

Two Views of Consilience

Edward O. Wilson

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Reviewed by Max Payne and Brian Goodwin

This is a seriously important book. The beginning and the end are superb, and if in the middle Wilson's total intellectual honesty undermines his final thesis, then this is the hallmark of a considerable work, if not a great one. Wilson is a polymath. His professional expertise stretches from the physiology of ants, through the conservation of the environment, to experiments in the nature of artistic creation. He is as well read in philosophy as many academic practitioners, and better equipped than most to live up to his own demand for "consilience".

"Consilience" is Wilson's requirement that everything shall be seen to fit together in one system of knowledge. We live in one universe with us ourselves inside it. Our knowledge should not be fragmented, but must strive after the same holistic unity as reality. Wilson repeatedly asserts that consilience does not mean naive reductionism. Analysis into parts is a royal road to knowledge, but so too is synthesising the fragments into a wider unity. The whole is often greater than the sum of its parts.

Wilson begins with a stirring defence of science as being the best form of knowledge the human race has ever devised. He defends science against religious dogmatism and fashionable post-modernism with equal vigour. Most scientists do not realise how precarious is the hold that science has on contemporary Western civilisation. Technology may forge ahead giving us new gadgets, but the scientific idea of impartial universal rationality is at a discount in university departments of humanities, and in the popular culture of the mass media. Religion is the old enemy, but Wilson deals equally severely with the new enemy of fashionable relativism, and nihilism. The book ends with a chilling analysis of world population growth and the future of humanity. Anyone aged more than 60 years has seen the world's population triple from 2 billion to 6 billion. A further tripling will take us to 18 billion, which is 2 billion over the maximum of the 16 billion that Wilson calculates this planet can sustain. We can draw as many blank cheques as we like on the hope that the rich will share with the poor, and that nuclear power will irrigate the Sahara. The upper limit is set by the total amount of the sun's energy available for conversion by photosynthesis into food. This is about 40 trillion watts, and will support approximately 16 billion frugal vegetarian peasants on a planet from which most other life forms have vanished. We can forget atomic war, bio terrorism or invasion from outer space. Mankind has a problem it has only just begun to face. Opposition to any form of artificial limitation on human fertility may come to be regarded as a crime against humanity on a par with the activities of Adolf Hitler and Pol Pot.

In Wilson's view "The central idea of the consilience world view is that all tangible phenomena, from the birth of the stars to the workings of social institutions, are based on material processes that are ultimately reducible, however long and tortuous the sequences, to the laws of physics." This is a grand hypothesis; and needs to be tested to its limits. The power and honesty of Wilson's thought demand it. In the opinion of this reviewer he fails, but his great synoptic vision is certainly worth the attempt. Despite the vast range of his expertise, Wilson is not a quantum theorist, so, perhaps wisely, he leaves it alone. Yet there

are problems. Sub-atomic energies certainly inhabit a reality very different from our own, but when all the wave equations are collapsed, and all the randomness has been added up to statistical precision, do we need to worry about the peculiar world of sub-atomic energy? Can we carry on with the material world given by our senses as happily as before? Wilson assumes we can. But quantum theory could be a black hole, literally and metaphorically, into which our universe collapses, and out of which we emerge into other realities. Roy Frieden has argued that the basic laws of physics are deducible from information theory, and Paul Davies suggests that if matter is organised information consciousness may not be so mysterious after all.

Perhaps it is unfair to suggest that Wilson's rather naive materialism may be already dated, because his demand that everything must fit together remains valid. The synthesis according to consilience starts with sub-atomic energies and then assembles up through complexity theory to atoms, molecules, the simple cell and up into complex forms of biological life. As a biologist, he views the whole vast process as exemplifying evolution through natural selection. The problems begin to arise when we reach man and his inner consciousness. Wilson believes in synthesis, but he is ruthless with any premature optimism that claims that a synthetic unity has been achieved, when it has not. In his opinion our knowledge of the workings of the brain is still far too crude to justify any claim that we know how neurones produce the mind. Similarly the chances of any computer being endowed with intelligence are extremely remote. Even so he thinks that the brain / mind problem can be solved in principle. If I can be given an exact statement of my brain state in an iconic image, then I know what my physical brain state is when I see the colour "red", or fall in love. In same way I can read the icons of another person's brain state, and know directly that they are having the inner experience of seeing "red" or being in love. In this way the gap between brain and mind can be bridged. It could be that this solves the problem, but a few questions remain. Does the brain structure icon merely record the existence of the inner conscious experience, or does it produce it? What is the power of understanding that perceives the icon, and knows the inner perceiving of "red", and then correlates the two.? It could be that consciousness is an irreducible surd which cannot be eliminated from all attempts to explain it away in terms of something else.

Consilience mounts up from biology to psychology, and on through sociology and economics to ethics and religion. Wilson is one of the founders of socio-biology. At each level he exposes how its practitioners fail to incorporate an understanding of the level beneath. The psychologists do not recognise the importance of biology and physiology in determining human action. Sociologists take little account of individual psychology in working out the mechanics of social interaction. Economists fail to recognise that their numerical units of financial choice happen to be men and women with powerful cultural values, and strong personal preferences. After reading Wilson anyone will take the expert pronouncements of any of the social sciences with an additional pinch of salt.

The summit this consilient structure is ethics and religion. Wilson holds that there are two positions with regard to values - transcendentalists and empiricists. Transcendentalists believe that moral values are given by the command of God, or emerge from some spiritual realm beyond this world. Empiricists think that human values have emerged by a process of natural selection. The hand and the eye are the product of biological evolution. The power to see and grasp confers an advantage in the struggle for survival. In the same way ethics are a product of social evolution. Societies that imbue their members with a code of altruistic

self-sacrifice are more likely to survive and pass on their cultural inheritance. Wilson is an empiricist. He considers altruism is right because it confers evolutionary advantage.

Usually materialists regard religion as an illusion to be dismissed, but Wilson is far too rigorous a socio-biologist. Religious belief is one of the most powerful aspects of human culture, and he explains its evolution very convincingly in terms of the need for emotional security, and the social requirement for rituals that give group coherence. Indeed I have never read a better socio-biological case for any set of human customs. And that should be that, except that Wilson does not believe in religion. He even gives quite good reasons for not believing, but he gives no explanation of what he is doing, when he does so. On his own terms he is a transcendentalist looking down on evolution from an empyrean rational heaven judging that the material process of evolution leads to mistakes. And on his own terms he cannot do this. As a good empiricist he should merely be saying 'this is what evolution has done, so we must accept it'.

There are serious difficulties with Wilson's theory of consilience. They probably demonstrate that it is difficult for systematic materialism to provide a totally consilient picture of human experience. However one should be grateful to him for raising the question so forcefully and clearly.

Max Payne is a former lecturer in philosophy and chair of the Network Trustees.

Jumping Together into Difficulties

Cultural traditions are punctuated by attempts by major participants to describe the essence of the tradition, to assess how far it has travelled towards its goals and how best to achieve them in the foreseeable future. Now that biology has begun to overtake physics as the dominant strand of the 400 year enterprise of modern science, it is not surprising that the figures coming forward to take on this role are biologists working from the perceived centre of gravity of the subject - evolution.

E.O. Wilson, named the new Darwin by Tom Wolfe, takes on this task in his ambitious new book. Evolution came to him in his youth as a revelation, an epiphany that provided a dynamic context for his first love - grasping the wondrous diversity of living nature through naming and classifying its creatures. Wilson's twin passions of encountering and getting to know everything that moves, from ants and termites to sharks and whales, together with his deep need to order and explain the phenomenal variety of living forms, have given rise to a series of widely acclaimed books containing some of the most moving and articulate expressions of the insights achieved within the biological tradition. The latest volume celebrates the enlightenment ideal of seeking a unified conceptual framework for understanding an intrinsically orderly world, based on faith in the potential of indefinite human progress in this direction. Consilience means "jumping together", a word Wilson prefers to coherence to express the linking of fact-based disciplines to create a common framework of explanation. The explicit goal of the book is to define such a framework for the union of natural science with the humanities, thus returning to the theme of Wilson's earlier Sociobiology. He is well aware that in returning to this ground he is walking through a minefield, so he mobilises all his considerable skills of persuasion and conciliation. However, in the end the narrowness of his conceptual base undermines the ambitious building he tries to construct.

The scope of *Consilience* is vast, as befits its theme. The historical depth that Wilson brings to his enquiry is impressive, so that his judgements about contemporary trends are well grounded in past movements. His references are not just standard Descartes, Bacon, Hume and Locke, but Condorcet, Goethe, Moore and Rawls as well. However, on Goethe he fails in terms of his own criteria of empirical understanding by doing and observing, since it is clear that he has never performed Goethe's simple experiments with a prism to discover a different approach to light than Newton's, complementary rather than conflicting. A failure to recognise such ways of extending science to include 'secondary' qualities is one of the limitations of Wilson's attempts to encompass the humanities within a unified context.

Wilson starts from the observation that disciplinary boundaries are disappearing in science, and a movement towards some form of scientific holism is emerging. One of the greatest obstacles that he sees to "consilience by synthesis" is the exponential increase in the complexity discovered at each level of organisation: the continually unfolding detail of molecular activity within cells, of cellular interactions in the brain, of species diversity within ecosystems, to mention only biological examples. He recognises that the new sciences of complexity have their focus precisely on the attempt to understand how orderly properties arise from such complexity, but regards most work in this field as poorly grounded in biological detail. More data is needed!

Wilson has his own proposals for handling this problem. In relation to emergent patterns of human behaviour from the complexity of the brain, he uses the language of developmental biology: the study of the orderly and repeatable emergence of high-level morphological and behavioural characters during embryonic development of the adult organism from the fertilised egg. Aristotle's term for this process was epigenesis, which today can be interpreted as going beyond the genes. Wilson makes extensive use of the term 'epigenetic rules' to describe hereditary regularities of species, acknowledging that human nature is not in the genes. However human inheritance, shaped by natural selection, imposes constraints on human behaviour. This is the link that Wilson uses to "jump together" biology and the humanities, via the constraints of what he calls gene-culture co-evolution. Parental investment, mating strategies, territoriality, and incest avoidance are the foundations of human cultural patterns, with aesthetics and moral concepts derived from innate emotions designed by natural selection. Human culture emerges from, and is to be understood in terms of, such hereditary constraints on human behaviour.

Few people would disagree with the view that human morphology and behaviour are constrained by evolutionary history. The debate centres on the extent to which these constraints provide an adequate basis for understanding central aspects of human culture: myths and story-telling, cave paintings, sculpture and the visual arts generally, morality and religion. Wilson pushes hard on the necessary connections between biology and culture, seeing ethics in functional terms as the glue for the social contract that confers selective advantage on human communities, and belief in the supernatural as a biological advantage throughout prehistory. He argues that the human mind evolved to believe in gods, not biology or scientific truth.

Wilson's primary concern in bringing together the sciences and the humanities is to maintain continuity of reasoning from human prehistory to cultural history. Since Darwinism provides explanations in functional, adaptive terms, the same reasoning is applied to cultural phenomena. However, there are other traditions of explanation that also respect continuity from biology to culture but proceed with a different emphasis. One of the dominant aspects

of human cultural life has to do with the search for meaning, which of course includes science itself. There are two aspects of meaning: one formal or third person, involving relationships within a whole which concerns intelligibility; the other affective(feeling) or first person, which involves mattering. The following is a context for understanding much of cultural life that acknowledges the importance of biological roots but goes so far beyond them that they cease to have significant explanatory value. I quote from Peter Caws' *Structuralism: The Art of the Intelligible*(Humanities Press International, 1988).

"The roots of mattering lie in the structure of biological needs, and it is in the intelligent satisfaction of those needs that meaning first comes into play. In the case of the matching of a structure of praxis with a structure of desire the proportion of the purposive to the intelligible is very high; as the immediacy of needs lessens, the balance of the two components changes, until at an advanced stage of culture or education a very complex structure of intelligibility may be evoked by almost casual purposes. One of the ways in which the meaningfulness of significant activity is maintained is through an intention to pursue the intelligible for its own sake, and in high civilisations this becomes, in literature, music, art, and other forms of creative activity, the dominant exercise of meaning".

Such a context respects biology but also acknowledges emergent properties that can so far transcend their lower-level substrata that they function in an almost autonomous manner. Of course these structures still have functions, primarily the resolution of the complexity that Wilson recognises as a problem in the explosive growth of biological and other knowledge. This is a primary function of science itself. But Wilson's Darwinian functionalism is unable to articulate the intrinsic organisational properties of cultural structures. It thus falls considerably short of his own goal of consilience. There is a final aspect of Wilson's book that I would like to consider. He suggests that the enterprise within the social sciences best poised to bridge the gap to the natural sciences is economics, since it uses facts and mathematics in analysing economic processes. It seems at first quite odd that someone as passionately concerned about environmental and species destruction as Wilson should promote a subject that fails to take account of nature as a third partner with labour and capital in the business enterprise. However, this omission is more than compensated for at the end of the book, where Wilson argues with utter conviction for a reformed economics with full-cost accounting, and a moving appeal for an environmental ethic based on conservation rather than technological fixes: *homo sapiens* rather than *homo proteus*, as he describes the alternatives. This is the master at his most powerful, with his knowledge firmly attached to his ethics in a manner that demonstrates how is and ought belong together, as he insists should be the case.

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