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Philosophy, Evolution, and Human Nature by Florian von Schilcher and Neil Tennant

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Essay Reviews

Human Nature and Evolution

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Florian von Schilcher and Neil Tennant, *Philosophy, Evolution, and Human Nature*, London, Routledge & Kegan Paul, 1984, pp. viii, 283, £15.95/\$29.95.

The conception that had reigned in the philosophy of nature and knowledge for two thousand years, the conceptions that had become the familiar furniture of the mind, rested on the assumption of the superiority of the fixed and final; they rested upon treating change and origin as signs of defect and unreality. In laying hands upon the sacred ark of absolute permanency, in treating the forms that had been regarded as types of fixity and perfection as originating and passing away, the *Origin of Species* introduced a mode of thinking that in the end was bound to transform the logic of knowledge, and hence the treatment of morals, politics, and religion.

So wrote in 1910 the great American philosopher and educator John Dewey in *The Influence of Darwin on Philosophy and Other Essays in Contemporary Thought*. That biological considerations, in a Darwinian perspective, are fundamental for understanding human nature is the starting assumption of Florian von Schilcher and Neil Tennant, a German behaviour geneticist and a British philosopher. The theory of evolution is examined first, with a critical eye for questions of method, theory formation, prediction and explanation, and reductionism. The discussion proceeds to three traditional philosophical problems that are illuminated in significant ways by evolutionary biology: ethics, epistemology, and the theory of knowledge. The cast of the net is not as wide as Dewey would have it, but the project is nothing if not ambitious; and it largely succeeds.

It has recently become fashionable to be critical of the Darwinian theory of evolution (the 'Synthetic Theory'). There are attacks from religious fundamentalists who would rather have the early chapters of *Genesis* as the literal account of origins. But there are also criticisms from practicing

scientists or philosophers who would make claims to fame by undermining the foundations of a cherished scientific theory.

The improbability of emergence of a complex organ is an old argument that has acquired new currency. The finely adjusted components of an organ like the eye are closely interdependent: without a properly shaped cornea and the right nerve and muscle connections, the retina (the only black tissue in the human body) would hardly be adaptive. But, then, the cornea and iris could not serve any adaptive function unless there was a retina. And so on. The probability of development of each individual component is extremely low, the joint probability of all elements suitably integrated is effectively nil.

But there are two things wrong with the argument. First, the calculus of *a priori* probabilities is not appropriate here. If I shuffle and deal a pack of 52 cards, the *a priori* probability of the particular sequence of cards that I get is one in $52!$ or less than 10^{-67} , but there it is. The events of an evolutionary lineage may each have a low probability, but if the lineage has survived to the present, one particular sequence will have actually occurred. The second error of the argument is that it ignores that there is natural selection, which introduces a bias in favor of sequences that are adaptive and proceeds stepwise. The vertebrate eye did not come into existence all at once in its present complexity. A concatenation of improbable events is not all that improbable if the events occur successively and at every stage there is time for each event to become universal. Consider a series of three gene mutations, each occurring with a probability of 10^{-6} ; their combined *a priori* probability is 10^{-18} , too unlikely to occur at all in a species consisting even of billions of individuals. But the first mutation will occur repeatedly in such a species, and if it is favored by natural selection it will spread to all individuals of the population; the second mutation will now occur and it will spread to all individuals if it is favorable; and then the third will occur and become pervasive if it also is adaptive.

The parameter used by evolutionists to measure the probability that a feature (a gene mutation, for example) will multiply in a given generation is called the *relative fitness* of the feature. But critics would have it that fitness is a circular concept. They claim that according to the theory, a feature will increase in frequency if it has higher fitness than alternate features. But the fitness of the feature is measured by observing its change in frequency from one generation to the next; and hence the alleged circularity. But this is a misunderstanding. Assume that I make an experiment with fruitflies by introducing two eye-color variants, red and orange, in equal frequencies, and I observe that in the next generation the frequency of red has increased. If I were to report such a result and claim without other evidence that the

results indicate that 'red eye' has higher fitness than 'orange eye', I would get nothing but scorn from my colleagues. Fitness is not a measure of the actual increase in frequency but of the *probability* of increase. And population geneticists have devised ways for measuring such probability; for example, by making several replicate experiments and taking into account the number of individuals in each generation as well as other factors. It is always possible that the conclusion may be in error, but that possibility can be reduced as much as wanted by proper experimental procedures. In any case, the point is that only ignorance of the ways of the geneticist can explain the claim that fitness is a circular notion.

Some biologists have argued that evolutionists have been too predisposed to see every trait of an organism as adaptive. S. J. Gould and R. Lewontin, following Haldane, use the label 'Panglossian adaptationism' for this position. There can be little doubt that not all features of an organism are adaptive, and even more so that not all theoretically possible adaptations will in fact develop. Only the most naive of evolutionists, if any, will hold such positions; the critics have built their own straw man. But their criticisms can be salutary by demanding increased attention to the limits of natural selection. The past history of an evolutionary lineage delimits considerably what is in fact possible. To use an exaggerated but illustrative example, it is most unlikely that mutations promoting the developments of wings in an elephant will be favored by natural selection.

But there is more to the criticism than the existence of developmental constraints: not all features of an organism are necessarily adaptive nor have all adaptive features necessarily come about because they were directly favored by natural selection. To stay with simple examples, the vermiform appendix is a human feature that is probably not adaptive; and the fact that the heartbeat can be used by physicians to diagnose the state of health of a person does not mean that it developed for this purpose. But let us not be carried away by the Panglossian criticism. It is salutary to search for the adaptive significance of any given feature because only someone looking for a function is likely to find one. The trick is to discover only those functions that actually exist and to interpret properly their evolutionary origin.

Günther Stent, a philosophically-sophisticated biologist if there ever was one, chides sociobiologists for overlooking the fact-value distinction. Sociobiologists often see altruistic behaviour and the prevailing codes of moral behavior as dictates of the tyranny of genes. Altruistic behavior is the outcome of kin selection, group selection, or selection for reciprocity; and if we consider incest immoral it is because it is bad for our genes and these have selected individuals who so believe. But morals, Stent would

argue, have to do with motivation: biologically determined drives are not as such moral. The authors of this book argue that sociobiological considerations are important to the moralist. Altruistic behavior may be genetically motivated, but even the perceptions of our behavior and our motivations are in some respects conditioned by our genes. 'It can do no harm to believe oneself to have been altruistic; for that way one can convince others of one's virtue' (p. 157). Sociobiological considerations are legitimate in complementing proximate accounts of human behavior with ultimate ones. Morality as an evolutionary product is, for von Schilcher and Tennant, not simply a useful by-product of evolution, 'but rather a central adaption of our species' (p. 158).

Those of the Ten Commandments that concern social behavior appear to inform the social life of other animals as well. It follows that our social norms probably have a biological basis. If these and other ethical precepts are now freed from biological determination, they must nevertheless retain a conformity to biological needs. 'Most probably biological tendencies towards certain forms of behaviour and social arrangements became solidified and sometimes modified within culturally imposed norms; with the latter ever subject, however, to continuing control from below'. This position seems to me identical to that of E. O. Wilson, encapsulated in his metaphor that genes hold culture on a leash. But this is only part of the truth. There remains the opportunity for truly selfless altruistic and moral behavior that sometimes counteracts the dictates, and not only the interests, of our genes.

Sociobiology is only the most recent of a continuous series of efforts that can be traced to Darwin's generation for finding in evolution a naturalistic foundation for ethics. The attempts to develop an evolutionary epistemology – a naturalistic theory of knowledge – are much more recent. Karl Popper and Dr. Campbell are the leading exponents in the English-speaking world; K. Lorenz, G. Vollmer, and R. Riedl are among those writing in German. The starting premise is that cognitive structures, like any other biological feature, evolve as a result of natural selection. Consequently these structures will be adapted to the external reality and will be endowed from birth with certain items of knowledge.

The core problem of epistemology is the relationship between the external world and our sensory perceptions. The idealist solution is that sense 'impressions' are the only reality; the external world is but one more construct from our mind. For the realist, we are part of the objective reality endowed as we are with faculties enabling us to perceive and interpret the real world of outside objects. Evolutionary epistemologists are rooted in the realist tradition. They seek to explain scientifically why cognitive beings exist by referring to the adaptive advantage provided by

knowledge of the external world, which justifies the realist position because he who would form wrong images of the outside reality would be doomed by natural selection. Kant's *a priori* forms of intuition and concepts are determined by our genes as products of the evolutionary process that came to be only with the advent of our species.

Evolutionary epistemologists see consciousness as a result of physiological (neurological) processes. It emerges 'from the integration of control functions, as a monitor of subordinate monitors... Consciousness "is there" to cope with the new and unexpected and to take appropriate measures' (p. 199). In this view, consciousness itself is one more product of the genes, because it is just an emergent property of sufficiently complex living systems; and it evolves by natural selection like any other trait that increases adaptation to the environment.

A vast assemblage of data and theories now exist bearing on the origin of language.

In the past century we have come to understand better the structure of natural language, and have made some conceptual progress in the philosophy of language. We have learned much about our own brains and vocal traits, and those of our primate cousins... We have attended closely to how children learn to speak (p. 204).

The time is ripe to advance an evolutionary theory for language.

The authors characterize human language as a 'recursively structured language' and argue that such form of language is a unique attribute of our own species. Systems of animal communication, such as the 'language' of the bees, are mere signalling systems, which trigger certain responses but do not contain meaningful messages beyond this causation. The authors remain unimpressed by the apparent successes in teaching chimpanzees and gorillas how to communicate by means of artificial systems not involving speech.

Chimp language, natural or taught, consists at best of 'conventions' that confer upon various noises and gestures certain relatively fixed meanings. Our ancestors must have possessed communicative skills of that type at some past time. From these primitive beginnings, syntactic structure evolved carrying with it a system of considerably greater generative power and creativity than anything existing before or now in any other species. The authors summarize their thesis: 'There could be staccato talk without thought. There had to be thought before structured talk. Once established, structured talk could be mastered with less thought. Once mastered, structured talk makes for more thought' (p. 205).

One need not agree with the authors' arguments in order to appreciate their well-informed and thoughtful discussion of the evolution of language. There is also much to learn from their discussions of sociobiology and ethics and of evolutionary epistemology. And the essay on evolutionary theory that fills the first one hundred pages of this book is one of the best brief expositions of the modern theory of evolution that have ever been published.