INTRODUCTION

MICHAEL L. PLATT

In the beginning was the Word.
—Genesis 1:1

Or perhaps it was the grunt. The origins of human language, arguments from religion notwithstanding, remain hotly debated. From a scientific standpoint, human language must have evolved. As the great biologist Theodosius Dobzhansky said: “nothing in biology makes sense except in the light of evolution” (Dobzhansky 1973). Yet, so far, evolutionary accounts have largely failed to provide a comprehensive explanation for why and how human language could have emerged from the communication systems found in our closest primate cousins. This dilemma reflects the fact that communication in human language arises from the union of semantics—words have referents—and syntax—words can be combined according to a set of rules into phrases and sentences capable of generating countless possible messages. Put simply, there is no single nonhuman animal—primate or otherwise—whose natural communication system possesses both semantics and syntax.

This apparent discontinuity has led some (Berwick and Chomsky 2011; Bolhuis et al. 2014) to propose that human language appeared fully formed within the brain of a single human ancestor, like Venus springing from the head of Zeus,
solely to support self-directed thought. Only later, according to this view, after language was passed down to the offspring of this Promethean protohuman, did language become a tool for communication. This solipsistic account, however, ignores emerging evidence for continuity in cognitive functions, like episodic memory (Templer and Hampton 2013), decision-making (Santos and Platt 2014; Pearson, Watson, and Platt 2014; Santos and Rosati 2015), empathy (Chang, Gariépy, and Platt 2013; Brent et al. 2013), theory of mind (Klein, Shepherd, and Platt 2009; Drayton and Santos 2016), creativity and exploration (Hayden, Pearson, and Platt 2011; Pearson, Watson, and Platt 2014), counterfactual thinking (Hayden, Pearson, and Platt 2009), intuitive mathematics (Brannon and Park 2015), self-awareness (Toda and Platt 2015), and conceptual thinking (MacLean, Merritt, and Brannon 2008), and the neural circuits that mediate these functions (Platt and Ghazanfar 2010)—though, to be sure, other discontinuities remain, in particular the ability to refer to the contents of representations (so-called ostensive communication or metarepresentations: Sperber and Wilson 1986; Sperber 2000). Despite growing appreciation for cognitive and neural continuity between humans and other animals, an evolutionary account of human language—in its full-blown, modern form—remains as elusive as ever.

This book attempts to provide a new perspective on this quandary and chart a novel pathway toward its resolution. We contend that any biologically and humanistically plausible answer to the question of the origins of language must reflect the combined wisdom of multiple disciplines, each providing a unique but related perspective. In this brief volume, we provide an open dialogue among experts in animal communication, neurobiology, philosophy, psychology, and linguistics that began with a two-day symposium convened by the Duke Institute for Brain Sciences in 2014, at Duke University in Durham, North Carolina. The symposium and accompanying book orbit a keynote lecture by Robert Sey-
farth and a provocative target article coauthored by Seyfarth and his long-time collaborator Dorothy Cheney.

Seyfarth and Cheney are well known for their long-term studies of the behavior of monkeys and baboons in the wild, in which they use audio playback of communication calls to probe how primates think about their worlds. In their much-heralded and popular book *How Monkeys See the World* (1990), Seyfarth and Cheney provided strong evidence that vervet monkeys in Amboseli National Park, Kenya, use communication calls that seem to function much like human words, effectively labeling important objects and events in the environment such as predatory eagles and snakes. Taking a fresh look at their own work on social communication among baboons in the Okavango Delta of Botswana, which was originally described in their book *Baboon Metaphysics* (2007), Seyfarth and Cheney argue that the grunts given by baboons in advance of friendly interactions, and the shrieks given in response to aggression, demonstrate not only a richness and complexity in how these animals think about others in their groups but, more surprisingly, that baboons seem capable of combining a small number of communication calls with the large number of individual relationships within the group to produce a vast number of possible messages about social interactions. Seyfarth and Cheney provocatively suggest that these findings provide evidence that the interaction of primate communication systems with cognitive systems representing social knowledge effectively translate into a rudimentary “language” capable of both semantics and generative grammar. For Seyfarth and Cheney, the key elements of human language emerge from the need to decipher and encode complex social interactions in a large, multilayered group.

This bold hypothesis serves as the jumping-off point for a targeted series of responses by symposium participants from several distinct disciplines. These rejoinders situate Seyfarth and Cheney’s hypothesis, and the evidence upon which it is
based, within the relevant contexts of linguistics, sociology, philosophy, psychology, and neuroscience. The authors find sometimes surprising consilience in the comparison, and sometimes equally surprising contrasts as well.

For example, John McWhorter, a linguist with broad interests in creole languages, finds great resonance with Seyfarth and Cheney’s arguments. McWhorter finds commonality in the pragmatics of language—the ways in which context and emphasis markers add new layers of meaning to an utterance—and the complex layering of structured communication in baboon social communication. He argues against a naively Chomskyan “syntactocentrism” and favors theories of language evolution in which pragmatics and semantics precede formal grammar, a view aligned with Seyfarth and Cheney’s. In his view, focusing on the complexity of modern languages with a long history of development may be a red herring. After all, pidgin languages possess minimal grammatical machinery yet efficiently convey precise information via pragmatic markers, consistent with a socially based origin for full-blown language.

By contrast, Ljiljana Progovac, a linguist who specializes in Slavic syntax, flips Seyfarth and Cheney’s approach on its head by arguing that rather than look for the antecedents of human language in animal communication, we ought instead to look for elements of animal communication systems in human language. Such “living fossils” as it were, for example, two-word combinations that function as a protosyntax, invite the possibility of continuity in the evolution of human language from primate communication.

Jennifer Arnold, a psychologist who focuses on prosody—the timing, pitch, rhythm, and acoustic properties of speech—sympathizes with this perspective as well. Her research emphasizes the impact of subconscious processing routines that somewhat automatically shade spoken language by altering speech timing, pitch, and rhythm. Such markers can betray informational redundancies or statistical regularities that may be exploited by listeners in conversation. It’s easy to
imagine that the baboons studied by Cheney and Seyfarth use contextual information attending grunts and shrieks to develop a savvy understanding of their social worlds.

Notably, the two more biologically oriented commentaries—one by Peter Godfrey-Smith, a philosopher of biology, and the other by Benjamin Wilson and Christopher Petkov, both neuroscientists—find some agreement with Seyfarth and Cheney but identify significant challenges to their proposal as well. Both chapters make the clear distinction between sender and receiver, and that what is unique about human language is that syntax allows for generative creation of an infinite number of messages by the sender and their interpretation by the receiver. The generative nature of baboon social communication appears to reside entirely within the receiver. Wilson and Petkov compare the impressive sensitivity of baboons to social order as expressed through sequences of calls with Artificial Grammar studies showing monkeys and other animals are sensitive to ordered sequences of arbitrary stimuli, and suggest that in fact social communication may be the prerequisite for the evolution of human language. They also sketch an outline of the neural circuits involved in sequence learning and production, and speculate that these circuits may interact with brain regions involved in social information processing when baboons or other animals make inferences about the interactions of others based on sequences of calls they hear.

Godfrey-Smith provides the most provocative challenge to Seyfarth and Cheney’s hypothesis by way of comparing the social communication system of baboons with the social communication systems of cephalopods—squid, octopuses, and cuttlefish. In his view, all the sophistication in baboon communication lies within the receiver. When a baboon emits a call, she surely intends to signal something about the environment—response to a threat, approach to a dominant baboon—yet the possible sets of messages are limited. Nevertheless, baboons listening to sequences of calls made by others can draw far more sophisticated conclusions about
their social worlds, which Godfrey-Smith describes as a fortuitous consequence of baboon social ecology and the statistical regularities of vocalizations within the group. By contrast, certain species of cephalopods have evolved elaborate, combinatorial patterns of sequential coloration changes on their skin that, apparently, have very little effect on receivers and, instead, appear to be fortuitous byproducts of internal processes. The comparison of baboons and cephalopods highlights the importance of both sender and receiver in communication, and the fact that all elements of human language—semantics, syntax, pragmatics—must be considered in any account of its evolution.

In the final chapter, Seyfarth and Cheney provide a synthesis of the chapters written by the other authors in response to their own target article. Seyfarth and Cheney find common ground with the other authors in the importance of pragmatics, in addition to semantics and syntax, for shaping the meaning of communication signals. Indeed, all authors seem to agree that primate communication systems provide a rich pragmatic system for representing information about the social world. Ultimately, Seyfarth and Cheney contend, the need for our primate ancestors to represent and convey information about social context was the biological foundation upon which much more complex aspects of human language were scaffolded by evolution.

The foregoing overview makes plain that we have much to learn about how we came to be the only animal on earth with true language. The chapters included here provide a thought-provoking set of interrelated lenses through which we might catch a glimpse of how human language evolved. The ideas summoned in this brief, yet powerful, book endorse the hypothesis that we will answer this, and other challenging questions, only through interdisciplinary dialogue and investigation.