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The evolution of human language: Biolinguistic perspectives. Ed. by RICHARD K. LARSON, VIVIANE DÉPREZ, and HIROKO YAMAKIDO. Cambridge: Cambridge University Press, 2010. Pp. 269. ISBN 9780521736251. \$40.99.

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Where does human language come from? The ‘greatest problem in science’, according to Bickerton (2009), remains a mystery. This new volume offers a partial but important map of current ideas on the problem. The book is stimulating because of the issues it raises and surprising in the issues it ignores.

The book is organized as a debate around the oft-cited paper by Hauser, Chomsky, and Fitch (2002), reprinted in the first chapter. In this paper as well as in his original contribution to the current volume, ‘Some simple evo-devo theses: How true might they be for language?’ (Ch. 2), NOAM CHOMSKY accepts a position restricting the part of the language faculty that is unique to humans down to the sole recursive processing ability. In other words, Chomsky would not be very surprised if everything about language were mere cultural invention, except the Merge operation, which keeps its innate nature and would have appeared by pure chance. Chomsky claims that Merge would have served as support for predicate argument structure, thus enabling a language of thought; only then would syntactic movement have been implemented, again through the Merge operation, for externalization purposes.

Some contributors, such as W. TECUMSEH FITCH (Ch. 4, ‘Three meanings of “recursion”: Key distinctions for biolinguistics’) and MASSIMO PIATTELLI-PALMARINI (Ch. 10, ‘What is language, that it might have evolved, and what is evolution that it may apply to language?’), follow Chomsky in this syntactocentric view of language origin. Others, including RAY JACKENDOFF (Ch. 3, ‘Your theory of the evolution of language depends on your theory of language’) and DEREK BICKERTON (Ch. 14, ‘On two incompatible theories of language evolution’), oppose it. For them, the ability to form predicates came first or in parallel. Predicates are the support of a new form of meaning, unknown to animals, that syntax merely helps connect to phonology. Syntax is not even necessary to link meaning to sound, as is demonstrated by the possibility of protolanguage, a notion invented by Bickerton (1990) that can convey reference through multi-metonymy (Dessalles 2008). Piattelli-Palmarini, however, denies this possibility, claiming that words without syntax are an empty notion, as would be color devoid of hue, saturation, and brightness.

The volume also offers a different perspective that may seem refreshing to linguists. We learn from PHILIP LIEBERMAN (Ch. 11, ‘The creative capacity of language, in what manner is it unique, and who had it?’) that the most important brain structures devoted to language might be subcortical. Will this perhaps lead to the end of Broca’s and Wernicke’s primacy? KARIN STROMSWOLD (Ch. 12, ‘Genetics and the evolution of language: What genetic studies reveal about the evolution of language’) reminds us of the obvious: that performance, not competence, is what natural selection acts upon. And linguistic performance is far from being equally shared. Studies on twins reveal, for instance, that syntactic fluency might be in part genetically controlled, and in a gradual way.

Many readers will appreciate that some of the authors engage in functional thinking. Studying linguistic structures and linguistic devices is commendable, and asking what these structures are useful to is equally essential from a reverse-engineering perspective. DAN SPERBER and GLORIA ORIGGI (Ch. 8, ‘A pragmatic perspective on the evolution of language’) suggest that the ability to form predicates—to form thoughts with variables such as ‘x-drink-y’—opens the way to inferential communication. Animals are stuck with using precoded meanings, whereas human beings go through an interpreting phase in which they have to assign logical roles to concepts. Predicates, thanks to the necessity of interpretation, open up communication to an infinity of meanings. Syntax also is given a functional role by Bickerton and Jackendoff: it is a tool for expressing predicative thought. I would like more functional analyses like this. For most of the authors of the volume, for instance, recursion remains an ingredient that, somewhat magically, would improve all other aspects of language. However, once one acknowledges the fact that predicates can help

determine the arguments of other predicates (as in the computer programming language Prolog), at least one function of recursion ceases to be mysterious (Dessalles 2007).

Quite surprisingly to me, some contributors, such as Chomsky, Piattelli-Palmarini, and IAN TATTERSALL (Ch. 13, 'A putative role for language in the origin of human consciousness'), adopt an antifunctionalist approach. Important aspects of the language faculty would just happen to exist, independently of any function they might have for cognition or communication (even if these aspects fortuitously end up having positive effects afterward). Such ideas create a split among the authors of this volume. Chomsky's antiadaptationist stance is due to the belief that exaptation (the reuse of a structure for a new function) would shield exapted structures from natural selection. This idea, which is due to a conflation between macroevolution and microevolution, is wrong: exapted structures evolve until they are locally optimal for their functions, including the new ones, and language is no exception to this rule (Pinker & Bloom 1990, Dessalles 2007).

The book may surprise many readers for two reasons. First, while the seventeen contributors write all about language behavior, they are perhaps considering only a fictitious version of it. Chomsky is perfectly comfortable with this restriction: 'Accordingly, any approach to evolution of language that focuses on communication ... may well be seriously misguided' (61). Yet standard procedure in science would dictate that one look at what language is used for, before inferring whether it was selected for that usage. What is the reality of language? We speak an average of 16,000 words a day (Mehl et al. 2007) and we use language in two major activities—narration and argumentation (Bruner 1986, Dessalles 2007). Instead of wondering whether language is well designed for telling interesting narratives or for making relevant points, the authors merely write about information exchange. PETER GÄRDENFORS and MATHIAS OSVATH (Ch. 6, 'The evolution of anticipatory cognition as a precursor to symbolic communication') go one step further by considering the role of language in planning action. But planning remains marginal in spontaneous conversation. The downgrading of language usage is well represented by Fitch's remark: 'Without [recursion], language might be a useful concrete communication system, perhaps adequate for the majority of day-to-day social communication that modern humans engage in' (90). Bickerton's (1990) observation that pidgin speakers are strongly impaired in their social communication reminds us that Fitch's picture is quite far from the reality of language use. Every compartment of the language faculty is crucial to conversational performance.

Ironically, the way the authors address the issue of language origins in this book offers a perfect illustration of the narration/argumentation dichotomy. At times, Tattersall, Gärdenfors and Osvath, Bickerton, and especially DANIEL DOR and EVA JABLONKA (Ch. 9 'Canalization and plasticity in the evolution of linguistic communication: an evolutionary-developmental approach') stop discussing in an argumentative manner and switch to narration, in a way that is quite unusual in scientific writings. These passages are recognizable by their use of past tense: 'Importantly, changes of this type were introduced into the language, as innovations, by individuals who thought and felt certain needs (about the world, about society, about communication) that were not yet communicable by language, and *also felt the need* to communicate them' (145).

The second and most surprising aspect of this book on the evolution of human language is that it is almost entirely a pre-Darwinian book! Among the seventeen authors, only two, Bickerton and PAUL BINGHAM (Ch. 15, 'On the evolution of language: Implications of a new and general theory of human evolution, properties and history'), show a clear awareness of the Darwinian paradox about language. The paradox goes like this: What benefit do speakers get from speaking? In a simple Darwinian world, the best strategy should be that individuals maximize the information they take from others and minimize the information they give away. The mystery gets even deeper when one realizes that the actual picture is almost the opposite: human beings are rather talkative (Mehl et al. 2007), and they compete for speaking (Miller 2000) and for showing off their ability to be relevant (Dessalles 1998, 2007). Gärdenfors and Osvath, as well as Bingham, think that human beings are cooperative animals and suggest that this sole fact may solve the paradox. But why would individuals strive to 'cooperate' more than others (in flagrant contradiction with Darwinian predictions) by talking a lot, and quite often about futile matters?

The Darwinian paradox goes with another mystery about language: Why us and not chimps? Chomsky's answer: because chimps do not have Merge. But as Bickerton observes, they have many other means to convey information, and yet they refrain from doing so. According to Bickerton, language emerged when it became in the interest of speakers to signal food sources that they were unable to exploit without help. Bingham's argument is, to my view, the closest to being correct: human beings differ from all other animal species in that they invented lethal weapons. For Bingham, it had the effect of enforcing cooperation by deterring uncooperative cheaters. I believe, however, that this hypothesis is unnecessary. As soon as killing at no risk becomes possible in a primate species, traditional politics based on pure strength becomes obsolete. This explains why information has replaced muscle in hominin displays (Dessalles 2007). Through language, individuals show off their ability to know better than others, a behavior predicted by the costly signaling theory (Gintis et al. 2001). These aspects of the behavioral ecology of language are absent from the book.

The papers collected by Larson, Déprez, and Yamakido are certainly interesting and stimulating. It is the perfect book for those who believe that language is a good thing to have anyway and that recursion (or Merge) is difficult to evolve. Those who find these two assumptions dubious will still appreciate the book, but they may feel that the contributing authors are far from explaining why we talk.

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