

International Darwin Conference, Bradford (September 2009)
Abstracts

1) Darwin's Theory and Popper's theory of Evolutionary Epistemology

Michael Akeroyd (Bradford)

Darwin's theory was originally criticised by philosopher Karl Popper as being a metaphysical research programme i.e. a theoretical system of considerable merit but one incapable of being falsified. However he later became impressed by its central prediction of gradualism, which he equated with the central tenet of continuous revolution in his own model of scientific growth. The recent discoveries of fossil feathered dinosaurs in China now indicate that the transition from dinosaurs to birds was indeed as gradual as Darwin had predicted, thus providing corroborative evidence for the views of both Darwin and Popper.

2) Does depression need an evolutionary explanation?

Sarah Ashelford (Bradford)

In this paper I review the implications of Darwinian thought on the origins of depression. This topic forms part of the relatively new discipline of *evolutionary psychiatry*; itself a fusion of *Darwinian medicine* and *evolutionary psychology*¹.

In the first part of this paper I consider the nature of depression and consider the reasons why researchers might subscribe to the view that depression is an evolutionary adaptation. Can we seriously envisage long-term gains from such a serious illness as depression? Does the high incidence of depression in today's society require an evolutionary explanation?

I examine the two different categories into which evolutionary models of depression may fit²

1. 'Dysregulation' models, whereby researchers aim to elucidate the nature of the mechanisms that are activated in depression. Depression is considered as a disorder or 'dysregulation' of core psychological mechanisms. These models do not claim that depression is adaptive.
2. 'Adaptationalist' models that consider episodes of depression themselves to be evolutionary adaptations.

I consider what evidence may be required to support an adaptationalist model, and conclude that the data currently fails to support one. It cannot realistically be considered beneficial in evolutionary terms to experience an episode of depression.

Many researchers working under a 'dysregulation' model, consider the adaptive value of 'ordinary' low mood. Could it signal 'acceptance of social subordination'? or 'a means of disengaging from situations where a life goal cannot be met?'¹. I argue that these ideas remain highly speculative under our present understanding of depression.

I argue that 'dysregulation' models of depression can be best accommodated within the framework of 'stress-vulnerability' models of depression. Implications for treatment and the nature of disease will be discussed.

¹Nesse (2000) Is depression an adaptation? Archives of General Psychiatry 57 14-20

3) Karl Popper on Evolutionary Theory.

Steven Bond (Limerick)

Beginning with the 1978 publication of 'Natural Selection and the Emergence of Mind,' Popper famously recanted on his earlier contention that Darwin's theory of evolution was 'almost tautological.' In characterising 'natural selection' as a successful metaphysical research programme, Popper therein aimed to demarcate it from the untestability of tautological propositions, thus salvaging its explanatory power.

I apply Imre Lakatos' critique of Popper's 'naive falsifiability' (as evidenced in Popper's treatment of the case of Neptune's discovery) to the question of 'natural selection's' explanatory power. Specifically, the paper will focus on Darwin's treatment of the Madagascar Star Orchid (*Angraecum Sesquepedale*), as encountered in the botanical work of Aubert du Petit Thouars. From the description of this orchid's twelve inch nectary, Darwin famously and successfully predicted the existence of a moth pollinator, a prediction which Huxley directly equated to Neptune's discovery.

This paper aims to explore the significance of a single case of Darwinian prediction to the core 20th century debate about the scientific justification of the historical sciences (Popper/Lakatos/Kuhn), and the broader question of the status of scientific knowledge in general. Firstly, the theoretical frame of Lakatos' critique is applied to the specific case of *Angraecum Sesquepedale*, in illustration of the absence of 'risk' from Darwin's prediction. Secondly, the case is used to argue against the later Popperian view of evolutionary science itself as an explanatory discipline. Finally, the question is posed of whether or not a metaphysical research programme, whose connection to singular empirical events is an *ad hoc* one, can still lay claim to a privileged scientific status?

4) Martin Brinkworth, tba

5) Nation, politics and evolution: Colombian Darwinism in last decades of XIX century.

Nelson Chacón (Colombia)

In 1859 the first edition of the Charles Darwin work "On the Origin of Species" was published in London. This book is important not only for the spread of biological theories all along the western world and for forming the basis of a new discipline, but for developing a new thought in social world. Writers, theologians, scientifics, politicians and social thinkers were involved and concerned with Darwin's theories during the entire XIX century, and Latin America was no exception.

In Colombia, where an elite of local politicians were constructing the new nation, ideas of Darwinism, Positivism, and Evolutionism (Spencer, Comte, Mill) were considered adequate by local thinkers to be used as part of the official discourses and to reflect and explain the reasons of their political power. These ideas were understood as schemes filled by the evidence of the modern world, and became the truth of the moment. Generally speaking, Colombian intellectuals used Darwinism to interpret their realities and creating a social

vision of indigenous, black people, progress, and nation all from European-intellectual parameters.

To sum up, this paper will focus our discussion based on two topics: the main characteristics the theory was interned and displayed in public conferences, newspapers, politic speeches, study programs, and the forms in which Darwinism helped out to read realities of our country (poorness, race, progress, evolution).

6) Breaking the Bonds of Biology: Natural selection in Nelson and Winter's evolutionary economics.

Eugene Earnshaw-Whyte (Toronto)

Nelson and Winter's *An Evolutionary Theory of Economic Change* (1982) was the foundational work of what has become the thriving sub-discipline of evolutionary economics. In attempting to develop an alternative to neoclassical economics, they looked to borrow basic ideas from biology, in particular a concept of economic 'natural selection'. However, the evolutionary models they construct in their seminal work are in many respects quite different from the models of evolutionary biology. There is no reproduction in any usual sense, 'mutation' is directed as opposed to blind, and there is no meaningful distinction between phenotype and genotype. Despite these substantial departures from the conceptions of evolutionary biology, I argue that the 'evolutionary' biology of Nelson and Winter is indeed a legitimate extension of Darwinian evolutionary principles to a novel domain, and that the novel features of evolutionary economics models reflect the distinctive theoretical requirements faced by economists. I further contend that reproduction, blind variation, and the genotype/phenotype distinction are all inessential to evolutionary theory, and that their role in evolutionary biology is a domain-specific feature of biological theory specially.

7) Contingency and explanation in biology.

Andrew Hartline (Edinburgh)

There is general consensus that biology is, at least in large part, an historical science. But some philosophers talk as if biological explanation is like an historical account of a game of billiards, in which we call merely upon static laws operating on a dynamic succession of particular physical circumstances. This kind of understanding is inadequate, because so many *evolving* entities are called upon in biology to perform explanatory functions analogous to the timeless laws of physical science. Biological phenomena such as the Hardy-Weinberg law and the Krebs cycle are contingent historical entities that nevertheless offer an understanding of the world that goes beyond mere data; that is, an understanding that is appropriately thought of as scientific. The evolution of such contingent constraints on evolutionary change is a subject of further biological interest. In general then, biological phenomena involve change on multiple orders, as constraints on change emerge according to higher-order constraints.

An adequate account of biology, and in turn an adequate general account of science, will require a nuanced apprehension of the role that such evolving phenomena can play in scientific explanation.

8) Depression as an Evolutionary Adaptation.

Colin A Hendrie & Alisdair Pickles (Leeds)

Several lines of evidence suggest that rather than being a disease state, depression is an evolutionary adaptation. Adaptations are produced in response to selection pressures and similar adaptations may easily have evolved in a range of other species. The current paper seeks to identify the social pressures that may lead to a species developing depression as an adaptation and the potential benefits that this may confer. It is proposed that depression is useful in group-living animals where there is competition for a social rank that gives reproductive advantage over others. The cluster of symptoms associated with depression include, altered activity patterns, reduced sociability and appetite and increased defensiveness and submissiveness. This combination strongly suggests that the function of depression is to reduce the likelihood of an individual being subject to further attack once they have lost social status and so increase their chances of survival in the period immediately following this. Loss of social status is also associated with damage to reproductive potential and so there is 'cross-reactivity' with this. Hence, depression is triggered by events that compromise the transmission of genes into the next generation, such as relationship breakdown at a critical time of life or the loss of a child, as well as loss of social status. It is concluded that depression may be seen in a variety of species, but not those that are commonly used to model human depression in the laboratory.

Hendrie CA, Pickles AR (2009) Depression as an evolutionary adaptation: Implications for the development of preclinical models, *Medical Hypotheses*, in press doi: 10.1016/j.mehy.2008.09.053

9) Assessing the Impact of the Ideas of a Victorian Biologist in 2009 (Adrew K. G. Jones, Bradford)

10) A Darwinian account of self and free will

Gonzalo Munevar (Lawrence)

A Darwinian account can reinterpret Llinas' and Dennett's neurobiological claims against the existence of the self, as well as several experiments by Nielson, Walter, Libet and Wegner that conclude that free will, like the self, is an illusion. For Llinas there is no centralizing "organ" in the brain, no tangible self. The self is a form of perception, ultimately an invention of the brain. For Dennett the self is an abstract center of narrative gravity. Both Llinas and Dennett assume that the self, if it exists, should be a Cartesian, conscious self. Nevertheless, since most of the brain's cognitive functions are unconscious, the self should also be mostly unconscious.

To survive, any organism needs to demarcate self from other. In more complex organisms, meeting that need requires the coordination of external information with information about the internal states of the organism. Such coordination, to be useful, must take into account the previous experience of the organism, as well as its genetic inheritance in the form, say, of basic emotions that will guide it to survive, reproduce, etc., as Damasio argues. Experience must be interpreted on the

basis of what the organism takes itself to be, a mostly subconscious task assigned mainly to the brain. The brain has evolved, then, to function as a self.

The issue of free will is not about having a little “prime mover” in residence but, as Watson argues, about whether our selves determine our actions. And since free will would be merely the means by which the mostly unconscious self determines its own actions, our free will should be rooted in unconscious processes as well. Now, if consciousness of the self is a sort of internal perception, then we should expect certain perceptual illusions (which can be explained by a Darwinian strategy of adaptation).

11) The influences of Charles Darwin’s evolution theory on the history and fate of modern China.

Qi-gao Sun (Beijing)

It is quite remarkable that Charles Darwin’s theory of evolution has been deeply rooted in the historic and cultural soils in the developing China, which is quite different from Darwin’s homeland. It is of great importance that evolutionary theory has become part of China’s mainstream ideology and brought about profound influences on the history and fate of modern China largely because China has more than 1.3 billion people, covering about a quarter of the population of the world. It was in 1873 that Darwin’s viewpoints were first introduced to Chinese newspaper readers. Yen Fu (1853-1921), who studied in Britain from 1877 to 1879 and graduated from the Royal Naval College in Greenwich, translated Thomas Henry Huxley’s (1825-1895) papers into Chinese and introduced Darwin’s theory of evolution in 1895. Yen’s book was entitled Tian Yan Lun (On Evolution), and appeared in 1898, which made a great impact in China at that time. Although there were various voices raised against the ideas, it served as an epoch-making book and encouraged many members of the Chinese intellectual elite to struggle for the independence and modernization of China in the 20th century. It was in 1920 that the first Chinese version of *The Origin of Species*, translated by Ma Junwu (1881-1940) appeared in China. From then on, more and more Chinese researchers worked on evolutionary theory and played a great role in the development of natural and social sciences in China. Darwin’s theory of evolution seems therefore to have been most encouraging to the political movements and social reformations in China.

12) Pre-Darwinian Muslim scholars' views on evolution

Sultan Shah (Lahore)

Charles Darwin (1809--1882) is believed to have first propounded evolutionary theory and postulated how all living organisms had been evolved from common ancestors. This paper presents another point of view and describes how many Muslim philosophers had already discussed the concept of evolution in their writings prior to Darwin. Among them are al-Jahiz (776--869), al-Farabi (870--950), al-Mas'udi (d.957), Raghīb Isfahani (d.1108), ibn Miskawaih (d.1032) al-Biruni (973--1048), ibn Bajah (d.533 A.H.), ibn Tufayl (d.1186), al-Khazini (d.1130), ibn Rushd (1126--1198), Rumi (1207--1273), ibn Khaldun (1332--1406) and Brethren of Purity. These pre-Darwinian Muslim scholars provided sufficient materials to Darwin for his theory of evolution who gave it scientific language. John William Draper (1811--1882), a contemporary of Charles Darwin, called it the "Mohammadan Theory of

Evolution". The works of some Muslim scholars had already been translated into English and published in the West. Furthermore, Darwin knew Arabic and was able to read directly from Muslim sources. He was initiated into Islamic Culture in the Faculty of Religion at the University of Cambridge under an Orientalist Dr Samuel Lee (1783--1852) who was a Professor of Arabic and Hebrew. Darwin referred to him in his letters as well. Thus, it can be said that he derived the raw material of his theory from oriental literature.

13) The problem of 'Darwinizing' culture (or memes as the new phlogiston)

Tim Taylor (Bradford)

The neologism 'meme' was coined by Richard Dawkins as a cultural counterpart to the gene. While the meme has not been widely adopted in the social sciences, neither has it gone away, being supported by Blackmore, Aunger, Dennett and, from my own discipline of archaeology, Shennan. It has survived (memically its supporters would say) despite the articulation of a series of philosophical and anthropological objections (from Sperber, Midgley and Kuper among others; cf Taylor 2008 a, b & 2009). The creation of the concept holds out the promise of 'Darwinizing' culture, understanding it in reductionist terms consonant with (neo)darwinist selection and inheritance theory. But I believe that culture, far from being understandable memically, can be uncontroversially included as one of those factors beyond natural selection that Darwin himself believed also operated. Here I (i) analyse various meme concepts, objections to them, and the availability of alternatives and (ii) indicate a synthesis in which culture is both irreducible and clearly able to subvert biological logic (implications for the orthodox views of human evolution are thereby signalled).

Taylor, T. 2008a. Skeuomorphism. In J. Brockman (ed.) *What are you optimistic about? Today's leading thinkers on why things are good and getting better* (intro. D. Dennett): 300-2.

-- 2008b. *Artificial, or why Darwin was wrong about humans*, in R.A. Bentley (ed.)

The Edge of Reason: Science and Religion in Modern Society (intro. M. Midgley): 95-106. London: Continuum.

-- 2009. Culture. www.edge.org/q2009/q09_1.html#taylor

14) Neo-Darwinism and its many challenges

Davide Vecchi (Independent Scholar)

Celebrating the tremendous influence that Darwin's ideas have had on our culture is surely legitimate. However, we should be careful not to transform Darwin's legacy into Darwin's Church. History shows that, in biology but not only, there has been a tendency to accept too uncritically an appealing but rather simplified vulgate of Darwinism. But things are starting to change.

Neo-Darwinism is still very influential. According to one of its latest official formulations (taken from Jerry Coyne's *Why Evolution is True*), evolution results from the slow replacement of one gene by another that confers a tiny reproductive advantage, where the major mode of variation generation is DNA-based mutation. The focus is entirely on selection and DNA sequences, while change is random and gradual. In this presentation I will highlight some of the respects in which neo-Darwinism is increasingly seen, within the life sciences, as providing an oversimplified picture of how evolution really works.

The last 30 years of biological research have shown that, for instance, variation generation can be targeted, abrupt, systemic and saltational. Molecular data concerning genome organization, genomic change, cellular and developmental processes are at odds with the anachronistic view of evolution still largely in vogue. Neo-Darwinism is challenged in a variety of respects. Overall, these challenges aim to show that evolution involves a panoply of processes, and that the role of selection, though crucial, has been overstressed. I will provide some illustrations of the fallacies of neo-Darwinism by focusing on phenomena and processes neglected by mainstream evolutionary thinking (e.g. phenotypic plasticity, developmental reorganisation, the inducing role of the environment, natural genetic engineering processes, the role of viruses, the role of horizontal gene transfer).

I will conclude by arguing that if all the additional knowledge that is emerging from genomics, evolutionary developmental biology and cell biology is not systematised and incorporated in a new pluralist theory of evolution, then we will, on the one hand, continue to define Darwinism simplistically (paying a limited tribute to Darwin), and, on the other, we will pay a disservice to the human sciences (as they will be unable to exploit the full arsenal of significant evolutionary analogies already available).

15) Response to Anthony O’Hear (Ian Vine, Bradford)

16) Misconceptions about Darwinism in the social sciences

Stuart West (Oxford)

The occurrence of cooperation poses a problem for the biological and social sciences. However, many aspects of the biological and social science literatures on this subject have developed relatively independently, with a lack of interaction. This has led to a number of misunderstandings on how natural selection operates, and the conditions under which cooperation can be favoured. I will review several misunderstandings about: the unit/level of selection; altruism; cooperation; spite; Darwinian approaches in economics; Darwinian methodology and methods of non-genomic inheritance such as cultural evolution.

17) Darwinian Inferences

Friedel Weinert (Bradford)

The Darwinians were particularly aware of the philosophical dimensions of their theory. Darwin faced the charge from his critics that he was a materialist and violated sound Baconian principles. Far from violating Baconian inductivism, Darwin in fact practiced it and his critics were mistaken. Bacon’s inductive principles are much more sophisticated than the simple inductive step from ‘some x’ to ‘all x’. Francis Bacon, and later J. S. Mill, showed that scientists should proceed like a detective. The detective uses forensic evidence to eliminate potential suspects; the scientist must use evidence to eliminate inadequate accounts from a pool of competing explanatory models. Darwin proceeded along such Baconian lines: he inferred from the existing evidence from anatomy, embryology and palaeontology to the adequacy of this own theory and showed at the same time that his competitors – Lamarckism and Design Theory – could not explain the evidence as well. In the language of

Bayesianism: the evolutionary theory makes the available evidence more likely than do the competing accounts. But this doesn't mean that it is true; it means that in the light of the evidence it is a better explanation. E. Haeckel and T. H. Huxley explained Darwin's inferential practices on similar grounds: you may arrive at theories by simple inductive reasoning but this does not establish their validity; you must test them against the evidence *and* (we should add) the alternative explanations.

There have been some attempts in the literature to associate Darwin's procedure with the hypothetico-deductive methodology (Ghiselin, Ruse). It is difficult to see how a statistical theory, like the evolutionary theory, can have the strict deductive consequences, which the HD approach requires. The more adequate view is that Darwin used induction by elimination, of which HD is a limiting case.

18) Does Darwinism Support the Humanities?

Waldemar Zareba (Lublin)

Human sciences (humanities) from the very start try to explain human behavior and its consequences in the form of products of culture. In this connection, humanists have taken their investigations in the light of their ontological, epistemological, and methodological suppositions, like those: human being is special kind of entity, and the products of his mind have special, spiritual features; humanities present special kind of knowledge with their special methods. But there is very difficult to say what does it mean the word of special, like special kind of humanistic interpretation. In my paper I would like to depict, on the basis of contemporary philosophical and methodological literature (e.g. Th. Dobzhansky, H. Skolimowski, P. Achinstein, M. Ruse, S. J. Gould, J. Dupré, Ph. Kitcher) that if human sciences want to gain effective solutions they should be supported by Darwinian (evolutionary) achievements. I will argue, supported by examples (like archaeology and psychology) that Darwinian impact on humanities may have two aspects: formal and material. The first is an example of reasoning, especially as a kind of hypothetical reasoning (namely Inference to the Best Explanation – IBE). Darwin shows, with reference to Whewell's methodology, that when induction does not work, scientific research should be supported by hypothetical reasoning. The second example, I would like to show, is that naturalistic (evolutionary) knowledge is reliable kind of human knowledge that should pervade also humanistic reflection. Moreover I would like to reject distinction between naturalistic (biologically oriented) and humanistic kind of reflection in psychology (e.g. cultural psychology) in order to show that every kind of human sciences could be cultivated in the naturalistic way because every kind of human knowledge has growth from the soil of evolution