

Book review

T. H. Huxley and the rise of modern science

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In the afterword to Adrian Desmond's biography of T.H. Huxley, the author observes: 'Isn't the modern function of biography to carve a path through brambly contexts? To become a part of history? Without comprehending Huxley, the *Times* said, no one could estimate the century's intellectual and social transformations. And isn't that the ultimate aim, to understand the making of our world?'

While it is certainly the case that a picture of the intellectual life of the nineteenth century is incomplete if one does not include a consideration of T.H. Huxley, his star shines less brightly than that of a Marx or a Darwin. Rather than a pathbreaking creative genius, Huxley was the principal defender, elaborator and populizer of the theoretical work whose pioneer was his friend, Charles Darwin.

Huxley went beyond Darwin, not in his intellectual insights, but in the courage and passion with which he defended natural science against religion, in countless pamphlets, articles and popular lectures in which he waged war against religious bigotry and superstition.

As the author's title suggests, Huxley began on the radical fringe of bourgeois society, only to become an establishment figure later in life. That being said, he remains one of the seminal and engaging figures of that epoch.

Huxley is known primarily for being 'Darwin's bulldog,' the foremost public advocate of the great naturalist's theory which explained how biological evolution occurred. He was a tireless writer and speaker, both a propagandist and an agitator for the new science, to which he gave the name biology.

He is also remembered for the famous exchange between himself and Anglican Archbishop Samuel Wilberforce, during a debate on evolution before an overflow crowd at Oxford. After Wilberforce ridiculed the notion of the descent of man from apes, asking Huxley whether he would prefer to have an ape or a man for a grandfather, Huxley quashed him memorably: 'If then said I the question is put to me would I rather have a miserable ape for a grandfather or a man highly endowed by nature and possessed of great means of influence and yet who employs these faculties and that influence for the mere purpose of introducing ridicule into a grave scientific discussion, I unhesitatingly affirm my preference for the ape.'

Huxley was a complex man, and the social significance of his role extends beyond these popular images. Desmond's book, which was published in England as two volumes, has been combined into one in the US edition, but its two sections remain quite distinct in their delineation of the two essential phases of Huxley's life. The prose is often quite heavy, but there are rewards for the serious reader.

T.H. Huxley is almost singularly responsible for the establishment of science as a profession in Britain. He was the leader of a group of young scientists, including such luminaries as botanist Joseph Hooker and physicist John Tyndall, who reshaped the manner in which scientific research was undertaken. Huxley and his group, who called themselves the X-Club, also championed the development of science education and

the training of science teachers.

Theirs was a battle against the well-heeled scientific 'old guard,' led by the renowned anatomist and paleontologist Richard Owen, and backed by the Anglican church. Desmond, on several occasions paints Huxley in Cromwellian colors, as a kind of Protestant revolutionary fighting for the advancement of scientists based on merit rather than on patronage and aristocratic privilege.

This is a literary device which, however, contains a grain of truth. Huxley himself rose from the lower middle class and made his closest relationships with rising manufacturers at odds with the Anglican landowners. And despite an at times ferocious struggle Huxley, like his bourgeois mentors, ultimately entered into an alliance with the aristocratic establishment and was received into it with full honors.

From the East End to the Rattlesnake

T.H. Huxley was born in 1825, the son of a struggling schoolteacher father and a 'cockney' mother. As a youth, he witnessed the social misery that swept England during the 1830s and 40s--poverty that inspired writers such as Gaskell (*Mary Barton*) and Dickens. The Industrial Revolution and the explosive growth of the factory system carved a path of destitution and squalor that left an indelible impression on the young Huxley.

Desmond writes of the winter of 1834: 'That January Tom found himself alone in a tiny Rotherhithe surgery. The horrors he saw there were to mark him for life. The East London poor were as little known as the 'savages of Australia.' Yet not aborigine, he later remarked, was 'half so savage, so unclean' as these troglodyte tenement dwellers. Rooms were putrid from overflowing cesspools. Even sanitation pioneers such as Southwood Smith (who took Dickens to see the fever nests) needed a 'dose of fanaticism, as a sort of moral coca,' to stomach the sights. Starvation left the children emaciated and typhus killed them. Even death brought its own shame. Wasteland burials were so common in Rotherhithe that rotting bodies were thrown up with each new interment. It was a macabre winter.'

Huxley, who early on had become interested in science and medicine, was influenced by the growing discontent swirling around him. Young doctors, treating the indigent from notorious Drury Lane, battled the tightly controlled medical colleges and licensing boards, administered by the scions of privilege. Science was the province of wealthy gentlemen, with the resources and leisure time to pursue their interests, or of those who could obtain the backing of rich patrons. Behind them stood the archbishops and vicars of the Church of England, Huxley's lifelong opponents, holding fast to the notion that all of nature was the working out of God's divine plan.

The 'powers that be' were under siege, however, as the discovery of the chemical composition of matter, the continued unearthing of fossil evidence and the growing knowledge of the earth's antiquity undermined church dogma. The streets, with their desperate poor, belonged to the

proselytizers of atheism, evolution and socialism, derisively called by their opponents, the 'red Lamarckians,' after the famous French evolutionist, Jean Baptiste Lamarck. At the same time, young intellectuals of various ideological persuasions, calling themselves 'dissenters,' coalesced in opposition to the established church and academe. Huxley solidarized himself with this milieu.

Desperate to make his way as a scientist, the young Huxley enlisted as a medical officer on the *Rattlesnake*, set to depart for Australia and New Guinea. On December 1, 1846, Huxley set sail on a voyage of discovery, not unlike Darwin's legendary voyage on the *Beagle* 15 years earlier. Huxley returned three years later. The Revolution of 1848 had come and gone, and Huxley once again found himself in a struggle to make a name for himself in science.

Desmond observes that, while Huxley felt deeply for the oppressed, he remained very much the Protestant individualist. Huxley read avidly and had a particular fondness for Thackeray's *Pendennis*. Desmond writes: 'The book appealed to alienated spectators like Huxley, 'soul sickened and skeptical'. It evoked his Grub Street anguish. Dickens was for dilettantes: he is 'not a great artist and rarely dips much below the surface'. But *Pendennis* --that captures 'more nearly than any book I know the condition of the thirsting young men!'. This 'thirsting' that Huxley refers to contains a strong element of careerism, that was very much a part of his social and philosophical makeup.

Having returned from his voyage, Huxley began a painstaking analysis of the thousands of mostly invertebrate specimens collected. He had a particular fondness for the Phylum Mollusca (clams, oysters etc.), as well as for jellyfish and medusae of all kinds, and would later reorganize their place in the animal kingdom by inventing a new phylum, Coelenterata. This was the first of his many contributions to natural science, which would later include an examination of the relationship of dinosaurs to birds, and speculation about the medicinal role of the mold, penicillium, more than a half century before Fleming.

Darwin's theory of evolution

Meanwhile, Charles Darwin, reclusive and reticent, was spending more than 20 years since his *Beagle* voyage becoming the world's expert on barnacles, while agonizing over going public with his theory of evolution through natural selection. A perhaps unintended byproduct of Desmond's biography is the appreciation of Darwin that it engenders. Darwin knew of Huxley, who had been gaining recognition for his zoological monographs and public denunciations of the scientific establishment. The two had met briefly in 1853.

Yet Huxley's outlook was actually closer methodologically to his arch-rival Owen, in that they both rejected the development and change in the natural order in favor of fixed archetypes--idealized forms that served as original models. Huxley saw the archetypes as abstractions, rather than, like Owen, seeing them as the result of God's creative will. Darwin observed with concern and, no doubt, with some amusement at Huxley's attempt to come to grips with the obvious antiquity of the earth by placing currently existing life further and further back in time. Huxley even held out the hope of finding human fossil remains alongside those of dinosaurs.

Desmond writes: 'Darwin watched. The last straw came when Huxley mauled even his friend Carpenter's [W.B Carpenter was an expert on forensic medicine-WG] evidence for a progressing fossil life. Carpenter's ancient life was more generalized. And so was Darwin's--but his ancestors were real ancestors. Transmuting through aeons of time, adult animals had gone on specializing while the embryos remained largely unmodified, retaining their ancestral looks. To Darwin it made evolutionary sense.'

Desmond continues, spelling out the opposition between theology and evolution: 'The creation of species was proof that God intervened in Nature, as through the clergy He was supposed to intervene in society,

upholding the paternalistic order. To deny God's intervention invited catastrophe. 'Once grant that species' mutate, Darwin himself wrote, and the 'whole fabric totters and falls.'

Darwin invited Huxley and the other young dissenting scientists to his Downe estate in the spring of 1856. It was the year of the discovery of the first fossil man, unearthed by quarrymen in the Neander Valley of Germany. Darwin took the young scientists on a tour of his laboratories with their countless specimens. He also showed them his pigeons. Darwin selectively bred pigeons as a way of studying change and variety in nature. Huxley's viewpoint began to shift.

In 1859, compelled by the news that fellow naturalist Alfred Russel Wallace was about to publish his own work on the question of natural selection, Darwin published his *On the Origin of Species*, a condensed version of a larger project, *Natural Selection*.

The struggle against religion

By this time, Huxley had already been addressing mass audiences on the question of human origins, and in 1862 published the provocative *Evidence as to Man's Place in Nature*. Huxley was the first to maintain that Neanderthal Man, as the fossil discovery came to be called, was not a deformed modern man but a very close human ancestor.

The notion of biological evolution, and of human evolution in particular, not only animated the scientific opponents of Owen and the clergy, it electrified the working masses of England. Popular hostility to religion and the established church was one of the most positive features of the early British working class movement. Even before Darwin's book appeared, Desmond notes, 'Infidel socialism was rampant on the factory floor. The extent of working-class atheism told as parsons urged bosses to sack freethinkers, often to find that they were the entire workforce. It told in the census revelation that only half the nation went to church, and next to none from the ghettos.'

Huxley found himself greatly in demand, speaking before rapt working class audiences from London to Glasgow. Karl Marx's daughter, Jenny, attended such a meeting, packed with 2,000 people. In a letter to a friend, she wrote: 'The top men of science, Huxley (Darwin's school) at the head, with Charles Lyell, Bowring, Carpenter etc. gave very enlightened, truly bold, free-thinking lectures for the people in St. Martin's hall.'

Desmond explains the significance of the workers' interest in Huxley's lectures: 'The curiosity is not that Victorians lectured the workers, but that the bearded men turned up in droves. It suggests that they weren't passive recipients, but that they wanted something. And their penny prints showed what it was. In a growing democracy they saw themselves preparing for power.'

One of the profound contradictions of the latter decades of the nineteenth century, as romanticism and, with it, the last vestiges of the Enlightenment began to fade, was how such a far-reaching and revolutionary theory, such as that of Darwin's, could be interpreted so differently by the contending social classes. By the end of the 1860s, Great Britain had undergone a spectacular development. London had become the world's most technologically advanced city, with a burgeoning middle class riding on the world's first commuter railroad. Scientific expertise became the demand of the rising class of industrialists, who tailored Darwinism to place a stamp of approval on their 'rightful' place as exploiters.

As Huxley increasingly oriented himself to this rising capitalist class, his continuing popularity among the working masses threw him into crisis. For Huxley, the goal of establishing a lucrative scientific profession, meant that he had to, in the end, strive for a modicum of respectability. However, for the working masses, Darwinism had revolutionary implications, and became part of a great and liberating ideology that included socialism and Marxism.

Thus, Huxley had to increasingly fend off accusations that he was an atheist. Desmond writes: 'Huxley's scientific civil service needed its own brocade banner. 'Atheist' was out, there being no disproof of God; and anyway, it was a red republican flag, a political weapon to smash the spiritual basis of privilege. On Mondays he had his share of agitators demanding the unfrocking of priests. He could not be seen to countenance the destruction of the entire Anglican fabric.' So Huxley, opposed to both religion and atheistic materialism, with its links to socialism, coined the term 'agnostic' to describe the philosophical outlook of the new science.

Huxley's agnosticism placed the emphasis on the uniqueness of scientific veracity, rather than science and religion advancing two irreconcilable worldviews. He combined Humean skepticism with empiricism, and maintained that there were 'unanswerable' questions. He rejected as 'utilitarian' the notion of necessity in nature. Or as Desmond observes: 'Having tarred the theological despots who ruled through the 'terror of possible damnation', he would have to make Nature rule against revolutionaries too.' Engels would chide the agnostics for their half-hearted atheism, which he attributed, in his *Dialectics of Nature*, to their 'lack of logical and dialectical education,' which 'gives rise to the idea that we cannot know the essence of things.'

By the 1880s, a great depression rent the social fabric of Europe, and of Britain, in particular. It was a decade that saw the rise of socialism in the English working class, as the masses were thrown back into poverty. Riots and hunger marches were frequent. By now, Huxley and his aging associates, all scientists employed by the state in one capacity or another, had become conservative defenders of British capitalism. Huxley had earlier broken with his long-time friend Herbert Spencer, who had opposed any state intervention to assist the poor. But he came to espouse a form of social Darwinism late in life, expressed in the title of his last major pamphlet, *The Natural Inequality of Men*.

Desmond remarks that excitement over the 'new' science envisaged by Huxley and his generation had become transformed. 'Its radicalism passed to politics, its moral drive to humanism; and the poison bombs raining death in the Great War finally killed its nineteenth-century promise.'

There is much in this biography worth pondering. Desmond alludes to some of it, when he describes how Darwinism had become 'nationalized,' a Spencerian tool to quell the socialist aspirations of the working masses. Significantly, by the 1890s, Darwinism had lost its appeal in the working class. 'There were dangerous currents beneath the gay nineties,' Desmond remarks. Yet, even later in life, as in his conflict with Britain's former Prime Minister William Gladstone over Gladstone's attempt to defend the Book of Genesis, Huxley was forced to do battle against the long-standing opposition of religion to the spread of scientific knowledge--and this is Huxley's enduring and progressive contribution.

See Also:

The Fifth Miracle: The Search for the Origins of Life by Paul Davies

Scientific controversies and a touch of mysticism

[4 November 1998]

Science v. Religion: The history and significance of the 1925 Scopes trial

[25 August 1998]



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