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WHERE DOES LANGUAGE COME FROM?



DEREK BICKERTON has two goals in *Adam's Tongue*: first, to convince us that language is the key to being human; second, to dispose of several confounding factors in the study of language evolution, including its primate-centric bias, its homo-centric bias, and its assumption that language is the target of natural selection. He doesn't believe in intelligent design but neither does he believe language evolution is a juggernaut of precursors and stepping stones. According to Bickerton, Darwin may have challenged the view that humans are special creations of God, but natural selection has never been properly understood. Since Darwin we've adopted the view that humans are special creations of evolution, and evolution has never been properly understood either.

As far as Bickerton is concerned, if the gap between humans and other animals is as minuscule as we've been told, what could this minuscule difference be, which makes other animals do so little and us do so much? Those who argue for continuity in evolution, between human beings and other animal species, fail to realise, let alone admit, that each time the gap is minimised the abilities of humans become more mysterious than ever. Bickerton's solution is to propose discontinuity in evolution, by applying what biology knows as "niche construction theory" to language evolution. Within this theory, the selector in natural selection isn't some generalised abstract environment; it's part of an environment already shaped by its inhabitants; it's a constant feedback process in which the things animals do guide their own evolution. Hence the subtitle of his book: "How humans made language, how language made humans."

Bickerton describes the size of the problem: the vast difference between animal communication and human

language. Animals communicate survival, mating and social signals in a "right now" which only relates to their fitness. Human language communicates ideas, remote from time and space, which don't necessarily relate to human fitness.

Theories of language evolution haven't accounted for just how radical a departure human language is from animal communication, or just how long it would have

taken human language to evolve. Whether a theory of language evolution revolves around making tools, or hunting, or social intelligence, it asks us to

accept that, while every other species took millions of years to develop rudimentary communication systems, our species developed a vastly more complex system in a tiny fraction of that time. Theories about our brain size are also back to front; we didn't get a bigger and better brain, which then gave us language; we got language, which then gave us a bigger and better brain.

To move the study of language evolution forward, Bickerton proposes four tests an adequate theory must pass: *uniqueness*—why language was acquired by humans and, conversely, why it wasn't acquired by other species; *ecology*—explanations of language origins mustn't conflict with what we know or can deduce about the ecology of our ancestors; *credibility*—language could never have got off the ground if the content of its first words couldn't be verified immediately and beyond doubt; *selfishness*—the first linguistic acts, whatever they were, must have been such that the speaker derived as much benefit from them as the hearer did. Also, he reminds us that, if we remain in one discipline, we remain in a straitjacket; an adequate theory of language evolution requires a lot of interdisciplinary work.

First, we have to start thinking like engineers, and draft specifications for what human language does that animal communication can't do. Others have tried, but they set the bar too high, by comparing animal communication with human language as it is now rather than how it may have been in the beginning. Bickerton thinks

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a better model for the early stages of human language comes from his study of pidgins; not everyone agrees, though, since the peoples who created pidgins already had at least one full human language, whereas the proto-humans who started language clearly didn't. Bickerton argues this really doesn't make much difference, when studying what proto-language and human language share, which all systems of animal communication uniformly lack: combinability.

Linguists who believe in continuity in evolution—that somehow animal communication segued seamlessly into human language—search for precursors of words and syntax in animal communication. The problem here is that animal signs are never combined. It makes no sense to combine them, since they're specific responses to specific situations; they're complete and sufficient in themselves. It's not that animals are too dumb

to put their signs together; it's just that their signs weren't designed to be put together; and, if animal signs were put together, one sign wouldn't modify the other and together they'd mean exactly what they meant separately. Since symbolism was the Rubicon that had to be crossed for our ancestors to start becoming human, it's more important to look for signs in animal communication which might, under special circumstances, take on symbolic properties; and, through symbolism, take on iconicity: the most probable road our ancestors took into human language.

Second, after we stop thinking like engineers, we need to start thinking like biologists, and start looking at how evolution worked in the past. We need to make some linkages, between our specifications for what human language does that animal communication can't do, and things that really happened in evolution. We need to test and discard some entrenched assumptions that have inhabited the study of language evolution, beginning with the assumption that the species closest to us, the primates, should have the most human language-like system of animal communication.

Apes don't, because all species get what they need and no more. Their communication systems are not failed attempts at human language; they're autonomous systems that exist to serve the adaptive needs of each species that has one. Bickerton discounts the holistic proto-language (or signing ape) theory, which rests on the fallacy that animal communication and human language are fundamentally the same thing; the assumption that apes were struggling towards language, but weren't smart enough to make it, while we were. This belief, tacitly and probably unconsciously held by many who see themselves as fighting anthropomorphic biases, is in fact hopelessly anthropomorphic itself. A holistic proto-lan-

guage, even if it could exist, wouldn't really be a proto-language at all. It would be a hyper-inflated system of animal communication; a series of reactions to specific situations, which may be anomalous, in not being fitness-enhancing, but would still be a hybrid; neither one thing nor the other; still not a viable intermediate stage between animal communication and human language.

Apes aren't "almost human". They don't have the capacity to learn the sign language used by deaf humans, let alone the same capacity to learn human language. Human language contains at least two major ingredients, which even the most sophisticated ape has never employed or mastered. One is grammatical structure, or syntax, the complex rules and principles that determine whether a string of words constitutes an acceptable sentence in a given language or is simply a string of words. The other is grammatical

items—the ats and dids and fors and -eds and -ings and -ses—which serve as signals of that grammatical structure, enabling us to parse and understand it rapidly and automatically, without a smidgen of conscious thought going into what is a frighteningly complex process.

WHAT WERE the apes actually doing, during those decades of experiments to teach them human language? Bickerton says they were doing three things: they were distinguishing between words and proper names, or intuitively grasping the difference between words for individuals and words for categories; they were spontaneously putting signs together, after modelling from trainers who addressed them with sequences of signs; and they were "getting it", as if a light-bulb had suddenly gone on in their heads: "So *that's* what these dumb humans are trying to get me to do!"

Only two things could have triggered the growth of the neural network that made it possible for the apes to connect arbitrary signals with things in the outside world. One of them, which worked for the apes being taught, was a deliberate act of intervention by another species: humans. The other, which Bickerton believes worked for our remote ancestors, is Factor X; the factor *Adam's Tongue* is looking for. But other questions flow from this example of our traditional primate-centric bias: If apes can be taught some kind of proto-language, maybe the kind our ancestors developed, how is it they never used that capacity for themselves in the wild? Are the great apes really unique?

To answer that, Bickerton immerses himself in biology, since "no serious scholar nowadays doubts that language is, at bottom, biological rather than cultural, and therefore was not created but somehow evolved."

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Theodosius Dobzhansky said it best: “Nothing in biology makes sense except in the light evolution.” But what kind of evolution? The one-way street of neo-Darwinian consensus, which saw adaptation as always asymmetrical, with organisms adapting to their environment, never vice versa; or in niche construction theory, which gives animals a vital role to play in their own evolution, and allows for rapid cascades of change, punctuated equilibrium, and the emergence, from time to time, of things that look at first like total novelties?

Take beavers, for example. They build their homes in places where no sudden rise in water level will sweep them away, and where no sudden fall will expose them and their kits to predators. Their favourite environment is a marsh or a pond; but, if there isn't one there already, they make one. They dam fast-running streams by chewing through stems of saplings and bushes, piling the resultant brushwood in the path of the current, and patching the gaps with mud. Sooner or later the dam holds, the water backs up, and the land behind the dam is flooded. Ecologists call beavers a keystone species because if you took beavers away many other species would collapse; just as an arch collapses if you knock the keystone out. They create wetlands that serve as homes and breeding grounds for an immense variety of species. In making an environment for themselves, they made one for others, and they also made themselves.

Evolutionary biologists say this occurred through a mixture of things: chance + necessity + time = perfect fitness. The teeth of beavers are massive, chisel-like objects, for ripping through bark; their mouth is shaped so, if they are chewing stems underwater, the water doesn't get into their throat and choke them; glands under their skin release oils that make them waterproof; their feet are webbed for stronger swimming; their lungs are disproportionately large, so they can work underwater for long periods; their eyelids are transparent, to protect their eyes and still let them see underwater; their tails are long and flat, driving and steering them in water, radiating heat when they cross dry land on hot days, and storing fat against lean seasons. Beavers adapted to the necessities of their environment; to all the things they had to cope with to survive. They selected from the variations, which is what natural selection means.

At this stage, we're still only halfway through Bickerton's journey into the evolution of language, and we're still very much at the beginning of his conversion to niche construction theory, which he explains in detail in the second half of the book. You'll need to read the book yourself, to find out where he disagrees with Richard Dawkins and Noam Chomsky, and discover how it's not just the species that makes the niche; it's also the niche that makes the species. There are memorable moments along the way, about lactose intolerance, and earthworms, and bees, and termites, to name a few,

and the many different things through which niche construction theory links humans, whose culture is simply one of many examples of niche construction, with other creatures in a far broader and more valid way than any claims about primate culture have.

For Bickerton, niche construction theory is the right kind of framework for examining how human language was born, and for explaining not just why we have language but why all other species don't. We need to seek the origins of language not in the things we share with other species but in the things that make us different; and, to return to primates for a moment, there must be some large but hidden difference between apes and us. That difference could hardly lie in genetic material, since ours is almost identical to theirs. The difference was much likelier to exist in the niche, or rather the niches, which our human ancestors constructed, for these were very different from the niches of all the other great apes. Therefore, somewhere, in one or other of those niches, the difference that gave us language must surely lie.

BICKERTON IS AN engaging character with lots of amusing anecdotes. It seems churlish, then, when confronted with so much infectious enthusiasm, good humour, common sense, candid admissions and sound scholarship, to find something fundamental missing.

He makes much of the need to be interdisciplinary, when proposing and testing an adequate theory of language evolution, to avoid the straitjacket of any one discipline. His scientism is still blinkered, though, since his idea of interdisciplinary excludes philosophy and theology; apparently he knows nothing of the important insights of process thinkers, secular and religious, who've done so much to reframe classical metaphysics since the Enlightenment.

Bickerton fails to acknowledge that both evolution and intelligent design are theories, not theorems. In presenting a niche construction theory about where language comes from, as if it were a sensible compromise between narrow-minded secularists and narrow-minded religionists, he avoids the complexity of the evolution versus intelligent design debate. For example, the mainstream churches have long since accepted the role of evolution within intelligent design—indeed, the two may well turn out to be the same thing—and his theory of how language evolved would be far more influential if he explored what that acceptance means.

Process thinkers and niche construction theorists have much to offer each other. If Bickerton ever decides to peep out from under the blankets, he'll see a lot of strange bedfellows.

*Michael Giffin discussed Derek Bickerton's **Bastard Tongues** in the October issue.*