A Tale of Two Reputations

by Jared Diamond

We scientists have fantasies of being uniquely qualified to make great discoveries. Alas, reality is cruel: most of us are replaceable. For the vast majority of scientific contributions, if scientist X hadn't achieved it that year, scientist Y would have achieved the same result or something very similar soon thereafter. In modern molecular biology, most famous discoveries emerged as multiple teams raced toward the finish line, with the "loser" only a few months behind the "winner." For instance, if James Watson and Francis Crick hadn't published the correct structure of DNA on April 25, 1953, Linus Pauling, who was working on the same problem and had just published an incorrect structure, would surely have arrived at the correct answer within a short time.

Have any individuals really made a major, lasting difference to the course of science? More specifically, would their discoveries or conceptualizations have eluded other scientists until decades later if these individuals had not been born, and did their contributions have a unique impact that persisted long afterward? By those two criteria, I think that only two scientists within the last two centuries clearly qualify as irreplaceable: Charles Darwin and Sigmund Freud. (I feel unsure whether Albert Einstein's impact was as far-reaching.) A comparison of Darwin and Freud proves interesting. What made them irreplaceable, what exactly did they get right, what did they get wrong, how similar were their personalities and their peer relations, and how do their reputations compare today?

To begin with, Darwin and Freud were both multifaceted geniuses with many talents in common. Both were great observers, attuned to perceiving in familiar phenomena a significance that had escaped almost everyone else. Searching with insatiable curiosity for underlying explanations, both did far more than discover new facts or solve circumscribed problems, such as the structure of DNA: they synthesized knowledge from a wide range of fields and created new conceptual frameworks, large parts of which are still accepted today. Both were prolific writers and forceful communicators who eventually converted many or most of their contemporaries to their positions. (In this, they were unlike Gregor Mendel, the founder of genetics, who within his lifetime convinced nobody of the significance of his discoveries.)

Both made their contributions as a result of new insights, not as a result of inventing a new instrument or technology. In fact, both used little more than their eyes and ears. One must therefore pause to wonder why Darwin's views on evolution, and Freud's on the human mind, had not already been formulated by Aristotle and the ancient Greeks. The answer is that the views of both depended on the enormous amount of knowledge that had accumulated over the two millennia since Aristotle's time—not only discoveries about natural history and the human mind but also a developing framework of concepts and questions (what historians describe by the German word Fragestellung).

Darwin's contributions came at a time when almost everyone (including scientists) believed in the divine and independent creation of species, and when scientists were recognizing patterns in the burgeoning discoveries about fossils, taxonomy, and biogeography but still lacked explanations for those patterns. Today Darwin is best known for establishing the fact of evolution and for recognizing the major role of natural selection in driving it. Actually, he achieved far more than those two most famous of his contributions. He also recognized sexual selection as an additional evolutionary driving force, laid the foundation for today's understanding of animal behavior, published a major work on the behavior and physiology of insectivorous plants, and provided the correct explanation for hierarchically branched taxonomies as well as for the origins of biogeographic regions, coral reefs, volcanic rocks, and soils. Underlying Darwin's contributions were his very broad technical competencies in anatomy, botany, embryology, geology, paleontology, taxonomy, and zoology, as well as his threefold methodological brilliance as an observer, experimentalist, and theoretician.

In his mastery and synthesis of many types of information and his ability to utilize diverse approaches, Darwin was unique. No biologist then or since has come even close to matching him, and that's why no one else made his contributions. While it is true that Alfred Russel Wallace and Darwin independently came up with the idea of natural selection and evolution, the reasons that Darwin, not Wallace, is regarded as the irreplaceable genius are instructive. Wallace's reasoning about natural selection, and the initial evidence he based it on,

were essentially the same as Darwin's. But the papers about natural selection by Wallace and Darwin that the Linnean Society published side by side in its journal in 1858 were ignored. The world did not begin to be convinced of natural selection until Darwin published the Origin of Species a year later, making an overwhelming case by amassing evidence from many fields. Because Wallace lacked depth in many of the disciplines and approaches mastered by Darwin, Wallace could never have made the overwhelming case that Darwin did, and he frequently acknowledged Darwin's greatness thereafter.

Freud's contributions came at a time when interest in mental illness and its classification was growing but its etiology was virtually unknown and treatments were mostly ineffective—in part because clinicians and researchers were still focused on conscious, cognitive processes. Freud's status is unique because he recognized an entirely different mental realm, and many of his concepts—pioneering and radical in their time—are so familiar today that they have entered the daily vocabulary of the general public. These include the idea of the unconscious, the significance of dreams, the lingering importance of early childhood experience, the Oedipus complex, motivational conflict, and defenses such as denial, rationalization, and repression. For some mental conditions, Freud also devised therapies based on the "talking cure" rather than just on the then-prevalent treatments of electric shock, hypnosis, or institutionalization. He also developed a unifying theory of the normal personality, recognized transference and countertransference in the patient/therapist relationship, and explored the broader social consequences of individual psychopathology.

Freud searched constantly for the underlying causes of mental disorders, and he developed techniques such as free association and the study of dreams to probe the unconscious. As with Darwin, Freud's immense contributions arose from the breadth of his competence—in anatomy, neurology, pharmacology, philosophy, physiology, and psychology. More than just a psychologist who wanted to understand what makes people tick, Freud also had the therapeutic goals of a physician who wanted to help people. Like Darwin, he had no contemporaries whose contributions approached his in scope and originality; there was not even the equivalent of a Wallace to be mentioned and explained away.

Those are some of Darwin's and Freud's successes. What about their omissions and failures? Given their achievements, it may seem absurd even to bring up the issue. This question reminds me of a cartoon of some cavemen pointing to another caveman and asking, "What's that guy done since he invented fire?" Of course they were limited by the technology of their time: one can hardly fault Darwin for not anticipating by a century the recognition of DNA as the genetic material, or Freud for not determining chemical structures and the role of neurotransmitters.

Nevertheless, we still can't help wondering about some things that Darwin and Freud might have recognized or might have gotten right but didn't. Darwin's foremost omission was his failure to progress in elucidating the principles of genetics. Such progress potentially lay within his grasp, because he designed and executed brilliant experiments with plants and published a whole book on cross-pollination and self-pollination. Similarly, the results of his many experiments in pigeon breeding might readily have suggested to him the concept of recessive and dominant traits. Yet Darwin failed to extract the fundamental genetic insights that Gregor Mendel extracte by planting peas during the years just before and after D writing the Origin of Species.

Darwin also got some big things wrong. He shared the thei widespread belief in "soft inheritance" the assumption that th environment could cause adaptive changes in the hereditar material, but his younger contemporary August Weisman showed that this could not be so. Darwin accepted the postulat of "blending inheritance" (the fusion of a mother's and father' characteristics in their offspring), even though his own exper ments on pigeons refuted it. Much more surprising are two othe errors: he eventually failed to acknowledge the reality of spe cies as non-interbreeding sets of populations, and hence he als eventually failed to accept that new species originate predomi nantly through geographic isolation, although that precise issu underlies the title of his most famous book. What makes th latter two errors so striking is that Darwin had previously for mulated both ideas correctly but then abandoned his formula tions in later editions of the Origin. These mistakes had long lasting consequences, because they were not rectified by othe biologists until about eighty years later and because a signifi cant minority of biologists persist in those errors today.

Freud also made some disconcerting omissions and errors He was a man of his time in some of his views of women; he believed, for example, that a woman's main and appropriate role was that of wife and mother. Rooted in an era that tabooed discussions of sex, he rebounded to the opposite extre and exaggerated the roles of sex and sexual conflict in the op ment of the psyche. He gave insufficient credence to some pa tients' reports of being sexually abused as children. His emphasis on a death wish is now viewed as wrong or greatly exaggerated. At least in part because his driving motivation was to help and to cure people, not just to understand them intellectually, he was not scientifically rigorous. And as a therapist, Freud could be faulted for not departing from his focus on individuals to develop therapy for couples, families, or groups.

Today we seem much more inclined to castigate Freud for his omissions and errors than Darwin for his. I suspect that there are two reasons for our differing attitudes toward these two pioneers. One is that Freud's failures, unlike Darwin's, have had a direct impact on the lives of individual human beings. Most of us don't suffer as a result of Darwin's having eventually attributed too much scope to the process termed sympatric speciation than it actually deserves. But a powerful man's mistaken ideas about women have certainly caused suffering, just as victims of child abuse have been made to suffer when the reality of their trauma has been denied.

The other reason we are inclined to judge Freud more harshly than Darwin is that these two scientists were near opposites in their relations with peers. In this regard, we find much to admire in Darwin and much to deplore in Freud. Darwin was outstandingly generous in crediting others—including, most notably, Wallace—for their work. While Darwin came in for severe criticism from other scientists and in turn often expressed his disagreement w ir views, he responded courteously, used scientific argume , and completely avoided personalizing disputes. I can think of no one about whom he expressed hatred or said nasty things, and no one whom he tried to impede professionally. Freud, on the other hand,

was outstandingly ungenerous: he denied credit to others, was intolerant of rivals, hated many people, and surrounded himself with unquestioningly loyal admirers. Freud's fallings-out with his famous psychoanalytic contemporaries Alfred Adler, Josef Breuer, Carl Jung, and Otto Rank are merely the most notorious examples. A legacy of this aspect of Freud's personality has been the ugly tendency among psychotherapists, especially those closest to the Freudian tradition, to personalize disputes and to break into factions.

Both Darwin and Freud have had their detractors, and the ideas of both men initially faced fierce opposition. Today very few scientists hold low opinions of Darwin, either as a person or as a scientist. The overwhelming majority of those who fundamentally disagree with Darwin's findings today are not scientists at all, but creationists, who do not engage seriously with the facts of biology. Virtually no contemporary scientists believe that Darwin was basically wrong. Since Darwin's time, we have of course discovered masses of new facts, formulated new concepts, and advanced beyond many of his specific interpretations, but modern biologists still consider themselves to be Darwin's intellectual descendants, working within his tradition.

By contrast, Freud's detractors remain numerous, even though they take for granted many of his concepts and contributions. Just consider how the Library of Congress's 1998–99 exhibition on Freud in Washington, D.C. (which has since traveled to major museums worldwide) triggered demands by serious thinkers that negative views of Freud be represented. There were protests that Freud was unworthy of even being honored by an exhibition. A corresponding exhibition on Darwin would have been protested only by creationists. I acknowledge a legitimate moral base underlying such Freud-bashing: the human consequences of his scientific errors, and his often ugly interpersonal relations.

But there are two other types of Freud-bashing that are not defensible. One consists of pointing out all the new things learned and all the new therapies devised since Freud, as if these represent his failures or demonstrate the uselessness of his work. Yes, we now know much more about how people think and how to help them than we did in Freud's day. But just as with Darwin, that subsequent progress began with Freud's insights and would have been unthinkable without them.

The other type of Freud-bashing—much more damaging because it hurts patients—comes from a too-narrow focus on biological psychiatry. I fully accept the importance of biological psychiatry, having devoted some of my own research to problems in that area (neurotransmitters and manic-depressive illness). It has now become clear, as it could not have been in Freud's day, that some major thought and mood disorders have a biological basis, even though the details of that basis in the most widespread syndromes (depression, manic-depressive illness, schizophrenia, autism) remain elusive.

Many medical-school psychiatry departments were once bastions of Freudian psychoanalysis, whose practitioners resisted biological studies. But now the pendulum has swung to the opposite extreme: psychiatry departments have become bastions of molecular biology, at which much more time is devoted to studying and teaching psychopharmacology than to what are called talk therapies. Outside academia, however—among clinical psychologists, social workers, and lay analysts—those therapies are a growth industry. Among the many reasons for academe's imbalance are its reductionist bias and its professional reward system: many Nobel Prizes and National Institutes of Health grants are available for biochemical research, but many fewer NIH grants and nary a Nobel Prize for talk therapies. Other considerations are that contemporary Western societies tend to seek technological fixes, and health insurance companies are more willing to reimburse claims for drugs than for talk therapy. Certainly, it would be less painful for both therapists and patients if our problems could be solved by taking pills rather than accepting responsibility for our suffering and then learning new ways of interacting with others. Not only that, but the stigma of "mental illness" and the challenges of moral responsibility would be diminished if one's problems arose from chemical processes beyond one's control (as is true in some cases) rather than from voluntary actions.

To my mind, academe's swing away from talk therapies is tragic. Major advances are still being made in this field—for instance, in crisis counseling and in child and family therapy. Almost all of us face stress in our jobs, our health, our personal relationships, and our own aspirations. Almost all of us carry emotional and cognitive baggage from our early lives that leaves us with some inappropriate responses in our lives as adults. Some of those problems can be dealt with by talking with friends. But some problems require professional distance, experience, and skills—the skills in which a talk therapist is trained and that are far beyond the capacity of a friend to deliver.

Even specialists in biological psychiatry need thorough training in talk therapies, because it can be difficult to figure out whether a patient's problems have a primarily biological or a primarily nonbiological basis. Even clients whose problems are probably fundamentally biological (such as in manic-depressive illness) tend to have associated psychological issues that need attention. Physicians who rely heavily on prescribing drugs often don't take time to establish a relationship with a patient, regularly forget that the patient and physician are locked in an emotionally charged relationship, and then are surprised at how often patients fail to take the drugs prescribed for them. Understanding that unique two-way relationship was one of the many deep and far-reaching insights that put Freud right up there with Darwin.

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