**Major Evolutionary Blunders: The 'Degenerate' Genetic Code?**

by Randy J. Guliuzza, P.E., M.D. \*

“Newspeak” was the language developed by the fictional totalitarian regime Oceania in George Orwell’s classic novel *1984*. The regime redefined words and slogans as a means of thought control over its citizens. Often, Newspeak words meant the exact opposite of the “Oldspeak” vocabulary. Citizens’ thinking eventually became characterized by contradictory beliefs that were embraced simultaneously, a practice known as “doublethink.” For instance, the Ministry of Truth produced Newspeak and fabricated history-altering propaganda. And in the Ministry of Love, people were tortured for committing “thoughtcrimes” such as individualism and independent thinking. Orwell’s novel cautions us against being fooled by cunning misapplication of words or deceptive redefinitions.

**Does Degenerate Mean Degraded or Upgraded?**

The answer to this question may seem obvious. Obvious, that is, if you think in Oldspeak, but elusive if you think in Evolutionspeak. When evolutionists claim that a biological feature is degenerate, do they mean that it is degraded, superfluous, redundant, or a defining characteristic of biological complexity? Apparently, any of these, depending on the evolutionist and the particular conclusions he or she is trying to draw.

A research paper from the 1970s described the genetic code as “a universal, highly degenerate, three-letter code”.1 For reference, a three-letter code, also called a *codon*, is a group of three bases of DNA that specify a single amino-acid building block for a protein. DNA bases are also referred to as *nucleotides*.

A more recent paper exploring the evolution of genes states, “Because there are much more different codons than coded amino acids, the genetic code is called degenerate. Since the discovery of the genetic code…how it is degenerated is one of the most fascinating problems of genetics.” This fascinating problem has evolutionary implications: “The hypotheses trying to explain the evolution of the genetic code can be divided into two groups [mechanistic and random].”2 The authors advocate the random hypothesis and describe how the alleged evolution and degeneracy of the genetic code developed together.

What might a biology undergraduate student learning about DNA make of these characterizations of genetic degeneracy? Evolutionists believe that genetic variety is mindlessly fractionated between organisms in a deadly struggle for life. Destruction associated with a struggle for life may fit the primary definition of “degenerate” in dictionaries like*Merriam-Webster*:

1 a: having declined or become less specialized (as in nature, character, structure, or function) from an ancestral or former state; b: having sunk to a condition below that which is normal to a type; *especially*: having sunk to a lower and usually corrupt and vicious state; c: degraded.3

The student could, therefore, readily interpret genomic degeneracy according to its common meaning—degradation.

But the student may be pushed to another evolutionary meaning of degenerate. Because there are more codons than coded amino acids, degeneracy might support evolution if some of the codons (or one of the three nucleotides making a codon) were superfluous. This understanding aligns with reports claiming that one in 200 human genes is “nonsense.” A lead researcher stated, “Our study suggests that overall, gene loss has not been a major evolutionary force: our genome does not seem to be in a hurry to get rid of these ‘superfluous’ genes.”4 Since living things supposedly evolve through the inefficient survival-of-the-fittest process, degeneracy could result from DNA being “cobbled together”5 through “evolution as a ‘tinkerer,’ building new machines from salvaged parts.”6 Alleged unessential leftovers junking up the DNA are therefore declared to be evidence of evolution…and certainly not indicators of good design.

As the student gathers yet more background information on the evolution of the genetic code, he may be surprised that in yet another report degeneracy does not mean superfluous, or functionally redundant, or degraded, but actually “degeneracy is a ubiquitous biological property” that researchers argue “is a feature of *complexity* at genetic, cellular, system, and population levels.”7 This novel evolutionary-based usage affirms,

Degeneracy, the ability of elements that are structurally different to perform the same function or yield the same output…is both necessary for, and an inevitable outcome of, natural selection.7

It seems that evolutionists can invoke degeneracy to bolster their favored concept.

To find a way through all of the Evolutionspeak on genomic degeneracy, the student can turn to actual studies of function for the three nucleotides in a codon. These studies point to another major evolutionary blunder since *all* of these possible evolutionary understandings of degeneracy are not supported by the science.

**Degeneracy, in Evolutionspeak, Is Stunningly Wrong**

A detailed literature review in 2014 found that even if different codons prescribed the same amino acid in a protein, the codon differences still mattered in how the protein was made. The final folding shape of proteins is vital to their function. David D’Onofrio and David Abel documented that the DNA and its corresponding RNA sequence carried information not only for the proper amino acid sequence but also to control the *timing* of its folding. They “demonstrate that this TP [translational pausing] code is programmed into the supposedly degenerate redundancy of the codon table.”8 What this means is that the code of differing codons, even if they specify the same amino acid, still supplies important information, information that “purposely slows or speeds up the translation-decoding process….Variable translation rates help prescribe functional folding of the nascent protein. Redundancy of the codon to amino acid mapping, therefore, is anything but superfluous or degenerate.”8

A recent experiment again shows that the specific nucleotides in a codon do matter. Mutations to a codon that do not change the protein-coding sequence are called *synonymous*. The consensus view was, “Until recently, most biologists believed that so-called silent mutations, created by ‘synonymous’ DNA changes—those that do not affect the protein-coding sequence—had very weak effects on the evolution of organisms.” But this long-term experiment with bacteria found “that single highly beneficial synonymous mutations can allow organisms to rapidly evolve and adapt to their environment.”9 Another “interesting phenomenon” was that bacteria with different codons initially, when faced with the same challenges, seemed to converge on the same changes. Researchers found that “furthermore, these mutations occurred at single points within the gene, were highly beneficial, and they seemed to recur in multiple experiments.”9

A nucleotide order that specifies rapid, repeatable, and useful adjustments to changed conditions does not sound like the serendipitous side effect of random “silent mutations” but rather speaks loudly of the designed outcome of intentional planning. The genomic code is not degraded or superfluous. It is also clear that structurally different elements that specify a common element *do not* necessarily yield the same output. Observations like these prompted D’Onofrio and Abel to conclude, “The functionality of condonic [*sic*] redundancy denies the ill-advised label of ‘degeneracy.’”10

**Corollaries to the “Degenerate Genome” Blunder**

Commenting on wide-ranging ramifications of D’Onofrio and Abel’s work, Casey Luskin made an insightful observation regarding how it relates to the conclusions of many other evolutionary studies. He observes,

Seeking to infer the activity of natural selection, evolutionary biologists statistically analyze the frequency of synonymous (thought to be functionally unimportant) and nonsynonymous (thought to be functionally important) codons in a gene….As the thinking goes, if synonymous codons are functionally unimportant, then three conclusions may follow: a bias toward synonymous codons implies purifying selection in the gene, a bias towards nonsynonymous codons implies positive selection, and an equal balance implies neutral evolution (no selection). But if synonymous codons can have important functional meaning, then the whole methodology goes out the window, and hundreds of studies that used these methods to infer “selection” during the supposed “evolution of genes” could be wrong.11

Aside from the science showing that the genome is not “degenerate” in any evolutionary sense, there is another—more important—lesson made evident by this blunder. It pertains to Evolutionspeak within evolutionary literature. This lesson flows from the ambiguous usage of words coupled with novel definitions that essentially oppose their primary meaning. That is conceptually misleading, and it’s possible that this Evolutionspeak could produce the same effect as Newspeak. Orwell was concerned about misleading definitions used by powerful institutions to impose big lies on those under their control. He illustrated this in *1984* with the Party’s oft-repeated mantra “war is peace, ignorance is strength, freedom is slavery.”

In scientific literature, metaphors, analogies, and anthropomorphisms abound. Some are useful in bringing clarity. However, cross-definitions, false analogies, or applying a word to something that its definition could never support can be misleading. This practice is highly detrimental to science, which is structured on precise language and clarity. We must be on guard to make sure Evolutionspeak doesn’t creep into and warp our own way of thinking about science.

**The Genetic Code Is a Design Marvel**

As noted above, *repeatability* is found in synonymous changes enabling bacteria to consistently overcome challenges. Repeatability is not a hallmark of chance outcomes but is suggestive that this result is due to designed mechanisms.

It is also telling how Gerald Edelman and Joseph Gally recognize that backup, or functionally redundant, systems are indicative of design. However, their worldview not only precludes any consideration of that conclusion but also shapes their choice of vocabulary in conveying their thoughts to others—i.e., Evolutionspeak. They astutely note:

The contrast between degeneracy and redundancy at the structural level is sharpened by comparing design and selection in engineering and evolution, respectively. In engineering systems, logic prevails, and, for fail-safe operation, redundancy is built into design. This is not the case for biological systems. Indeed, not the least of Darwin’s achievements was to lay the argument by design to rest.12

Thus, they believe “the term ‘degeneracy’ is more apt than ‘functional redundancy.’”12

When humans can identify the true source of fail-safe redundancy, it always is an indicator of good design and a good designer. Given that, redundancy of a code embedded in another code reveals great design. D’Onofrio explains, “Redundancy in the primary genetic code allows for additional independent codes….We have shown a secondary code superimposed upon the primary codonic prescription of amino acid sequence in proteins.”13

Geneticist Dr. Jeffrey Tomkins of the Institute for Creation Research summarizes that “we are only beginning to decipher the true complexity of these different genetic languages,” but we do know that “for the genome to function in all its complexity, many different codes and languages are used, and they all mesh and work interactively with one another….These highly complex language systems speak directly to a Creator of infinite wisdom and capabilities.”14 How true. For by the Lord Jesus “all things were created that are in heaven and that are on earth, visible and invisible” ([Colossians 1:16](http://www.icr.org/bible/Colossians/1/16)).

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