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EvoLang is a series of international conferences held every two years to examine the evolution of language. The first was held in Edinburgh in 1996 in an effort to establish a Darwinian basis for language origins. The project's major difficulty has been that although there are good theoretical and linguistic reasons for believing that our speaking capacity evolved, the physical evidence for language's biological development has been wanting. The main evidence of speech is cultural. Symbolic usages appeared a hundred thousand years ago when *Homo sapiens* began making beads and using skin pigments. Anthropologists say such traditions can be maintained and passed on only through language. Archaeologists have argued that language might be like baseball, a cultural creation that takes advantage of existing biological abilities.

The seventh EvoLang conference, held in March in Barcelona, brought together for the first time clear physical evidence supporting claims for the biological origins of speech. The argument is not over, but new genetic, fossil, and archaeological evidence suggests that by half a million years ago—well before the split in the human lineage between *H. sapiens* and Neanderthals—our ancestors had evolved the biological basis of at least a primitive form of speech. When the two *Homo* lineages did divide, both took their languages with them and both eventually turned their speech into tools rich enough to support symbol-based cultures.

The genetic evidence appeared shortly before the conference and it was widely cited in Barcelona. Neanderthals shared with *H. sapiens* a gene associated with language, *FOXP2,* according to a report from Johannes Krause and others in the 6 November 2007 issue of *Current Biology.* The human gene was known to have undergone two mutations not found in chimpanzees, and now those same mutations have been found in the Neanderthal genome. In Barcelona the news was not considered definitive, however, because *FOXP2* may have mutated for nonlinguistic reasons. Perhaps it became important to language only later.

The second bit of new evidence concerned the vocal tract. Like humans, apes have a long tube running from lung to mouth, but they also have air sacs attached to this tube, turning their vocal tract into something like a bagpipe. Bart de Boer, a researcher from the University of Amsterdam, presented a detailed account of the impact air sacs have on articulation. Using their air sacs, apes can produce a loud and deep noise, making them sound larger. Human voices are less intimidating but can make a greater range of distinct sounds. De Boer hypothesized that natural selection began to work against air sacs when what was said became more important than how it was said.

Vocal tracts are soft tissue and do not fossilize, but the hyoid, a small bone that is in the tract, sometimes survives time's eraser. An ape's hyoid is readily distinguishable from a human's on the basis of the sturdier design required to support both tongue and air sac muscles. It was already known that the Neanderthal hyoid is almost identical to the modern human one. Now a 530,000-year-old hyoid fossil belonging to a human precursor, *Homo heidelbergensis,* has evinced a clearly human form, according to work led by Ignacio Martinez at the Universidad de Alcalá de Henares, near Madrid, and reported in the January issue of the *Journal of Human Evolution.*

On the conference's final day, Francesco d'Errico, an archaeologist at the University of Bordeaux, presented new archaeological evidence that Neanderthals lived in a symbol-based culture that would have required language to maintain its traditions. Such claims have usually been minimized on the grounds that the Neanderthals may have just stolen their symbols from *H. sapiens.* D'Errico was not impressed with that argument, but it did not much matter. He reported finding clear use of body adornments (beads and skin paint) by European Neanderthals 60,000 to 65,000 years ago, well before *H. sapiens* migrated into the area. Symbolic culture among *H. sapiens* has been routinely accepted as evidence that they had language, so the evidence should hold for Neanderthals as well.

Individually, none of these findings is conclusive, but together they help shift the balance toward biology. D'Errico said the default position can no longer be that language is the result of a *H. sapiens* culture that spread out of Africa across the earth. Or as Rudolf Botha, a linguist at Stellenbosch University in South Africa, told attendees, people who claim that language took over an existing ability must tell us how we came by that ability. It cannot have been just luck.

Edmund Blair Bolles (e-mail: blairbolles@gmail.com) blogs about the origins of speech at www.ebbolles.typepad.com.

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