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NATURAL SELECTION: SCIENCE OR MORE THAN SCIENCE?

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WHEN PEOPLE USED to suggest that natural selection is only a theory, not a fact, they may have meant that evolutionists invent plausible stories about how the history of species may have unfolded long ago, but do not test the truth of these stories in a laboratory, as real scientists (read physicists) do. This imputation is obviously false. Viruses rapidly evolve resistance to drugs, demonstrating that, over several generations, biological organisms with an advantage over other organisms (in this case, the ability to coexist with the drug regimen) will win out over those other organisms. Presumably the same principle would have operated in the past as well: natural selection of the fittest must be responsible for much biological development. This is so obvious that philosophers of biology have labored to show that survival of the fittest is not a mere tautology and that evolutionists are actually telling us something we did not know beforehand. What makes a scientist a card-carrying evolutionist is the belief that the mechanism of natural selection is the primary cause of change.

When Darwin wrote in the late 19th century, and for several generations after, the great puzzle was how natural selection operates through heredity. Evolutionists were gradualists. If our society revolved around basketball, taller offspring will be favored, all things being equal, in competing for money, spouses and so forth, and so they will have more children, who in turn will be rewarded for their height. When dogs came indoors, the tamer ones were favored; so modern dogs progressively diverge from their vulpine origins.

This model of selection, through the intensification of an advantageous trait, fails to fit many important cases. Biologists say that reptiles evolved into birds: Does that mean that reptiles with rudimentary wings were better equipped for survival? No, because wings alone are useless appendages, burdens rather than boons. Flying requires other complex adjustments, the coincidence of which must be more than sheer luck. A naturalistic explanation of the transition from reptile to bird assumes that wings first appeared without any connection to flight, perhaps to help regulate body

temperature. Only when other fortuitous changes accumulate does flight become possible.

Modern genetics explains evolution at a biochemical level. The DNA that confers the advantage thrives. When DNA mutates, those mutations will survive that enhance the organism's fitness. Nonetheless, the stories about function typical of classical Darwinism are still needed to explain how these characteristics help the successful organism to cope with external conditions, competitors and so forth.

Let's distinguish two types of evolutionist. For hard liners the explanatory mechanism of natural selection promises a thorough account of how the world has turned out. A softer, more skeptical approach holds that natural selection explains a lot, but that other factors are also crucial. And the most important phenomena of life, particularly those having to do with human history and our spiritual destiny, are probably among those where natural selection has little to say. A remote example: did the dinosaurs die out because of some structural weakness that made them vulnerable, or did they succumb to catastrophic, unpredictable accident, to a literal bolt out of the blue? Closer to home: the history of the human race has been drastically altered by the existence of individual persons. Adolph Hitler survived World War I; millions of men, in no way less suited for combat, were slaughtered. From a scientific point of view, Hitler's survival, and perhaps the extinction of the dinosaurs too, are purely accidental events, yet everything follows on such accidents. Could natural selection predict the revelation at Sinai or the strange subsequent career of the Jewish people?

Hard line evolutionists tend to be hard line secularists. They believe that, in principle, they hold in their hands the keys to the mysteries of the universe. Those like Stephen Jay Gould, who highlight the place of accident in natural and human history, are often viewed as lacking in true Darwinian fervor.

II

What challenges does the idea of natural selection pose for religious believers? Why is it such a controversial matter for so many?

Many would immediately complain that scientific natural history differs from the account of natural history that would be derived from a literal reading of Genesis. Much ink has been spilled in the effort to demonstrate that Genesis, when read properly, teaches no more and no less than the most up to date theory. I prefer not to devote space to this literature, having suggested elsewhere that it is neither honest nor religiously beneficial to study Torah as a series of oracular pronouncements about natural science intended for an ingenious, sophisticated interpreter living millennia later. If you intend to

read only one excerpt on the subject, see R. Kook's *Iggerot haReiyah* #91 (English in Tsvi Feldman, *Rav A.Y. Kook: Selected Letters* 3-10).

There is a more serious form to this contradiction. Let me quote *maran haRav* Soloveitchik's recently published *The Emergence of Ethical Man*: "What in fact is theoretically irreconcilable is the concept of man as the bearer of the divine image with the equaling of man and animal-plant existences." The danger to religion is the attempt to understand the human being in merely biological terms. Confronting this threat, the Rav makes it clear that Judaism does not advocate the opposite error of denying our kinship with the animals. We are not angels. The Torah is not identical with idealistic philosophy. If I may paraphrase Ramban (*Bereshit* 1:26), God created man out of the dust of the earth: the earth (i.e. the physical element) remains a partner in the human condition. In truth, when one contemplates the resemblance between human beings and apes, it seems all the more wonderful that some humans can explicate a difficult Rambam or produce great poetry.

The sense of wonder is, of course, one of the great resources of religious experience. Rambam, in *Hilkhot Yesodei haTorah*, saw in the grandeur of God's creation the origin of our love and fear of Him. Philosophers have turned this experience into an argument for the existence of God. Many of you are familiar with R. Bahye Ibn Pakkuda's version of the argument from design: When you find ink distributed to form sentences, you can safely infer that this is not the result of an accidentally spilled inkwell, but rather the product of intelligent design. Philosophers of the late 18th and early 19th centuries, like Archdeacon Paley, argued to God from cases where the parts of an organism are wonderfully adapted to its function. As a young man Charles Darwin devoured this literature. But the upshot of Darwinism is that many of these cases can plausibly be attributed to naturalistic processes. From a religious perspective, this usually viewed as a loss. The theistic argument from design is still alive. The "anthropic principle," for example, which maintains it unlikely that naturalistic processes would produce a being capable of understanding the laws of nature, is one current form of the argument. Nonetheless, the straightforward briskness of the inkwell argument is not available to us.

None of this changes the fact that many religious people—and I include myself among them—experience wonder when we contemplate examples of adaptation, regardless of how they may be explained, and this apprehension of the wonders of creation enhances our awareness of God. Indeed, it is precisely when I learn how various organs that seem perfectly intended for their present function, may have evolved in a purely fortuitous manner that I am most fascinated and awestruck by the strange twists and turns of creation. This is part of Gould's attraction for me.

This road to God through biology is very different from the classical proofs. Even when it grows out of study, it has the flavor of immediate experience. In certain respects it is more like aesthetic apprehension than like scientific reasoning and inference. From a Jewish perspective there is nothing particularly modern about this. After all, the special occasions for which the Mishna ordained *berakhot* do not pick out the purposeful displays of God's creative power. We are often commanded to recognize God in odd and frightening occurrences: gales, thunder, fulgurations, comets and the like; mountains, seas, deserts and rivers; exceptionally beautiful people, but also those of abnormal appearance and anomalous form. When God finally appeared to Job from the whirlwind, He exhibited His mastery of nature less in the purposeful arrangement of the cosmos than in His creation of bewildering natural processes and monstrous beings like Behemoth and Leviathan.

All this requires a great deal of fundamental reflection; what I'm giving you here is an introductory sketch. People accustomed to thinking of religion in terms of cool, detached reasoning rather than vivid experience, or those who think we encounter God only in the neat and orderly features of the world, may be dismayed by this development. They may wish they could turn the clock back to pre-Darwinian times. Paradoxically, such religious believers, in their preference for exhaustive deterministic explanations, free of colorful, unpredictable, disorderly elements, may have more in common with the narrow-eyed hard line Darwinists than either has with a scientist like Gould, who makes room for sharp, unpredictable change, or with a theist like me, who values the variety and freedom of God's creation.

III

Academic types commonly caricature the question of evolution and religion as a battle between enlightened science and villainous theology. They snicker at those who don't join their chorus of contempt for the great mass of religious believers. Biological evolution is more than a merely technical scientific discipline. I have tried to outline the genuine intellectual issues and why these exciting scientific ideas should not be approached with anathema but with curiosity. Yet, a couple of cultural notes are in order to help explain why evolution is so widely dismissed.

Historians of science have observed that Darwinism was marginalized in biology departments for much of the 20th century. Partly this was because taxonomy, the classification of species and their history, has little practical application. *Mai da'hava hava* (what's the bottom line), asked the funding powers, and directed the money to projects and scholars who promised tangible results. Evolutionary research consequently languished. Meanwhile, the cultural implications of evolutionary theory were hot stuff. The outcome

was that, more than more respected branches of science, the reputation of evolution depended on its popularizers and cultural salesmen.

Darwinism gave popular culture the outlook that change is glacial and inexorable and takes millions of years. Hence much was made of the search for "missing links" in the fossil record that would confirm the mini-stages of evolution. Thus Mr. Boynton, the reticent science teacher on the postwar situation comedy "Our Miss Brooks," once justified his slowness in romance by referring to his investment in evolution. In the late 19th century, the influential secularist journalist Ahad Haam proposed that Halakha, like biological organisms, changes slowly but surely, so gradually as to be unnoticeable, a view that persists in Conservative circles today.

The big theme, though, was that human beings are nothing but apes wearing clothing, and we may as well revert to our roots. You may recall, from the Marx Brothers movie "The Coconuts," Irving Berlin's lines: "Listen to me dearie/ Darwin's theory's/ telling me and you/ to do the Monkey Doodle-doo." Doing a 1920's dance is not the only social lesson to speak in Darwin's name. Social Darwinism told me and you that the winners in the contest of life deserved their good fortune and that helping "weaker" people interfered with progress. Scientific racists rejected the old-fashioned religious belief that because we have a common ancestor in Adam, we all possess the same human dignity. Of course, as noted above, reducing the human being to our common denominator with the apes undermines the idea of man as created in the divine image. Altruism and other moral ideas are often reduced to the prompting of the "selfish gene." Exploiting evolution in such manners makes a person wonder about evolution's claim to be science. The philosopher of biology Michael Ruse, narrating this phase of cultural history, concludes that when a theory tries to be more than science, it risks becoming less than science.

Note: For additional related discussion, see my editor's column "A Religion Challenged by Science—Again? A Reflection Occasioned by a Recent Occurrence" (*Tradition* 39:2).

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