

God and Natural Selection

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Many scientists have found ways to accommodate a belief in God along with evolutionary science. They may view the evolutionary chain of events in Earth history to be the gradual unfolding of God's creation, or they may view religion as the moral dimension to an otherwise entirely biological process. Examples include Darwin's contemporaries Sir Richard Owen and St. George Jackson Mivart, and, later, Henri Bergson. Modern examples include Francis Collins, head of the NIH, and the American Scientific Affiliation (<http://www.asa3.org>). But there is one aspect of evolutionary science which they have not been able to reconcile with religion: natural selection.

Natural selection is a fundamentally simple process:

- Genetic variation arises in populations. This variation is random with respect to the "needs" of the organisms.
- Some individuals reproduce more than others, as a result of their genetic characteristics.
- Over generations, the characteristics of the successful individuals become more common in the population.

That's what natural selection is. That's all it is.

New genetic characteristics arise through such processes as:

- Mutations in existing genes
- Duplication of existing genes
- Changes in gene expression

Such “mutations” can be good, bad, or neutral, depending on the circumstances. But some mutations are simply bad. Why would God “use” natural selection as the method of creation, if most mutations are bad?

Some mutations appear overwhelmingly detrimental, yet the people who display them often compensate for them with astonishing abilities. As psychologist Mark Blumberg explains, a person who loses his or her legs in an accident encounters tremendous difficulty in learning to live without them, but a person born without legs will often learn to walk on his or her hands. People born without arms learn to use their feet for many activities that hands perform for most people.

Mutations that have their effect early in embryonic development may be detrimental, or may (as with the repeated evolution of limblessness in reptiles) be the founding event of a new evolutionary lineage.

Back when I was contributing articles to the journal of the American Scientific Affiliation, this is how I dealt with the problem of mutation. I wrote two articles that said: Over evolutionary time, as in an individual’s life, God allowed adversities, and progress resulted from life overcoming them.

But many mutations have severe effects that cannot offer an evolutionary benefit under any conceivable set of circumstances. Proponents of *intelligent design* insist that the complexity of the human genome and the physical bodies that the genes encode had to be designed by an intelligent Creator. What they do not discuss is that a lot of the apparent design in the human genome confers affliction rather than benefit. That is, the Intelligent Designer, if there is one, has no discernible purpose, and is as likely to afflict as to bless the human race. The existence of a large pool of mutations, which natural selection has not completely gotten rid of, is consistent with evolution but not with Intelligent Design, or with any conception of an all-powerful God who is in control of what happens in the universe.

Geneticist John C. Avise points out two challenges that the human genome presents to the concept of a beneficent Intelligent Designer. The first challenge is the sheer number of mutations. Of the 18,000 genes listed in Online Mendelian Inheritance in Man (OMIM; <http://www.omin.org>), three-quarters of them have documented mutations. Many genes are, in fact, named after the disorders that occur when they malfunction. Once I consulted a human chromosome chart. For chromosome 17, at least fifty-three such mutations were listed. The list

was very depressing. Mutant genes on chromosome 17 cause: Bernard-Soulier syndrome, a type of uncontrolled bleeding; lissencephaly, which means that the brain is smooth, lacking the folds and grooves that allow proper function, and is usually fatal in the first few months of life; one of eleven mutations that can cause Leber congenital amaurosis, a type of blindness; medulloblastoma, which is the most common childhood brain tumor; early onset breast cancer; ovarian cancer; a type of muscular dystrophy; and many other disorders.

Perhaps the most disturbing mutation is the one that causes Lesch-Nyhan syndrome. This one mutation, of a single amino acid in a protein, causes the victim to have an uncontrollable compulsion for self-mutilation: the victims chew their own lips and fingers, and find sharp objects to stab their faces and eyes. The victims are fully able to feel their pain and they know what they are doing, but cannot control it.

Not only do such mutations exist, but they have come into existence many times. Consider glycogen storage disease, in which a defective enzyme causes glycogen (animal starch) to build up in tissues throughout the body. The result is severe debilitation, and usually death. Geneticists know of 86 different mutations that can disrupt the enzyme and cause this disease. That is, this genetic disease has mutated into existence 86 separate times.

The second challenge, according to Avise, is the structure of the human genome itself. It is, he says, a clumsy system that seems set up to frequently fail. First, consider the fact that only about one percent of human DNA codes for enzymes. About 68 percent of the DNA consists of *non-coding DNA* that is between the genes, and about 31 percent of the DNA consists of non-coding DNA that is inside of the genes. Whenever a cell divides, all of this DNA is copied, not just the DNA that the cell will use. In addition, since each gene is broken into little “exon” fragments by a large amount of internal “intron” DNA, the genetic information must be spliced together in order to be put to use. That is, to get a functional enzyme, the genetic information from lots of exon fragments has to be cobbled together. If it works, there is no problem, but the whole system is so clumsily complex that it often fails. Not only are many genetic diseases caused by mutations in the genes themselves, but many genetic diseases are caused by (or also caused by) failures of the cell to deal properly with the non-coding DNA and the splicing. One example is muscular dystrophy.

We know that the complexity of non-coding DNA is not necessary for the function of a genetic system, because bacteria do not have any of this: they have very little non-coding DNA, and they get by just fine without them.

As geneticist James Shapiro points out, the genomes of everything from bacteria to mammals appear to be set up for a creative response to adversity (e.g. the SOS response of bacteria). Instead of random mutations, the organisms generate reshuffled protein domains. Nevertheless, most of the mutations are deleterious. And, most of all, these mutations are random with respect to any goal of adaptation.

Moreover, the process of natural selection itself is a merciless process that seems incompatible with a loving God that rules the universe. Natural selection emerged from the insights of economist Thomas Robert Malthus, who wrote that human populations inevitably outrun their resource bases. Malthus struggled to reconcile this observation with a belief in a merciful God. Darwin applied this concept to evolution. Natural selection, without mercy, kills individuals (mostly fetuses and babies) that have bad mutations. Many other individuals, even if they are not killed, experience an incalculable amount of suffering. One has only to think about parasitic wasps that lay their eggs on the bodies of living caterpillars. The wasp grubs eat the caterpillars from the inside, while the caterpillars are still alive. Darwin in fact did think about this example. Darwin's friend, the botanist, evolutionist, and Christian Asa Gray maintained a belief in the ultimate purposes of a good God. In a letter of May 22, 1860, Darwin wrote to Gray:

With respect to the theological view of the question. This is always painful to me. I am bewildered. I had no intention to write atheistically. But I own that I cannot see as plainly as others do, and as I should wish to do, evidence of design and beneficence on all sides of us. There seems to me to be too much misery in the world. I cannot persuade myself that a beneficent and omnipotent God would have designedly created the Ichneumonidae with the express intention of their feeding within the living bodies of caterpillars, or that a cat should play with mice.

The contradiction between a cruel world of mutations and natural selection on the one hand and a good God on the other is only one example of a dilemma that thoughtful people have noticed for thousands of years. A whole field of theological inquiry, called *theodicy* (“defense of God”) addresses how a good God can allow evil to occur. Some of the earliest Christian theologians, such as Augustine, wrote extensively about theodicy, as did pre-Christian philosophers such as Plotinus. The Old Testament prophets, New Testament apostles, and theologians of Judaism, Christianity, and Islam have given many different answers to why an all-powerful God permits evil events to occur. The writer of the Biblical book of Ecclesiastes presents a nearly agnostic resignation to the impossibility of answering the question. In fact, as theologian Bart Ehrmann explains, the Bible itself provides several mutually-contradictory forms of theodicy.

Theodicy was certainly on the minds of philosophers and theologians shortly before and during Darwin’s day. German mathematician Gottfried Leibniz said that everything that happens is part of the ultimate good. He said that humans experience “the best of all possible worlds,” implying that a world without suffering was not possible. The writer Voltaire lampooned this viewpoint, expressed by Dr. Pangloss, in *Candide*. Theologian Henry L. Mansell published a Christian theodicy the same year and through the same publisher as Darwin’s *Origin of Species*. The poet Alfred Lord Tennyson, a literary friend of both Darwin and Huxley, captured the dilemma in his most famous poems (*In Memoriam*). The poem was published before the *Origin of Species*, but reflected much of the thinking prevalent among his scientific acquaintances. It is the poem from which the phrase “Nature, red in tooth and claw” comes. Tennyson also noted that not only do individuals suffer but entire species become extinct. Thomas Henry Huxley, Darwin’s contemporary and defender, said that even though natural selection is a violent and unfair process, human responsibility was to resist acting in a violent and unfair manner. Natural selection produced humans, but humans should not practice “survival of the fittest” in society or between nations. In this, Huxley directly opposed the “social Darwinism” of people like Herbert Spencer.

Darwin noted a couple of silver linings in this Malthusian cloud. First, his principal contribution was to point out that the victims of natural selection were primarily those that had inferior adaptations, with the result that the destructive process of death produced improvements in adaptation. At least something good—in fact, a whole world of biodiversity—comes from it.

The author of this encyclopedia, in younger and more naïve days, published this view in an unsuccessful attempt at Christian theodicy. Second, Darwin assured his readers that most animals were incapable of feeling pain, and even for those that could, “. . . we may console ourselves with the full belief, that the war of nature is not incessant, that no fear is felt, that death is generally prompt, and that the vigorous, the healthy, and the happy survive and multiply.”

One reason that many in the general population have a hard time accepting natural selection was that it seemed so unfair. Neither the individuals with superior nor those with inferior characteristics deserved them; they were born with them, and most have paid the price for it. Lamarckism, the inheritance of acquired characteristics, seemed much more fair: an individual that worked hard could pass on to its descendants the progress that it had made. While all evolutionary scientists may wish that Lamarckism were true, it simply is not.

It is true that even an all-powerful God would not be able to create a world in which there is no possibility of suffering. To prevent pain, God would have to make fire no longer burn; but then it would not be fire. One of the most famous Christian writers, Clive Staples Lewis, noted that one cannot make nonsense into sense by sticking the words “God can” in front of it. But Lesch-Nyhan syndrome? Potentially deadly mutations in three-quarters of human genes? Isn't this a bit excessive? This can be considered the modern, genetic statement of the questions posed by Tennyson and Darwin.

Perhaps the minimalist version of the union of science and religion is the statement, of uncertain origin, that God is the answer to the question of why anything exists rather than nothing. Because the presence of God may be easier to detect, or imagine, in broad universal terms rather than in biological particulars, most of the scholars who attempt this union have been physicists such as Erwin Schrödinger and John Polkinghorne. The Templeton Foundation, started by a rich philanthropist, gives awards for investigations that bring science and Christianity together. These awards have a greater cash value than a Nobel prize.

If science and religion, especially evolutionary science and Christian religion, are to be compatible, a rethinking of both science and religion must occur. Science already undertakes a constant process of rethinking. It is religion that must take the unaccustomed step of questioning ancient assumptions.

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