

It's a leopard!

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Peter F. MacNeilage

THE ORIGIN OF SPEECH
389pp. Oxford University Press. £25 (US \$50).
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James R. Hurford

THE ORIGINS OF MEANING
Language in the light of evolution
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Darwinian evolution is easiest to grasp when its modifications are ever so slight, one tweak at a time. But the idea starts to become elusive when we focus on its cumulated, complex achievements. The more we behold the hawk's eye, or the toucan's beak, the more incredulous we become: how could something so perfect, so detailed, "just evolve"? Language, the topic of the two books under review, is one such wonder.

Not a physical structure, but a pattern of behaviour, language is as finely detailed, as vast and as astonishing as any eye or beak – in fact more so: it is harder to pin down. One special thing about language is that there are literally infinite possibilities for its form. There is radical variation across the 6,000 or so existing languages of the world (not to mention the hundreds of thousands of languages that have existed). Each of these offers true generativity, that is, the constant possibility for speakers to say things that have never been said before. Unlike eyes and beaks, these infinite linguistic forms cannot be mechanically dissected in the lab. Nor can they be lined up alongside near-identical structures in other species. The problem with language is not just its vastness or complexity. It is that we find nothing remotely like it even in our closest relatives. Language looks like a miracle.

In his book *The Origin of Speech*, Peter F. MacNeilage conveys this feeling of awe as he describes the sheer virtuosity involved in merely stringing a sentence together: "We typically produce syllables at the rate of 5–6 syllables or about 15 phonemes per second – often 15 different phonemes. The speed of operation here is quite phenomenal. By comparison, concert pianists are seldom required to produce individual notes at anything like this rate". MacNeilage's book was pre-announced as *The Invisible Miracle*. The reason he didn't stick with this more evocative title is surely this: language is amazing, but it's no miracle – which is precisely what these two erudite and readable books aim to convey.

Both MacNeilage's book and *The Origins of Meaning* by James R. Hurford maintain that, since language is a product of biology, it is not excused from requiring a Darwinian account. Language can have evolved gradually, both authors insist, with a received scorn for any claim of saltation in evolution. This presents a tough challenge, because language really is unique as far as animal communication systems go. As the anthropologist Terrence Deacon has pointed out, there is nothing in nature that resembles a simpler, in-between version of language, not within our species, nor in others. There are no primitive languages, say, with just a few hundred words, or with just a handful of grammatical structures: language seems to be all or nothing, and this is difficult to reconcile with the proposed gradualism. Hurford's way of trying to close the gap between language and what other animals possess is to play down the size of this gap: "the transition from non-human to human was not such a drastic jump as some have imagined", he writes. His argument is that animals have a great deal of the necessary wherewithal for language, it's just that they don't make it public. The question why our ancestors (and only our ancestors) needed something like lan-

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ment from many angles, aiming where possible to forestall sceptical readers' knee-jerk reactions and misconstruals. Despite these efforts, I fear that the vastness and remoteness of the processes being discussed will still leave room for sceptics. Hurford will be taken to task for his seemingly liberal attribution of concepts to animals. Consider an example: a vervet monkey sees a leopard approaching. The monkey can recognize the leopard and categorize it as a predator, and can act upon this recognition by producing the appropriate "bark" alarm call, causing other vervets to take cover. Have vervet concepts played a role? Or is this just stimulus response, a chain of physical events in which ideas play no part?

The role of sheer physiological processes in language is a prominent factor in both books. They draw heavily on the new revolution in neuroscience, a rapidly opening horizon driven by breathtaking technological advances in brain imaging. As MacNeilage



A male vervet, Kenya

guage as we know it was the utilization of vocal signals for grooming. Hurford is less approving of that theory, explicating in somewhat more detail its pros and cons. But his contention is in the same vein: "Negotiation of social life in primates is the central function of communication . . . rather than the giving and receiving of information". The key developments, Hurford argues, were changes in social arrangements whereby we became more cooperative. Unfortunately, as he makes clear, the origin of this cooperative mentality is even more of a puzzle than the origin of language.

Working on puzzles of evolution requires tremendous vision. While evolutionary processes are finite, making them theoretically tractable, they are simply enormous. So we are fortunate when scholars like Hurford and MacNeilage offer us carefully constructed proposals based on years of toil. Their elaborate narratives are far from Just So stories. Each author works hard to shore up his argu-

ment from many angles, aiming where possible to forestall sceptical readers' knee-jerk reactions and misconstruals. Despite these efforts, I fear that the vastness and remoteness of the processes being discussed will still leave room for sceptics. Hurford will be taken to task for his seemingly liberal attribution of concepts to animals. Consider an example: a vervet monkey sees a leopard approaching. The monkey can recognize the leopard and categorize it as a predator, and can act upon this recognition by producing the appropriate "bark" alarm call, causing other vervets to take cover. Have vervet concepts played a role? Or is this just stimulus response, a chain of physical events in which ideas play no part?

proposes, this adds a fifth question to the ethologist Niko Tinbergen's famous four questions to be asked of any biological structure (mechanism, function, development, evolution), namely: "How is it controlled by the brain?". With new ways of monitoring the human brain, measurable events in the head are linked to observable behaviours in the world. Could this be an invitation to bypass concepts altogether? Not likely. While Hurford embraces biology and neuroscience, he stands his ground as a linguist and philosopher of language, rightly insisting on the utility of concepts as distinct from mere patterns of brain activity.

it concerns our fellow humans ("What did she mean by that?"), other animate beings ("Fido is sulking"), or random events in the natural world ("Our crops failed because the gods are upset"). This may be what makes strong behaviourism seem so spurious, and what made Noam Chomsky's withering review of B. F. Skinner's *Verbal Behavior* in 1959 so welcome. But what sorts of minds are we talking about? A classical answer comes from the nineteenth-century psychologist William James, in the opening to his *Principles of Psychology*. Iron filings, he notes, have no mental states. They will be drawn to a magnet, but the filings are not driven by any desire or intention. If a paper card covers the magnet, the filings will press against the card without ever thinking to go around it. Sentient beings are different:

Romeo wants Juliet as the filings want the magnet; and if no obstacles intervene he moves towards her by as straight a line as they. But Romeo and Juliet, if a wall be built between them, do not remain idiotically pressing their faces against its opposite sides like the magnet and the filings with the card. Romeo soon finds a circuitous way, by scaling a wall or otherwise, of touching Juliet's lips directly.

This means-to-ends flexibility is a mark of higher cognition: a single goal is pursued, but if frustrated, new means towards that goal may be tried.

On this account of cognition, animals have it to burn. Some readers may be concerned with Hurford's equation of such cognition with concepts, but he is not stretching it. He offers an ingenious account of why general animal cognition is quite language-like, or at least clause-like, where different parts of the brain (a "where" and a "what" region) perform complementary, interlocking functions. First, like the subject of a sentence, the brain and mind begin by directing the attention to something of interest. Next, like a sentential predicate, this focus of attention is enriched with thoughts about it. If the underlying structure of cognition is already language-like, Hurford reasons, this narrows the gap, bringing a gradualist account of language within reach.

Both authors focus not just on the importance of thought, but of action, too. When MacNeilage speaks of action, he means motor activity. His book is a sustained argument for the importance of bodily action in the development and evolution of psychological processes – in this case, those processes that control the production of speech. He despairs of the lack of attention that action in this sense has received in the psychology of language. Not only does MacNeilage deliver a relentless attack on Chomskyan rationalism and its disembodied Cartesian assumptions, he points out that even the empiricists, who put bodily experience centre-stage, "didn't ascribe an important role to action".

By contrast, Hurford's concern is with social actions, things people do using language as a tool. As he puts it, people use language to "do things to each other". (I would prefer "do things *with* each other", allowing two interpretations: the interlocutor as collaborator, and the interlocutor as tool.) This speech-act version of language goes back to John Austin's William James lectures at Harvard in the 1950s, published as the classic *How To Do Things With Words*. The

essential point – that words are used to perform social actions like greeting, accusing, blaming, praising – is in line with the view that the core function of language is to manage social relations.

Both Hurford and MacNeilage should be congratulated on their careful, decades-long investigations, and on having written them up in a way that remains both accessible and respectful of the reader's intelligence. Hurford's range is particularly broad, engaging us with a plethora of examples from the natural world. We learn of pigeons that can tell a Monet from a Picasso, Californian sea lions that can pass a ten-year memory test, baboons that display nuanced knowledge of social relations within their troop, and rats that run mazes by day, and dream of them by night. We learn of the social functions of the whoopgobble vocalization of grey-cheeked mangabeys, and dialect variation in the pant hoot of chimpanzees. MacNeilage, too, goes out of his way to engage the reader with wonderfully interesting facts. Handedness, for example, has long been associated with hemispheric specialization in language (in right-handers, language will be controlled in the left half of the brain); when people show mixed hand-foot preference (left-handed but right-footed, for example), language will pattern with the *footedness* preference, not with handedness.

Both authors have a message. Hurford's claims about "semantic" structure in animal thought make good sense once we are beyond the cross-disciplinary pitfalls of terminology. And MacNeilage's claim – that the mandibular cycle (close-open jaw movement, as in chewing) is a launching pad for speech – adopts a standard Darwinian line of reasoning that it is much more economical, and much more likely, for new functions to exploit and be built on existing structures. In short: evolution tinkers, it doesn't invent anew. Like their colleagues in this interdisciplinary field, Hurford and MacNeilage each lend a hand in the ongoing demolition of a now outdated ban on this difficult but surely not impossible question. They do this not by giving knock-down conclusions, but by showing how it is possible to look for them.