Hauser, Chomsky, and Fitch, 2002. For the time being, however, I only want to discuss the views he held before co-writing that paper.) With regard to the first question, Chomsky said it was both trivial and unhelpful to say, in the usual Darwinian style, that organism **O** had a certain trait **T** because it was adaptively advantageous for **O** to have **T**, since any statement of that type did nothing more than repeat the original claim it was supposed to account for in the first place. In his (now past) opinion, assertions of the kind Darwinians routinely offered as if they were clarifying and explanatory, were no more than “story telling.” For example, they have approximately the same scientific value as the “just so” childrens’ stories written by Rudyard Kipling, about how the leopard got its spots, how the elephant got its trunk, and so on. (See 1997a, p.24 and 1997b, pp.125-7.) As for the second question, Chomsky claimed it was an observable matter of fact that human beings, and their ability to acquire, understand, and use meaningful, syntactically organized language, were uniquely special. This implied in turn that investigators should not waste time searching for past creatures from which humans might have evolved in a law-like manner, since the enormous gap separating humans from all other living things implied that there neither were, nor ever could have been, any such creatures.

Chomsky proposed a hypothesis (see 2000, pp.4ff.), which he admitted was fanciful since there was no way of confirming it. It was that a mutation occurred, perhaps as a result of a random shower of cosmic rays, which rearranged DNA molecules in one or several of the genes carried by one of our early ancestors; and because of that mutation, roughly half the children later born of, or sired by, that ancestor acquired a special part and/or function of the brain that Chomsky called the language faculty (arguably located on and in the left frontal cortex; see Pinker, 1994, p.307). This faculty enabled the children just mentioned to construct, employ, and make sense of (i) phonetically correct sounds, syllables and words, and (ii) grammatically correct phrases and sentences—organized in terms of innately given hierarchical systems—in a way that no other animal had been able to do before. Thus the language faculty, according to the view we now are considering, was that which first brought what we think of as fully-fledged human beings into existence.

Many scientists and philosophers, including quite a few of Chomsky's former students, rejected the preceding hypothesis, on the grounds that it posited an objectionably miraculous transport of our ancestors out of the natural system that was, and deserved to be, the object of all scientifically respectable biological thinking. For instance, Phillip Lieberman and Derrick Bickerton accepted the Platonic and Cartesian claim Chomsky made that language was the most important thing about humans and their nature. (Lieberman paraphrased a dictum of Descartes as a means of summing up his own view about this matter: "We are because we talk." See his 1991, p.4.) But neither of those people agreed with Chomsky's further claim that humans' difference from all other creatures implied that their ability to use language could not have evolved by natural selection. Rather, they said humans' use of language could have come into existence in approximately the same evolutionary manner that applied to most other properties of animals as well, because being able to speak (or to speak better than one's competitors) was bound to have given some humans a

selective and reproductive advantage over others, since language was useful for communicating, and for organizing and controlling social groups.

I am of two minds about this dispute. On one side, it strikes me as foolishly arrogant for someone to reject a whole dimension of *prima facie* scientific truth, whose validity and usefulness has been confirmed by competent investigators, over a comparatively long period. Karl Popper arguably made a mistake of the same sort, when he denied that natural selection was a legitimate part of science. Popper proposed the following guide (quoted in my newspaper) for would-be scientific investigators: “Don’t ask *what are* questions, ask *what do* questions; don’t ask *why* questions, ask *how* questions.” But that criterion implied that admirers of Darwin could not be genuine scientists, because they stubbornly clung to the discredited method of posing why questions to nature—a method that did not allow for empirically falsifiable predictions. Yet who really was being stubborn and blindly old-fashioned in this case? Towards the end of his career, Popper revised his views about Darwinism—largely because he disapproved of attempts by religious creationists to exploit his earlier description of natural selection as unscientific, for their own, antiscientific purposes. He now said that natural selection was a legitimate method of science after all because, in directing our gaze backward rather than forward in time, it allowed us to “*retrodict* “ theoretically falsifiable claims about past events, as opposed to predicting things that would happen in the future. (My colleague and former student, David Stamos, reminded me of these points about Popper.) Even after having made that change, it seems doubtful to me that Popper grasped the basic problem here—the problem, namely, that no human being, by himself or herself, has a right to dictate what the general nature of science ought to be. Instead, the most honest policy is to accept what the practical experience of scientists has shown that science is and has become. In my view, the only justified criterion of the scientific legitimacy of any claim is the admittedly vague test of whether that claim says something

true and significant about things in the world. Thus, if Chomsky was inclined to make the same mistake as Popper, then I think both of them were wrong.

On the other side, with all the preceding having been said, I continue to believe that the idea of humans' being different from other creatures contains an important kernel of truth. One reason this is so is that it seems to me that the most popular strategy for opposing the idea just mentioned depends on a misinterpretation of Darwinism.

The typical way critics try to combat this view is by looking for middle cases that might be capable of "filling the continuity gap." E.g., Diamond's peninsulas, and King's iconic gestures. People ought to be suspicious of this rather simple-minded approach, because of the fact that it takes a very wide range of contentious points for granted. Like the apple tree example, or case of taking a wrong strategy for dealing with a singer's pessagio.

Shift of gears. Once things have fallen into a rut, very little further "progress" can be made until a radically new approach is allowed to be taken. There must be room for experimentation. The wheel of fortune vs. the wedge of progress. As Gould pointed out, this still counts as Darwinism.

My suggestion about this is that

1.4 The Thesis of this Book: Human Distinctiveness is not just a passive product of Biological Changes but also is partly "Self-Created"; this is shown (illustrated) by what I believe is the fact that one of its most important sources was a Conception of ourselves as Set Apart from the Rest of the World, which

members of a small number of Founding Traditions Invented Independently,
then passed down to their Cultural Descendents

It's frightening to think that you
mark your children merely by
being yourself.

Simone de Beauvoir

In a previous book (2003), I drew a distinction between “mind in the broad sense,” which referred to the style of life typical of (i.e. the niche occupied by) primates considered in general including our own species, and “mind in the strict sense,” or the special type of thinking and reasoning used by those humans who are and were members of “Western Civilization”—a culture whose rules and standards of thought were largely determined by traditions that had their beginnings in pre-Classical Greece. Neither of those senses of “mind” can be of much help for the task I am undertaking here—i.e. attempting to say why and how humans differ from all other animals—since the first is too broad for that purpose, and the second is too narrow. Thus, finding a useful answer to what I call the oldest question, requires looking for ways of thinking about human nature that are both more general, and more specific, than those I employed before.

Past philosophers like Plato, Aristotle, Descartes, and Kant assumed there was a radical difference of kind between humans and everything else that existed in the world. Many ordinary people, and even some professional theorists like Chomsky, continue to subscribe to a view similar to that today. By contrast, for at least the last three centuries or so, the vast majority of scientifically informed theorists (as we saw in the last section) suppose that everything in the natural world is continuously related to everything else, so there cannot be any valid distinctions of kind in that world. For example, Donald says (1991, p.23):

The fatal difficulty with a discontinuity approach [i.e. dualism] is that it leaves
language without a frame of reference in the external world.

Again (*ibid.*, p.24):

[Even though] a continuity approach is . . . vulnerable to a whole range of criticisms . . . *it appears to be the only avenue open to us.* [Italics added.] It is not a new avenue; continuity theories have been proposed since the Enlightenment. Although Darwin is the touchstone of modern continuity theory, he had predecessors.

As opposed to the outlook just mentioned, what I propose to do in this book is to revive a theoretical defense of a discontinuity view of humans and their place in the world. What this means is that, unlike Chomsky's superficially similar challenge, it does not seem to me that humans' special status is based on facts rather than on thoughts. In other words, consistent with the idea that we should take the findings of social and historical sciences as well as natural sciences seriously, I maintain that there was a series of inventions made in our pre-history that has had the result of leading humans to think of themselves as separate from everything in their environment, and to act in ways appropriate to that idea.

Why do I emphasize the theme of ecological niches in this book, rather than using the past-directed method of trying to account for the strengths, weaknesses, and peculiarities of human nature simply in terms of inherited bodily characteristics? One reason for this is that I believe it is more informative to use the future-directed method of asking what changes had to take place in our ancestors' thinking, to enable them and their descendents to take advantage of a set of newly discovered opportunities. Thus, I identify present-day human nature with the ecological niche humans now occupy; and I claim that the proper way of investigating what that niche is and how it works, is to compare it with niches that various other creatures do now occupy, and have occupied in the past.

Consider a simple parallel taken from the field of sociology. What accounts for the fact, repeatedly confirmed by sociologists, that people born into the Ibo tribe of Nigeria tend to be more economically and professionally successful than members of the other tribes of that country? The answer is not that natural selection has made members of the tribe just mentioned more intelligent, organized, and ambitious than other Nigerians. Rather, the crucial causal factor is a cultural tradition the Ibos inaugurated a long time ago. In particular, one part of this tradition is that, in the funeral rites and ceremonies held for any dead Ibo, all the honors, titles, offices, and most of the wealth that once belonged to the dead man or woman are laid into the grave symbolically, along with the corpse. This is a ceremonial reminder both to the children of the deceased, and all those who know them, that none of those things is available to be inherited by the children, and therefore whatever they achieve in their lives, they must earn through their own, unaided efforts.

The ancestors who started this tradition did not “plan” for their descendents to compete relatively more successfully for money, jobs, influence, and prestige with representatives of Western and Westernized societies in Europe, North and South America, Japan, China, India, etc. Rather, those descendents found themselves in a position to compete with non-Nigerians in a more effective manner than other, presumably comparable people from their country, as a result of nothing more (from their own point of view) than luck. Nevertheless, the cultural tradition did have this effect, just as surely as if that result had been “naturally selected.”

Can we make a point concerning the nature that belongs to all of present-day humanity, which is relevantly similar to that just illustrated about the Ibo tribe? I believe the answer is Yes, because the nature we now have was influenced in important respects by a “founding” cultural tradition that began long ago, and whose influence continues to be felt today. To be specific, I shall argue that the most important thing leaders of the envisaged founding group of ancient humans

handed down to their successors was the habit of thinking of themselves as special and set apart from everything else around them. Again, as in the case of the Ibos' culturally-based suite of attitudes and behaviors that gave them an advantage, I do not think natural selection could have brought this set of predispositions into existence, just by itself. Instead, they were items of the sort that could not have arisen without help from a culture.

Dregs:

What exactly is a nature? People often talk and think about natures in terms of “if-thens,” since one sometimes can get an idea of what items of a certain type or kind are like, by considering what they do in various circumstances. To take a simple example, one “behavioral” expression of the nature of water is to note that if it is heated to 0 degrees Celsius, it begins to be transformed from a solid into a liquid state; and if the heat is further increased to 100 degrees Celsius, it begins to be transformed from a liquid into a gas—i.e. water vapor (the principal “greenhouse gas”). Similarly, a partial expression of the nature of table salt (NaCl) is to say that, whenever one puts salt into liquid water for a sufficient amount of time, it dissolves.

A similar point also applies to living creatures. For instance, having spots is not an important aspect of the natures of the large cats we call jaguars, leopards, and cheetahs, as shown by the fact that, although fully black cubs (commonly known as black panthers) frequently are born into jaguar litters, all the rest of whose cubs are spotted, it is not contrary to our knowledge or intuitions to think of those animals, which lack obvious spots, as jaguars. On the other hand, the same is not true of the behavioral facts that jaguars are good swimmers, that leopards drag their killed prey up into trees, and that cheetah breeding involves several cheetah brothers chasing down a single female for several days over a large amount of territory. Biologists think of these last points as more substantive and central parts of the natures respectively belonging to the species just mentioned, so they would say of any animal that lacks one or more of them that it was malformed, deficient, and abnormal.

But in the case of human nature,

Similarly, we also are justified in thinking of the phrase “human nature” as primarily referring to certain ways in which the members of our species behave, learn, think, and adapt themselves to their environments, as opposed to certain functions, shapes, parts, or chemical constituents of the human body.

Although most present-day theorists do not equate the natures of living things simply with properties of the bodies of the organisms that have those natures, quite a few of them do claim that the natures of all animals, including humans, do and must come from a bodily source. In practice, what this means is that the thinkers in question believe natures always are created and expressed by genetic inheritance, and never—not even in part—are products of culture and learning. For example, the currently standard criterion social scientists use to distinguish “nurture and/or culture” on one side, from “nature” on the other, is this that whenever one has reasons for believing certain characteristics belong to all the undamaged members of a species (whether the human species or some other), then it is appropriate to count those characteristics as natural ones. By contrast, characteristics that only belong to certain groups of organisms within a species and not to other, physically separated groups within that same species, and which furthermore are typically acquired by a process of learning rather than simply being acquired from maturational, biological processes, are ones theorists speak of as cultural rather than natural ones. (See de Waal 2001, p.6.)

I have been suspicious of this last idea for a long time. I shall argue in the following pages that, at least as far as the case of human beings is concerned, it is not just fishy, but positively false. To be specific, my thesis is that learning and culture play a far more extensive role in human life and society than it does in the lives of any other known species of animals; and therefore one cannot understand what makes humans different from all other animals without taking account of the historical fact that some aspects of human culture have not merely affected, but have reshaped the

nature that now belongs to all human beings, in a way that apparently is unique among earthly organisms.

In effect, then, my project is to reformulate the oldest question that has puzzled investigators for thousands of years, with a sharper version of the same question that provides us with a better chance of fashioning a substantive, informative, and scientifically justified answer. The new version of the old question I propose is this: What special, culturally-influenced parts or aspects of human nature have been most important in creating the gap now exists between humans and all other forms of life? In the following pages, I shall spell out, clarify, and elaborate this answer, and defend it against objections.

In spite of that, however, no scientist, or philosopher (like me) who claims to base his or her ideas on results of scientific discoveries, has yet succeeded in proposing a generally acceptable answer to the question of what people similar to us are like. One reason this is so, I suggest, is that a majority of investigators interested in the topic of human nature tend to look for answers in wrong places. For example, on the front cover of a recent issue of *Scientific American* (May 2009), the following question appeared: “Does evolution explain human nature?” In my view, the answer to this question is yes, but only if—as is not usually the case today—investigators are both able and willing to take account of the topic of humans’ cultural as well as narrowly biological evolution.

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