

Précis of

Babel's Dawn: A Natural History of the Origins of Speech

Edmund Blair Bolles

The biological changes supporting language can be summarized: (1) rise of emotional vocalizations, babbling; (2) appearance of protolanguage—words and phrases—as part of a radical adaptation to cooperative life on the savanna; (3) development of the ability to direct attention at two points simultaneously, enabling the production of complete sentences; and (4) a growing awareness of subjective states, generating a need for a metaphorical account of invisible processes. All of these changes had become genetically fixed by 165,000 years ago.

Apes today—chimpanzees, gorillas, and orangutans—are already sufficiently intelligent to use a protolanguage. What they lack is cooperative motivation. They are social in the sense of banding together to repulse common enemies, but within their societies they are highly competitive, too competitive to share information, even if, in the long run, they would benefit from such sharing. The human lineage broke with its ape heritage when it began cooperating, probably about 2.7 million years ago, when the modern, savanna grasslands finally appeared over large portions of Africa. The human lineage, with its slow lope, poor digestion, and clawless fingers could only survive on the plains by banding together into cooperative groups. At that point they had both the intelligence and the motivation to share information; inevitably the use of words and phrases to report news to a group emerged.

Apes do not have the vocal abilities to speak and, if they began using words, they would have to form them with hand signals. The human lineage used vocalizations from the beginning, however, because it went through a long period (perhaps 1.5 million years) when it babbled, i.e., vocalized without forming words. This development is older than the savanna and came in

response to the lineage's general loss of hair (3.3. mya). Among apes, hair is critical in social bonding—permitting grooming between individuals—and in providing infants with a hand hold so they can grasp their mother while she is moving about. Babbling replaced hair by providing an alternate means of social bonding through pseudo-conversations and by establishing a means of maintaining contact between mother and infant after the mother had placed the infant on the ground. Babbling still occurs in infancy and the emotional character of expression continues to rely heavily on tone of voice.

Protolanguage—the use of words or phrases without the presence of a complete sentence—was likely in full place by the time of *Homo erectus* 1.7-1.8 mya. It worked simply by directing a listener's attention to something concrete that was either physically present or readily imagined. Further evolution built on this attentional foundation so that the kind of meaning we see in computers—i.e., the use of a dictionary to provide a definition—never evolved. Dictionary meanings are circular—definitions depend on other definitions—and require special procedures for introducing novelties, whereas attention can add something new just by pointing to an unnamed phenomenon and coining a term for it. Dictionary meanings are also abstract concepts, while attentional ones are concrete percepts.

The two critical attentional changes in transforming protolanguage into modern speech were the introduction of complete sentences and the use of metaphors. A complete sentence consists of two phrases that share a common verb, thus enabling a person to direct attention in two places simultaneously. Normally *President Obama* and *a piece of apple pie* are two separate points of attention, but they can be united by a verb: e.g., *tasted*, *threw*, or *grabbed at*. Modern apes have been unable to use complete sentences, so this capacity appears to have evolved specifically in humans. The Acheulean axe (introduced by *Homo erectus*) appears to also require attending to two things at once (both sides of the axe, linked by a common edge), so complete sentences may be as old as 1.5 million years, but such a date is uncertain.

Metaphors enable the expression of invisible, subjective experiences. For example, *He wrestled against Betty's beauty* describes a contradictory, invisible set of emotions—personal desire, and some moral emotion that rejects satisfying the desire. The verb *wrestled* is not literally correct but catches an emotional resemblance. Without metaphors, language could only draw attention to the visible world. With metaphors, speakers can draw attention to subjective experience by expressing resemblances between the visible and invisible realities. The use of such metaphors requires awareness of one's own subjective state, something necessary in cooperative groups whose survival depends on members who can discipline their own behavior.

Dating such capacities is not easy, but they appear to have become fixed by 165 thousand ago. Since then, changes in language have likely been cultural alone. Particularly important was the very recent introduction of writing, which loses tone of voice and makes both generalization and abstraction much easier.

Many evolutionists argue that humans can be only slightly different from apes because evolution does not allow for jumps. However, humans have not been in direct competition with apes for a very long time, while human groups have been in competition for almost two million years now. Group rivalry has been the main driver making the human lineage so much more adaptive than the apes. The difference between humans and Neanderthals is subtle, while uncooperative, undisciplined apes do indeed belong in a separate genus.

Linguists tend to focus on the structure of language rather than its functional qualities. Although interesting for its own sake, the structural approach inevitably obscures evolutionary accounts of origins, which present functional adaptations. For example, linguists will point out that a special property of language is its unbounded nature. A sentence can always be a bit longer, and have a bit more structure. Thus, linguists look for an explanation of this recursive capacity (the ability to follow a finite set of rules to produce an unbounded utterance) without troubling over why the lineage might have acquired such a thing. A functional account focuses instead on adaptation to habitat changes—e.g., the loss of body hair, the appearance of open grasslands—and the behavioral changes that support the adaptations—e.g., the cooperative triad in which speaker and listener share a topic. In this functional account, the rules of syntax are much more *ad hoc* and never require the creation of anything so formal as a recursive rule.