JETS 58/4 (2015) 771–86

A LINGUISTIC ARGUMENT FOR GOD'S EXISTENCE

JOHN R. BAUMGARDNER AND JEREMY D. LYON*

I. INTRODUCTION

Many arguments to demonstrate the reasonableness of God's existence have been advanced over past millennia.[1] On this issue, the biblical record maintains that clear evidence of God's reality resides in the natural realm all around us. This evidence is so plain, the record claims, that no human being can fail to have awareness of God's existence (Rom 1:20). This paper calls attention to a category of reality that provides especially powerful support for God's existence. Our focus is upon the phenomenon of language. We begin from our own subjective experience of this phenomenon and then extend our considerations to the realm of the material world around us. Because language is so integral to our own mental processes and so intuitive in the way we relate to other human beings, most of us never pause to analyze just what is occurring when we think, write, speak, or process what we read or hear others say. Therefore, a crucial first step in this discussion is to establish clearly what the term "language" entails.

II. WHAT IS LANGUAGE?

There is an extensive body of scholarly literature, generally under the category of philosophy of language, that deals with this and related questions.[2] In this article we deliberately narrow our scope to what we deem to be the most basic aspects of the phenomenon of language. In particular, we shall focus on the close association of language with meaning. And in regard to the term "meaning," we utilize its widely accepted definition in a linguistic context of "the denotation, referent, or idea associated with a word or phrase."[3] Although the philosophers of language have written a great deal on the nature of meaning, we will restrict our use of the term to this standard definition. Furthermore, in speaking of language we include not only spoken and written human languages, but also the realms of computer languages and mathematics, and the message-bearing sequences of nucleotides in DNA and RNA observed at the molecular level in the biological domain. Hence, our use of the term *language* agrees in most essential respects with the term *formal language* used in the fields of linguistics, computer science, and mathematics. Under

* John Baumgardner is an adjunct instructor at Southern California Seminary, 2075 E. Madison Ave., El Cajon, CA 92019. Jeremy Lyon is associate professor of OT and Hebrew at Truett-McConnell College, 100 Alumni Dr., Cleveland, GA 30528.

[1] For example, the various forms of the cosmological, teleological, ontological, and moral arguments.

[2] E.g. Scott Soames, *Philosophy of Language* (Princeton, NJ: Princeton University Press, 2010).

[3] The Free Dictionary, http://www.thefreedictionary.com/meaning.

these caveats, what are the essential characteristics of language? We offer a simple answer that emphasizes two essentials.[4]

1. *Language involves the assignment of meaning to otherwise meaningless symbols to form a vocabulary.* As we have already hinted, language is intimately associated with meaning. The first elemental characteristic is that language maps or assigns meaning to a set of symbols. The symbols in themselves, apart from this assignment, generally have no meaning. In the case of spoken human languages, sounds, normally referred to as *words*, serve as the symbols. For example, in the English language, the spoken word "dog" encodes for a certain range of meaning. Other spoken human languages may use entirely different sounds to represent a similar range of meaning. For instance, Spanish uses the spoken word "perro," French "chien," Italian "cane," German "Hund," Russian "sobaka," and Chinese "gǒu." The sounds, or symbols, are arbitrary. Without meaning assigned to them within the context of a specific language, the sounds in themselves carry no meaning. The set of words in a language is usually referred to as its "vocabulary." Emphasizing this essential characteristic of language, namely, of associating meaning with symbols (in this case sounds), Noam Chomsky, regarded by some as the father of modern linguistics, has written, "At the crudest level of description, we may say that a language associates sound and meaning in a particular way."[5]

Most human languages today also have a written form that utilizes a set of characters. In this form, individual characters or strings of characters or letters represent the words to which meanings are assigned. This written form of a given language often has a phonetic correspondence with its spoken form. Many human languages have 100,000 or more distinct words that comprise their vocabularies.

2. *Language involves a set of rules by which elements from the vocabulary may be joined together to create more complex meaning-bearing messages.* The second essential characteristic of language is that it includes a set of rules by which elements from its vocabulary may be joined together to create more complex meaning-bearing messages. Indeed, there is no effective limit to the complexities of the messages that can be constructed in this manner. As Chomsky has noted, "A person who knows a language has mastered a system of rules that assigns sound and meaning in a definite way for an infinite class of possible sentences. Each language thus consists (in part) of a certain pairing of sound and meaning over an infinite domain."[6] When one considers all the books, articles, and scientific papers that have ever been written on almost every conceivable topic, the power and flexibility of human language to describe and represent the rest of reality dazzles the mind. Not only are individual words the bearers of abstract meaning, but so also are sequences of words when joined together according to the grammatical rules of the language. The meaning that se-

---

[4] John Baumgardner, "Language, Complexity, and Design," in *Divine Action and Natural Selection: Science, Faith and Evolution* (ed. Joseph Seckback and Richard Gordon; London: World Scientific, 2009) 938–54.

[5] Noam Chomsky, *Language and Mind* (enlarged ed.; New York: Harcourt Brace Jovanovich, 1972) 115.

[6] Ibid. 103.

quences of words can represent far transcends the meanings of the individual words by themselves. There is no limit to the diversity or complexity of the messages that can be created in this manner. The messages may be, for example, a novel, a Shakespearean play, an encyclopedia, all the libraries of the world, or all those that might ever be imagined. Regardless of the length or content, the essence of a linguistic message is its meaning. Language is the agency by which the message's meaning is encoded and conveyed.

What is language? In summary, language involves (1) an assignment of meaning to a set of otherwise meaningless symbols to form a vocabulary; and (2) a set of rules by which words from the vocabulary may be joined together to form more complex meaning structures.

III. LANGUAGE IS NON-MATERIAL

1. *Meaning itself is non-material.*[7] Because language is so integral to our subjective moment-to-moment experience, few of us ever pause to reflect upon what sort of reality our linguistic expressions belong. Few of us ever ponder the ultimate essence of our spoken words, our text messages, our emails, the cards and letters we write, and the books we read. Is their ultimate essence energy? Is it matter? The answer is no. Their ultimate essence is entirely distinct from energy and matter.

As we have just outlined, language maps meaning to a set of symbols, or words, and has a set of rules by which words may be joined together to form more complex messages. The words are bearers of *meaning*. Meaning is inherently an abstract entity, comprised neither of matter nor energy. Simply stated, meaning is non-material. The linguistic rules likewise are abstract entities and similarly non-material. This implies that in their fundamental essence linguistic expressions, consisting of sequences of meaning-bearing words, logically are also non-material.

Many people find it surprising that something so large a part of their moment-to-moment experience as the words they use when they think and speak as well as words they hear from others could possibly belong to the realm of the non-material. On encountering such a claim, some might respond by pointing out that we form our spoken words via the material air flowing through our material voice box and mouth and that the air surrounding us must be present to carry these acoustic oscillations to allow the person to whom we may be speaking to hear them. Do such observations not suggest that linguistic expressions somehow rely on matter for their existence?

2. *The intersection of matter with language.* When we examine the context of linguistic messages in the world about us, we find that they are in fact normally associated with some sort of material carrier, such as physical sounds produced by the human voice that travel as pressure oscillations through the air, or as character images that appear on the screen of our physical smartphone or tablet, or as printed characters on the page of a physical book we hold in our hand. What effect does

[7] We use the term 'non-material' to refer to realities distinct from those that can be described solely in terms of matter and energy.

this association with physical entities have on the meaning that linguistic expressions convey? We can verify that when the transmission of linguistic messages is done reliably, their meaning remains unaltered, regardless of the material carriers which may have been involved. The sounds of the words produced by our voice may travel as acoustic oscillations a short distance in the air to our phone, be converted into electronic form, be digitized and transmitted as gigahertz electromagnetic radiation to a cell phone tower, be chopped into packets and routed through a complex switching network to its proper destination where, in the phone of the person we are calling, they are reconverted into acoustic oscillations which that person can hear and understand. If all the technology works properly and the signals are transmitted reliably, the message remains the same despite the many different transformations, encodings, and decodings it has experienced en route.

Similarly, these days we can order a hard copy book and receive it in three or four days through the mail, or, with a few clicks of the mouse on our computer, we can download a digital copy of the same book and be reading it on our tablet in the span of a minute or so. The words and the meaning they convey are the same, regardless of whether the book is printed on paper and arrived through the mail or whether it is displayed on our tablet and arrived via the Internet. The book's meaning is independent of the material medium or the process by which we received it. It is therefore easy to verify that the meaning encoded in linguistic expressions has a reality of its own and is genuinely independent of the physical media or processes by which it may have been stored or transmitted. This observation reinforces the conclusion that meaning and language actually do reside in the realm of the non-material. Most of us have been deeply influenced by our culture to think of reality only in terms of material entities. Therefore, it can come as a surprise to learn that an activity as routine as conversing with another person or reading an email message involves the non-material.

3. *Einstein recognized the realm of concepts as non-material.* For those who nonetheless might still be uneasy with the notion that non-material entities are so common and truly part of our everyday experience, it is notable that Albert Einstein defended this conclusion. Commenting on Bertrand Russell's ideas relating to knowledge Einstein states, "We have the habit of combining certain concepts and conceptual relations so definitely with certain sense experiences that we do not become conscious of the gulf—logically unbridgeable—which separates the world of sensory experiences from the world of concepts and propositions."[8] The world of sensory experiences to which Einstein refers is the material realm, and the world of concepts and propositions includes the realm of language. Linguists, giving due credit to Einstein for this observation, refer to the "logically unbridgeable" separation of these two realms as the "Einstein gulf" (see Figure 1).[9] Einstein correctly recog-

[8] Albert Einstein, "Remarks on Bertrand Russell's Theory of Knowledge," in *The Philosophy of Bertrand Russell* (ed. Paul A. Schilpp; New York: Tudor, 1944) 290.

[9] John W. Oller Jr., Stephen D. Oller, and Linda C. Badon, *Milestones: Normal Speech and Language Development across the Lifespan* (San Diego: Plural, 2006) 168, 223, 226. Figure 1 is adapted from figure 8-1, p. 223.

nized that the 'world of concepts and propositions' belongs to a category of reality distinct from that of matter and energy, that is, a non-material category, despite the fact that we so commonly fail to make that distinction.

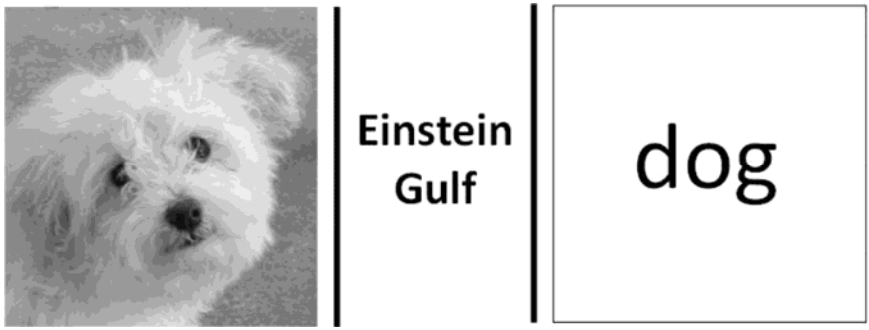


Figure 1: A bodily thing, such as the dog shown on the left, exists on the side opposite the Einstein Gulf from the word "dog," which can be used to refer to the dog. The two entities are in separate categories of reality. The word is not a dog and the dog is not a word.

4. *The effect of language on matter.* Within the totality of the world we can perceive, including the material world, just how important is the realm of language? With a small amount of reflection, one can recognize that all our thoughts and essentially everything we accomplish as human beings involve language. Language enables all human institutions, indeed all aspects of human society. Society's infrastructure—its communication, transportation, governmental, education, defense, energy, agriculture, manufacturing, scientific, engineering, financial, and commerce networks, just to list a few of its components—all relies critically on people using language to relate to one another. Much of the material reality surrounding us—our homes, cars, electronics, the highways on which we drive, the jetliners on which we fly, the skyscrapers that surround us in our cities, for example—depends critically upon language-based interactions, specifications, and plans. In short, the meaning conveyed by language plays a critical role in determining and shaping the material world about us.

5. *The power of language in our machines.* Language—involving a vocabulary of words to which distinctive meanings are assigned together with a set of rules for joining these words to form more complex meaning structures—includes not only ordinary human languages, but also machine or computer languages. Software, via the meaning it carries, enables the complex electronic circuitry in computer chips to perform amazing feats. Without software, computer hardware could accomplish nothing useful. Enabled by software, however, the circuitry in our smartphones allows us to send and receive calls from a good fraction of the earth's inhabitants, can provide detailed navigation instructions for driving in a strange city, can recognize our speech, and can search the Internet to provide verbal answers to our spoken questions. It can interpret speech from someone with a language different from ours and almost instantaneously translate it verbally into our own language. It

can tell us where the nearest branch of our bank is located, where the closest Wendy's restaurant is to be found, and what star constellations exist in the sky above us.

Moreover, the meaning carried by the machine language in the software of computer-controlled manufacturing robots enables these robots to fashion and assemble most of the parts required in our automobiles, and for that matter, most of the other machines and appliances we use today. The power of this non-material encoded meaning to shape the material world around us almost exceeds what we can imagine. The example of manufacturing robots illustrates how non-material meaning encoded by language can and does result in profound tangible consequences in the material realm.

IV. MATHEMATICS AND THE LAWS OF NATURE

1. *Mathematics is language.* Noteworthy among the many languages humans use is a crucially important one that can easily be overlooked. It is mathematics. Mathematics involves the assignment of meaning to symbols and has a set of rules for joining symbols together to create arbitrarily complex meaning-bearing expressions. To illustrate how this works let us consider a simple example. Suppose we are given the following problem and asked to solve it using algebra:

> An exam has fifteen questions worth 100 points. The exam consists of true/false questions worth 5 points each and multiple choice questions worth 10 points each. How many multiple choice questions are on the exam?

The first step in solving the problem is to assign meaning to some symbols. Suppose we let the symbol t represent the number of true/false questions and the symbol m represent the number of multiple choice questions. We also let the symbols +, -, •, /, and = respectively represent add, subtract, multiply, divide, and equals. Utilizing these symbols we can then express the problem in terms of two expressions involving the symbols as follows:

$$t + m = 15$$
$$\text{and } 5 \bullet t + 10 \bullet m = 100.$$

Since both these expressions include the equals symbol =, they are known as equations. We can then apply two rules that we learn in algebra or some other mathematics class which are valid for equations. The first rule is that multiplying or dividing all terms on both sides of an equation does not alter the equality. The second rule is that adding or subtracting two equalities yields another equality. Therefore, if we multiply all the terms in the first equation by 5, we obtain the equality $5 \bullet t + 5 \bullet m = 75$. If we then subtract this equality from the second equation, we obtain the equality $5 \bullet m = 25$. Dividing both sides of this equation by 5 yields the equality $m = 5$, which is the desired answer for our problem, namely, that there are five multiple choice questions on the exam.

This simple example helps us see that mathematics indeed does satisfy all the criteria we have been using to define language. It involves assigning abstract meanings to a set of symbols and then applying a set of rules to generate more complex meaning structures utilizing these symbols. Like all other linguistic expressions,

mathematical expressions are in the realm of the non-material. Their ultimate essence is the meaning they convey, and meaning is non-material.

2. *The laws of nature are non-material.* The discovery that the material world behaves in accordance with rules describable in terms of mathematics, mostly in Europe during the 16th and 17th centuries, resulted in the emergence of modern science. Most people today, including most scientists, simply take the laws of nature for granted. Most view the laws of nature simply as qualities inherent to the material realm itself. Yet we have just shown that mathematical expressions are linguistic in their ultimate essence and hence non-material. The laws of nature, because they are mathematical expressions, are therefore also non-material. This observation implies that the material realm has linguistic underpinnings. It functions according to them in a precise and consistent way. These linguistic underpinnings are the mathematical specifications, commonly referred to as the laws of nature, which we have discovered mostly over the past 400 years.

An example is the mathematical law, first published by Isaac Newton in 1687, describing the attractive gravitational force observed to exist between two material bodies such as the earth and the moon.[10] Today this law can be expressed $F = Gm_1m_2/r^2$, where F is the force between the masses, G is the universal gravitational constant (experimentally measured in SI or metric units to be 6.674×10^{-11} N m^2 kg^{-2}), m_1 is the mass of the first body, m_2 is the mass of the second body, and r is the distance between the centers of the mass of the two bodies. It is the application of mathematical laws like this one which enables the technology today that provides us cell phones, robotic manufacturing, and rovers on the surface of Mars.

V. LANGUAGE AND NATURALISM

1. *Language falsifies naturalism's foundational truth claim.* The claim that matter, as expressed in various configurations of elementary particles, together with energy in all its many forms, constitutes the totality of reality is a widely held outlook today. For example, Carl Sagan famously claimed, "The cosmos is all that is, or ever was, or ever will be."[11] This naturalist, or materialist, view of reality rose to prominence in Western intellectual circles during the Enlightenment, roughly from the mid-17th through the 18th century.[12] This view continues to influence deeply, if not dominate, the outlook of most university educated people in our day. However, in light of our current knowledge, can one credibly defend the perspective that matter is all there is? As astonishing as it may be to some people, the answer is no. It is now clear that as human beings we participate in non-material realities during every waking moment of our lives. We are immersed in the non-material at every turn.

---

[10] Isaac Newton, *Philosophiæ Naturalis Principia Mathematica* (1687).

[11] Carl Sagan, *Cosmos* (New York: Random House, 1980) 1.

[12] The article 'Enlightenment' in the Stanford Encyclopedia of Philosophy available at http://plato.stanford.edu/entries/enlightenment (accessed 2/23/2015) provides a helpful summary of this period in the history and culture of Western thought.

What are some of the implications of the recognition that language is a non-material phenomenon and that language shapes the world around us in tangible and powerful ways? One implication is that it exposes the foundational truth claim of philosophical naturalism as false. The foundational truth claim of philosophical naturalism (hereafter referred to simply as naturalism) is that there are, categorically, no non-material realities. Because naturalism's entire framework depends so critically on this single assumption, merely a single counterexample is sufficient to falsify it entirely. Can falsifying naturalism really be so simple? Yes. If indisputable non-material realities exist—and language certainly qualifies—then naturalism logically cannot be true. This means that naturalism, which has been taught as dogma in most of the world's universities for the past century or more, is intellectually untenable. An obvious reason is because language demonstrates that matter is *not* all there is.

2. *Language demands a non-material source.* Even though we have seen that language expressions are non-material because their fundamental essence is abstract meaning, it is useful to consider whether or not language expressions can have a material cause. Are there any observations or theoretical reasons which suggest that matter/energy has such an innate ability? The short answer is no. The laws of chemistry and physics offer no clue whatsoever that matter can assign meaning or otherwise deal with meaning at even the most rudimentary level. Even when matter is organized in extremely complex ways, such as in electronic networks with trillions of interconnected transistors, there is no hint, in the absence of software, of any ability whatsoever to generate meaning-bearing signals or behavior. Although naturalists once imagined that such behavior might somehow emerge, there is no observational evidence that suggests that it possibly can. Indeed, why should atoms, even when organized in complex ways, be able to assign meaning to otherwise meaningless symbols to form a vocabulary or, beyond that, invent rules by which words from the vocabulary might be joined together to form arbitrarily complex meaning-bearing expressions? The laws of physics offer no indication at all that matter has such capacity. Furthermore, no theoretical reasons are being offered for how matter conceivably could behave to allow linguistic capacity to emerge. This state of affairs argues compellingly that linguistic phenomena require a non-material explanation.

3. *Language ability demonstrates that we as humans possess non-material attributes.* Because of its prominence in institutions of higher learning since the Enlightenment, naturalism has played a major role in shaping the way people today view themselves and other human beings. Naturalism, in excluding non-material reality of any sort, must also insist that human beings can possess no non-material faculties or attributes. Yet the observation that language is non-material and that we as humans so readily use language and even create new languages for our computers should cause us instantly to question such a limited picture of who we are. Our language ability demonstrates that we possess obvious and profoundly significant non-material capacities within ourselves. Our language ability implies that we are dramatically more than a complex assemblage of atoms, as naturalist philosophy would have us imagine.

Testable from our own experience, we discover that our capacities to think, reason, and make choices are all involved in how we form and interpret language. Indeed, thinking apart from language seems impossible. Chomsky noted, "When we study human language, we are approaching what some might call the 'human essence,' the distinctive qualities of mind that are, so far as we know, unique to man and that are inseparable from any critical phase of human existence, personal or social."[13] We observe that our freedom to select a particular word and not another with similar meaning when we compose a message implies that making free choices is an integral aspect of our language capacity. Because the case is so strong that material causes are incapable of generating non-material effects, the human use of language provides compelling support for the conclusion that our mental faculties that enable us to generate and process language must also be non-material. If our abilities to think, reason, and make choices are ultimately non-material, it is plausible to conclude that other aspects of our subjective experience such as consciousness and self-awareness are as well.

The proposition that we as humans have, in addition to our physical bodies, a non-material component is referred to in philosophical circles as *substance dualism*.[14] It is also known as *Cartesian dualism* in honor of René Descartes who argued that the mind is a non-physical substance, the seat of consciousness and self-awareness, and to be distinguished from the brain as the seat of intelligence. In his *Meditations on First Philosophy,* Descartes describes a quest in which he called all his previous beliefs into doubt in order to find out of what he could be certain.[15] In so doing, he discovered that he could doubt on whether he had a body but not on whether he had a mind.[16] This gave Descartes his first insight that a categorical distinction must exist between mind and body. We have arrived at this same conclusion via an analysis of language.

VI. LANGUAGE—THE UNDERPINNINGS OF BIOLOGY

Up to this point we have limited our attention to natural human languages, man-made computer languages, mathematics, and the laws of nature. Yet there is a realm where the power of language to shape and specify material structure and function far transcends what we have considered in previous examples. This realm is that of biology. Meaning is encoded by genetic language in the DNA of every living organism in the same manner in which meaning is encoded by any other type

---

[13] Chomsky, *Language and Mind* 100.

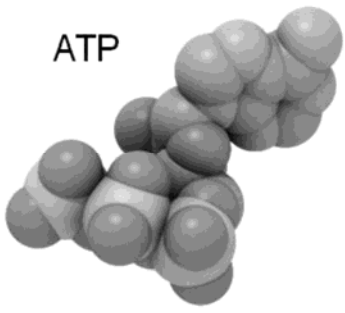
[14] The article 'Dualism' in the Stanford Encyclopedia of Philosophy available at http://plato.stanford.edu/archives/fall2003/entries/dualism (accessed 2/23/2015) discusses the term "dualism" in the context of philosophy of mind as the view that the mental and the physical, or mind and body, or mind and brain, are, in some sense, radically different kinds of reality.

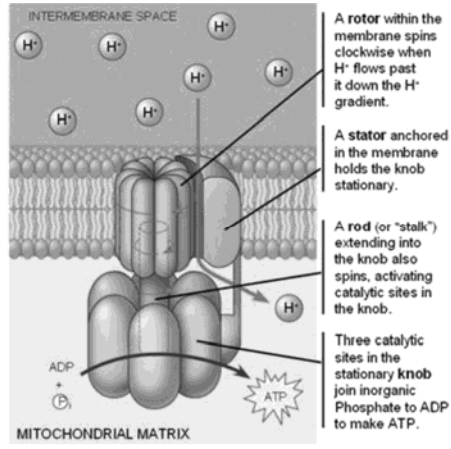
[15] René Descartes, *Meditations on First Philosophy* (1641) in *The Philosophical Writings of René Descartes*, vol. 2 (trans. J. Cottingham, R. Stoothoff, and D. Murdoch; Cambridge: Cambridge University Press, 1984) 162.

[16] Descartes found that he could doubt whether he had a body (it could be that he was dreaming of it or that it was an illusion created by an evil demon), but he concluded he simply could not doubt whether he had a mind.

of language. Since meaning is abstract and non-material, the meaning conveyed by genetic language, as with any other language, likewise is abstract and non-material. One of the most striking contrasts between genetic language and languages utilized by humans is the complexity of the encoding. Because each DNA letter, or nucleotide, commonly is utilized simultaneously by several overlapping but distinct messages, the amount of meaning or specification conveyed per letter far exceeds that of human languages.[17] This enables genetic language in a relatively modest amount of DNA to specify details of the structure, development, metabolism, repair, and reproduction of an organism, astonishingly, to the level of the organism's individual atoms.

The ability to specify structure at the level of each individual atom represents the ultimate in nano-technology. And this is precisely what has been discovered in living systems over the past 60 years. Most cells in all organisms contain millions of nano-scale machines of astounding complexity, many of which are mobile and/or contain moving parts. These nano-scale machines perform the myriads of functions required for the organism to live, utilize resources from its environment, and reproduce. One example of these nano-machines is ATP synthase (see Figure 2). ATP synthase is a rotary machine found in all organisms, from bacteria to humans, and plays a crucial role in cellular metabolism. This machine is built from approximately a dozen different proteins and consists of about 90,000 atoms. The details for its astonishing structure, to the level of each individual atom, are specified linguistically in the organism's DNA. It is the power of linguistic encoding of meaning that makes such detailed specification possible. It has thus become clearer than ever before that it is life's linguistic component that makes living systems possible. Apart from this linguistic component, there would be nothing but lifeless chemistry and physics on the face of our planet.





[17] E. N. Trifonov, "Genetic sequences as products of compression by inclusive superposition of many codes," *Molecular Biology* 31 (1997) 647–54; S. Itzovitz, E. Hodis, and E. Sega, "Overlapping codes within protein-coding sequences," *Genome Research* 20 (2010) 1582–89.

Figure 2: (Left) Depiction of a molecule of adenosine triphosphate (ATP), $C_{10}H_{16}N_7,O_{13},P_3$. The three phosphorous atoms are depicted by the lightest gray, the oxygen by the darkest gray, and the carbon and nitrogen atoms by intermediate gray. Nitrogen atoms are slightly smaller than the carbon atoms. Hydrogen atoms are not shown. ATP serves as the "energy currency" in cells of all organisms, from bacteria to humans, and supplies the energy for most cellular processes at the molecular level. Energy is released when the bond holding the leftmost phosphate unit (PO_4^{3-}) to the rest of the molecule is broken. Our bodies have about 50–100 g (2–4 ounces) of ATP. This inventory is utilized and reconstituted about 1500 times per day, or about once per minute. (Image credit: http://commons.wikimedia.org/wiki/File%3AAtp_exp.qutemol-ball.png, licensed under a Creative Commons Attribution Share-Alike 3.0 License.)

(Right) Depiction of the rotary machine known as ATP synthase. ATP synthase reconstitutes ATP by joining a molecule of adenosine diphosphate (ADT) with a molecule of inorganic phosphate, P_i, via mechanical and catalytic action. The rotor spins at about 9000 rpm. In humans the ATP synthase machine is built from some fourteen different kinds of protein and consists of about 90,000 atoms. ATP synthase differs little in its structure among bacteria, plants, and animals. Some of our cells have as many as a million of these rotary machines. The total amount of ATP reconstituted by ATP synthase per day is approximately equal to our body weight. (Image credit: http://cellular-respiration.wikispaces.com, licensed under a Creative Commons Attribution Share-Alike 3.0 License.)

Like other examples of formal language, the linguistic elements in DNA responsible for describing the proteins from which these machines are built also involves assignment of meaning to words to form a vocabulary and rules for joining the words together to form more complex linguistic expressions. Each protein corresponds to a highly specific linear chain or sequence of molecular units known as amino acids. Most proteins found in living systems are built from only 20 of these amino acid building blocks. Soon after the double-helix structure of DNA was elucidated by Watson and Crick in 1953, it was recognized that the four nucleotide bases, adenosine (A), cytosine (C), guanine (G), and thymine (T), that link the two helical strands of the DNA backbone together, like rungs of a ladder, might serve as the letters in a genetic alphabet.[18] It was later verified that triplets of letters could and indeed did specify specific amino acids in sequences that matched those found in actual proteins.[19] Three-letter words derived from a four-letter alphabet give a vocabulary of $4^3 = 64$ possible words. It was found that meaning was assigned to all 64 of the possible words. In all but two cases multiple DNA words were found to refer to each of the 20 amino acids. Three words were used for punctuation to signal stop, like a period in written English. It was later discovered that the use of more than one word to represent each amino acid is extremely useful because it

[18] J. D. Watson and F. H. C. Crick, "Molecular structure of nucleic acids," *Nature* 171 (1953) 737–38.

[19] F. H. Crick, L. Barnett, S. Brenner, and R. J. Watts-Tobin, "General nature of the genetic code for proteins," *Nature* 192 (1961) 1227–32.

allows for multiple overlapping meaning-bearing messages to be encoded with the same sequence of nucleotide letters.

Let us briefly examine the linguistic coding for just one of the protein structures on which our bodily functions depend, namely, hemoglobin. Hemoglobin is what fills our red blood cells and what carries oxygen from our lungs to every cell in our bodies and returns carbon dioxide from each of our cells back to our lungs. A unit of hemoglobin is built from four individual protein strands. Each strand as we mentioned corresponds to a chain of amino acids that link together like Legos. Pairs of the four chains are identical. The pair referred to as 'alpha' chains are each composed of 141 amino acid units. The other pair referred to as 'beta' chains are also identical and are each composed of 146 amino acid units. The order and identity of the amino acids in a given chain determine the precise 3D structure into which the chain folds and also the precise biological functions that it can perform. Using a separate letter of the English alphabet to designate each of the 20 different amino acids, we can express the hemoglobin alpha chain as the following sequence of 141 letters, here grouped in units of 10 amino acids, as follows:

> vlspadktnv kaawgkvgah ageygaeale rmflsfpttk tyfphfdlsh gsaqvkghgk
>
> kvadaltnav ahvddmpnal salsdlhahk lrvdpvnfkl lshcllvtla ahlpaeftpa
>
> vhasldkfla svstvltsky r.[20]

In a similar way, the hemoglobin beta chain consisting of 146 amino acids can be expressed:

> vhltpeeksa vtalwgkvnv devggealgr llvvypwtqr ffesfgdlst pdavmgnpky
>
> kahgkkvlga fsdglahldn lkgtfatlse lhcdklhvdp enfrllgnvl vcvlahhfgk
>
> eftppvqaay qkvvagvana lahkyh.[21]

Even a single error in this amino acid sequence can prevent the resulting chain from folding properly and can have severe medical consequences. For example, a mutation in the DNA specifying the sixth amino acid in the beta chain, changing it from glutamic acid (e) to valine (v), results in the genetic condition known as sickle-cell disease when the defective gene is inherited from both parents. The disease leads to major health issues.

The alpha and beta chains of hemoglobin represent only two of about 100,000 different proteins that enable our bodies to begin from a fertilized egg, to develop as an embryo with all the specialized tissues our many organ systems require, and to display all the amazing metabolic, sensory, repair, mobility, and other functions we experience as human beings. Non-material linguistic specifications encoded in our DNA not only describe the structural details of all these proteins down to the level of individual atoms, but they also implement and manage the feedback control mechanisms that allow such complex systems to operate stably

---

[20] Hemoglobin subunit alpha, Homo sapiens, http://www.uniprot.org/uniprot/P69905.

[21] Hemoglobin subunit beta, Homo sapiens, http://www.uniprot.org/uniprot/P68871.

within a changing and dynamic environment. At this point we have only begun to understand how all this astonishing bio-informational, biochemical, and biomechanical technology works in such a seamless manner. Such complexity makes the human technology underlying our cell phones appear as mere child's play by comparison.

VII. LINGUISTIC CODING IN THE NATURAL REALM—FROM WHENCE DID IT ARISE?

An obvious issue is the origin of all the encoded DNA specifications in the living organisms we observe around us, including ourselves. Any credible explanation must account for the staggering level of the coded specifications that exist in the DNA of even the simplest bacterium. We have already considered whether material causes can account for linguistic phenomena at any level. Our conclusion was no. Human experience, by contrast, points exclusively to mind as the source of linguistic expressions. In addition, our own thinking and reasoning seem to rely unequivocally upon language. Moreover, our ability to use and create language enables us to devise computer languages, and with these languages all the software required to operate the computer-enabled machines we also design and build which influence and shape the material world around us. This reality leads us by analogy to conclude that the most plausible explanation for the linguistic content we find in living organisms is an entity with mental faculties qualitatively similar to our own, but vastly superior, including those of thinking, reason, and making choices, faculties which we ourselves employ when we create linguistic content.[22] Yet the complexity of the linguistic messages encoded in the DNA of living organisms so far transcends the language expressions that humans are able to generate that we can only shrink back in wonder. The mental abilities required to account for such messages stagger human imagination. If ever there were tangible evidence for intellectual capacities far, far exceeding our own, the linguistic messages in our own DNA surely must qualify. An entity possessing such astonishing mental powers certainly qualifies as God in the way most people understand that term. What other rational alternative can there be?

---

[22] Others have made this same deduction. E.g. A. C. McIntosh, "Information and entropy—top-down or bottom-up development in living systems?" *International Journal of Design and Nature and Ecodynamics* 4 (2009) 351–385; A. C. McIntosh, "Information and Thermodynamics in Living Systems," in *Biological Information: New Perspectives* (ed. R. J. Marks II, M. J. Behe, W. A. Dembski, B. L. Gordon, and J. C. Sanford; Singapore: World Scientific, 2013) 179–201. We make the deduction via linguistic considerations without reference to entropy or thermodynamics. Another example is Werner Gitt, *Am Anfang war die Information* (Neuhausen-Stuttgart: Hänssler, 1994); ET *In the Beginning Was Information* (Bielefeld, Germany: Christlich Literatur-Verbreitung, 1997). Gitt extends the engineering information theory approach pioneered by Claude Shannon in the late 1940's by adding four additional levels or dimensions of information. These ideas, slightly updated, are found in Werner Gitt, Robert Compton, and Jorge Fernandez, "Biological Information: What Is It?," in *Biological Information: New Perspectives* 11–25. We make the same ultimate deduction via linguistic considerations much more directly without the complexities of engineering information theory.

Let us review the logical steps that lead us to this conclusion. First, we provided a clear definition of language in terms of encoded meaning. We demonstrated that because meaning is non-material, linguistic expressions likewise must be non-material. We further showed that there is no indication that matter can generate non-material meaning-bearing linguistic expressions. Why should we expect that even to be possible, given that matter and meaning are in separate ontological realms? On the other hand, as humans we are immersed in language realities. We associate our own use of language with our own mental faculties. It seems indisputable that the source of our thoughts and other language expressions is our mind. For lack of any other plausible explanation for linguistic phenomena other than a mind like our own, the linguistic coding observed in the DNA of every living organism points to a mind with the capabilities that most people associate with the term God. The strength of that conclusion depends on the deduction that language is always a product of mind. But there appears to be no other rational possibility. In fact, the case is so overwhelmingly strong that rarely in the history of mankind has there been such clear and unambiguous evidence for God's reality as there is today. This evidence consists in what has been revealed concerning the structure of living things at the molecular level during the past half century and concerning the mathematical laws of nature over the past 400 years. The case is so strong that God's reality ought to no longer be a topic for debate in scholarly circles.

As we have already noted, the linguistic signature we observe in the realm of biology extends to matter itself, because the very laws of nature are linguistic entities. The conclusion is close to inescapable that the whole of reality testifies to God's existence. This logic led Antony Flew, the renowned British philosopher and arguably the best-known atheist in the English-speaking world during the final half of the 20th century, to abandon his atheism and in 2004 to announce an earnest belief in God.[23] Flew stated, "I now believe that the universe was brought into existence by an infinite Intelligence. I believe that this universe's intricate laws manifest what scientists have called the Mind of God. I believe that life and reproduction originate in a divine Source."[24]

VIII. A GOD WHO SPEAKS

Beyond vastly greater mental and linguistic capacities than our own, what more might be inferred about this God? Many today acknowledge evidence for a divine Mind and Designer behind the realm of nature but are reluctant to go further. We, however, conclude that the linguistic capacity of such an Intelligent Designer who created the laws of nature as well as earth's living organisms ought to draw a person's attention to the God of the Bible. The Bible, from its first page to its last, discloses a God who speaks. And especially in the Bible's opening verses, when God speaks, things happen. Ten times in the Bible's first chapter we find the

---

[23] Antony Flew, *There is a God: How the World's Most Notorious Atheist Changed His Mind* (New York: HarperCollins, 2007).

[24] Ibid. 88.

phrase ויאמר אלהים "And God said …."[25] What follows each of these declarations is the creation of light, the expanse, the dry land, plant life, luminaries in the heavens, marine life and birds, land animals, humans, the dominion mandate for humans, and the diets for humans, birds, and land animals. In five of these ten instances, what God is recorded as speaking is followed immediately by the phrase, ויהי כן ("and it was so").[26] Taken at face value, the biblical text indicates that it was God's spoken declarations which brought these aspects of His creation into existence in a miraculous, instantaneous way.[27] Other biblical passages affirm this inference. Psalm 33:6 declares, "By the word of the LORD the heavens were made, and all the host of them [that is, all the stars] by the breath of His mouth." Verse 9 adds, "For He spoke, and it was done; He commanded, and it stood fast." The book of Hebrews also affirms that, "By faith we understand that the worlds were framed by the word of God [ῥήματι θεοῦ], so that the things which are seen were not made of things which are visible" (Heb 11:3).[28] Thus, the Bible indicates that God created the physical universe and life itself through his spoken word. Not only this, according to Scripture, it is Christ himself who continues to uphold all of creation "by the word of His power" (Heb 1:3). Furthermore, the Bible throughout its pages reveals a God who communicates, highlighting one of the attributes of the God of the Bible—that he is a God who speaks.

IX. CONCLUSION

Language plays an integral role, not only in our own subjective experience, but also in the material realm around us. This includes its role in human thought and communication, in the laws of nature, and in the specifications and function of every living organism. As encoded meaning, language is non-material in its ultimate essence. Apart from something akin to the human mind, there are no serious candidates for explaining how linguistic phenomena might otherwise arise. The only reasonable way to account for the linguistic aspects of the laws of nature and of DNA is an intellect with capacities so vast that most people would immediately identify this entity as God. Such linguistic capacities draw attention to the God of

---

[25] The root אמר (to say) is used 11 times in Genesis 1, with the other occurrence in the Qal Infinitive construct form (לאמר "saying") in 1:22.

[26] ויהי כן ("and it was so") is used in Gen 1:7, 9, 11, 15, 30, while the identically functioning ויהי אור ("and there was light") is used in 1:3.

[27] Even ancient rabbis, from the period of the Tannaim and Amoraim (first to fifth centuries AD), understood the biblical text as teaching instantaneous creation through God's spoken word. For example, *Midrash Rabbah* discusses God's creation of light in Gen 1:3: "Rabbi Berechyah in the name of Rabbi Yehudah bar Simone opened, *By the word of HASHEM [the LORD] the heavens were made, etc.* [Psalm 33:6]. Rabbi Yehudah bar Simone said: not with toil nor with exertion did the Holy One, blessed is He, create His world; rather *by the word of HASHEM [the LORD],* and already *the heavens were made.* Here too [Gen 1:3], *'ve'hayah' light* [והיה אור] is not written here; rather, *'va'yehi'* light [ויהי אור], there was light immediately." Also noteworthy is the observation of the use of ויהי "and it was," a *wayyiqtol* verb (past tense), instead of והיה "and it will be," a *weqatal* verb (future tense), in Gen 1:3, 7, 9, 11, 15, 30.

[28] The root word ῥῆμα is understood as "that which is said, word, saying, expression, or statement of any kind." See BDAG 905.

the Bible. The paramount role that language plays in the world around us indeed mirrors the prominent role that God's spoken word plays in the Bible's account of the manner in which God brought this world and all its astonishing wonder into existence: "Then God said … and it was so."[29]

[29] I, John R. Baumgardner, would like to express earnest appreciation to Professor John W. Oller Jr. who, some 25 years ago, coached me in the linguistics basics on which this article relies. I am grateful for his friendship, encouragement, and counsel over these many years. He is currently Professor of Communicative Disorders at the University of Louisiana.