

Darwin vs. Darwin

by Jenna E. Levine '01

The public is well aware of the raging controversy over evolution. A lesser-known fact is that much of the nastiest fighting takes place among even those who define themselves as staunch supporters of "Darwinism." The issues at stake cut right to the heart of what it means to be a Darwinian, a public intellectual, and a scientist.

For many Americans, evolutionary theory and Stephen Jay Gould are synonymous. The Harvard professor, paleontologist and prolific writer has used his many best-selling books and a column in *Natural History* magazine to establish a name for himself as "America's unofficial evolutionist laureate," (Wright, 1999) developing a reputation as the premier mass teacher of evolutionary principles. Coverage of the evolution-creationist battles often features Gould as a scientific authority. His wide exposure has brought him a level of visibility unusual for those in the sciences, leading to profiles in such non-academic forums as *Cosmopolitan*, *Rolling Stone*, and *People* magazines. He has been called a "science celebrity" (McMurray, 1995), and is the recipient of numerous awards including the MacArthur "Genius" fellowship. His immense popularity is the primary reason that recent very public attacks on Gould have been so shocking. A proponent of a controversial subject must to be targeted by those who disagree with them, but some of Gould's harshest detractors are those who one would expect to be on his side. Robert Wright's December 1999 article in *The New Yorker* devoted 5,000 words to a devastating critique of Gould, leveling the seemingly heretical charge that Gould's theories lend support to, of all people, the creationist crusaders. This may have been the first time that those outside scientific circles had heard of dissension in the ranks of the evolutionists, but the essence of the charges is not new. Prominent evolutionary theorists such as John Maynard Smith, Richard Dawkins and Daniel Dennett have long been charging Gould with a myriad of offenses against science in gen-

eral and evolution in particular. Both Dennett and Dawkins devoted whole chapters of recent books to critiques of Gould. Maynard Smith, in a widely quoted comment from 1995, suggested that Gould is seen by scientists as "a man whose ideas are so confused as to be hardly worth bothering with, but one who should not be publicly criticized because he is at least on our side against the creationists" (Maynard Smith, 1995). Robert Wright's *New Yorker* article foregrounded this issue, and marked a public departure from Maynard Smith's more tolerant example.

The extent of the disagreement is astounding among a group of theorists all claiming to be loyal adherents to "Darwinism." Tracing the history of debate that has culminated in Wright's full-frontal assault on Gould raises many concerns about modern "interdisciplinary" science, and the interaction between trained scientists and the public they attempt to reach.

To the non-specialist, the terms evolution, natural selection, and Darwinism are all largely interchangeable. In contrast, those who have made the field their life's work (and even some who have not; Robert Wright is primarily a journalist) are in a constant struggle to define these terms precisely and establish their opinions of them. The current hot topics at stake in many of the debates are central to the critiques of Gould, and include such varied themes as genetic determinism, adaptationism, directionality (or lack thereof) of evolution, and "punctuated equilibrium" theory and its implications.

The fossil record usually lacks evidence of transitional forms from one species to its descendants. Gould and Niles Eldredge proposed that this might not simply be due to gaps in the record, but is actually representative of the evolutionary processes that produce new species. What exactly they meant by this is still the subject of heated debate decades later, but the heart of the theory is that evolution does not move at a slow and steady

pace. It has been interpreted both to suggest that speciation proceeds in a series of rapid “jumps” (“saltationism”) as a result of dramatic changes to individuals in the species (“macromutations”), or that change occurs somewhat steadily at a faster pace than had previously been expected (“rapid gradualism”). One charge that is repeatedly leveled against Gould by his detractors is that he has repeatedly shifted his stance on exactly how dramatic he expected this theory to be. Richard Dawkins has stated that the theory is either “modest and probably true or... revolutionary and probably false” (Dawkins 1996,). Gould has repeatedly said that he did not present his theory as a revolution per se, but that has not stopped his critics from claiming that was what he really had in mind.

Dennett in particular devotes much discussion to what he thinks Gould and Eldredge really meant to say, and proclaims that they have been proved wrong. In support of his arguments, he invokes Darwin’s own work, claiming simultaneously that Darwin both rejected the idea of leaps in nature (Dennett 1995) and had proposed the original theory of “punctuated equilibrium” (Dennett 1995). Much of this discussion rests on the question of geological time, and the fact that “instantaneous” events in the fossil record may really have occurred over thousands of generations.

Gould responded to these (and other) charges made against him by Dennett in two articles in *The New York Review of Books*. He claims that “punctuated equilibrium does not challenge accepted genetic ideas about the rates at which species emerge,” but “does contravene conventional Darwinian expectations for gradual change over geologic periods” (Gould 1997a). The two men debated (somewhat) directly in an exchange of letters in the same publication, where Dennett claims he gave Gould the opportunity to convince him he was wrong but found him unable to do so. Gould in turn accuses Dennett of hostility simply because he (Gould) doesn’t pay enough attention to Dennett’s work.

Punctuated equilibrium is a contentious subject because of its use by anti-evolutionists. Macromutations in particular have been invoked as an illustration of divine intervention, with the claim being that the sudden development of, for example, an eye, is not possible either by chance

or by gradual evolution. An example of this is a passage written by the anti-evolutionist Phillip Johnson which favorably cites Gould as asking how “5 percent of an eye” could have enough adaptive benefit to be favored by natural selection (Johnson 1991, 34). Gould is also quoted as an authority in Michael Denton’s book “*Evolution: A Theory In Crisis*,” which cites Gould’s questioning whether biologists have discovered a “reasonable

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sequence of intermediate forms... in major structural transitions” (Denton 1986, 229).Denton implies that if similar statements from such an eminent theorist had been introduced into the Scopes “monkey trial,” the verdict might have been quite different. At issue is both what Gould truly meant by these statements, and whether he is responsible for the use that others choose to make of them.

Another much debated issue is progressivism, whether evolution moves towards increasing complexity or is analogous to a “random walk.” Gould has been an adamant supporter of the latter point of view, and has drawn much criticism for it. However, all parties in the debate devote much time to the question of definition; one person’s concept of “progressive evolution” is not necessarily the same as another’s, creating much confusion as to who actually agrees with whom.

Gould has stated his belief that

...humans are not the end result of predictable evolutionary progress, but rather a fortuitous cosmic afterthought, a tiny little twig on the...bush of life, which if replanted from seed, would almost surely not grow this twig again or perhaps any twig with any property that we would care to call consciousness. (Gould 1995, 8)

In the same article he proceeds to ascribe anti-Darwinian motives to those who suppose otherwise, alleging that a belief that evolution works towards a “higher good” is intended to let humans “view the late evolution of *Homo sapiens* as the highest stage...of this predictable progress” (Gould 1995, 8). In an interesting and seemingly paradoxical twist, Richard Dawkins turns this around and claims that Gould’s definition of progress is “human-chauvinistic” and “calculated to deliver a

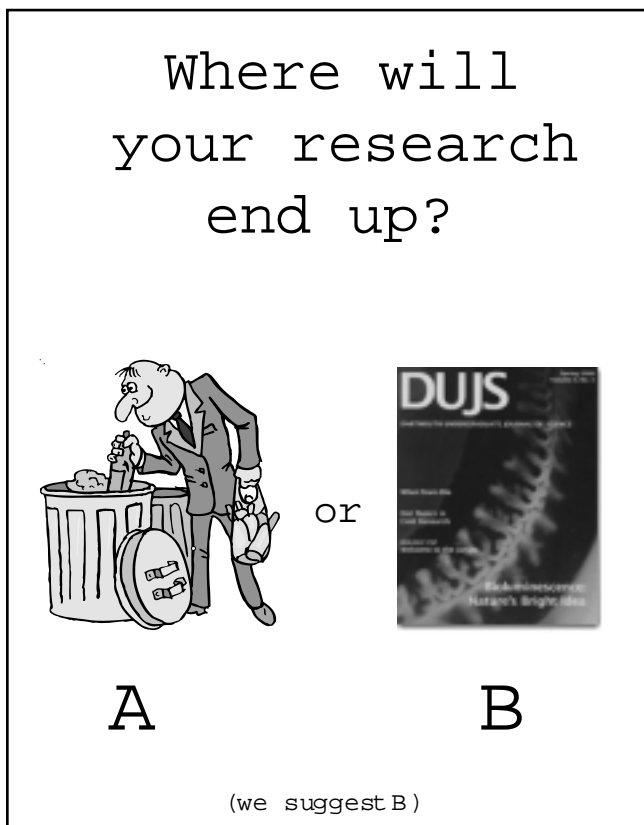
negative answer to the question whether evolution is progressive” (Dawkins 1997, 51). Dawkins offers what he calls an “adaptationist definition of progress,” namely “a tendency for lineages to improve cumulatively their adaptive fit to their particular way of life by increasing the number of features which combine together in adaptive complexes” (Dawkins 1997, 51). Using this definition, Dawkins draws the conclusion that evolution is “clearly and importantly progressive” (Dawkins, 1997). In a review several years earlier, Dawkins had already stated that “the view that [Gould] is attacking - that evolution marches inexorably towards a pinnacle such as man - has not been believed for 50 years” (Dawkins, 1990). It is hard to wade through the different conceptions of “progress” and decide who truly believes what. The one clear message is that they are adamantly opposed to the idea of agreeing with each other.

The most vicious and public attacks on Gould have come from Robert Wright, who has often used the issue of progressivism as his main ammunition. He has used Gould’s stance to accuse him of “aiding and abetting” (albeit unwittingly) the creationist cause, labeling him a “particular godsend to the more intellectual anti-evolutionists” (Wright, 1999). Wright’s justification for this is the stress that Gould places on the improbability of the evolution of humans, claiming that Gould takes this to such an extent that “if you really pay

attention to what he is saying, and accept it, you might start to wonder how evolution could have created anything as intricate as a human being” (Wright, 1999). In contrast to Gould’s views, Wright maintains that “there is a plausible argument that the coming of self-conscious intelligence was nonetheless quite likely from the beginning, and Gould never succeeds in casting any doubt on it” (Wright, 1990). Wright further discounts Gould’s statement that while “average complexity of all species may have grown,” this is not “‘progress’ because it is fundamentally ‘random’” (Wright, 1999). Wright introduces a number of examples to contradict Gould on this issue, including the idea of an evolutionary “arms race.” He uses the example of the peculiar and specialized defense mechanisms used by the bombardier beetle, claiming that such a highly evolved system must be the result of evolution moving “forward.” He extends this concept to his discussion of increasing complexity and intelligence, maintaining that if humans had not come along, other groups would have developed comparable intellectual capacity.

While even Wright has acknowledged that this particular criticism of Gould is not new or original, The New Yorker article in which he used it to paint Gould as a friend of creationists was shocking to many who read it. The publication aroused such public response as to merit articles in unlikely places, including the spring fashion issue of New York magazine. The author of that piece labeled Wright an “academic stalker” making a “foolish and outrageous claim” (Smith, 2000), and quoted a number of prominent scientists expressing similar disbelief at the idea that Gould was aiding the anti-evolutionists.

A related issue and similarly contentious point is so-called “adaptationism,” which Daniel Dennett calls the focus of most of his disagreements with Gould (Dennett, 2000). In 1979, Gould and Richard Lewontin published a paper called “The Spandrels of San Marco and the Panglossian Paradigm: A Critique of the Adaptationist Programme.” The word “spandrels” is derived from architecture, where a spandrel is a design feature of an arch that is not necessary in itself, but arises consistently as a consequence of other engineering necessities. In biological terms, spandrels are features that have arisen through evolution but were not subject to selection pressure. An example Gould uses is the human capacity to read, which is highly advantageous now but must have arisen as a by-product of other necessary brain structures. The “Panglossian paradigm” takes its name from a



character in *Candide* who espoused the view that everything happened because it was the best possible outcome. Gould claims that “adaptationists” interpret “all relevant attributes of organisms as adaptations for reproductive success,” thus positing natural selection as the only mechanism for change over time (Gould, 1997b). He rejects this view, the so-called Panglossian paradigm; Gould denies that all change is due to natural selection, instead proposing that some “adaptations” are merely spandrels that arose as by-products of other adaptations. This is true even if later they turn out to convey fitness advantages. While he states that he does not “deny either the existence and central importance of adaptation, or the production of adaptation by natural selection,” he believes “selection cannot suffice as a full explanation for many aspects of evolution” (Gould, 1997b). Gould calls himself a “pluralist” because of this view, a term defined elsewhere as “the view that more than natural selection is not the sole, nor perhaps the main active process in evolution” (Wilkins, 1998). He goes on to further claim that the pluralists are “a long line of thinkers including Darwin himself” (Gould, 1997a).

Dennett takes issue with Gould’s entire argument on the grounds that the “thesis that every property of every feature of everything in the living world is an adaptation is not a thesis anybody has every taken seriously” (Dennett, 1995). He goes as far as saying that Gould’s supposed “Darwinian fundamentalists” (essentially those who do not agree with pluralists) are “mythic,” in particular denying that he holds the proposed “preposterous views” (Dennett 1997, 64). However, Dennett still maintains that “if [Gould] really wants to ask and answer ‘why’ questions, he has no choice but to be an adaptationist” (Dennett 1995, 247).

Genetic determinism in the area of sex differences has become such a familiar issue that it has entered the public discourse. A hot topic in evolutionary psychology, the essence of the argument is that natural selection has evolved humans in such a way that men behave so as to maximize their “genetic spread,” while women try to maximize male commitment during and after pregnancy (Wright 1996). Robert Wright is much identified with this theory, discussing it in his 1994 book *The Moral Animal*. While Gould allows that he doesn’t think, “the basic argument is wrong,” he does claim that “our biology does not make us do it”

(Gould 1996, 18) and rejects any argument of “genetic determinism” as such. He criticizes the entire field of evolutionary psychology as lacking in scientific credibility because it is “untestable,” and because it relies on adaptationism (Gould 1997a, 47).

Richard Dawkins also claims intent to “expose the myth of genetic determinism” (Dawkins 1999, 9), but he assigns a different meaning to this than Gould. Dawkins essentially posits that “if a genetic sex difference makes itself felt through...a sex-biased education system, it is still a genetic difference” (Dawkins 1999, 12). This argument rests on the premise that determinism and genetic determinism are not fundamentally different, and it is irrelevant whether society or genes perpetuates the difference. For example, many girls prefer to play with dolls while boys prefer more physical activity. Dawkins allows that these differences may not be hard-wired from birth, but instead imposed by societal conventions. For him, this is determinism in the same way that it would be if such traits were genetically programmed. The disagreement here seems to be largely one of semantics, making it difficult to see exactly where the difference of opinion rests.

The disagreements described above only scratch the surface of the issues at stake. The doctrines in question and the various opinions about them are far too numerous to be comprehensively dealt with here, but illustrate the central point -- that the battles evolutionists fight are not only against their traditional adversaries. Why is so much of the vitriol directed at one man? The inter-sections of politics, educational and vocational background, and views of “public science” may begin to explain.

Notable in this debate is that several of the loudest voices are not scientists by trade. Dennett is a philosopher and the director of the Center for Cognitive Studies at Tufts University. Wright has written two “science books,” but is primarily a journalist (he was a senior editor at *The New Republic*). Wright’s “lack of scientific credentials” have been noted by commentators suggesting that his “vehemence” in trashing Gould was an attempt to provoke “a public reply,” which “would have done wonders for his credibility” (Smith 2000, 48). Dennett admits to thinking that his background as a philosopher influences his approach to science, but does not feel that it does so negatively (Dennett 2000).

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Both Gould and John Maynard Smith have addressed the question of training, but in different ways. Smith admits that he is “used to being misunderstood by philosophers,” but says so at the beginning of a generally positive review of Dennett’s book. He explicitly states that “it is therefore a pleasure to meet a philosopher [Dennett] who understands what Darwinism is about” (Maynard Smith 1995, 46). Gould has also spoken favorably of “the enlightenment that intelligent outsiders can bring to the puzzles of a discipline” (Gould 1992, 118) but does not apply this designation to Wright and Dennett. He accuses Dennett of having “little understanding of evolutionary theory beyond natural selection,” and claims that his “high density of errors...indicates an apparent indifference to the vital details” (Gould 1997a, 47). He even goes so far as to refer to him as “Dawkins’ lapdog,” a reference to T.H. Huxley’s characterization as “Darwin’s bulldog” (Gould 1997b, 34). His use of the word “pathetic” to describe Wright, and his mocking apology for “not paying enough attention to your [Wright’s] work” (Gould 1997C, 64), certainly imply a negative opinion. Additionally, it is unusual for so much scientific debate to take place in books and lay journals rather than peer-reviewed forums, which tend to demand a more scientific and experimental approach.

Of the four men who are the focus of this paper, the two who are most “vicious” in public forums are the two “non-scientists” (Dennett and Wright). Both Gould and Dawkins may at times be just as critical as the others, but they tend to focus more on scientific criticisms and to qualify their statements with appropriate disclaimers. Before devoting several pages to a focused critique of Gould, Dawkins stresses that he is “anxious that such critical concentration upon one individual shall not be taken as personally rancorous,” stating that “Gould’s excellence as a writer” is what makes his errors “so eminently worth rebutting” (Dawkins, 1998). Gould himself objects to the premise that evolutionists should “cover up debate within [their] field” to protect against the creationists (Alters, 1998) but does caution that “we will not win this most important of all battles if we descend to the same tactics of backbiting and anathematization that characterize our true opponents” (Gould, 1997b). Obviously, four men make up a limited sample; however, there is a strong possibility that this divide among prominent theorists is significant.

“Pop” science and science writing for the

public is in itself an issue. It has been suggested that some of the attacks on Gould are motivated by jealousy for his fame and popularity, and the personal attacks made by his critics lend credence to this theory. Wright’s statements tend towards the extreme and the inflammatory (for example: “Gould’s long-repressed contempt burst forth from the reptilian core of his brain and leapt over the fire walls in his frontal lobes” (Wright, 1996) seems like an overly dramatic reaction to a seven-word comment by Gould). Gould himself has stated publicly that “anyone who has success in writing for the general public is envied” (Dreifus, 1999). The possibility seems very strong that by virtue of his immense exposure, Gould has become a sort of lightning rod for criticism - even Wright’s friends admit that “he has this obsession with Gould” (Smith, 2000), a situation which seems unlikely to develop if Gould were an obscure academic. In conjunction with the empirical evidence that “non-scientists” tend to resort more quickly to vitriol and accusations, we cannot ignore the possibility that those seeking to establish themselves in the field see attacking its most prominent member as a fast way to do it. This is not to say that Gould does not make mistakes or leave himself open for criticism; however, the way in which people like Wright and Dennett go about it often cast doubt upon their true motivations.

Though science is often thought of as an objective discipline, a charge being thrown around in the debate is that Gould’s politics are responsible for his so-called scientific errors. In his earlier days, Gould was quite open about his leftist and possibly Marxist political views; he has recently retreated somewhat, but does not deny his earlier affiliations. His critics have seized upon this fact. Wright levels the charge that Gould’s persistent denial of progressive evolution is a response to earlier misuses of Social Darwinism, something that he reacts against as a consequence of his Marxist views (Wright, 1999). Dennett also accuses Gould of “egregiously” violating “his own principle..., letting his political/religious goals distort his account of science” (Dennett, 2000) as in denying progressive evolution because of the Social Darwinist implications.

Obviously, evolution is a complex and controversial issue even to those who fervently believe in it. While scientists cannot reach a consensus, and indeed perhaps may gain from healthy disagreement and debate, they must bear in mind the fact that evolution in America is under constant attack. Discussion to refine the details of evolu-

tionary theory will strengthen and advance their cause; petty fighting will only give the creationists more ammunition to attack them with. Gould was an expert witness in a Supreme Court case protecting evolution in the schools; after recent attacks, is there anyone in the field who would have the credibility to serve as such an expert witness again?

Richard Dawkins recommended that I read a chapter of his work for research on this paper. It at first seemed inapplicable, but I suspect he meant to draw my attention to the following quote:

“With the exception of a few genuine opponents of Darwinism...we are all in this together, all Darwinians who substantially agree on how we interpret what is, after all, the only workable theory we have to explain the organized complexity of life” (Dawkins, 1999).

Rather than turning on each other, those who truly want to protect and advance the theory of evolution (in whatever form they choose to believe it) will need to present a united front. Debate over the details is healthy and productive, but the only ones who gain from petty personal rivalries are the creationists. ❖

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