

Commentary

The scientist of the underdog

One of my first interactions with Stephen J Gould was in the line for the cashier at the Harvard Coop. This was my first year as a graduate student. Gould was closely behind me and watched me as I began writing a personal check. “Don’t do it that way!” he said. “When you write the amount in letters, you have to fill the whole space. You want to write a check for twenty dollars, but now anyone who wants can add “thousand” and make it twenty thousand!” He took my pen and showed me how to draw a line immediately after the amount to prevent tampering with my check. That was Gould. When he thought something was wrong, he interfered.

This wish to set things right was an important driving force in Gould’s scientific career. Unlike many modern scientists who saw their task as limited to the pursuit of knowledge, leaving it to the political process to decide about the uses of science, Gould pursued a combined scientific and moral/political agenda. Gould’s science was typically “engaged”, it was science for a purpose. And the overall purpose was to make this world a better place to live for society’s less privileged. Coming from an immigrant background himself, keenly aware of his family history and alert to the fact that scientific findings could be used to legitimize social discrimination, he saw as one of his tasks to identify and debunk potentially dangerous biological claims about humans. This is why he devoted a great deal of his time during the last quarter century to criticizing IQ research and sociobiology. One convenient outlet for this criticism was his monthly columns in *Natural History*, where his attacks on research in the biological foundations of human behaviour peacefully coexisted with observations on the wonders of nature and intriguing historical details. (These columns were subsequently turned into a stream of wittily titled popular books.)

Meanwhile, Gould’s own scientific career can be said to have coevolved with the IQ and socio-biology controversies. These academic debates stimulated him to find ever new critical angles against science that he disliked and gave him opportunities to develop novel arguments against prevailing orthodoxy in evolutionary biology. He never abandoned his beloved snail research, but his public role increasingly came to occupy his time. At the same time writing columns satisfied an inquisitive and perhaps “antique collector” streak in his personality – it gave him the chance to investigate interesting curiosities not only in natural history but also history of science and history proper. In writing about these things he could give outlet for yet another side of himself: his literary ambition.

Understanding Gould means realizing the deep connection he as a scientist felt to the humanities. Unlike many of his fellow evolutionists, Gould graduated from college as a humanist rather than a scientist. Later he declared that when it came to his own work he drew no line between the sciences and the humanities. The result was that unlike many other scientists, he gave himself licence to write as a “total” person, guts and all, feeling free to draw explicit moral and political messages from the various scientific topics he introduced.

The sociobiology controversy was the place where Gould was eminently able to articulate his moral/political convictions while pursuing his own evolving scientific agenda. When in the early summer of 1975 E O Wilson’s *Sociobiology* – with its last chapter discussion of humans – was announced as a scientific breakthrough on the first page of the *New York Times*, Gould was among several Harvard biologists who spontaneously formed the nucleus of the so-called Sociobiology Study Group. The mission of this loose coalition of Boston-area academics was to debunk sociobiology and warn the general public about its dangers. (This group later joined Science for the People and engaged in various types of political activism.) Although Gould as a group member was one of the co-signers of the infamous letter in the *New York Review of Books* that connected sociobiology to Nazi crimes, he generally preferred to work within a framework of scientific criticism. (It was in such a context he developed his argument about the panda’s thumb, for instance.)

Gould was a political radical and a self-proclaimed Marxist, but his weapon was his pen. An example of his distaste for activism is his thorough disapproval of the famous ice-water incident at the 1978 Washington meeting of the American Association of the Advancement of Science, when in the middle of the Sociobiology symposium a group of demonstrators from the International Committee against Racism rushed up on the podium and poured a pitcher of ice-water in E O Wilson's neck. Gould, a member of the same panel, having just wielded scientific critique of sociobiology, raised to condemn this attack as an unacceptable "infant disorder of socialism" (Lenin). Later he privately expressed deep sadness over what he saw as a "victory for sociobiology". Indeed, the news reports almost exclusively focused on the incident.

Gould's big chance to do something dramatic himself was the Royal Society meeting in London in December that same year. Behind that discussion meeting stood Fellow John Maynard Smith and the aim was to assess recent developments in the explanation of the evolution of behaviour. It was actually Gould's Harvard colleague Richard Lewontin who had been invited as a well-known scientific critic of such things as optimization and game theory (part of the framework of sociobiology especially in its British version). But it was Gould that ended up traveling instead, delivering in his and Lewontin's name the famous Spandrels of San Marco article, which accuses fellow evolutionists of believing with Dr Pangloss that this is the best of all possible worlds. But just as decorative ceiling spaces are created in architecture by the structural requirement of two crossed arches, many adaptations are not there for a particular purpose, they are nothing but evolutionary byproducts, says the paper. Gould, who wrote most of it, later revealed with some satisfaction that the style was deliberately aimed at persuasion and dramatic effect. The idea was to use emotion and surprise to break through the audience's resistance.

One question is how much the audience needed to be persuaded, and whether all the drama was not something of an overkill. Actually it later seemed that the essence of Gould's scientific message – that adaptation is not the only evolutionary force and that alternatives need to be considered – was quite well-known (indeed, some other papers presented made similar points). But Gould stole the show with his architectural onslaught. The Spandrels paper and its various rhetorical strategies have later been analysed in depth by humanists in a book edited by Jack Selzer. The volume makes for amusing reading, especially the experiment where a number of biologists are "reading aloud" the Spandrels paper and react to the paper's claims and style.

It was with the Spandrels paper that Gould established himself as an avid anti-adaptationist, on both moral/political and scientific grounds. Before he had written more popular criticisms of socio-biological "just-so" stories, and it was rather Lewontin who had systematically been attacking adaptation in scientific publications. Gould had in fact started out as a traditional adaptationist himself but changed his mind around the time of the sociobiology controversy, largely through the influence of Lewontin and also while familiarizing himself with Continental evolutionary thought, such as the idea of Bauplan (organisms possessing internal structural constraints). (He explored this further in *Ontogeny and Phylogeny* in 1977.) Gould's taste for the view of constraints on evolution, again, was stimulated partly by his Continentally trained mentor, Ernst Mayr.

Gould and Lewontin's fierce resistance to what they called "the adaptationist program" was due to a rather complex set of reasons. It was clear to them that the ubiquitous "adaptation talk" implicitly conveyed the undesirable political message that the current social system with its inequalities was nothing but a natural product of adaptation, and therefore naturally "good". In turn, this could be used to legitimize existing inequalities and discourage social reform. This was a political concern they shared with the Sociobiology Study Group. But for Gould and Lewontin, more was at stake in their effort to oust the adaptationist program. They wanted nothing less than a paradigm shift in evolutionary theory, away from what they saw as sociobiology's mistaken emphasis on single genes and toward a view of the true complexity of the evolutionary process.

This scientific interest Gould also shared with his fellow graduate student and "brother" Niles Eldredge. Their common concern was to recapture the true meaning of the Neo-Darwinian or Modern Synthesis of the first half of the 20th century. In their view, the architects of the Modern Synthesis (who translated the process of evolution into the language of population genetics and extended it to a number of biological fields) had a much more pluralistic vision than the limited gene-selectionist reasoning of today. According to Gould just before the sociobiological "revolution", the field of evolutionary biology had been well on its way towards a pluralist conception of evolution.

For Gould, then, the problem with sociobiology was not only its extension to humans (although this was a serious matter for him) – the whole field presented a false view of evolution. Gould simply refused to consider the logical and technical view of someone like Dawkins who saw evolution as consisting of transmission and replication of “immortal” genes – for him that was an accountant’s view which said nothing about what really took place. Dawkins in turn persisted in pointing out that his argument was a logical description of the net result, not a naturalistic description of the actual processes involved. This odd duel went on for over a quarter century, providing material for best-selling books on both sides.

Later on, Gould and Eldredge launched a broader attack on anyone following the adaptationist paradigm, labelling them “Ultra-Darwinians.” Ultra-Darwinians were contrasted with “pluralists” (Gould) or “naturalists” (Eldredge), who were interested in the real truth about evolution, especially the existence of various types of constraints and multiple levels of selection (the latter were also, presumably, the true followers of the Master). In his categorical condemnation Gould never stopped to consider that the popularity of an adaptationist, gene-selectionist explanatory framework might have been partly due to its fruitfulness as a scientific approach. Instead, he treated the views of sociobiologists – and later evolutionary psychologists – as expressions of deep metaphysical convictions. (Interestingly, Eldredge, although he disliked “selfish genery”, did admit that the selectionist framework had been enormously useful for the field of evolutionary biology as a whole.)

The most famous cooperation between Gould and Eldredge was their work on punctuated equilibria – the idea of the evolutionary process consisting of long periods of stasis punctuated by shorter periods of rapid change where speciation events could take place. This theory (in its various forms as it evolved over time) got at least implicitly connected to the general anti-adaptationist crusade, while it became explicitly part of an emerging discourse about macro-evolution. It was clear that Gould wanted nothing less than a revolution in – or at least repunctuation of! – evolutionary theory itself. Note that while doing this, he consistently regarded himself as a true Darwinist – in fact, he often upheld Darwin’s own pluralist views against prevailing Neo-Darwinian trends.

The Mismeasure of Man (1981, 1996) was the book that pulled together Gould’s views on the political abuse of biological theories about humans. Some considered the book unfair, because it connected modern sophisticated IQ testing to craniometry and failed early attempts to test intelligence. Others wondered what sociobiology had to do in a book about skull measurements. The thread that brought the parts together for Gould was that all these attempts were examples of “bad science” at the same time as they had been used (or could be used) for socially discriminatory purposes. In this book he acted both as a scientific critic and a historian. He dismissed current IQ research as nothing but correlations and the obtained result, an individual’s so-called general intelligence “g”, as a mere reification which did not reflect any “real” entity in anybody’s head. At the same time, he showed how earlier, now obviously incorrect, biologically based theories of racial and individual differences were taken seriously at the time. The question he raised for the general public and scientists alike was: on what grounds, and with what confidence, should we today accept supposed state-of-the-art scientific claims?

In other words, Gould did not accept the standard scientific view that science corrects itself in the long run. For him, when it came to implications for human affairs, the long run might be just too long. So Gould the historian-scientist asked us to be more reflexive about the biases that go into our research. Meanwhile, Gould the philosopher-scientist calmly declared that debunking was a positive science. Gould was clearly a “weeder” in my categorization, believing (with the rest of the Sociobiology Study Group) that “bad science” of humans should be weeded out before it could do social harm. (“Bad science” was research in behaviour genetics, cognitive traits, or sociobiology, all of which used correlational methods or hypothetical genes “for” behaviour.)

But Gould the theorist-sociologist went one step further. How would it be possible to ensure that theories with potential implications for human life would not have adverse social consequences? Gould’s answer was to try to deliberately develop theories that just might lead to the “correct” political conclusions – if and when applied to humans and social affairs! Much of Gould’s own theoretical work seems indeed designed to generate “desirable” political and moral belief. Over time, as he found or invented them, Gould brought forth all kinds of arguments to show that adaptation was not the only evolutionary force (or even not the most important one): punctuated equilibria, exaptation

(a feature having evolved for one thing but being used for another), and contingency (the role of chance in evolution). He explained that evolution sometimes does not lead to higher complexity and may even go backwards. He declared the humble bacteria the most important species on Earth. The idea of contingency served to tell us humans that we should be grateful to be here at all – we may never have come about. Gould in his science sympathized with the underdog and seemed to want to discourage any topdog complacency.

Sometimes his colleagues thought he exaggerated or dramatized, or needlessly harped on things that were already well-known to evolutionists. But Gould saw himself increasingly as a public intellectual. His audience was not only, and perhaps not even primarily, the scientific community. There is no doubt that because of his penmanship, a lot of people who had no idea about evolution got interested exactly because of the way Gould told his stories. A drawback, though, was the interest that creationists started taking in his attacks on adaptation. In Gould's critique of Neo-Darwinism they found useful ammunition against evolution as such. So Gould ended up fighting a two-front battle, criticizing and defending evolution at the same time, not always knowing who was listening.

Friends and foes alike were curious about the connection between Gould's science and his Marxism. In my view, Gould's Marxism was of a rather general socialist kind: a political concern for the underdog that he shared with many left-wing intellectuals. In addition, he had a strong vision of humans as free and active agents. He saw humankind as disconnected from biological evolution because of language and culture. No wonder he locked horns with sociobiologists and evolutionary psychologists, while he was much appreciated by many humanists and social scientists. Actually much of Gould's science did not have a direct relation to Marxism, unless one counts the Hegelian influences on his mentor, Ernst Mayr, whose ideas Gould often built on.

Gould represented a unusual type of scientist who was able to broaden the scientific role to encompass not only scientific but also philosophical, esthetic, and moral/political concerns. He did this following his taste and intuition, and here he resonated with the general public, although not always with his colleagues. But unlike the new wave of postmodern nihilism in regard to science and scientific truth promoted by younger academic radicals, Gould believed that science can find out about truth, although perhaps through a glass darkly. For Gould science was a full-blooded, real human endeavour, full with biases, idiosyncracies, mistakes, and rhetoric. It was the whole human drama in miniature. Finding the truth in this situation required eliminating "bad" science and promoting "good" science. For Gould this was at the same time a scientific and moral/political quest and he pursued it with gusto.

Papa Joe, Gould's grandfather who made it to America despite all, would have had reason to be proud of him.

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