Science's twin taboos

Is it premature to declare that the debates about the role of religion and race in science are closed?

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In October 2007, the Nobel laureate and co-discoverer of DNA, James D. Watson, was hounded out of the UK during a book tour for comments he made to the effect that Western development aid to Africa was wasted because of the relatively low intelligence of its recipients (Milmo, 2007). He was subsequently forced to resign from one of the leading US biomedical research facilities, Cold Spring Harbor Laboratory in New York, which he had directed for 35 years of its most notable growth.

Almost exactly two years earlier, Michael Behe, a tenured Professor of Biochemistry at Lehigh University (Bethlehem, PA, USA), had testified under oath in the Third US Circuit Court that the scientifically credentialled form of creationism known as 'intelligent design' deserved a place in the public high-school science curriculum alongside neo-Darwinian evolution as an explanation for the origin of life. Not only did his side lose the case, but Behe himself has been subsequently subjected to personal vilification, abetted by the official—and continuing—dissociation of his department from his views (Lehigh University Department of Biological Sciences, 2007).

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These two cases touch on the twin taboos of science: race and religion. It seems that science, especially biological science, cannot live with—or without—them. Together they define the limits of respectable public scientific discourse. To be sure, race and

religion breach scientific respectability from opposite directions: racism makes a fetish out of the persistent diversity of the human population, whereas creationism overplays the importance of our common descent from a deity in whose 'image and likeness' we are supposedly created. Hence, racists and creationists propose alternative utopian visions for humanity: the former project an ideal world of well-bounded limited populations in ecological equilibrium, whereas the latter envisage that our ever-expanding numbers and greater mobility will permanently transform the planet for our collective benefit (Weikart, 2005; Noble, 1997). Their respective visions of history can be captured in a single phrase: evolution versus progress.

There used to be an entire science dedicated to debating creationism and racism on empirical grounds. It was called 'anthropology', named after the title of a 1798 work by the German philosopher Immanuel Kant (1724–1804), which was dedicated to how—and whether—the different races might embody the same Enlightenment ideal of a *Weltbürger* or 'world-citizen' (Kant, 1798). For much of the eighteenth and nineteenth centuries, the two positions travelled under the epistemologically sanitized labels of 'monogenesis' and 'polygenesis', respectively (Harris, 1968). Yet their proponents did not quite match up to the creationists and racists of today: there were religious and secular thinkers on both sides of the divide. On the one hand, the party of monogenesis was composed of New Testament promoters of the 'universal brotherhood of man' and Enlightenment optimists, such as the French philosopher Nicolas de Caritat, Marquis de Condorcet (1743–1794), pursuing human perfectibility.

On the other hand, the party of polygenesis consisted of literal adherents to the multiple dispersals of human life postulated in the Old Testament as well as Enlightenment sceptics including the Scottish philosopher David Hume (1711–1776), who regarded 'humanity' as the brand name for a range of upright apes.

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The difference between monogenesis and polygenesis is epitomized in a question: are the diverse beings that pass for humans the result of one or multiple origins? I say 'pass' because, at the time, few denied for example the *prima facie* grounds for moral concern about the hereditary enslavement of Africans in Europe and the Americas. However, that shared concern did not necessarily translate into a belief that Africans and Europeans shared a common ancestry or at least an ancestry that was sufficiently strong to overcome their differences in appearance and mode of being.

The mindset of contemporary animal rights' activists provides a point of reference for these debates about slavery. Although the activists strongly object to the suffering endured by caged laboratory animals, most would stop short of according them civil rights because they doubt the animals' competence to take full responsibility for their actions. Similarly, it is one thing to justify the emancipation of slaves in terms of upholding universal human rights *à la* monogenesis, and quite another to justify it in terms of supporting the cultivation of life

under conditions where it is likely to flourish à la polygenesis. Do slaves suffer and revolt out of their God-given sense of natural liberty, which is shared by all humans, or out of their instinctive rejection of unnatural living conditions, which varies across animals?

The dispute between monogenesis and polygenesis gradually subsided as people eventually accepted the plausibility of a negotiated settlement, which was brought into effect by Charles Darwin (1809–1882) with the publication of *On the Origin of Species* (1859). Human races are environmentally reinforced genetic subdivisions or ‘subspecies’, descended from a common hominid ancestor, which itself descended from ancestors common to other species, ultimately going back to a primordial soup out of which life on Earth came into existence.

Darwin did not explicitly associate the emergence of life from the primordial soup with the creative efforts of God: the process could have been the result of a divine spark or, equally, of an entirely self-organizing process. Conversely, he not only refused to rank human races, but also stopped short of admitting that humans were the noblest species. Indeed, *The Descent of Man* famously ends with his declaration that he is happier knowing that he descended from baboons—not Caucasoids—rather than the fierce inhabitants of Tierra del Fuego whom he encountered on the *Beagle* (Darwin, 1871). If anything, the studied anti-racism of Darwin looks like the sort of ‘species egalitarianism’ that is nowadays associated with the animal liberation proponent Peter Singer (1999).

The rhetorical genius of Darwin lay in his refusing to take a clear stand on the matters that divided the creationists and racists of his day, and hence leaving the nature of humanity profoundly ambiguous. However, 150 years after the publication of *On the Origin of Species*, Darwinian diplomacy seems to be unravelling with the resurgence of both racism and creationism as potentially scientific propositions.

Anyone familiar with American legal history will be struck by the similarity between the rhetoric now used to ‘separate’ religion from science and that introduced a century ago to ‘segregate’ Blacks from Whites. In the case of race, the precedent was set after the abolition of slavery by the US Supreme Court in *Plessy*

v. *Ferguson* (1896); a decision that was eventually overturned with *Brown v. Board of Education* (1954). In *Plessy*, the justices ruled that formal recognition of racial equality did not require that the races be given access to common facilities. The justices appeared to believe that racial equality was compatible with a caste system that restricts the mutual access of Blacks and Whites. At the same time, they also stressed

that the provision of separate schools, wash rooms or rail coaches for Blacks and Whites did not *ipso facto* imply that Blacks would receive inferior facilities. This even led some Whites to complain that *Plessy* compelled the construction of facilities for Blacks that might be underutilized.

A similar segregationism with regard to religion was explicitly made in the Pennsylvania case mentioned earlier in this article:

Kitzmiller v. Dover Area School District (2005). Here, circuit court judge John E. Jones III expressly refused to pass judgement on the truth of intelligent design, ruling only on its status as science. Indeed, he suggested that intelligent design might be true in some other sense that might be taught outside the science class. Ironically, this line of argument—which is sometimes called the ‘double truth’ doctrine after the medieval scholastics—was the one used by the Roman Catholic Church against Galileo Galilei (1564–1642) to limit the reach of his scientific claims against theological interpretations of the Bible. After all, Catholic missionaries in China were promoting science as one of the fruits of their religion, while refusing to have it impinge on religion at home. Now, with *Kitzmiller*, the tables seem to have been turned. Just as the Church was happy to let Galileo conduct his research if he stopped promoting it as superior to Catholic doctrine, intelligent design can be taught as one wishes but not as science (Fuller, 2008).

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Despite the similarities, there is an obvious difference between the legal fates of racial and religious segregation in the USA: discrimination on the basis of race has been overcome, whereas discrimination on the basis of religion has been intensified. Yet in both cases, the consequences have been perverse for science, and have resulted in the coining of mildly euphemistic expressions such as ‘genetic diversity’ and ‘intelligent design’ to keep the issues represented by race and religion in the scientific debate. Interestingly, both strategies are compelled by virtue of traumatic historical events that have inhibited any role that race or religion might ever again play in science. I illustrate the point initially with race, followed by religion.

During their lifetimes and until the end of the Second World War, Darwin and Herbert Spencer (1820–1903) were regarded as the main promoters of the theory of evolution by natural selection, as popularized in the expression used by Spencer, “survival of the fittest”. Both were,

broadly speaking, *laissez faire* liberals, sceptical of the role that states might have in reversing natural dynamics. Confessing ignorance of the mechanisms of heredity and inclined to believe that natural selection would always ultimately trump artificial selection, both refrained from endorsing the original version of eugenics touted by the cousin of Darwin, Francis Galton (1822–1911).

Of course, this did not stop twentieth century developments in genetics, including their eugenicist applications, from being treated as extensions of the work of Darwin and Spencer. Back then, the difference between the two was seen to lie more in emphasis than in substance: Spencer focused on the implications of evolution for contemporary human concerns, whereas Darwin generally avoided any such talk. This made Spencer the most influential spokesperson for evolution in the final quarter of the nineteenth century, even including the public defender of Darwin, Thomas Henry Huxley (1825–1895).

However, all of that changed with the rise and fall of the Nazis, and the unspeakable atrocities they carried out in the name of eugenics, which led to the subsequent stigmatization of the “survival of the fittest” policies. The post-war political climate was such that evolutionary theory was potentially held liable for the carnage caused by Hitler. The diplomatic solution, again to the advantage of Darwin, was to jettison Spencer as a “social Darwinist” (Hofstadter, 1944). The phrase had neutrally referred to the extension of the ideas of Darwin to human affairs, typically on the basis of what he himself had provided in *The Descent of Man*. Yet thereafter, ‘social Darwinist’ referred specifically to the overextension, and hence misuse, of those ideas. Spencer was the obvious target of this semantic shift, as he had been the most visible promoter of Darwin in the social sciences and politics, not least in Germany. The studied silence of Darwin on public policy left him as the only ‘politically correct’ nineteenth century ancestor to the post-war synthesis forged between natural history and Mendelian genetics. However, the conceptual cost of overcoming racism in this fashion was excluding by default any deep studies on *Homo sapiens* from modern evolutionary theory.

This point is epitomized in the influential 1950 United Nations Educational, Scientific and Cultural Organization (UNESCO) statement on “the race question”

(Brattain, 2007). Asserting the biological unity of humanity, it portrayed claims to racial difference as little more than socially based ‘ethnic’ stereotypes ultimately grounded in unscientific prejudices. The coalition of distinguished social and natural scientists, who were involved in finalizing the statement, ensured its legitimacy. Nevertheless, it appeared shortly before DNA-driven breakthroughs in molecular biology revolutionized our understanding of genetics by providing a more fine-grained sense of both what unifies and what differentiates humanity. Two large-scale projects from the past 25 years, one devoted to sequencing the common human genome and the other to charting the course of human genetic diversity, represent the fruits of that revolutionary endeavour. It is the latter that concerns us here.

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The Human Genetic Diversity Project draws on an eclectic mix of genetics, archaeology and linguistics to follow the migration patterns of the peoples of the Earth (Cavalli-Sforza, 2000). Courtesy of IBM (Armonk, NY, USA) and *National Geographic* magazine (Washington, DC, USA), the project acquired a populist dimension in 2005, when it invited people who are interested in tracing their family histories to contribute personal information online in exchange for access to the collective knowledge base of the project. So far, more than 250,000 people worldwide have complied. However, the United Nations Permanent Forum on Indigenous Issues has recommended suspending the project because its results might be used opportunistically either to undermine affirmative action policies—if the disadvantaged indigenous turn out to be genetically similar to the dominant foreigners—or, in keeping with earlier racist policies, to ‘repatriate’ those who happen to have a large number of medically relevant alleles belonging to peoples normally resident elsewhere (Harmon, 2006).

No doubt the idea of genetic diversity taps into the heritage of *Rassenwissenschaft* (‘race science’) and *Rassenhygiene* (‘racial hygiene’), an original stronghold of Darwinism and

perhaps the most exciting field of German biomedical science before the ascendancy of Hitler (Proctor, 1988). Its intellectual leader, Alfred Ploetz (1860–1940), promised no less than perpetual peace if the peoples of the Earth confined themselves to lands suitable to their respective genetic make-ups. For this he was nominated for a Nobel Prize—albeit in 1936, late in life and after the Nazis had come to power. A staunch anti-imperialist, Ploetz had called for a massive resettlement policy of the multiple ethnic groups of the newly amalgamated Second Reich as early as 1895, with each ‘homeland’ urged to design its own indigenous social security system, customized to the specific health needs of its people (Fuller, 2006).

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Originally, this proposal was made in the spirit of social democracy, even socialism, which by the 1930s had turned the Nordic countries into welfare states (Broberg & Roll-Hansen, 1997). However, it took a sinister turn in the wake of the defeat of Germany in the First World War in 1918, when it became incorporated into the campaign platform of the newly formed National Socialist Part. By contrast, the Human Genetic Diversity Project is operating in a political climate less prone to totalitarian abuse. An interesting witness here is the German born and trained Harvard evolutionist, Ernst Mayr (1904–2005), who remained active until his death. Without ever endorsing Nazism, he never failed to assert the relevance of biologically grounded racial differences for medical and perhaps even legal purposes (Mayr, 2002). Indeed, biomedical research provides growing evidence that race can be used by physicians as a marker to influence diagnostics and recommended treatments, and for preventive measures (Weigmann, 2006; Kahn, 2004). Yet, as long as ‘politically correct’ intuitions remain firmly anchored in the sentiments expressed in the original UNESCO document, there will be formidable barriers to allowing genetic diversity to explicitly inform policy-making.

A US-style exclusion of religion from science is inscribed in the constitutions of many modern states. Usually the difference between religion and science is reduced to the distinction between private and public knowledge. Moreover, in the USA and elsewhere, the legal separation of church and state has evolved from preventing a specific church dominating civil society to preventing the influence of religion altogether. The anchoring trauma here is the social discrimination originally suffered by wealthy, well-educated Christians in seventeenth century England who happened not to be members of the established church. They were compelled to start their own society, which over the next 150 years became the USA. The founders of this new nation resolved that never again would the same mistake be made: since 1791, the separation of state and church is derived from the first amendment to the US constitution, which states that “Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof...”

Indeed, the separation of state and church has been pursued in the USA with a bloody-mindedness that now overlooks the distinctly positive impact of religion on the development of science. This is a point that the original American settlers, as Puritan promoters of the Scientific Revolution, would have been the first to admit (Merton, 1970). The expression ‘intelligent design’ taps into that founding sentiment by recalling the strong analogy that the seventeenth century scientific revolutionaries, most notably Isaac Newton (1643–1727), drew between the machine-making capacities of humans and the creative agency of God. In effect, to see life as the product of intelligent design is to conceive of biology as divine technology. This eventually led the US founding fathers to conceptualize the ‘mechanism of government’ as literally a second creation (Cohen, 1995).

Certainly, intelligent design always had a heretical cast. It implied that the power of God exceeds human power only by degree and not by kind. Instead of upright apes, we are demigods. This explains the initial plausibility of what is now an ordinary feature of modern scientific reasoning—namely, model-building. After all, it is one thing to design a machine that works on its own terms, but quite another to think that the machine captures properties of the natural world to such an extent that it might be used as a basis for prediction and

control. The scientific method honours that distinction as the difference between ‘reliability’ and ‘validity’ in laboratory experiments and computer simulations. Therefore, Behe (1996) might be wrong in claiming that the cell is “irreducibly complex” in the same sense as a mouse trap, all of the parts of which must be in place to work. But, to think that a cell might work like a mouse trap is very much in the spirit of the mechanistic worldview that launched modern science (Fuller, 2007).

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More generally, intelligent design theory taps into the vast majority of science that has been done under the assumption that nature is a unified, rational whole; and humans have been specially created to understand, manage and possibly improve it, if not to bring it to outright completion. The philosophical term of art for this quality of nature is ‘intelligibility’ (Dear, 2006). The assumption of intelligibility is shared not only by so-called young-Earth creationists, who claim on biblical grounds that the planet is only 6,000 years old, but also by physicists who continue to search for a grand unifying theory and biologists who seek a progressive direction to evolution. Darwin stands out in the history of biological science from his great predecessors—Carl Linnaeus (1707–1778), Georges Cuvier (1769–1832) and Jean-Baptiste Lamarck (1744–1829)—as well as his great successors—Gregor Mendel (1822–1884), Sewall Wright (1889–1988), Ronald Fisher (1890–1962) and Theodosius Dobzhansky (1900–1975)—in his failure to find his faith in God bolstered by his research, although his many decades of intellectual labour were originally motivated by a search for intelligent design in nature.

Given the recent strong public expression of atheism (Dawkins, 2006), the following question looms large: can the degree of human cognitive privilege implied in the idea of intelligent design be denied without undercutting the basis for the most inspiring theoretical projects in

science? Atheists, of course, say yes. However, in the *Critique of Pure Reason*, the cornerstone of modern Western philosophy, Kant answered with a resounding no, quickly adding that just because we need to postulate the existence of God to justify the pursuit of science, it does not follow that God actually exists (Kant, 1781). Kant had in mind Newton, whose exemplariness lay not only in the detail in which he worked out material motion in the known cosmos, but also in developing an artificial language—physics—that could lay reasonable claim to represent the divine standpoint, shorn of the partial subjectivity of his creatures.

However, Newton took a beating with the early twentieth century revolutions in relativity and quantum mechanics, which empirically undermined some of his fundamental conceptual assumptions. These developments, combined with the perverse uses to which the physical sciences were put in the two world wars, shook the faith of many in the intelligibility of nature. Even those scientists who continued to believe in God tended to conceive of the deity in more remote, sometimes irrational, terms than Newton or Kant would have deemed appropriate.

Yet atheism would hardly do as well as a background belief for science. The track record of atheism is limited to dispelling superstition and challenging dogmatism—it does not extend to promoting science. Consider Hume, the most intellectually substantial and attractive figure reasonably counted as an atheist—as opposed to simply a heretic or deist. His famed scepticism cut against not only theologians, who saw the design of nature as evidence for the existence of God, but also scientists, who followed Newton in thinking that they were on the verge of fathoming the inner workings of nature (Schliesser, 2008). The counsel of Hume was ultimately a therapeutic one, later echoed by that other icon of Anglophone analytical philosophy, Ludwig Wittgenstein (1889–1951), advising that we should lower our epistemic expectations and let

go of the idea that some overall mastery of nature is to be had by either philosophical or scientific means.

Although such advice might put worried minds at ease, it does not explain the success of those who failed to heed it. After all, notwithstanding the post-war taboo on race, the revolution in molecular biology managed to bring genetics to the brink of bioengineering by the 1960s (Morange, 1998). Moreover, in the light of the ongoing success of both the Human Genome Project and the Human Genetic Diversity Project, we might need to revisit eugenics with a more positive frame of mind towards social experimentation. In the end, the question that continues to dog us is who exactly are ‘we’, the subject of this grand narrative that would unify our racial and religious differences. Once we get some agreement on that issue, race and religion will cease to be taboo subjects.

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