

Talking Back in Time

Prehistoric origins of language attract new data and debate

By BRUCE BOWER



The compulsion to open our mouths and gab sometimes gets a bad rap. Consider the phrases “talk is cheap” and “actions speak louder than words.” Or as an old blues song puts it, “Your mind is on vacation, and your mouth is working overtime.”

Behavioral scientists, however, regard humanity’s conversational stream with awe. Psychologists, for instance, have dubbed spoken language “the jewel in the crown of cognition.” Yet the evolutionary origins of this bauble of babble are hotly contended.

Two general schools of thought currently square off on this issue. “Early-origin” theorists argue that the ability to speak developed gradually over at least 2 million years among human ancestors, although opinions vary regarding the complexity of the speech of fossil species.

A “late-origin” alternative holds that anatomically modern humans rapidly transformed communication with simple sounds and gestures into grammatical speech sometime between 50,000 and 100,000 years ago.

New linguistic and anatomical research offers some ammunition for early-origin advocates, although disputes within and between theories show no sign of diminishing.

The first shot comes from Johanna Nichols, a linguist at the University of California, Berkeley. At the American Association for the Advancement of

Science’s annual meeting in February, Nichols presented evidence that the common ancestor of the world’s modern languages arose at least 100,000 years ago, suggesting ancient roots of premodern types of vocal communication. She obtained this estimate by calculating the time necessary to achieve current worldwide linguistic diversity.

“It’s possible to reconstruct a picture of language in very ancient times, at the dawn of the global expansion of modern humans, based on standard comparative linguistics,” Nichols maintains.

Until now, comparative linguistics revolved around studying corresponding use of sounds in a few languages at a time. This approach traces language roots back some 8,000 years at most.

Nichols instead charted statistical tendencies in nearly 200 of the 300 known language stocks, the oldest groups of related languages established through comparative linguistics. Examples of stocks include Indo-European and Austronesian (which encompasses many native languages of the Pacific islands). Most stocks extend back about 6,000 years.

Language stocks multiply more rapidly in tropical areas along coastlines and more slowly in the drier interior of continents, especially in regions where political empires and agriculture predominate, Nichols asserts. Thus, the island of New Guinea harbors at least 80 stocks — the greatest density of languages found anywhere in the world — while much larger

Busts portray, left to right, a modern human, a Neandertal, and Homo erectus (or perhaps another early Homo species).

Australia contains only about 30.

Moreover, Nichols also estimates that the linguistic ancestors of Eurasian and North American stocks branched into an average of 1.6 daughter tongues.

Assuming that current stocks extend back 5,000 years and derive from individual languages that spawned an average of 1.6 daughter tongues each, it would take at least 100,000 years to create today’s linguistic diversity, she concludes. Her calculation assumes that ancestral environments threw up few roadblocks to the creation of new languages, much as in New Guinea.

Nichols also finds that considerable linguistic variety existed by 50,000 years ago, when humans began to migrate from Asia to the Pacific and later the Americas. About a dozen stable features of languages — such as changing word meaning with voice pitch, assigning gender to nouns, and overt distinctions between singular and plural nouns — appear in distinctive clusters as modern stocks move from west to east, the Berkeley researcher holds. This reflects the diversification of languages as people migrated from Africa to points east, according to Nichols.

Her analysis also suggests that colonization of the Americas began around

35,000 years ago, much earlier than the common archaeological estimate of 12,000 years ago. About 10 separate migrations of people speaking different languages account for the current diversity of language in the Americas, Nichols says.

Linguists generally admire Nichols' ingenuity, yet they voice various degrees of skepticism about her technique for tracing language roots. For instance, much remains unknown about many of the more than 5,000 languages now spoken. This renders the identification of stocks "somewhat of an art," says Stephen Anderson of Johns Hopkins University in Baltimore. And language features considered stable by Nichols can change and spread rapidly, Anderson argues.

"Nichols' methodology might work, but it's too early to tell for sure," remarks Donald A. Ringe of the University of Pennsylvania in Philadelphia.

S spoken language evolved in stages that eventually produced the hypothetical common ancestor of modern languages, in Nichols' view. This reflects a biological process in which natural selection assembled intertwined brain circuits that regulate speech perception, formation of words out of sounds, phrase structure, and other universal aspects of language, asserts Steven Pinker, a psycholinguist at the Massa-

chusetts Institute of Technology. Pinker elaborates this position in *The Language Instinct* (1994, William Morrow, New York).

Other researchers argue that predecessors of modern humans, including Neandertals, lacked the anatomical hardware necessary for fully modern speech (SN: 7/8/89, p.24). Neandertal skulls display a relatively flat base, denoting a larynx (voice box) high in the neck, which would have reduced the ability to make vowel sounds, these scientists maintain. Modern humans, they add, possess an arched cranial base, denoting a lower larynx and greater dexterity with vowel sounds.

This and other evidence indicates that early members of the *Homo* lineage parlayed general cognitive abilities into a language composed of gestures and relatively simple sounds, say two anthropologists in the December 1993 CURRENT ANTHROPOLOGY. Brain reorganization in modern humans and accompanying pressures for handling large amounts of information facilitated the emergence of rapid-fire, grammatical speech, argue Richard G. Milo of the University of Chicago and Duane Quiatt of the University of Colorado at Denver.

But a study presented in April at the American Association of Physical Anthropologists' annual meeting in Denver challenges this theory. A series of human skulls and cadavers measured in a univer-

sity anatomy lab shows no typical larynx position or cranial base shape, report Kathleen R. Gibson and Steve Jessee of the University of Texas Dental Branch in Houston. A wide range of laryngeal and cranial arrangements – including those reported for Neandertals – allow people to speak normally, Gibson asserts.

The Houston investigation quickly drew criticism. Cadavers yield misleading larynx positions because internal bodily structures shift during rigor mortis, maintains Jeffrey T. Laitman of Mount Sinai School of Medicine in New York City, who has directed previous research on the anatomy of speech.

Laitman also argues that he and his coworkers, who find a reduced capacity for speech in Neandertals, use a more accurate method of estimating the degree to which a cranial base bends than Gibson and Jessee do.

A small Neandertal neck bone found in 1988 also generates contrasting interpretations. Some researchers say that the close resemblance between the fossil and the same bone in modern humans reflects Neandertals' advanced talking ability, while others – including Laitman – contend that the shape of this bone has nothing to say about the capacity for speech (SN: 4/24/93, p.262).

Remarks Leslie C. Aiello of University College, London: "The problem of linguistic and cognitive evolution in the later hominids is far from solved." □

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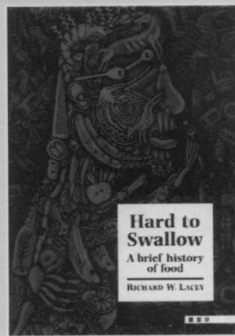
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