



Center for Academic Research & Training in Anthropogeny (CARTA)

**“Is the Human Mind Unique?”**

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*Chairs:*

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**ABSTRACTS**

***Symbolic Communication: Why is Human Thought so Flexible?***

**Terry Deacon, UC Berkeley**

Why is human thought so flexible? Although many features of human brains can be attributed to selection for novel cognitive functions (e.g., for symbolic language), relaxation of selection on other attributes has additionally contributed to de-differentiation of certain brain functions. A parallel process will be described involving domestication and birdsong. In humans, this has produced a reduction of innate behavioral tendencies, new possibilities for novel synergistic brain functions, and an offloading of functions onto socially transmitted information. It has also influenced human emotional systems in ways that have contributed to our aesthetic, empathetic, and even religious predispositions.

***Desperately Seeking Explanation***

**Daniel Povinelli, University of Louisiana at Lafayette**

As early as 600 million years ago, some branches of life on earth evolved what we now consider to be the first “complex brains.” Since then, a fantastic diversity of animal brains (and hence, minds) have evolved. How do we compare these minds? One way is unabashedly anthropocentric, using the human mind as the gold standard. In principle, there is nothing wrong—and much to recommend—with this myopic interest in the origins and uniqueness of our mental abilities. In practice, when we fail to highlight both the commonalities that link our minds to other species and the differences that contrast them, we quickly go astray. Even a cursory glance at the fantastic intelligences of the animal kingdom should impress us. The waggle dance communication of honeybees. The echo-informed mental images of bats and dolphins. The memory-laden manner efforts of seed-storing birds who accurately recall the locations of tens of thousands of hidden seeds. Unaided, the human mind cannot replicate these feats. But our minds appear to have some tricks of their own. In this talk, I suggest that “desperately seeking explanation” is a uniquely human mental function. In every domain of intelligence—from temporal and spatial reasoning, to social cognition, to understanding the causal properties of objects—the human mind may have specialized in the ability to construct higher-order, analogy-based inferences that support the explanations for the (admittedly limited) patterns our minds detect in the world. I propose that this mental oddity, coupled with other uniquely human abilities, has, in the blink of an evolutionary eye, given our species the capacity to begin to understand and manipulate forms of intelligence our brains cannot manifest. In science, this “explanatory drive” can be properly regarded as a mania, which, as it proceeds largely uncontrolled, will continue to yield products that both improve, and threaten, our very existence.

***An Evolved and Creative Mind***

**Steven Mithen, University of Reading**

The human mind is quite evidently unique when compared against the minds of all other living creatures today. Our closest living relative, the chimpanzee, with whom we shared a common ancestor six million years ago, exhibits some of the foundations for symbolic thought and language, but there is a cognitive gulf separating its cognitive capacities from those of humans. A more challenging question is whether the mind of modern humans, *Homo sapiens*, is unique when compared to those other members of the *Homo* genus, all of whom are now extinct. Of most interest is our evolutionary evolutionarily close and large-brained relative *Homo neanderthalensis* with whom we shared a common ancestor a mere 500,000 years ago. What can the archaeological and fossil records tell us about the similarities and differences between the minds of *Homo sapiens* and *Homo neanderthalensis*? Did both species have symbolic thought and spoken language? Did both species make art and music? Are the differences significant in explaining the extinction of the Neanderthals c. 30,000 years ago and the remarkable economic and cultural developments of modern humans in the last 30,000 years involving the origin of agriculture and civilization?

## ABSTRACTS (CONTINUED)

### ***Humor***

**Daniel Dennett, Tufts University**

Young mammals like to cavort, to be tickled, to play-fight, but not even the chimpanzee exhibits anything like a sense of humor, which is apparently found only in humans. Why does humor exist at all? It's a time and energy consuming taste, and some humans are arguably addicted to humor. What, in biological terms, sustains this costly habit? The Hurley Model of Humor answers these questions and shows how over the centuries we have learned to tickle our funny bones in ever more sophisticated ways.

### ***Archaeological Evidence for Mind***

**Colin Renfrew, McDonald Institute for Archaeological Research**

The emergence of our species *Homo sapiens* is generally set around 200,000 years ago in Africa, and its out-of-Africa dispersals around 60,000 years ago. Yet early indications of 'mind' in Africa, for instance at Blombos (70,000 BP: incised grid on ochre, shell beads), are meager before the agricultural revolution (11,000 BP). Apart from Franco-Cantabrian cave art in Europe and its outliers (35,000-15,000 BP), few radical changes in behavior seem to take place until the villages, towns, and cities which began (in the 'tectonic' phase) with that revolution in the Near East, in China, in Middle and South America and beyond. So what took so long? That is the 'Sapient Paradox.' If the genetic basis of humankind was established 200,000 years ago, why is the tectonic phase of human development only 10,000 years old?

### ***Entering the "Soul Niche"***

**Nicholas Humphrey, Darwin College**

Human beings are animal-machines with added souls. This was famously Descartes' view, and it's the view of a good many people today. I think it's essentially right. Humans have evolved a kind of consciousness that, when egged on by culture, leads them to have an extraordinary view of their own metaphysical importance. The idea of the soul, considered objectively, is absurd. Yet it's an idea that is nonetheless irresistible to humans. Why should consciousness have evolved to promote it? The clear answer is that humans who believe in the idea of the soul live more productive and creative lives. Indeed, arguably it has been the main driver of human evolution in the last hundred thousand years.

### ***Skilled Performance and Artistry***

**Merlin Donald, Queen's University**

The human mind is unique in so many ways that it is necessary to recognize that our species is of a different order, in cognitive terms, than other species. If one crucial adaptation had to be singled out as the signature move that started the human journey, I would nominate "mimesis," or body artistry, which is the platform on which all complex skilled performance, including language, has evolved. A capacity for refining skill started to evolve very early in the emergence of hominids, as testified by the existence of very ancient stone tools that predate the appearance of our species. Such tools cannot be made without a capacity to rehearse systematically and an ability to imagine an idealized performance.

The evolution of this capacity produced two consequences: a major modification to the primate mind, and a radical change to primate culture. The first was evident in the development of 'mimetic imagination,' whereby the performer's own actions could be imagined and modified accordingly. Mimetic imagination is functionally equivalent to fantasy and role-playing, which triggered the second change: 'mimetic culture,' the culture of skill, performance, theater and drama, that is, of actors acting out imagined roles in an imagined, shared, virtual world. Paleolithic tool-makers and fire-tenders learned their skills in the same way as modern humans: they imagined their performances in a social context, and played them out as dramatic scenarios. In hominid evolution, this contributed to the emergence of such characteristically human phenomena as craft, athletic performance, ritual, and culturally-specific displays of emotion (as in, for example, public displays of grief or triumph).

Mimetic acts are, by their very nature reconstructive, comparative, and creative. The emergence of this capacity, in the context of a shared cultural space it created, altered the course of brain evolution by creating a virtual environment that might be called a "cognitive ecology." The latter gradually dominated cognitive evolution, creating a platform for the later evolution of language and symbolic thought, which remain tethered closely to the distributed cognitive systems of culture itself. Mimetic culture still survives in the performance arts, in athletics, and in public spectacle, while mimetic role-playing remains the cognitive foundation for human personal development, even in the modern era.

## ABSTRACTS (CONTINUED)

### ***Moral Sense***

**Patricia Churchland, UC San Diego**

Morality is a social behavior seen in mammals, and some birds, that depends on an interlocking brain organization shaped by four factors: (1) caring (rooted in attachment to kin and kith, and the pain of isolation), (2) recognition of others' psychological states (goals, feelings, needs), anticipating events painful to me-and-mine is more efficient when brains can represent others as having sensations and intentions, regardless of assorted contingencies in behavior and background conditions, (3) learning social practices and the ways of individuals in the group that emerges from reward system-cortex interactions, (4) problem-solving in a social context (figuring out what modifications to social practices serve stability and prosperity). Between species, the importance of these factors can vary, as a function of natural selection operating on subcortical structures, and of the degree of flexibility of the cortical organization. Increased capacity for impulse control is a feature of frontal brain expansion. Social benefits are accompanied by social demands; we have to get along, but not put up with too much. Hence impulse control -- being aggressive or compassionate or indulgent at the right time -- is hugely advantageous. In different contexts and cultures, expression of sociality may vary, as local factors limit solutions to the social problems of getting along and prospering despite competition between individuals.

### ***Inter-Modular Interactions, Metaphor, and the "Great Leap"***

**V.S. Ramachandran, UC San Diego**

Is the human brain unique? The rhetorical (philosophical) answer is that the brain of any species is unique -- it's the definition of a species. So why bother? There are two answers: first, we are human and are, therefore, more naturally curious about our own uniqueness. Second, some traits may just be quantitatively different on a pre-existing continuum while others represent a quantum leap. Which are the latter? In other words, people have an intuitive understanding of the word 'unique.' Technically, a mouse's or pigeon's neck is as unique as a giraffe's, but only a pedant would fail to acknowledge that the latter is off-scale. The question is "what are the human brain equivalents of the giraffe's neck or elephant's trunk?" What about language, especially recursiveness? Self-awareness? Laughter and humor (even though not all humans share them)? We argue that human mental uniqueness emerged from the fortuitous co-emergence of certain novel anatomical structures and functions and equally fortuitous synergistic interactions between them. These include structures involved in inter-sensory abstraction (IPL and its uniquely human subdivisions; supra-marginal gyrus and angular gyrus; certain frontal structures, Wernicke's area, etc.) and sensorimotor abstraction (mirror neurons). These were then exapted for higher-level abstractions such as metaphor.