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**The unifying vision:
Julian Huxley, evolutionary humanism and the evolutionary synthesis**

Vassiliki Betty Smocovitis

*By working together, we must lay a conscious basis for a
new world order, the next step in our human evolution.*

Julian Huxley¹

Introduction

Though it has not seemed as glamorous nor drawn as much scholarly attention as in the physical sciences, the goal of unification has dominated twentieth century biology, especially in the first half of the century.² Comparing their field to the physical sciences, such icons of early twentieth century biology like John Scott Haldane, William Morton Wheeler, J.H. Woodger, and even lesser figures like botanist W.B. Turrill, all wrote extensively in both their scholarly and semi-public and public works of the goal of unifying biology. All attempted to unify what appeared to be a fragmented and immature science and to use biology to ground a coherent worldview. Biology, in their vision, could rival the unity of the older physical sciences, but also become an autonomous science that could not be reduced to physics. All, however, recognised the difficulty of this project. In 1939, for example, William Morton Wheeler found it so difficult that he remarked that it might take ‘a few super-Einsteins to unify biology’.³

In the 1930s and 1940s the movement to unify biology accelerated with a group of individuals who attempted to unify the biological sciences within an evolutionary worldview. These included figures like Theodosius Dobzhansky, Ernst Mayr, G.G. Simpson, G. Ledyard Stebbins Jr and Julian Huxley. Though they came from different areas of the biological

¹ As cited in J.P. Sewell, *UNESCO and World Politics. Engaging in International Relations* (Princeton, N.J., 1975).

² V.B. Smocovitis, *Unifying Biology: The Evolutionary Synthesis and Evolutionary Biology* (Princeton, N.J., 1996). This paper develops further some themes introduced in this earlier work.

sciences (genetics, systematics, paleontology and botany), all believed in the unifying ability of evolution and evolutionary theory. Their efforts during the 1930s-1950s to bring about a synthesis of disparate points of view and representative fields, has been variously named by historians of science as the neo-Darwinian synthesis, the modern synthesis, the evolutionary synthesis or simply, and reverently, as ‘the synthesis’. They are frequently known as the ‘architects’ – so designated by Ernst Mayr – of the new synthetic theory of evolution that emerged at this time. The characteristic features of the synthetic theory and its relationship to the historical event of the evolutionary synthesis will not concern us here (discussions can be found elsewhere);⁴ instead, I will examine how this attempt at synthesis led to the belief that biology was a unified and central science. At the same time the ‘architects’ organised, and in fact disciplined, their community through the unifying theory that would serve as the unifying principle of evolutionary biology. The theory formulated in turn, I argue, was consistent with – and would in fact stabilise – a worldview that advocated liberal, progressive and secular humanistic beliefs within the interwar political context. This unifying project was carried into the 1950s, the 1960s and well into the latter half of the twentieth century by these biologists’ disciples and students like Carl Sagan and E.O. Wilson. In particular, I will explore the interplay of science, worldview and ideology (to use historian John C. Greene’s popular phrase) by concentrating on the figure best known for his efforts to unify biology within a coherent worldview, Julian Huxley.⁵

³ W.M. Wheeler, *Essays in Philosophical Biology* (Cambridge, 1939).

⁴ See the historiographic discussion in Smocovitis, *Unifying Biology* (n. 2). So far the most comprehensive work on the synthesis is E. Mayr and W.B. Provine, eds, *The Evolutionary Synthesis: Perspectives on the Unification of Biology* (Cambridge, Mass., 1980; 2nd edn, 1999).

⁵ See J.C. Greene, *Darwinism Debated, The Adventures of a Darwin Scholar* (Claremont, Cal., 1999). See especially his earlier article, reprinted in this volume, J. C. Greene, ‘The interaction of science and world view in Sir Julian Huxley’s evolutionary biology,’ *Journal of the History of Biology*, 23, 1990, 39-55. For general background on Julian Huxley, see C.K. Waters and A. Van Helden, *Julian Huxley, Biologist and Statesman of Science* (Houston, Tex., 1992); K. Dronamraju, *If I Am to Be Remembered: The Life and Work of Julian Huxley, with Selected Correspondence* (Singapore and Riveredge, N.J., 1993); and M. Keynes and G. Ainsworth Harrison, eds, *Evolutionary Studies: A Centenary Celebration of the Life of Julian Huxley, Proceedings of the Twenty-Fourth Annual Symposium of the Eugenics Society*, London, 1987 (London, 1989). For special treatment of Huxley’s political views, see C. Divall, ‘Capitalizing on “science”: philosophical ambiguity in Julian Huxley’s politics 1920-1950’, University of Manchester PhD thesis, 1985; R.M. Gascoyne, ‘Julian Huxley and biological progress’, *Journal of the History of Biology*, 24, 1991, 433-55; and M. Swetlitz,

Julian Huxley and evolutionary humanism

The famous grandson of Thomas Henry Huxley, also known as ‘Darwin’s bulldog’, Julian Huxley (1887-1975) was the most visible representative of the group of ‘super-Einsteins’ who would attempt to unify biology. His role in the evolutionary synthesis has been misunderstood by historians of science.⁶ He did the most to promote the newly emerging sense of unity in the community and extend this unity to the wider global community at the same time that he offered a coherent framework that preserved an autonomous science of biology. Huxley was a voracious reader and prolific author, an international traveller, an ambitious statesman, and an indefatigable promoter of science. Huxley was acutely aware of the fact that biology appeared to be a fragmented, disunified science. He was an active member of the philosophical community, interacted with Bertrand Russell, and was generally well informed of the philosophical status of biology. He was especially sensitive to criticisms of biology since he seemed to inherit the crusading zeal from his grandfather who wished to integrate the sciences in general and biology in particular with traditional humanistic concerns. While the two differed fundamentally on the extent to which one should ground humanistic philosophy (and ethics in particular) in evolution, both had life-long issues with locating ‘Man’ in the ‘Place of Nature’ as revealed by recent science and not revelation.⁷ If evolution – and biology – were to help inform and reform the life of ‘Man’, then the science had to be not just unified and coherent, but also progressive.

Julian Huxley’s particular version of humanistic theory – a kind of secular belief – thus offered a seemingly contradictory blend of mechanistic materialism within a purposive,

‘Julian Huxley and the end of evolution’, *Journal of the History of Biology*, 28, 1995, 181-217.

⁶ See also Smocovitis, *Unifying Biology* (n. 2). Historians of science have generally made little of Huxley’s contributions to the evolutionary synthesis, largely because they have sought to understand them in the context of a traditional scientific career. Huxley engaged less and less in formal scientific research as he devoted more of his energies to serving as writer, publicist, and promoter of evolutionary science. His eventual celebrity status did not help give him the credibility or weight with scholars whose contributions were in technical science exclusively.

⁷ Thomas Henry Huxley wrote a famous essay on this theme with the title *Evidence as to Man’s Place in Nature* in 1863. The essay is reprinted in T H. Huxley, *Man’s Place in Nature* (Ann Arbor, Mich., 1959). See also Julian Huxley’s famous articulation of science without

progressive and meaningful worldview.⁸ His worldview was first made public in a series of lectures he gave shortly after leaving Rice University in 1916 under the title of ‘Biology and Man’. In 1923 he subsequently published the first of many works intended for public consumption that promoted this same worldview, *Essays of a Biologist*.⁹ It was still dominating his worldview in his last major collection of essays, *Essays of a Humanist*, published in 1964.¹⁰ For Huxley ‘scientific humanism’, later more popularly known as ‘evolutionary humanism’, was more than just an abstraction or a philosophical exercise; it was instead a central feature of his worldview, his philosophy of life and simultaneously of his scientific and political endeavours. Over the course of his long career as scientist, popular writer and public servant, in his specific support of endeavours like eugenics and population control, in his moves to reform education and in his support of global movements like internationalism, evolutionary humanism served as a guiding principle. It was in fact a kind of unifying element in his own life.¹¹

His progressive visionary worldview needed much invention and reworking, however, given the historic events that Huxley had witnessed in his youth. Progress – the hallowed Enlightenment ideal inextricably linked to the historical origins of evolutionary thinking – had been hard to sustain in the modern world.¹² The bloody ‘Great War’ was accompanied by a growing and widespread sense of degeneration (cultural and biological) and a widespread belief in the decline of the West. A global sense of fragmentation ensued. The need for a more hopeful, optimistic and progressive worldview intensified yet further in the 1930s, a decade that saw the Great Depression. Worse, the rise of mass movements like Nazism, fascism and communism, that threatened the autonomy and agency of the individual, made the call for an ethical system that gave a measure of freedom to the individual all the more urgent. For Huxley, a grounding in evolution and the construction of an evolutionary humanism became an imperative for the future of ‘modern man’. From the 1930s his growing publication oeuvre

revelation in J. S. Huxley, *Religion without Revelation* (London, 1927). This work was later revised and reprinted in 1957.

⁸ See the works in note 5 for more on Huxley and his worldview.

⁹ J.S. Huxley, *Essays of a Biologist* (London, 1923).

¹⁰ J.S. Huxley, *Essays of a Humanist* (London, 1964).

¹¹ A similar point has been made by C. Divall, ‘From a Victorian to a modern: Julian Huxley and the English intellectual climate’, in Waters and Van Helden, *Julian Huxley* (n. 5), 31-44.

¹² For a historical survey of the idea of progress and the idea of evolution, see M. Ruse, *Monad to Man* (Cambridge, Mass., 1996). See also M. Nitecki, ed., *Evolutionary Progress* (Chicago, 1988); and the sources in note 5.

was thus fuelled in part by his need to apply evolutionary humanism to cure the ills of the modern world.

By the 1930s Huxley had increasingly turned to such larger themes in evolution, largely giving up his earlier interests in embryology and animal behaviour. Not only was he an active contributor to the literature on evolution, he was also instrumental in helping found a society for experimental biology in 1925. In 1927 he surprised his colleagues in biology by giving up a coveted academic position at King's College at the University of London to complete what became one of his most successful and ambitious projects. He collaborated with H.G. Wells and his son 'Gip', a zoologist at University College London, on an ambitious project to lay the groundwork for *The Science of Life*, a three-volume work that appeared in 1929-30.¹³ Wells and Huxley had shared a similar unified worldview and a distaste for incoherence. In one well-known response to the novelist James Joyce dated 23 November 1928, Wells had expressed his frustration with the lack of coherence of Joyce's work, writing: 'Your training has been Catholic, Irish, insurrectionary, mine such as it was scientific, constructive and I suppose, English. The frame of my mind is a world wherein a big unifying and concentrating process is possible and progress not inevitable but interested and possible'. Expressing his abhorrence of Joyce's work he continued: 'Your work is an extraordinary experiment and I could go out of my way to save it from destruction or restrictive interruption. It has its believers and its following. Let them rejoice in it. To me it is a dead end'.¹⁴ Though some correspondence exists, little of scholarly utility is known about the collaboration between Huxley and Wells on this great work outside of Julian Huxley's recollections in his *Memories*.¹⁵ According to this source, it was a tumultuous, but productive relationship that resulted in a very popular book – mostly written by Julian Huxley – that influenced biology education widely.

By the mid-1930s Huxley had also begun to connect with American colleagues pursuing similar ends, like Theodosius Dobzhansky and Ernst Mayr. In Britain he was in close contact with evolutionists like J.B.S. Haldane, C.D. Darlington along with C.H. Waddington and Joseph Needham. He was in especially close contact with R.A. Fisher and E.B. Ford. The

¹³ H.G. Wells, J.S. Huxley, and G.P. Wells, *The Science of Life*, 3 vols (London, 1929-30) A two-volume edition was published in New York, 1931.

¹⁴ As cited in R. Ellmann, *James Joyce: New and Revised Edition* (Oxford, 1983), 607.

¹⁵ J.S. Huxley, *Memories*, vol. 1 (London, 1970).

other person who inspired Huxley was the geneticist Thomas Hunt Morgan to whom he eventually dedicated his great book on evolution entitled *Evolution: The Modern Synthesis*, which appeared in 1942.¹⁶

In 1936 Huxley extended his interest in evolution by supporting systematics, when he helped to organise the Association for the Study of Systematics in Relation to General Biology. This increased his interactions with other British systematists who were trying to bring consensus to the systematics community between the newer sciences of genetics and ecology and the older aims of taxonomy within a Darwinian evolutionary framework. In 1940 his efforts to launch a reform of systematics culminated with the appearance of an edited collection under the title, *The New Systematics*.¹⁷ Suffice it to say that by the mid-1930s Huxley's involvement with biologists and evolutionists along with literati and British intellectuals was extensive. If any one person in the 1930s could summarise the modern evolutionary state of the art in a palatable form for a wide readership that person was Julian Huxley.

Evolution: The Modern Synthesis

The opportunity to publish a synthetic work that would draw together the burgeoning literature in evolutionary studies with his evolutionary humanism came with the request to give the presidential address to the zoology section of the British Association for the Advancement of Science in 1936.¹⁸ In the essay written for this occasion, Huxley expressed his wish for a unified biology and observed that a move toward unification was taking place. In a now famous passage, he wrote:

Biology at the present time is embarked upon a phase of synthesis after a period in which new disciplines were taken up in turn and worked out in comparative isolation. Nowhere is this movement towards unification more likely to be fruitful than in the many sided topic of evolution and already we are seeing its first fruits

¹⁶ J.S. Huxley, *Evolution: The Modern Synthesis* (London, 1942).

¹⁷ J.S. Huxley, ed., *The New Systematics* (Oxford, 1940).

¹⁸ Huxley first demonstrated his acumen in contemporary evolutionary theory in Books 3 ('The incontrovertible fact of evolution') and 4 ('The how and the why of development and evolution') in Wells et al., *Science of Life* (n. 13).

in the reanimation of Darwinism which is such a striking feature of post-war biology.¹⁹

This essay, entitled 'Natural selection and evolutionary progress', formed the basis for Huxley's 1942 book. Entitled *Evolution: The Modern Synthesis*, it was intended to serve as a technical book giving a status report incorporating the new insights that had been emerging from the newer evolutionary genetics with more traditional approaches to Darwinian selection theory that accounted for the origins of biological diversity. Although it was replete with new developments from genetics, systematics and the work of mathematical population genetics – all within an ecumenical perspective on evolutionary theory – it was also a book that embodied Huxley's worldview. It was in fact his most skilful weaving of science, worldview and ideology, the integration of which had been long coming.

The very structure of the book revealed Huxley's intent. From chapter 1, 'The theory of natural selection', which raised the status of natural selection to theory, to the final chapter, 'Evolutionary progress', natural selection was used to ground a progressive vision of the world within Huxley's evolutionary humanism. The 'modern synthesis' of evolution, according to Huxley, took readers from the idea of the gene to the sociopolitical reality of the 1930s.

Beginning with a historical retelling of the period preceding the modern synthesis, Huxley described the 'eclipse of Darwin' (and coined this now famous phrase) at the turn of the century. He charted the demise of evolutionary studies, dominated by a descriptive natural history tradition, with the establishment of more experimental sciences like Mendelian genetics. The first chapter, which ostensibly was to discuss the theory of natural selection, thus became an historical account of the philosophical and methodological struggle to lend scientific legitimacy to evolution. He singled out evolution as 'the most central and most important of the problems in biology'. He also argued that selection – based on a deductive logical step for Darwin – was now a 'fact of nature capable of verification by observation and experiment'.²⁰ Most importantly, Huxley presented to his readers an ongoing process of

¹⁹ J.S. Huxley, 'Natural selection and evolutionary progress', Presidential Address at Annual Meeting, *Report of the British Association for the Advancement of Science*, 106, 1936, 81-100.

²⁰ Huxley, *Evolution: The Modern Synthesis* (n. 16), 13-28.

integration between diverse biological disciplines leading to the unification of biology. In a revealing passage that echoed his address in 1936, Huxley argued for the unification of biology and the consequent rebirth of Darwinism:

Biology in the last twenty years, after a period in which new disciplines were taken up in turn and worked out in comparative isolation has become a more unified science. It has embarked upon a period of synthesis, until to-day it no longer presents the spectacle of a number of semi-independent and largely contradictory sub-sciences but is coming to rival the unity of older sciences like physics, in which advance in any one branch leads almost at once to advance in all other fields, and theory and experiment march hand-in-hand. As one chief result there has been a rebirth of Darwinism.²¹

This new science of modern biology had the methodological rigour of the physical sciences, yet because it had unique processes that could not be reduced to physics and chemistry was also autonomous or independent of the physical sciences. Though there was plenty of room for processes like random genetic drift, Darwinian natural selection as mechanism was responsible for evolution. The same natural selection also grounded Huxley's secular belief, his evolutionary humanism.

In choosing to ground evolutionary science and evolutionary humanism in the same process of natural selection, Huxley had to reconcile a serious contradiction. If selection were a truly mechanistic principle then belief in evolutionary progress was exceedingly hard to sustain. If it were mechanical it was also nonteleological, and purposiveness or directionality could not be ascribed to it. No evolutionary progress could therefore occur if there were no goal or end point for evolution; and, without evolutionary progress no hope existed for human improvement. Articulating a nonteleological version of natural selection that could still somehow give direction and make possible progressive evolution, and at the same time adhering to selection as a mechanistic and therefore a legitimate scientific principle, was the challenge that he left until the very final chapter of his book.

²¹Ibid., 26.

The trick was in maintaining the balance between extremes that permitted enough room for progress. For Huxley, the handle in achieving a balance lay in the close association he made between evolutionary progress and technological progress. According to Huxley, humans had at least one ability that made them unique, and that was their ability to control their environment through technology. Through conscious, wilful use of their own evolved intelligence, humans had attained agency over their own evolution. This same intelligence would also be able to generate human values, giving rise to ‘morality, pure intellect, aesthetics, and creative activity’. For Huxley, ‘Man’ had attained a certain status in evolutionary history by virtue of possessing this controlling intelligence. Humans were not just unlike any other animal forms, they were the most ‘unique’ and ‘highest’ of all organisms on earth.²² For Huxley, evolution, was thus ‘as much a product of blind forces as is the falling of a stone to earth or the ebb and flow of the tides’, but purpose itself would only come from human will. He wrote ‘if we wish to work towards a purpose for the future of man, we must formulate that purpose ourselves. Purposes in life are made, not found’.²³ Evolutionary progress in Huxley’s form was as mechanistic and nonpurposive as possible, yet made room enough for free will.

This same evolutionary framework, that was progressive and lent human agency, also made possible the control of human heredity leading to human improvement, and was translated into Huxley’s ardent support of eugenics, in a ‘modernised’ or liberalised form that was wary of ethnic, race and class bias. Huxley’s support of this ‘reform’ eugenics was in fact a dominant theme in his evolutionary worldview.²⁴

Finally, for Huxley, evolutionary progress and evolutionary humanism were to do one more thing: they would stabilise an ideology. The last two pages of *Evolution: The Modern Synthesis* reveal the complex interplay between science, worldview and ideology. First

²² Huxley wrote an entire book on the uniqueness of humans: J.S. Huxley, *The Uniqueness of Man* (London, 1941). In the United States this book was published as *Man Stands Alone* (New York, 1941).

²³ Huxley, *Evolution: The Modern Synthesis* (n. 16), 576.

²⁴ Julian Huxley was a life-long advocate of eugenics, becoming President of the Eugenics Society in the 1960s. For an analysis of the complex twists and turns in Huxley’s support of eugenics, especially his support of postwar ‘reform eugenics’, see G. Allen, ‘Julian Huxley and the eugenical view of human evolution’, in Waters and Van Helden, *Julian Huxley* (n. 5), 193-222; and David Hubback, ‘Julian Huxley and eugenics’, in Keynes and Harrison, *Evolutionary Studies* (n. 5), 194-206.

echoing two of the great icons of his age, George Orwell and Eugene Ionesco, Huxley revealed his fears of the growing collective movements – of both the political right and left – of the 1930s. To Huxley, these collectives threatened to lead to ‘subordination of the individual’. Upholding an overly purposive or teleological perspective was an equally distasteful prospect, since it meant that life would be fulfilled in a ‘supernatural world’. The struggle to avoid both collectivism and teleology was the struggle Huxley saw facing the modern world. It was his hope that his theory of progressive evolution would provide solutions to these problems, and at the same time resolve the ‘central’ problem of evolution. In Huxley’s theoretical formulation of progressive evolution, selection acted on the individual level so that the individual could be ‘unique’ at the same time that it existed in a populational or social group.²⁵ Neither totally mechanistic/materialistic (hence avoiding the politically extreme left wing of atheists and communists), nor too vitalistic/spiritual/mystical (hence avoiding the extreme right wing of fascists, Nazis and religious fundamentalists), Huxley’s evolutionary framework balanced just enough mechanism and materialism with purpose and progress to sustain and justify a moderate liberal ideology. The threat to evolution that Huxley attributed at the end of the first chapter to the extremes of Henri Bergson, the ultravitalistic metaphysician, and William Bateson, the ultramechanistic materialist, was thus to be neutralised by a mechanistic yet purposive view of evolution. After World War II, Huxley and his framework would in turn sustain an increasingly moderate, popular liberal ideology with a view of an independent biological science.

Because the book had a clear political and ethical agenda and because it appeared to have an unconventional organisation (some complained it was disorganised), and perhaps because it really was not original in terms of scientific insights, it was not as well received by fellow scientists as other books that are associated closely with the evolutionary synthesis.

Evolutionists never really thought the book properly synthetic in the way that Theodosius Dobzhansky’s older *Genetics and the Origin of Species* was.²⁶ Huxley’s book did, however, become a popular account of evolution reaching far wider audiences. Huxley was a popular writer, an authority on current evolutionary science, and even more importantly, was rapidly attaining celebrity status in Britain as a result of his masterful appearances from 1939 on the

²⁵See Huxley, *Uniqueness of Man* (n. 22).

²⁶T. Dobzhansky, *Genetics and the Origin of Species* (New York, 1937).

BBC radio programme the Brains Trust.²⁷ The book appeared just before his popularity peaked as a result of this show. It was published simultaneously in Britain and the United States, was widely distributed, and was cited as an authoritative source on evolution during the postwar period, especially by readers interested in general science. For these wider audiences, the book served to herald the coming of the unified biological sciences now ‘modernised’ and rivalling both physics and chemistry. With its emphasis on evolutionary progress, furthermore, the book offered an enquiry into an ethical system grounded in evolution and a worldview that supported a liberal, secular and progressive ideology. Evolution was thus presented as a legitimate, rigorous and palatable science that was heavily materialistic and mechanistic, yet left enough room for purposiveness and free will for human beings.

The postwar period

Belief in such a scientific worldview that made evolution by natural selection accountable for life became even more needed in the postwar period. As the horrors of the Holocaust became known and nuclear threat loomed with the Cold War, a framework that endorsed the fundamental adaptability of life that offered some progress, a moderate or liberal ideology, and an optimistic and coherent worldview with humans as agents of their own evolution became even more urgent. For many evolutionists, only with progressive evolution would human ‘improvement’ be thought possible. Huxley’s version of evolutionary humanism also helped account for, justify and accelerate first atomic-age and then space-age technology. By the early 1960s – the same historical moment characterised as the most prosperous and optimistic in recent American history – belief in selection culminated with panselectionism, an overarching selectionist theory supporting the view that natural selection had extreme power to shape evolutionary history: social improvement and biological improvement could both be engineered with the same evolutionary technology.

Evolutionary progress through the mechanism of evolution, though it appeared to be a contradiction, struck just the right balance between purpose, progress and mechanistic materialism – it was deterministic enough to be predictable yet not enough to remove free will

²⁷ H. Thomas, *Britain’s Brains Trust* (London, 1944). See also D. L. Lemahieu, ‘The

– for a wide audience of evolutionists who took their views through textbooks, semi-popular works and essays addressed to the wider audience of scientists. Closely echoing Huxley were his evolutionary colleagues who upheld doctrines of evolutionary progress throughout the 1940s, 1950s and 1960s: Theodosius Dobzhansky, G. Ledyard Stebbins, Hermann J. Muller, G.G. Simpson and even Ernst Mayr.²⁸ All came to subscribe to versions of evolutionary progress at the same time that they made natural selection a mechanism. Each of these evolutionists in some fashion addressed the ‘future of Mankind’ either in concluding chapters of their books or in more popular books written at later stages of their careers. For example, G.G. Simpson strongly echoed Huxley when he wrote:

It is another unique quality of man that he for the first time in the history of life has increasing power to choose his course and to influence his own future evolution. It would be rash indeed to attempt to predict his choice. The possibility of choice can be shown to exist. This makes rational the hope that choice may sometime lead to what is good and right for man. Responsibility for defining and for seeking that end belongs to all of us.²⁹

The links between all these evolutionists were solidified, formalised and indeed *disciplined* in 1946 when they came together to found the first international society for the study of evolution, the Society for the Study of Evolution (SSE).³⁰ Huxley had been in on that from the start. In 1939, at a special ‘Symposium on speciation’ organised by Dobzhansky for the American Association for the Advancement of Science (AAAS) meetings in Columbus, Ohio, Huxley met with him, Carl Epling and Ernst Mayr to suggest the formation of an official

ambiguity of popularization’, in Waters and Van Helden, *Julian Huxley* (n. 5), 252-6.

²⁸ For instance, T. Dobzhansky, *Mankind Evolving: The Evolution of the Human Species* (New Haven, Conn., 1962); idem. *The Biology of Ultimate Concern* (New York, 1967); and Dobzhansky’s ‘Introduction’ to the ‘Life Nature Library Series’ volume by R.E. Moore, *Evolution* (New York, 1962). See also G.G. Simpson, *The Meaning of Evolution* (New Haven, Conn., 1949); idem, *This View of Life: The World of an Evolutionist* (New York, 1964); idem, *Biology and Man* (New York, 1969). See also an unpublished monograph in the author’s possession by G. Ledyard Stebbins entitled ‘Objectives and philosophy of an evolutionist’. And for discussion of themes of progress in Huxley’s and Simpson’s works, see M. Swetlitz, ‘Julian Huxley, George Gaylord Simpson and the idea of progress in 20th century biology’, University of Chicago PhD thesis, 1991. For general discussion of progress in evolution, see Nitecki, *Evolutionary Progress* (n. 12), and Ruse, *Monad to Man* (n.12).

²⁹ Simpson, *Meaning of Evolution* (n. 28), 348.

³⁰ V.B. Smocovitis, ‘Organizing evolution: founding the society for the study of evolution, 1939-1947’, *Journal of the History of Biology*, 7, 1994, 241-309.

Society for the Study of Speciation. An informal society that functioned as an information service was indeed formed in the United States, but it was thwarted by the outbreak of the war. After a series of attempts to bring workers together, and after the end of war, the formal society was officially founded at the AAAS meetings in St Louis in 1946. A grant proposal submitted to the American Philosophical Society by two of the ‘architects’ of the synthesis, Ernst Mayr and G.G. Simpson, to help fund the new journal *Evolution*, highlighted the fact that the journal would help in ‘unifying the fields’.³¹ These same individuals joined forces on the occasion of the bicentennial of Princeton University in 1947 and celebrated what they recognised as the new discipline – evolutionary biology – whose purpose would be to unify biology. In writing the summation to the edited volume of the proceedings published shortly thereafter, Hermann J. Muller wrote that a ‘convergence of evolutionary disciplines’ had taken place.³² Muller argued that the process of synthesis had given rise to a new type of evolutionist, the synthetic type of evolutionist. Closing with the scientific points of agreement, Muller then moved on to explore what all this meant for the formulation of a meaningful worldview. Though he recognised that a mechanistic and materialistic view of evolution did not bode well for the future of all species, he echoed Huxley in his belief that humans could rise above their own evolutionary destiny. In a soaring passage he wrote: ‘If, then, we wish evolution to proceed in ways that we consider progressive, we ourselves must become the agents that make it do so. All of our studies of evolution must finally converge in that direction’.³³

Julian Huxley had not just been a keen organiser on behalf of evolution; through his writing he had helped shape the discipline and give it its characteristic flavour as well as give it its close relations to the modernised biology. He was one of the first to explicitly adopt the phrase ‘evolutionary biology’ in his 1942 book, giving the new science a disciplinary rubric that remained intact through much of the twentieth century. He subsequently took every opportunity to promote the new science as the central science of biology, which in turn would serve as the central science in a unified theory of scientific knowledge. In 1949, in an address

³¹ As cited in J.A. Cain, ‘Common problems and cooperative solutions: organizational activities in evolutionary studies, 1936-1947’, *Isis*, 84, 1993, 1-25. Mayr and Simpson were successful in their grant application.

³² H. J. Muller, ‘Redintegration of symposium on genetics, paleontology and evolution’, in G. Jepsen, E. Mayr and G.G. Simpson, eds, *Genetics, Paleontology and Evolution* (Princeton, N.J., 1949; repr. New York, 1963), 421-45.

³³ *Ibid.*, 445.

entitled 'Evolution and scientific reality', he wrote that 'one of the outstanding events in scientific history has been the emergence, during the second quarter of the present century, of evolutionary biology as a science in its own right'. Drawing a comparison with the way that the germ theory of disease had been consumed by the new sciences of bacteriology and microbiology, Huxley then noted that 'in a rather similar way, the evolution theory has today been swallowed in that science of evolution – evolutionary biology. The difference is that, while microbiology is a departmental branch of science, involving a certain definable field, evolutionary biology is a central science, with ideas demarcating all other branches of the life science'. Huxley continued: 'this you may say, is by now a commonplace. However, I do not consider that all the implications of evolutionary biology have been grasped. They have not been fully grasped at all in relation to science as a whole, from physics on the one hand to psychology and the human sciences on the other'.³⁴

Nearly four years later, in another well-known book, *Evolution in Action*, Huxley extended the reach of evolutionary biology to the universe at large to make it become part of a cosmic evolutionary process:

Evolutionary science is a discipline or subject in its own right. But it is the joint product of a number of separate branches of study and learning. Biology provides its central and largest component, but it has also received indispensable contributions from pure physics and chemistry, cosmogony and geology among the natural sciences, archaeology and prehistory, psychology and anthropology. As a result, the present is the first period in which we have been able to grasp that the universe is a process in time and to get a first glimpse of our true relation with it. We can see ourselves as history, and can see that history in its proper relation with the history of the universe as a whole.³⁵

Huxley's cosmic unifying vision met with sympathetic resonance as a generation of astronomers and cosmologists began to see the universe as part of an historical process, an evolving entity that reflected progressive evolution. Cosmic, galactic, stellar, planetary, chemical, organic and cultural evolution began to emerge as a continuum in 'unified'

³⁴ Huxley Papers, Rice University, Houston, Tex., manuscript entitled 'Evolution and scientific reality', dated 1949, Box 67.7.

³⁵ J. Huxley, *Evolution in Action* (New York, 1958), 1-3.

evolutionary cosmology as astronomers, physicists, chemists and even social scientists began to look to each other, and to each other's disciplines, in their vision of a unified theory of knowledge. From leading figures like Sir James Jeans, Arthur Eddington and Fred Hoyle to Jacob Bronowski and Loren Eiseley, the belief in evolutionary progress through the mechanism of natural selection began to be extended to formulate the beginnings of a unified theory of knowledge in the postwar period. Biology occupied a central niche within this unified theory of knowledge, and immediately after the war, biology itself would be organised into one enormous 'umbrella' organisation in the United States called the American Institute of Biological Sciences (AIBS). The 'architects' of the evolutionary synthesis continued to operate within this organisation to argue that evolution unified the biological sciences. Beginning in the 1950s and continuing through the 1960s and 1970s arguments were made that evolution served as 'the central organising principle' of the biological sciences and that 'nothing in biology made sense except in the light of evolution'.³⁶

The unity of knowledge itself – what it was, what it would entail, and what it would mean for the 'future of modern man' – came to dominate discussions in wide intellectual circles in the 1950s. This was not simply a response to the philosophical Unity of Science Movement launched by the crusaders within the Vienna Circle, nor was it inspired directly by their Encyclopedia of Unified Science project; this was a new global movement that was reflected in intellectual circles worldwide as they recognised the possibility of a global community of shared values where education would play a central role. This was no more apparent than in the theme of Columbia University's bicentennial conference of 1954. The full title of the conference was 'Unity of knowledge' and the central theme was 'Man's right to knowledge and the free use thereof'. The list of contributors to, and participants in, this conference and its edited collection of works reflected the grand sweep of the unity of knowledge: Pierre Teilhard de Chardin, Theodosius Dobzhansky, Julian Huxley, Talcott Parsons, B.F. Skinner, Harold Urey, Niels Bohr, John Von Neumann, Willard V.O. Quine, Ernest Nagel and Philipp Frank. All of these individuals were linked, if not enveloped by the same Enlightenment ideals brought to light: unity and diversity, progress, and a belief in a liberal, secular and

³⁶ By 1973 this argument also warded off the rise of scientific creationist assaults in the United States aimed at doing away with the teaching of evolution in high schools. T. Dobzhansky, 'Nothing in biology makes sense except in the light of evolution', *American Biology Teacher*, 35, 1973, 125-9.

evolutionary humanism. Huxley's own contribution to this conference once again reified and updated his grandfather's famous attempt to determine 'Man's place and role in nature'.³⁷

Huxley's ideological commitments materialised most fully outside traditional academic domains, however. Not holding a traditional academic position since his resignation from King's College in 1927, Huxley put his formidable administrative talents to use in promoting science first as Secretary to the London Zoological Society between 1935 and 1942, then took the unprecedented step of becoming the first full-time secretary to United Nation's Educational and Scientific Cultural Organization (UNESCO) from 1946 to 1948. It was on his and his colleague's Joseph Needham's insistence that the 'S' for science was formally included in UNESCO. His first charge as secretary of the Preparatory Commission was to draft a charter for the new agency. It comes as no surprise that Huxley wasted no time in directing the commission; this was the perfect opportunity to apply his deepest belief in the guiding force of evolutionary humanism. Drafting a 60-page booklet for the new commission entitled 'UNESCO, its purpose and philosophy', Huxley set forth the policy that the UN could not rely on conventional religious philosophies or doctrines, nor on any academic theories. He argued forcefully for the power of 'scientific humanism', in what amounted to an evolutionary manifesto that would guide and unify humanity:

UNESCO must work in the context of what I call *Scientific Humanism*, based on established facts of biological adaptation and advance, brought about by means of Darwinian selection, continued into the human sphere by psycho-social pressures, and leading to some kind of advance, even progress, with increased human control and conservation of the environment and natural forces.³⁸

Huxley's views were met with less than enthusiasm, however. They did not sit well with other members of the commission who rejected the pamphlet, which they thought reflected a dangerously atheistic worldview. A small slip was inserted into the published document stating it reflected the personal views of the author. Huxley was nonetheless given the honour the following year of being elected the first Director-General of UNESCO, though he was

³⁷ See L. Leary, ed., *The Unity of Knowledge* (New York, 1955) for a description of the conference, its aims and goals, along with a more detailed list of participants.

³⁸ J. S. Huxley, *Memories*, vol. 2 (New York, 1973), 15. See also G. Blue, 'Scientific humanism and the founding of UNESCO', *Comparative Criticism*, 23, 2001, 173-200.

given the position for only two years instead of the constitutional six.³⁹ There is some indication that the American delegation urged the reduction of his term to the two years. Huxley served out his term and put much of his liberal philosophy to work by supporting international conservation efforts through the creation of state parks and the special preservation of natural sites. He also supported the creation of museums and institutions to safeguard cultural and historical artifacts and traditions. He was actively involved in promoting birth control, especially in developing nations. Though he had stepped down as Director-General, he continued to play an active role in drafting the first UNESCO Statement on Race, which appeared in 1950 and denied the existence of innate biological and mental differences between different human 'races'. Though some of this work has been subsequently criticised as being less than liberal, and even elitist, there is little doubt that Huxley shaped the character of the organisation during that critical early period.⁴⁰ Reflecting on Huxley's accomplishments overall, Assistant Director Richard Hoggart noted that:

He was less perceptive in proposing that the Organization propound a world philosophy, a new humanism; that could never have been adopted. But in general he kept up the flow of good ideas through the two years of his tenure, and his speech to his last General Conference is still not only useful but exciting reading. He gave UNESCO an intellectual head of steam and a restless sense of enquiry at its start.⁴¹

Walter Laves and Charles Thomson, respectively the assistant director of UNESCO and the director of the U.S. National Commission of UNESCO under Huxley, echoed some of Hoggart's reflections when they wrote, 'Probably no one person more directly influenced the content and direction of UNESCO. Indeed, he was largely responsible for charting the broad course to which the organisation became committed during the early years'.⁴² Whatever the influence of Huxley's two years in UNESCO, the 'S' survives and serves as a permanent reminder of Huxley's guiding mission.

³⁹ W.H.G. Armytage, 'The first Director-General of UNESCO', in Keynes and Harrison, *Evolutionary Studies* (n. 5), 186-193. Armytage gives a fuller discussion of Huxley's election.

⁴⁰ See Waters and Van Helden, *Julian Huxley* (n. 5) for some of these criticisms.

⁴¹ Richard Hoggart, *An Idea and its Servants. UNESCO from Within* (Oxford, 1978).

⁴² W.H.C. Laves and C.A. Thomson, *UNESCO, Purpose, Progress, Prospects* (Bloomington, Ind., 1957), 295.

Huxley's unifying vision extended

After leaving his position at UNESCO, Huxley continued his work on related commissions promoting his liberal causes and continued to capitalise on his fame and celebrity status by writing for mostly popular or semi-popular audiences. His 1942 book continued to be read and cited widely. He travelled extensively, continued to make public appearances and, inevitably, he found newer and more popular audiences that were opened up and created by the growing telecommunications technology. Capitalising on the celebrity he had acquired in the 1940s through the Brains Trust, one of the most popular radio programmes of the BBC, Huxley continued to charm audiences throughout the 1950s and 1960s as he was frequently heard as spokesperson of science, first on radio and then on television programmes. He was an engaging speaker, and a charismatic showman.

This native talent and his worldview were put to use at what we can view as the apogee of the evolutionary synthesis when Huxley was invited to give a special convocation address in 1959 on the occasion of the 100th anniversary of the publication of Darwin's *On the Origin of Species*.⁴³ A grand celebration organised by anthropologist Sol Tax and a special committee at the University of Chicago was staged that included an organised media-blitz rivalling that for the coronation of Queen Elizabeth II. As grandson of Thomas Henry, and as honorary visiting professor at the University of Chicago for the year, Huxley was one of highlights of the five-day conference that culminated in a special secular service on Thanksgiving day in the Rockefeller Chapel. Given the pulpit for the convocation address, Huxley delivered what is probably his most famous – indeed notorious – lecture of all, his 'secular sermon' entitled 'The evolutionary vision'. Huxley's lecture once again embodied his unifying vision made possible by evolutionary humanism. Religion, according to Huxley, was but an 'organ of evolving man', and the time had come for a 'new organization of thought' based on the new evolutionary vision. He continued:

⁴³ V.B. Smocovitis, 'The 1959 Darwin centennial celebration in America', in Clark Elliott and Pnina Abir-Am, eds, *Commemorations of Scientific Grandeur, Osiris*, 14, 1999, 274-323.

Evolutionary man can no longer take refuge from his loneliness in the arms of a divinized father-figure whom he has himself created, nor escape from the responsibility of making decisions by sheltering under the umbrella of Divine Authority, nor absolve himself from the hard task of meeting his present problems and planning his future by relying on the will of an omniscient, but unfortunately inscrutable, Providence.

Furthermore, the 'evolutionary vision,' as 'opened up to us' by Charles Darwin, 'exemplifies the truth that truth is great and will prevail, and the greater truth that truth will set us free'.

'Evolutionary truth' could, he added, free humans from 'subservient' fears, and showed the way to 'our destiny and our duty'.⁴⁴

On that occasion, at least, Huxley's 'secular sermon' was not well received: many of the audience members, including numerous scientists, later reported that they were stunned by the lack of discretion that Huxley had displayed, though none so publicly or vociferously as the popular press which feasted on the newsworthiness of Huxley's fire and brimstone secular sermon. Clearly not all was acceptable in Huxley's ideology, especially when stated this baldly to conservative American audiences. Yet Huxley's evolutionary humanism, in various guises, continued to have broad enough and, I would argue, enduring appeal throughout the 1950s and well into the closing decades of the twentieth century. Versions of it were picked up and extended, if not echoed, by other popularisers at the same time, such as Loren Eiseley. His popular book *Immense Journey* picked up much the same cosmic striving for a unified whole based on evolution and influenced a generation of younger scientists.⁴⁵ Evolutionary humanism was perhaps best seen in the worldview transmitted by Jacob Bronowski in his popular television show *The Ascent of Man*, in the early 1970s.⁴⁶ And, Huxley's evolutionary humanism reached vast international television audiences in the 1980s and well into the 1990s through the American Public Broadcasting Services show *Cosmos*.⁴⁷ Beginning with episode 2, entitled 'One voice in the cosmic fugue', Carl Sagan grounded his unifying vision of the

⁴⁴ J. Huxley, 'The evolutionary vision: the convocation address', in Sol Tax and Charles Callender, eds, *Evolution after Darwin*, vol. 3 (Chicago, 1960), 249-61.

⁴⁵ L. Eiseley, *The Immense Journey* (New York, 1959).

⁴⁶ J. Bronowski, *The Ascent of Man* (London, 1973).

cosmos in evolutionary theory as it had emerged from the work of Julian Huxley and the other architects of the evolutionary synthesis.⁴⁸

Carrying the torch of unity and synthesis into the twenty-first century was the unchallenged heir to the synthesis, E.O. Wilson. His unifying project extended the synthetic theory to realms of human social behaviour, beginning with his controversial 1975 book *Sociobiology: The New Synthesis*.⁴⁹ A compact popular account, *On Human Nature*,⁵⁰ extended his evolutionary vision to include humanistic concerns like agency, free will, and religious belief. Wilson's last book, *Consilience: The Unity of Knowledge*, the most ambitious of all, argued for the extension of the synthetic project to the whole of knowledge, bringing the humanities into the realm of the sciences.⁵¹ Through what he terms 'unification metaphysics', Wilson claims release from 'the confinement of fundamentalist religion'. The concluding chapter of this book echoes beliefs that all these books have in common and that originated with Huxley: although humans are animals subject to mechanistic forces like natural selection, humans are unique in their ability to know and to override evolutionary determinism. According to Wilson, 'thanks to advances in genetics and molecular biology, hereditary change will soon depend less on natural selection than on social science'. The prospect of what he terms 'volitional evolution', which Wilson takes to mean 'a species deciding what to do about its own heredity', will present 'the most profound intellectual and ethical choices that humanity has ever faced'.⁵² Evocative of Huxley he concludes that *Homo sapiens* is the first 'truly free species', because it is the species that 'decommissions' natural selection as the 'force that made us'.⁵³

Closing thoughts

Evolutionary humanism, thanks first to the special efforts of biologists like Huxley, other architects of the evolutionary synthesis, and their numerous disciplines and heirs like Carl

⁴⁷ C. Sagan, *Cosmos* (New York, 1980).

⁴⁸ Sagan had once been a student of H.J. Muller, who in turn had worked closely with Julian Huxley.

⁴⁹ E.O. Wilson, *Sociobiology: The New Synthesis* (Cambridge, Mass., 1975).

⁵⁰ E.O. Wilson, *On Human Nature* (Cambridge, Mass., 1978).

⁵¹ E.O. Wilson, *Consilience: The Unity of Knowledge* (New York, 1998).

⁵² *Ibid.*, 273.

Sagan and E.O. Wilson, reached vast popular audiences in the latter half of the twentieth century. It was also simultaneously disciplined through the efforts of a narrower community of evolutionists through the science of evolutionary biology and its organisations like the Society for the Study of Evolution. These beliefs were extended through textbooks, semi-popular books, radio and television programmes to vast audiences. How has the drive for unity affected the efforts of such scientists? In the case of evolution I would argue that it has been the central problem in the field; the 'unification metaphysics' described by Wilson and so perfectly demonstrated by his attempts to unify all knowledge in *Consilience* is probably held up by a majority of practising evolutionary biologists. As the case of Wilson also demonstrates, some version of Huxley's evolutionary humanism remains alive and well within a liberal, secular framework, even though evolutionary progress is no longer a credible belief in evolutionary science.

What general conclusions can we then draw about the attempts to unify biology in the twentieth century? For one thing, we see how evolution served as the vehicle for the unification of the biological sciences following the evolutionary synthesis. Arguments like 'evolution is the central organising principle' and 'nothing in biology makes sense except in the light of evolution' abound in the period following the evolutionary synthesis. Within what had previously been perceived as the fragmented biological sciences, evolution was to serve as the unifying element of a unified modern biology. It simultaneously performed a range of functions that led to arguments for not just the unity of biology, but also for the unity of the sciences, the unity of knowledge, and all ultimately offering a coherent worldview. This worldview offered an ethical or moral system, a stable political ideology – liberal, progressive and secular – at the same time that it supported an autonomous science of biology. The appeal of this worldview is perhaps due to the fact that, being grounded in evolutionary science, it appeared benignly political or even apolitical. For Huxley himself it was a way to truth, which would prevail in the service of universal 'mankind'. Such is the power of evolutionary science, which could appear, and I would argue continues to appear, as though it were a value-neutral science capable of supporting a worldview that is taken to incorporate universal human values and to be ideologically neutral.

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Figure caption

3.1 Sir Julian Huxley at the pulpit of Rockefeller Chapel, Chicago, 1959, delivering his address 'The evolutionary vision'. Source: Darwin Centennial Papers, Department of Special Collections, Joseph Regenstein Library, University of Chicago. Reproduced with permission.