Africa: Continent of Origins

This lecture was delivered by Dr. Ian Tattersall at The Metropolitan Museum of Art on the occasion of the symposium "Genesis: Exploration of Origins" on March 7, 2003. This symposium was held in conjunction with the special exhibition, "Genesis: Ideas of Origin in African Sculpture," and was made possible through the support of The Ford Foundation.

It has been pointed out many times that every human group in the world today has its own origin myths. Indeed, if there is one cultural universal, this is surely it. In the Metropolitan Museum's marvelous exhibition, "Genesis: Ideas of Origin in African Sculpture" we learn about a host of tribal myths of this kind, as they are reflected in various African cultural traditions, and in some of the most graceful and evocative sculptures ever made. But in the Western world, as well, we have a whole variety of such myths on offer. The most famous of these is probably the biblical creation myth which so many appear to prefer in translation. But among them we also have one very special and unusual origin story. This is the scientific account of how we came to be human, and it is a story in which the continent of Africa plays a central role. Unlike other origin myths, which are timeless and at least in principle unchanging, the scientific story is purposely designed to be a transient one. Science does not, or certainly should not, set out to prove anything about the world and its origins. Scientific statements are not for the ages, as most origin myths are intended to be. Instead, science is about the continual refinement of our picture of the world, and of its components, and about how they all fit together into a functioning whole. Scientific knowledge is by its very nature provisional; for if nothing else science is surely about progress; and how can we make scientific progress if what we believe today is not somehow wrong, or at least incomplete?

Science advances by throwing out idea after idea and then discarding the bad ones, those that fail a rigorous process of testing against other knowledge. It may take many years for a bad scientific idea to be rejected, just as it may take years for a good one to be finally accepted; but science is less a body of knowledge than an ongoing and self-correcting process. And the upshot is that, although most scientific ideas may today appear to be true, or as good as true, they are always susceptible to modification or at least refinement in the longer term. To paraphrase Keynes, "In the long run, we are all wrong." So the story that I shall be telling is very different, by its very nature, from the stories that are told by the sculptures on display in this exhibition. Nonetheless, its intent is inevitably similar. One of the most fundamental characteristics of our species *Homo sapiens* is its unquenchable curiosity about the world around it, and about itself and its place in that world in particular. Science is simply one possible response to this apparently innate need. For science, like mythology, seeks to explain; and surely an explanation for the extraordinary nature of human consciousness is well worth seeking.

To obtain some kind of insight into the process by which our predecessors became fully human (in the sense of having acquired all of those sensibilities and capacities that human beings exhibit worldwide today), we need to turn to the archaeological record, the material record of earlier human behaviors. And ever since early hominids first made crude stone tools some two and a half million years ago, the archaeological record reveals that—to the extent that the material record can stand as a proxy for cognitive states—innovation in hominid cognitive capacities, or at least their material products, was a highly sporadic and occasional process. New types of stone tool (e.g. Fig. 1) show up with extreme infrequency in the archaeological record, and for well over two million years the pattern is more strongly one of monotony than of change. To cut a very long story short, it is emerging that modern human symbolic thought processes were foreign to all hominid species prior to the appearance of *Homo sapiens*. In other words, poorly defined though the concept of humanity is—and few concepts are more poorly defined—it is evident that fully modern humanity, of the kind that we readily recognize today, only appeared with our own species.

But the story is actually more complicated than that. For the earliest *Homo sapiens* who possessed all the anatomical attributes of our species—as far as can be told from their bony remains (see Fig. 2)—apparently behaved much as earlier hominids, exemplified by the Neanderthals, had done. The stone tool industries created by early anatomical *Homo sapiens* in the Levant, for example, are virtually

indistinguishable from those bequeathed us in the same region by the Neanderthals, with whom they shared the Levantine environment in some way for upwards of 50,000 years. During this long period of coexistence or time-sharing, despite the morphological disparity between the two hominid species, there is no good reason to suspect any significant behavioral distinction between them.

Perhaps this may on the face of it seem surprising. For it is logical, and certainly convenient, to attribute a new capacity or way of doing business to the arrival of a new species. But a moment's thought should be enough to make it clear that any innovation, cognitive, technological, or whatever, has to arise *within* a species. Because, quite simply, there is no other place for it to do so. Any such innovation, after all, has to arise with an individual, who cannot differ too much from his or her own parents or offspring. It is possible, indeed likely, that the uniquely human symbolic capacity was based on a new anatomical potential which had lain fallow, so to speak, until it was somehow "discovered" by its possessors. And if so, *Homo sapiens* was following a pattern routinely exhibited in the history of life: that of "exaptation," the later exploitation in a new context of an acquisition originally made in another entirely. For example, birds were apparently using feathers to maintain their body temperatures for many millions of years before using them in the context of gliding and eventually for flight. Extraordinary as the product may have been, the mechanism by which it came about was entirely routine (Tattersall, 1998).

As Alisa LaGamma (2002) has pointed out in her perceptive introduction to her catalogue of the present exhibition, it was for long believed that the earliest evidence for the expression of what Alexander Marshack (1985) has called "the human capacity" came from Europe in the period following about 40–35,000 years ago. Prior to this time, the only hominid species populating Europe was *Homo neanderthalensis*, a highly distinctive form (Fig. 3) whose ancestral split with the lineage leading to *Homo sapiens* dates back to at least half a million years ago, and probably more. At about 40,000 years ago, however, *Homo sapiens*, in the form of the Cro-Magnons, began trickling into Europe, probably from an initially African place of origin. And by not much less than 30,000 years ago, the Neanderthals were gone from the entire huge swath of Europe and western Asia that they had previously inhabited, leaving the Cro-Magnons in sole possession. Except (possibly) in the post-contact period, the Neanderthals had exhibited only equivocal signs of symbolic behaviors. They may indeed, for instance, have invented a tradition of burial of the dead, which they practiced occasionally if only simply. But such interment was bereft of the symbolic paraphernalia associated with Cro-Magnon burial; and it may well have served no more than a utilitarian purpose, rather than a ritual, symbolic one. And there is, overall, no contrast in the entire archaeological record greater than the one between the material culture left behind by the Neanderthals and that bequeathed us by the Cro-Magnons. For just as that of the Neanderthals was largely or entirely devoid of symbolic content, the record of the Cro-Magnons was drenched in symbol.

The record of the Cro-Magnons is truly extraordinary (see White, 1986). Over 30,000 years ago they had already begun to leave extraordinary art on the walls of caves (Fig. 4; see also Chauvet Cave and Lascaux Cave). At the same time bone flutes of complex sound capabilities announce the advent of music (Fig. 5). And if these people made music (see examples of the earliest playable prehistoric bone flutes from East Asia), surely they sang and danced as well. Markings on bone plaques (Fig. 6) clearly represent systems of notation, perhaps even lunar calendars. Burials were often complex, and crammed with grave goods. And some of the most beautifully observed and crafted sculptures ever made date from this time. Notable among these is the tiny Vogelherd horse (Fig. 7) carved from mammoth ivory, perhaps the earliest art object known at around 34,000 years old. This exquisite piece is no simple rendition of the chunky horses of the Ice Age European steppes; instead, it is a quintessentially symbolic piece: an abstraction of the graceful essence of the horse. At the same time, technology became more complex and started on a course of constant change and innovation. By 26,000 years and more ago, bone needles (Fig. 8) announce the advent of tailoring, and equally early on ceramic technology was invented, figurines (Fig. 9) being baked in simple but remarkably effective kilns. Hunting became more complex, and fish and bird bones show up abundantly for the first time in food refuse.

The list of Cro-Magnon achievements could go on and on, but the point is already evident: these people were us, possessed of a sensibility totally unprecedented in all the hominid history I've briefly reviewed (for greater detail see Tattersall, 1998). However, as I intimated earlier, this extraordinary record from Europe shows the human capacity already fully fledged. And quite evidently, this intellectual facility did not emerge in Europe. It was brought with them by the Cro-Magnons, whose new qualities had emerged elsewhere. Probably this was in Africa, for it is from this continent that we have not just the first suggestions of the emergence of modern anatomical structure, but of modern behaviors as well.

The most remarkable early evidence of symbolic activity in Africa comes in the form of the recent find of engraved ochre plaques, such as this one, from Blombos Cave on the southern coast of Africa (Fig. 10). This is an unequivocally symbolic object, even if we cannot directly discern the significance of the geometric design that the plaque bears; and it is dated to around 70,000 years ago, over 30,000 years before anything equivalent is found in Europe.

To evidence such as this can be added suggestions of a symbolic organization of space at the site of Klasies River Mouth (Fig. 11), also near the southern tip of Africa, at over 100,000 years ago. Pierced shells, with the strong implication of stringing for body ornamentation, are known from Porc-Epic Cave in Ethiopia at around 70,000 years ago. Bone tools of the kind introduced much later to Europe by the Cro-Magnons, are found at the Congolese site of Katanda, dated to perhaps 80,000 years ago. Blade tool industries, again formerly associated principally with the Cro-Magnons, are found at least sporadically at sites in Africa that date to as much as a quarter of a million years ago. Also in the economic/technological realm, such activities as flint-mining, pigment-processing and long-distance trade in useful materials are documented in Africa up to about 100,000 years ago. These and other early African innovations are reviewed by McBrearty and Brooks (2000).

Even taken together, these developments do not constitute as visually impressive a record as that compiled by the Cro-Magnons in Europe. But it is a highly significant one, and it leaves little doubt that the first stirrings of the human capacity were felt in Africa, whence all major innovations in human evolution appear also to have come. And the nature of this African record also suggests that the process of discovery of the human capacity was not a sudden event but—in modern cultural terms at least—a gradual one. For it seems that the myriad uses of the new human potential that had presumably emerged with the origin of anatomical *Homo sapiens* were sequentially discovered over a long period of time. Which is hardly surprising, for even today we are continuing to find new uses to which our remarkable underlying capacity can be put.

This, in a nutshell, is my version of the scientific story of human cognitive origins: of the sequence of events by which human beings were transformed into the remarkable creatures that we are. A new potential was born in Africa with anatomically modern *Homo sapiens*. And that exapted potential lay fallow until it began to be released by some unknown cultural stimulus. Most likely this cultural stimulus was the invention of language, for language is surely the ultimate symbolic activity, and one which might well have mediated the discovery of all the other uses to which this new potential might have been put. But with the emergence of behaviorally modern *Homo sapiens* a totally unprecedented entity was on the scene. And to understand the qualities of this new phenomenon, it's important to remember that *Homo sapiens* does not appear to be simply an extrapolation of earlier trends.

So what happened? This issue was the cause of the deepest disagreement that ever fissured the relationship between Charles Darwin and Alfred Russel Wallace. Darwin firmly believed that natural selection was the unambiguous explanation of human consciousness, while Wallace simply couldn't see how this could be so. But it seems to me that both men were right. It's just that they were right in different ways. For as Darwin knew, our peculiar consciousness is the product of our brains, which are indisputably the product of a long and accretionary evolutionary history. What evidently bothered Wallace, though, even though he didn't put it in these terms, was that the *properties* of the modern human brain are evidently emergent, unpredicted by what went before. In the lack of any evident

alternative, Wallace favored supernatural intervention to explain this fact; today it looks to be more plausibly the result of a chance coincidence of acquisitions. For clearly, while classical natural selection plays an essential role in the evolutionary process, it is not a creative force. It has to act on variations that come into existence spontaneously. Nothing arises *for* anything, and the forces of natural selection can only work on variations that are presented to them.

We must thus conclude, I think, that the immediate ancestor of modern humans possessed a brain that had—for whatever reason—evolved to a point where a single change or genetically related group of changes was sufficient to create a structure with an entirely new potential. And this is the change that resulted in the emergence—literally—of the unique phenomenon that is humanity. But this is probably not the whole story. Recall that the earliest humans who looked exactly like us behaved, as far as can be told, pretty much like Neanderthals—for upward of 50,000 years. These humans had brains that were externally like our own, but that evidently did not function in the way that the Cro-Magnons' brains did in later times.

So, once more, what happened? Did the earliest anatomically modern and the earliest behaviorally modern humans represent separate but skeletally identical species, one of which eventually replaced the other? This scenario seems inherently improbable to me, since any such dramatic Old World-wide replacement would have had to have taken place in a very short window of time. The only evident alternative is that the unique human capacity was born with anatomically modern *Homo sapiens*, and that it lay fallow, as it were, until it was unleashed by some unknown cultural stimulus. This innovation, whatever it was, would then have been able to spread by cultural contact among populations that already possessed the latent ability to acquire it. No wholesale replacement of populations need have been involved.

What might that stimulus have been? Like many others, my best guess is that it was the invention of language, and we must bear in mind that by the time *Homo sapiens* evolved the peripheral equipment that allows articulate speech had already been around for several hundred thousand years—having clearly evolved initially in other contexts entirely. The archaeological record is but a dim reflection of the full panoply of behaviors of any early hominid, but if it shows us anything at all it is the starkness of the contrast between the torrential outpouring of symbolic behaviors by the Cro-Magnons and the essentially symbol-free behaviors of their predecessors. The fundamental innovation that we see with the Cro-Magnons is that of symbolic thought, and this is something with which language is virtually synonymous. Like thought, language involves forming and manipulating symbols in the mind, and our capacity for symbolic reasoning is almost inconceivable in its absence.

Imagination and creativity are part of the same process, for only once we create mental symbols can we combine them in new ways and ask "What if?" Intuitive, nonsymbolic reasoning can, of course, take one a long way; and indeed, we can probably look upon the considerable achievements of the Neanderthals as the ultimate example of what intuition can do (Tattersall, 2000). But there's little doubt that it is symbolic thought that above all differentiates us from them. And that, indeed, separates us not only from every other hominid, but from every organism, that has ever existed.

The origin of the human capacity was thus a recent happening. And it was an emergent one (Tattersall, 2000), not an extrapolation of earlier trends. Much as many paleoanthropologists like to think of our evolution as a linear process, a gradual progression from primitiveness to perfection, this conceptual hold-over from the past is clearly in error. We are *not* the result of constant fine-tuning over the eons, any more than we are the summit of creation, the ultimate product of an inexorable trend. Instead, we are the product of a much more complex process of speciation, competition, and ecological change. This pattern of human evolution, as shown in the accompanying diagram (Fig. 12), emphasizes that *Homo sapiens* is simply the single surviving product of a complex sequence of events that produced an extremely bushy hominid family tree, rather than the culmination a linear sequence of steadily perfecting species. Throughout the long story of human evolution prior to our arrival, the presence on earth of multiple kinds of hominid at any one time seems to have been typical. From which we may conclude that the status of *Homo sapiens* as the lone hominid on earth

today says a great deal more about the special nature of our species in particular, than about what it means to be a hominid in general.

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Ian Tattersall is a curator in the Division of Anthropology of the American Museum of Natural History, New York City. Over the past thirty-five years he has published almost 300 books and papers in paleoanthropology and in various areas of primate ecology and systematics, especially the lemurs of Madagascar. His most recent trade publication is The Monkey in the Mirror (Harcourt, 2002).

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Figure 1: Oldowan Tools. Top row: hammerstone, unifacial chopper, bifacial chopper, polyhedron, heavy-duty scraper, discoid. Bottom row: light-duty scraper, and six flakes. Photo: Katherine Schick and Nicholas Toth.

Figure 2: Three-quarter view of the Mousterian cranium Qafzeh 9 from Jebel Qafzeh in Israel, about 92,000 years old. Photo: Tsila Sagiv/IDAM.

Figure 3: Composite skeleton of a Neanderthal, as reconstructed by Gary Sawyer and Blaine Maley. Photo: Denis Finnin/AMNH.

Figure 4: Panel of the Horses, Chauvet-Pont d'Arc cave, in Vallon-Pont-d'Arc (Ardèche). Photo: French Ministry of of Culture and Communication, Regional Direction for Cultural Affairs—Rhône-Alpes region—Regional department of Archaeology.

Figure 5: Fragments of animal-bone flutes from several Upper Paleolithic sites. Photo: Alain Roussot.

Figure 7: Mammoth-ivory image of a horse. Aurignacian, Vogelherd, Germany. Photo: Alexander Marshack.

Figure 9: Kiln-baked clay animal figurines. Gravettian, Dolni Vestonice, Czech Republic. Photo: Ian Tattersall.

Figure 11: The site of Klasies River Mouth, near the southern tip of Africa. Photo: Ian Tattersall.

Special exhibition installation:

Figure 6: Bone plaque bearing markings that have been interpreted as a lunar calendar. Aurignacian, Abri Blanchard, France. Photo: Alexander Marshack.

Figure 8: Bone needles from various Upper Paleolithic sites in western France. Photo: Alain Roussot.

Figure 10: Incised ochre plaque from Blombos Cave. Photo: Prof. Christopher Henshilwood.

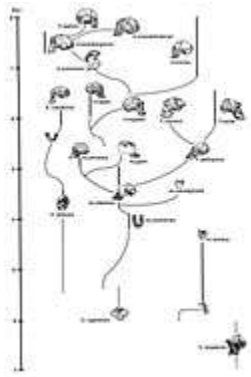

Figure 12: Highly provisional "family tree" of fossil hominids. Image: Ian Tattersall.

Special exhibition installation:

"Genesis: Ideas of Origin in African Sculpture"
November 19, 2002–July 4, 2003
Gallery view of Introduction

Special exhibition installation:
"Genesis: Ideas of Origin in African Sculpture"
November 19, 2002–July 4, 2003
Gallery view of Family Origins

Special exhibition installation:
"Genesis: Ideas of Origin in African Sculpture"
November 19, 2002–July 4, 2003
Gallery view of the Invention of Agriculture: *Ci Wara's* Divine Gift

"Genesis: Ideas of Origin in African Sculpture"
November 19, 2002–July 4, 2003
Gallery view of Foundations of Kingdoms

Special exhibition installation:
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