Evolution and the Origin of Human Language

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Abstract

A critical difference between humans and all other life-forms is language. Neo-Darwinism teaches that language evolved from gestures into grunts, then into primitive and, eventually, highly evolved languages. A comparison of ancient and modern languages reveals that the so-called primitive languages are as complex—or in some ways more complex—in grammar and syntax, the ability to accurately express ideas, and other central aspects of language as most modern languages. One advantage in studying ancient languages compared to other ancient artifacts is that many ancient languages are known today in a fair amount of detail. All languages change, as can be easily determined by a study of a single language such as English, but no evidence exists that language began as animal grunts and evolved into fully developed human language.

Introduction

Language is viewed by Darwinists as a critical breakthrough that has forever separated humans from all other life-forms (Müller, 1996; Svoboda, 2007). In Darwin's words, language has justly been considered "one of the chief distinctions between man or the lower animals" (Darwin 1871, p. 53). The problem of the origin of language "has traditionally been seen as the central question about the nature of man" (Aarsleff, 1976, p. 4). Darwinists also have concluded that language is the "most significant and colossal" innovation that has yet evolved and is "essential to human life" (Gaeng, 1971, p. i). Darwin's theory is "now the keystone for every discussion about language evolution that has followed it" (Kenneally, 2007, p. 20).

Darwin (1871) concluded that language evolved from grunts by a Lamarckian process: "As the voice was used more and more, the vocal organs would have been strengthened and perfected through the principle of the inherited effects of use" (p. 57). Before Darwin, the "orthodox view" by language scholars was "that language could not have been invented by man, but was a direct gift from God" (Jespersen, 1964, p. 27). Stokoe (2001) concluded that after Darwin, "supernatural" explanations were "not acceptable as scientific postulates" to explain the origin of language (p. 40). Stokoe argued that if God created language in humans, who taught God language? My present article documents that no evidence exists for Darwin's grunts-to-complex-language theory; rather, language has always been highly complex, having grammar, syntax, vocabulary, and other aspects that fit the needs of the speakers.

The Evolution of Language

Languages are probably the best-documented aspect of culture, partially because they are among the most carefully studied of all cultural artifacts. Written languages in many cases have been well preserved back to ancient times (Friedrich, 1957). Written language is "only six

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thousand years old," and one of the earliest known written languages appeared in Sumeria around 4000 BC., but several script languages also date back that far (Bodmer, 1944; Gaur, 1984; Kenneally, 2007; Linton, 1969). Extensive literature written in Sanskrit dates back farther than any European language; and from a study of the earliest known examples, linguists have determined that Sanskrit contains a complete system of declinations and conjugations that has helped us to trace the Indo-European family of languages back to a common original language (e.g. see Baugh, 1957, pp. 19–20).

The origin of language is, for all of the above reasons, an important research topic. It is also a very controversial topic and widely recognized as unsolved (Svoboda, 2007). Nonetheless, Darwinists have concluded that human language evolved from nonverbal gestures, growls, pointing, and grunts—as are common in many modern mammals—and eventually into the complex languages that we know today (Ludovici, 1965).

It is well documented that a chasm exists between human communication and that of all other life-forms, including the higher primates. Linguist John Oller has gone further by arguing that in the evolution from unicellular organisms to humans "the most difficult transition in the series was the one leading up to the human language capacity" (Oller, 2001, p. 28). The chasm is so great that Nowak and Krakauer (1999) noted the "lack of obvious formal similarities between human language and animal communication has led some to propose that human language is not a product of evolution but a side effect of a large and complex brain that evolved for nonlinguistic purposes" (p. 8028). They concluded that the emergence of language radically changed not only the "character of human society" but also the course of evolution (p. 8028). The solution required to "scale mount improbable, that huge feature of the evolutionary landscape that would seem impossible to conquer" was, as Darwinists propose, a gradual evolution of language ability (Oller, 2000, p. 337).

Critics of the evolutionary theory of language origins point to the fact that little need existed to evolve complex human languages because many modern primates are excellent at communicating "by means of facial expressions, calls, gestures and other behaviours, and our language does not seem to have been designed to do that job especially well" (Blackmore, 1999, p. 96). One would assume that the reason language evolved is obvious, but "why and how language arose, and what its early forms were like are still shrouded in mystery" (Deacon, 1992, p. 133). This includes written language, which evolved so rapidly that no evidence of its evolution exists today (Gaur, 1984).

The Glorious Accident Hypothesis

One theory, called the glorious accident hypothesis, was advocated by Harvard paleontologist Gould and MIT professor Chomsky, as summarized by Kenneally:

> Throughout his career, Gould stressed the ways in which the human species was a glorious accident. The wonder of evolution, he emphasized over and over, was that it was "an unpredictable process with no drive to complexity"... At some point in the past, Gould believed, our brains evolved to a level of complexity that would enable us to reason our way through certain situations, and at that level we had the structures for language already in place. In a sense, language simply "happens" when you have a machine complex enough to accommodate it. So rather than language being selected, we lucked into it, and it wasn't part of what initially made us successful as a species—even though now it's essential to our existence (Kenneally, 2007, p. 55).

Professors Steven Pinker and Paul Bloom in a paper presented at MIT wrote,

> Noam Chomsky, the world's best known linguist, and Stephen Jay Gould, the world's best known evolutionary theorist, have repeatedly suggested language may not be the product of natural selection but a side-effect of other evolutionary forces such as an increase in overall brain size and constraints of as yet unknown laws of structure and growth (Quoted in Kenneally, 2007, p. 57).

The glorious accident hypothesis explains little, however, and is based not on evidence but on lack of evidence. For these reasons it is no longer accepted by many evolutionists.

Alarm Calls Theory

Hayakawa concluded that before humans developed languages as we now know them today, our ancestors

> probably made, like the lower animals, all sorts of cries, expressive of such internal conditions as hunger, fear, loneliness, sexual desire, and triumph. We can recognize a variety of such noises and the conditions of which they are symptoms in our domestic animals. Gradually such noises seem to have become more and more differentiated; consciousness expanded. Grunts and gibberings became language (1972, p. 76).

Although this gesture theory has been "widely embraced" (Blake, 2000, p. 213), it is still very controversial. Gaeng (1971) stressed, as is true of "all other theories that have been advanced to account for the mystery of how (and when) man first learned to speak," that the gesture theory has both its adherents and critics:

> Whatever its shortcomings may be (and how are we to pass judgment

> on the scientific validity of any such theory that must remain, at best, intelligent guesswork?), its most plausible feature would seem to be the fact that it sees language as derived from words signifying human actions (Gaeng, 1971, p. 4).

The main problem with this theory is that alarm calls are not comparable to human words because they are genetically programmed, and for this reason animals will produce them even when reared in isolation from other animals (Kenneally, 2007). They are automatic responses to such stimuli as hunger and pain or to internal conditions such as fear.

Nowak and Krakauer (1999) postulated that protolanguages evolved in a nonlinguistic human society by the natural selection of superior communicators because the better communicators were more able to survive and thus more likely to pass on their improved language genes to offspring. Actually, there are at least eight different theories to explain the origin of language, all of which have their supporters and detractors (Gaeng, 1971). A major debate among evolutionists centers on this question: "Was it the power of speech that caused the mind to develop, or was the evolution of the mind a critical influence in developing the power of speech?" Contemporary theorists differ enormously on the importance of each. Although Darwin (1871) seemed to have favored the view that the ability to use speech had a major effect on the evolution of the mind, Haeckel (1900) argued for the view that the

> higher grade of development of ideas, of intellect and reason, which raises man so much above the brute, is intimately connected with the rise of language. Still here also, we have to recognize a long chain of evolution which stretches unbroken from the lowest to the highest stages (p.18).

The problem is that we humans required a complex set of biological capabilities, including not only the mind, but also the nervous system, the entire oral-nasal-pharynx design, and many accessory structures such as the teeth, tongue, lips, nasal cavities, larynx, lungs, uvula and nose, before we could have used the complex human expressive language existing in humans today (Gaeng, 1971). Hauser et al. (2002) reviewed three major biological language evolutionary theories, each of which they conclude is "plausible to some degree," but acknowledged that to determine which one is correct requires "empirical data, much of which is currently unavailable" (p. 1573). Among the many major differences that exist between human and animal language is the fact that the human brain is not merely a scaled-up ape brain, but is qualitatively different in several critical ways (Pilbeam and Gould, 1974).

This problem was well expressed by Scaruffi, who wrote that, while "language may date back to the beginning of mankind," the real problem is

> not the evolution of modern languages from primordial languages: it is how non-linguistic animals evolved into a linguistic animal such as the human being. It's the "evolution of language" from non-language, not the "evolution of languages" from pre-existing languages. Several biologists and anthropologists believe that language was "enabled" by accidental evolution of parts of the brain and possibly other organs (Scaruffi, 2003, p. 378).

The "accidental evolution" view of language evolution is not supported by any direct evidence, and is widely discounted by linguists because it is not an explanation for language evolution but actually evades the problem. It assumes evolution from grunts to fully developed language in contrast to the findings of long-term empirical research on language evolution that the historical trend is a tendency to shorten words as a result of the common trend to reduce the muscular effort needed to enunciate words, making pronunciation easier (Diamond, 1965).

Another difference is that children usually require several years to acquire their specific language, whereas animal species possess an innate set of oral responses that have very limited malleability (Tomasello, 2003). The human communication system is far richer and more varied and employs numerous communication techniques not used by any other primate (Oller, 2000). Furthermore, animals must rely on a single system of communication; humans use one or more of the almost 7,000 different extant language systems, from English to Swahili (Harrison, 2007). Although both humans and many animals can use body gestures to communicate, humans can effectively use both oral and written language, while animals have only a very limited vocal system. Furthermore,

> no other species has been shown to have a full-blown syntactic systems of the sort found in human language, whether spoken or signed.... It has been argued convincingly that the primary infrastructural features of human syntax (grammatical categories and hierarchical syntactic phrase structures as specified in x-bar theory, recursive application of rules, various characteristics of government and binding, etc.) are entirely absent, as far as can be told, from the communication systems of any other species (Oller, 2000, p. 212).

Human linguistic communication also involves interpretation of symbols by social convention. In addition, human language is grammatical—meaning that factors such as word order are all critical in determining meaning (Tomasello, 2003). A few examples where word order is critical:

- Nietzsche said God is dead. God said Nietzsche is dead.
- The girl likes to drive fast. The fast girl likes to drive.
- Word games like this will drive

me to drinking. Drinking will drive me to word games.
- Only I can do this job. I can do only this job. I can only do this job.

Human language is also highly contextual. For example, "wise man" and "wise guy" mean opposite things, as do "overlook" and "oversee," but "slow down" and "slow up" have the same meaning. A critical factor often ignored in language evolution theory is the need for a corresponding brain and nervous system able to produce and understand language. Oller noted that the

> richness of human syntax represents a remarkable feature of differentiation from other species. Yet before a creature can be expected to form advanced linguistic structures (e.g., hierarchical phrasing, center embedding, anaphoric reference, and complex agreement patterns), the creature needs a whole series of more basic capabilities that can be expressed in terms of design features that are essentially ignored in the widely noted literature on syntactic superiority or uniqueness of humans. These largely ignored basic capabilities can form a more substantial basis for illustrating the relations in power and in evolutionary distance between human and nonhuman communication (Oller, 2000, p. 212).

Study of Putative Primitive Languages

Extensive study of putative "primitive" languages does not support the theory that humans once communicated by grunts and slowly evolved a language. The "incredible complexity" of both primitive and extinct languages is well documented (Rice, 2007; Friedrich, 1957). Professor Dixon, chair of the Department of Linguistics at the Australian National University, wrote that he learned in school that the

> Australian Aborigines were the lowest type of man, scarcely better than animals, with no idea of property or work; they were explicitly contrasted with Maoris who were said to be at the top of the blackman league, only a jump away from Europeans in their capacity to be civilised. I'd long since worked out my own views on such matters, but it was still a surprise to be told that Australian languages had complex grammars that could provide as strong an intellectual challenge as any linguistic system known (Dixon, 1989, pp. 5–6).

He added that the Australian anthropological journal *Oceania* reported that their language, even of "the lowest type of man," has many "gender classes and extensive grammatical concord, perhaps even more than the Bantu languages of East Africa." Dixon also learned from his field work that the

> language of the Worora people had just the kind of grammatical detail that fascinated me. They had lived for thousands of years in the mountainous ranges of north Western Australia…Capell's paper led me to a sketch grammar…in the *Journal of the Royal Society of Western Australia* for 1930–32. He reported, amongst much else, that there were no less than four hundred and forty-four forms of the verb "to be", each carrying information about the subject and object of the sentence (Dixon, 1989, p. 6).

A careful study of ancient languages has revealed that many of the earliest written languages "were as complete in their grammar and as adequate for the conveyance of ideas as any modern ones" (Linton, 1969, p. 9). Those who study ancient languages such as Latin, Hebrew, or Biblical Greek soon realize that their grammar is as complex as that of modern languages. It has been possible to piece together many so-called dead languages (i.e., those that are no longer spoken today), often by utilizing documents that contain the same text repeated in several languages. The best-known example of this, the Rosetta Stone, was discovered during Napoleon's campaign in Egypt (Bodmer, 1944). The stone contains early Egyptian, later Egyptian (called demotic), and the Greek translation.

Yale linguist Edward Sapir, after a lifetime of language study, concluded that simple primitive languages do not exist (Kalmár, 1985). Eminent linguist Stuart Chase bluntly stated that "stories about tribes with only grunts and squeals are biological fakes" (Chase, 1954, p. 91). Kalmár (1985) wrote that from "earliest times ... it seems to be universally agreed, language has ... [remained] essentially the same, except for changes in the lexicon" (p. 151). Gaeng (1971) concluded that we cannot learn anything about the evolution of language from

> observing the speech of primitive societies that are still functioning. Anthropological research has conclusively shown that even the most primitive tribal societies of our time possess highly structured and complex languages with rich vocabularies. Any difference that may exist between the languages of primitive communities and our highly sophisticated cultures lies in the number of ideas and concepts that require expression rather than in the way in which they are expressed. Any hope, therefore, of discovering the specific origin of language from the languages of primitive groups must also be abandoned. (p. 8)

One reason why we cannot observe the evolution of language by studying primitive languages is that

> there are really no 'primitive' languages. All languages have much the same degree of complexity. All fit the demands of the people who use them." (Ludovici, 1965, p. 21)

Vocabulary Evolution

Although "at some 'deep' level all languages are the same," language vocabulary especially changes in response to cultural, technological, and other societal changes (Kalmár, 1985, p. 151). Gaeng (1971) wrote,

> Constant change both in time and space is a universal characteristic of any living language. Meanings, vocabulary, grammar, and, of course, sounds change. Nothing in language stands still until a particular language is no longer spoken. At that point it has become a "dead" language like classical Sanskrit, Greek, and Latin, which now exist only in written records (p. 201).

The study of changes in language vocabulary over time has documented that although names of persons, places, and things increase, the general trend for language is to simplify with time (Diamond, 1965). Linguist Albert Baugh concluded that "the evolution of language, at least within the historical period, is a story of progressive simplification" (Baugh, 1957, p. 10). By comparing twelfth-century English with fifteenth-century English and with twenty-first-century English, the many changes that have occurred during this time can easily be evaluated. It is well documented that the spelling and pronunciation of modern English words are in some ways "much simpler than ... immediate precursors such as Old English and Anglo-Saxon, and all the Romance languages" (Rice, 2007, p. 233). Furthermore, many ancient languages in some ways seem to be more complex then the languages of the putative "primitive" tribes living today. Even societies with the

> least complex cultures have highly sophisticated languages, with complex grammar and large vocabularies, capable of naming and discussing anything that occurs in the sphere occupied by their speakers. The oldest language that can reasonably be reconstructed is already modern, sophisticated, [and] complete from an evolutionary point of view (Simpson, 1966, p. 477).

Since language is intelligently modified, it must respond to the needs of the population (Lehmann, 1992). The best example is vocabulary growth, but other aspects of language are intelligently changed as well, leading to the conclusion that language becomes simpler in some aspects, yet more complex in others. Language is a lens through which one sees the world (Winawer et al., 2007). In one ancient language called Sawi, fully 38 verb endings existed (Richardson, 1976, p. 171). In English we have one word, namely "open," for all of the following phrases: "open your eyes," "open your heart," "open your door," "open a tin can," or "open someone's understanding." The Sawi language uses a different verb in *each* of these cases.

In some Eskimo languages, a single noun can have more than a thousand different forms, each with its own precise meaning. In one Guatemalan language, any verb can have thousands of different forms by adding various endings. Eskimos have long been known to have many different words for "snow," whereas English has one. These examples illustrate the conclusion that having specific words for objects and ideas produces a heightened sensitivity to them and is another reason why language is important.

Many ancient languages such as the Myan, the Olmec, the Isthmian, and the Oaxacon languages have left adequate written records to allow us to study their changes for much of their history (Pohl et al., 2002). A study of these "so-called primitive languages can throw no light on language origins, since most of them are actually more complicated in grammar than the tongue spoken by civilized peoples" (Linton, 1969, p. 9). He further admits that we "know absolutely nothing about the early stages in the development of language, although this has not prevented philologists from putting forward a number of more or less ingenious theories about their evolution" (Linton, 1969, p. 9).

Researchers "have no actual knowledge of language earlier than about 4000 B.C." which is the date of the oldest written records by the Sumerians (Gaeng, 1971, p. 3). Aronoff and Rees-Miller (2001) estimated the earliest language dates back to only 3,000 BC. Of note is the fact that the Sumerian language is a complex, well-developed language. The oldest known written language, Accadian, was spoken by the people who inhabited the plains of Arabia. They used cuneiform writing, and a wealth of their records still exists today on clay tablets, bricks, and cylinders (Bodmer, 1944). Study of these records shows they used an advanced, complex language.

It is often assumed that Western nation tongues are more advanced because they have more words. For example, English and certain other major Western languages each contain about a half million words, and the Zulus and Australian Aborigines far less. This fact should not mislead us into making oversimplified generalizations about the vocabulary range of so-called "primitive" languages. They lack the scientific, technological, and occupational words of the languages used in the Western lands, but they often use an amazingly large vocabulary for objects, concepts, and terms to describe their world that we have no equivalent for in English. The best evidence is that we often borrow their terms instead of translating them into our language. Examples include the word "taboo" from the South Sea islands, "boomerang" from Australian natives, and "totem" and "wampum" from the American Indians. We also use a conventional translation of a term to use the idea, such as when we copied the Chinese and speak of "saving face."

Although, the basic language families are, in many ways, drastically different (indicating a separate origin

for each major language family) some linguists have found four elements useful in determining the development of a language in a national group (Bodmer, 1944). These elements are: (1) similarity of vocabulary, (2) accidence (word inflection), (3) syntax, and (4) phonetics (the sounds or pronunciation of words). Vocabulary is commonly spread from different languages, and phonetics but can be studied only in living or voice recorded languages. Of note is the fact that these four factors are poor predictors of complexity in child language development, contradicting the common Darwinist claim that language development in infants imitates language development in human evolution.

Darwin's Theory of Language Evolution

Darwin concluded from his research that language evolved from animalistic emotional communication, such as grunts, into modern languages such as Chinese and English (Bever and Montalbetti, 2002). The evidence he used to back his theory of language evolution includes fieldwork with the Fuegians, a people who lived in South America whom he called "savages," "primitive beasts," and "cannibals" (Bergman, 2007). Darwin concluded that these "savages" had an extremely primitive animal-like language.

In contrast to Darwin, Thomas Bridges (1886), a missionary who lived and worked intimately with the Fuegians for many years, concluded that the Fuegians, although "one of the poorest tribes of men, without any literature, without poetry, song, history or science…have a list of words and a style of structure surpassing that of other tribes far above them in the arts and comforts of life" (quoted in Barclay and Jenkins, 1950, p. 148). Darwin concluded that the Fuegians had only around 100 words in their language, called Yahgan. Contrarily, Thomas Bridges researched the Yahgan language for his Yahgan-English dictionary and identified over 32,000 words and inflections (Barclay and Jenkins, 1950). To put this number in perspective, a speaker who knows the basic grammar and 5,000 words in a language is considered to have basic competence in the language.

The language of the Australian Aborigines (once incorrectly considered the most "primitive" of all known languages) is not only complex but also very different from ours. An examination of other tongues, such as those spoken by American Indians and the Australian Aborigines, reveals that languages once thought to have inferior modes of expression in fact display a wealth of novel and significant concepts and forms that rival those of the best-known classical tongues of Europe.

The first person to pen a pamphlet on the Darwinist theory of linguistic evolution was August Schleicher in an 1869 work that arranged languages in an evolutionary line in what seemed to Schleicher to "be a progression from simple to more advanced" (Kalmár, 1985, pp. 148–149). The problem is that Darwin taught "evolution was not goal-diverted, not progressive," but rather a product of natural selection favoring random factors (Kalmár, 1985, p. 149). According to Kalmár, language changes actually are often progressive, not due to random factors, but because they are goal-directed by scribes, priests, language teachers, the media, and cultural trends. Another problem is that the Schleicher scheme was racist (Kalmár, 1985).

Influenced by Darwin, Sir Richard Paget argued that humans first communicated by body movements, and "human speech originated in verbal imitations" of these body movements (Gaeng, 1971, p. 3). In spite of a century of work on Darwin's idea, Hauser et al. (2002) stressed that the means by which humans made the jump from animal grunts to their rich expressive human communication is an "evolutionary puzzle" not bridged by quantity changes but quality leaps (p. 1570). In fact, Darwin's gradual theory is now largely viewed as dead by many evolutionists, and in its place is the saltational view—language evolved by jumps.

These examples support Ruhlen's conclusion that there is "no shortage of speculation about how and when language developed" (Ruhlen, 1994, p. 1). Kenneally (2007) reported that "hundreds" of scholars are working on solving the problem of language evolution. Language evolution is even now a separate discipline, yet the question of "how did the language of our parents get here" remains unanswered and "remains the hardest problem in science today" (pp. 6, 11, 12).

In contrast to Darwin's conclusions, historically it was widely believed that humans used a very complex language from the beginning of human existence. This was based on the belief that Adam and Eve could use language from their initial creation as recorded in Genesis 2:16–17. One illustration of this belief is an ancient emperor named Akbar, who was informed that Hebrew was the original language of humans and that children who were not taught a language would naturally speak Hebrew. To test this conclusion, a group of infants was isolated and raised by deaf mutes. They found that the 18 subjects could not speak Hebrew, but rather communicated by gestures just like their caretakers (Linton, 1969, p. 9). The problem with Darwin's theory of language evolution from grunts, called the "gestural origins" theory, is the fact that

> chimpanzees, monkeys, and other primates address each other with gestures and calls lends plausibility to this hypothesis, and gestures are part of everyone's face-to-face language today, but the gap between these rudimentary communication systems and human language is enormous, and how that gap was bridged, and when and where it was bridged, are questions that are not really resolved by the theory of

> gestural origins, even if it should be correct (Ruhlen, 1994, p. 2).

Nonetheless, some linguists still hold to Darwin's view:

> Charles Darwin observed that languages seem to evolve the same way that species evolve, but, just like with species, he failed to propose what the origin of language was. Today, we have growing evidence that ... languages evolved just like species, through little "mistakes" that were introduced by each generation (Scaruffi, 2003, p. 378).

But little evidence exists to support the "language evolves by mistakes" idea, as revealed from the study of various language families such as the Romance languages. We "simply do not know how language originated" (Yule, 1996, p. 1). These problems with Darwin's theory of language evolution have motivated some linguists to conclude that linguists should "exercise more caution in their dependence upon Neo-Darwinian theory," which Stebbins calls a "still unstable and fallible scientific theory" (Stebbins, 2007, pp. 1, 16). Oller (1997) has shown how Darwin's ideas about language have even influenced the development of IQ tests, which, in turn, were used to support the social Darwinism eugenics movement.

Language Families

There are almost 7,000 known languages, and it has yet to be explained why so many exist that have a basic core, yet are radically different (Nettle and Romaine, 2000). Human DNA uses a universal code, yet humans lack a universal code of communication, as is apparent from the wide variety of human languages (Hauser et al., 2002, p. 1569). Yet, in spite of the enormous differences in language, communication between individuals who speak the same language is highly effective. Even slight nuances of vocabulary usage or contextual distinction are generally well recognized and understood by those fluent in the same language (in contrast to the difficulty such nuances present to someone not fluent in the language).

Nonetheless, some scholars believe that all languages can be traced back to about a hundred language groups or less (Bodmer, 1944; Hagman, 1990). Linguists have been endeavoring to extrapolate from modern speech back to the ancient languages for decades, and research completed so far indicates that all human language families had their roots in small populations (Allman, 1990, p. 69). This supports the conclusion of Morris (1976) that

> there is a deep commonality between the basic thought patterns of all men, regardless of how diverse their individual languages may be. That is, there is a fundamental connection between all human languages, but no connection at all between human language and animal "language" (p. 1).

Conversely, there were far more languages spoken in the past than there are at present. Many languages with a recorded history have been lost as living languages, the most famous of which is Latin. Cornish and Euskara, although still spoken by a handful of Basque people, are examples of languages that likewise are expected to die soon. Instead of new languages evolving, Nettle and Romaine (2000) estimated that in the past 500 years close to half of all languages have disappeared, and of the 6,000 remaining, about one language becomes extinct each week. Harrison (2007) added that many linguists predict that by the end of the century only about half of the 7,000 languages existing today will still be spoken. Others dispute their estimates, but if even only partly valid, this trend shows not only simplification of certain aspects of each language, but fewer distinct languages—the opposite of what evolution predicts.

Work on preserving dying languages has been a focus of several research groups, and, with much effort, some have been resurrected (Harrison, 2007). The best example is Hebrew, which was resurrected in order to utilize it as the official language of the modern state of Israel when that country was formed in 1948. Prior to this, Hebrew was learned primarily in academia, often by theologians, Old Testament scholars, priests, or others (usually Christians and Jews).

The most intensively studied language group is the Indo-European language family. Although its development has been well documented, its origin has so far eluded researchers (Gray and Atkinson, 2003). Scientists have attempted to determine how it spread into Europe. One view, called the Kurgan theory, postulates that it spread into Europe by Near East Kurgan horseman about 6000 years ago (Gray and Atkinson, 2003). A recent analysis of a matrix of 87 languages with 2449 lexical items by Gray and Atkinson has supported this hypothesis. Other theories also have been proposed, all of them very speculative and based on limited historical evidence.

The Origin of the 7,000 Languages

The origin of the human ability to use language is compounded by the problem of the origin of the almost 7,000 different languages. This is especially problematic when all of the enormous diversity existing in human language must be explained primarily by geographic separation. Consequently, linguists have debated whether the variety of languages existing today arose due to either monogenesis (a large tree with one trunk) or polygenesis (many trees and many trunks). That is, did all of the languages originate by the "evolution" of one language from non-language, which then diverged into the many known languages, or did the ability to use language evolve separately in several different geographic locations?

The proponents of the monogenesis view focus on the overall pattern of linguistic similarity, while the proponents of polygenesis focus on the major distinctions that divide language families today. It is very difficult to explain, solely on naturalistic grounds, why such overall unity of human language exists, yet also explain the sharp dichotomies in grammar, symbols, and vocabulary existing between the language families. Within they sharp distinctions, many unexplainable similarities also exist (e.g. one study of 1,000 languages found close to 700 uses of the word "papa" for father) (Morton, 2006, p. 33).

Evidence for an Innate Language System

The fact that all languages share so many similarities argues that at the foundational level language "is innate and thus universal" (Kalmár, 1985, p. 151). MIT professor Noam Chomsky spent his career studying languages, and is often called the father of modern linguistics (Aronoff and Rees-Miller, 2001, p. 2).

In the first half of the twentieth century, *structural linguistics* was a popular construct. This view suggested that language was a purely social phenomenon like learning table manners. Chomsky was troubled by this theory and began raising questions that the structuralism theory was unable to answer. For example, if language is simply learned behavior, why do very young children have the ability to produce and understand an infinite number of sentences, including those that they never heard uttered before? Chomsky recognized that children normally acquired language spontaneously without being overtly taught; and he came to the conclusion that language is rooted, not in behavior, but rather in biology. Each child subconsciously deduces a set of rules that is unconsciously drawn upon when they produce or understand a sentence. Chomsky introduced his inherited program theory in 1957.

Some linguists have noted that two competing demands exist in learning a language. First, a language must contain a large set of rules to effectively communicate. Conversely, the more devices available to convey information, the more difficult it is to learn a language, and the harder it is to sort through the maze of possibilities in order to express oneself properly. To resolve these conflicts, Chomsky worked out a theory that he called the minimalist program, which, using Occam's razor, postulates that all healthy people are born with a complex brain system that allows them to effectively acquire the native language to which they are exposed while growing up (Fox, 1999).

Fox concludes that Chomsky's inherited program theory involves a system that "has been optimally designed—that the connection of sound to meaning was forged as simply as possible, as by the divine super engineer" (Fox, 1999). This biological mechanism allows children to generate a rich array of sentences with a minimal amount of information. Of note is the fact that Chomsky's work has "explicitly discouraged interest in language evolution, and has even suggested that language is so different from most other animal characteristics that it may be a product of physical or chemical processes rather than biological ones" (Aronoff and Rees-Miller, 2001, p. 2).

Another problem is that animals can imitate sounds and understand commands (often by simple repetition, plus reinforcement and punishment), but there is an enormous gap between the noises that animals produce and human speech. Chomsky concluded from his lifelong research on this subject that no evolutionary transition exists between the noises that animals make and human speech (Chomsky, 1972). Of note is the fact that humans are the *only* lifeforms on earth that possess the complex biological equipment, such as the brain, required for speech (Finn, 1985, p. 53). Our putative closest relatives, the chimpanzees, are physically unable to produce speech.

Evidence for an inherent propensity for language is found in many sources, including the fact that children generally begin learning a language about the same age regardless of the individual child's specific environment (McNeill, 1970). Even hearing children born to deaf parents begin to speak at about the same time as children growing up in a normal hearing family. Furthermore, the position of a child in the family does not appear to affect the time that language development begins. On average a first child begins speaking about the same time as the last child, even in large families. Of course, exceptions exist due to factors such as brain damage, birth defects, or extreme environmental deprivation. Nonetheless, these patterns hold across a wide variety of environments.

Even though Chomsky recognized that language is genetically inherent in the human brain, he assumed that this could have resulted from a few mutations. This macro-mutation theory of language evolution "maintains that modern language exploded onto the planet with a big genetic bang, the result of a fortuitous mutation that blessed the Cro-Magnon with the gift of tongues" (Kenneally, 2007, p. 9). The mutational theory is central to Chomsky's view of the origin of the human brain's language center. However, there is no genetic data supporting the mutational origin of human language. Instead, mutations are generally degenerative (Bergman, 2005; 2008), and the entire genome is steadily degrading (Sanford, 2008). What is more, the mutational origin is refuted by research on communication defects caused by disease that destroy parts of the brain. This research proves that many different parts of the brain are involved in language, disproving the idea that a few critical macro-mutations could have created language ability. Scientists

now realize that thousands of mutations would be required (Kenneally, 2007).

Therefore, what is more plausible is to conclude; that the human brain's language center resulted from thousands of independent, yet essential and interlinked mutations, or that is was initially designed to use language and effectively acquire a language as young children? Such an acquisition was not a process of mindlessly repeating sounds heard from their elders as once thought, but by subconsciously ascertaining language rules that they then fit into a preexisting brain language program. For example, every child has the concept of singular and plural. A child only needs to put the plural rule into his or her mental construct. The English rule often requires adding the letter "s" or the letters "es" to the singular form. In Latin, the rule often requires dropping "us" and adding the letter "i" (octopus is singular, octopi is plural).

Conclusions

No evidence exists to support Nowak and Krakauer's (1999) Darwinian challenge: "If language has evolved, it must have done so from a relatively simple precursor" (p. 8028). Although languages can be ranked from those lacking a written language to those with a highly developed written language, or those with a few symbols or letters (such as English's 26 letters) to those such as Chinese that use a large number of symbols, the hierarchy depends on the factors used to do the ranking. The number of words, the size of its written literature, and the number of "cases" all have been used to rank languages from so-called "primitive" to "advanced." University of Virginia professor Paul Gaeng wrote that the answer to the

> question of where language started ... must be just as uncertain as it is to the question regarding the precise location of the Garden of Eden. No language spoken today, no language of which we have any sort of record, can suggest what prehistoric language was like (Gaeng, 1971, p. 8).

Bodmer (1944) wrote that, aside from having no idea of what prehistoric language was like, we can only speculate about the origin of human language:

> In a modern classification of the animal kingdom taxonomists unite many small groups, such as fishes, birds and mammals, or crustacea, insects and arachnida (spiders and scorpions) in larger ones such as vertebrates and arthropods. *Beyond that point we can only speculate with little plausibility about their evolutionary past ... So it is with languages* (p. 186, emphasis added).

MIT professor Noam Chomsky (1972) concluded that we have "no more of a basis for assuming an evolutionary development of 'higher' from 'lower' stages, in this case, than there is for assuming an evolutionary development from breathing to walking" (p. 67). Many attempts have been made to "determine an evolutionary origin of language, and all have failed" as supported by the finding that people

> with least complex cultures have sophisticated languages, with complex grammar and large vocabularies, can name and discuss anything that occurs in the sphere occupied by their speaker…the oldest language that can reasonably be reconstructed is already modern, sophisticated, and complete from an evolutionary point of view (Simpson, 1966, p. 477).

The claim that primitive languages are simple has been shown by numerous studies to be wrong, falsifying Darwin's conclusion that language "slowly and unconsciously developed by many steps" from primitive language consisting of grunts (Darwin, 1871, p. 55). The biggest problem has been bridging the chasm that separates humans from nonhumans.

> The question of when our ancestors were first able to produce articulate speech has long puzzled scientists. Anthropologists who trace the development of complex behavior in the archeological record, as well as linguists concerned with the definition of language, have offered many reasoned accounts about how prehistoric humans crossed some "vocal threshold," abandoning apelike grunts for the mellifluous tones of an Olivier (Laitman, 1984, p. 20).

Although we know about when the first written language appeared, scientists have no way of knowing how language began or even when (Kenneally, 2007). Since no one can prove any of the theories about language origins, a "free-for-all" exists. Although the "origin of human language has been an evanescent topic in the history of ideas for many centuries" and will no doubt continue to be so in the future, we are no closer to uncovering its origin today (Bever and Montalbetti, 2002, p. 1565). An article in *Science* titled "What Don't We Know," in answer to the question, "What are the evolutionary roots of language and music?" stated, "Neuroscientists exploring how we speak and make music are just beginning to find clues as to how these prized abilities arose" (Kennedy and Norman, 2005, p. 99). The evidence is that fully developed language existed from the beginning of human existence (Muresan and Wieland, 1998; Harbin, 1982; and Morris, 1976).

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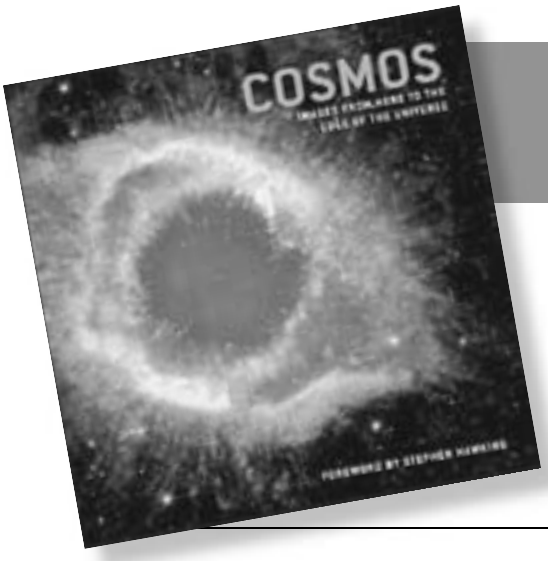

Book Review

Cosmos: Images from Here to the Edge of the Universe

by Mary K. Baumann, Will Hopkins, Loralee Nolletti, and Michael Soluri

Duncan Baird Publishers, London, 320 pages, $20.00.

This "coffee table" book displays a gallery of 150 outstanding astronomy photos taken through 2006. Sources include Hubble and ground-based telescopes. The book itself is small, just 7 ½ inches square.

The author team includes three writers and a photographer. None is a scientist, but the text shows careful consultation with astronomers. The book reads much like a university astronomy course or a media nature program. I kept track of the frequency of mention of several topics: star formation, 27 times; life in space, 5 times; Greek gods and goddesses, 13 times; the Biblical Creator of all the objects shown, 0 times.

Some specifics will catch the reader's eye. The Orion Nebula Complex is said to have produced more than 100,000 new stars during the past 10^7 years (p. 16). The alleged big bang is said to have occurred 13 billion years ago, while some stars are 12 billion years old. Some of the writing is a bit crude: When a coronal mass ejection occurs on the sun's surface, "all hell breaks loose" (p. 113). One intriguing galaxy, NGC 4622, is rotating backward, against the curvature of its spiral arms (p. 267).

Space photos are accumulating rapidly. The growing reservoir of data awaits detailed technical analysis by creationists. The book begins with a foreword by Stephen Hawking and concludes with a survey of telescopes, glossary, and index. The price for this color-filled book, $20, is a bargain.

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