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# Myth, metaphor and hypothesis: how anthropomorphism defeats science

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## THE HEDONISTIC PARADOX

Dawkin's theory of the selfish gene has achieved a hegemony quite out of proportion to its intellectual finesse. Its popularity among not just sociobiologists, but biologists proper, provides yet another illustration of the susceptibility of scientific rationalism to the social and political ideologies of the day, to which scientists, being only too human, are heir.

A singular achievement of nineteenth century biology, through such writers as Darwin and Huxley, was the construction of an objectifying language for the description of biological phenomena. Transposed into evolutionary theory, this language carefully de-anthropomorphizes the processes of mutation, competition and survival, which were defined as central to the state of being of the natural world. Implications of motivation and intention were excluded from the meaning of these terms, as improper for the species and operations involved.

Although such phrases as 'struggle for survival' and 'competition of species' were used, it was absolutely clear, from their attachment to the theories of natural selection and random mutation, that in this context these were objectively descriptive, rather than subjectively experiential words. They were chosen, from those that language offered to potentially do the job, for their least imbue with specifically human overtones: for example, 'competition' rather than 'battle' and 'survival' rather than 'victory'.

Because of our natural tendency to interpret the world in the light of human experience, and because language expressing this viewpoint comes most readily to our tongues, it is a constant intellectual discipline when talking of animal behaviour, to steer clear of anthropomorphism. Nevertheless, for close to a century, biology as a discipline managed to indoctrinate its students with this care which is essential to its scientific purity. It was kept clean of anthropomorphism by constant mutual vigilance.

When Richard Dawkins' book, *The selfish gene*, was published in the 1970s, it read like a clever piece of popular science aimed at those who are not initiated in the proper intellectual rigour, which excludes anthropomorphic lapses; and indeed, Dawkins admitted the 'sloppiness' of his language, but discounted its potential for ill-effects. However, because of a variety of concurrent influences, the scientific resistance to anthropomorphism was low (Kennedy 1992) and the infection spread: slowly at first, but with increasing

vigour. Today, Dawkins' transformation of the Darwinian hypothesis is the favourite explanatory model, from genetics to social biology, providing a replica, within science, of market theory in economics and contract utilitarianism in ethics, both of which emphasize self-interest as a dominant factor in human motivation.

When Dawkins introduced the word 'selfish', and it was accepted by the scientific community, the damage was essentially done. Darwin would not have used a word so excessively moral, and therefore anthropomorphic. Many far more neutral words could have expressed Dawkins' meaning. What he is talking about is maximization of survival of genes, not selfishness. His book was as much a challenge to the social morality of altruism taught by Christianity, and indeed by every religion in one form or another, as it was a work of science. It developed at a biological level, a version of philosophy's hedonistic paradox: the hypothesis that all human behaviour, even when it appears to be self-abnegating, can be ascertained as furthering self-interest in the final analysis, and that this selfishness represents the truth about human nature. Thus its appearance, or rather success, in the seventies was no chance event. It was a book which was ripe for its time: for an era which sustained a great confluence of movements whose common goal was the weakening of social, philosophical and bureaucratic resources of restraint of the selfish beast in us all (which is not to say, that is all we are).

Dawkins' essential proposition, that we should conceptualize survival of the fittest as operating at the genetic level (even though via mutation and morphological adaptation in the individual), rather than at species level as proposed by Darwin, does not appear to have been particularly fruitful. However, the anthropomorphization of the mechanisms of natural selection has flourished. The result, as Darwin and his contemporaries so clearly understood, is a proliferation of pseudo-theories, whose claim on our attention lies more in the realm of literature than of science. Therefore, their validity is entirely open to interpretative challenge without recourse to scientific methodology.

## DECONSTRUCTING SELFISHNESS

Let me give some examples. An article in *Science* (July 1992) reported a model of intra- and intercellular 'conduct' developed by two Oxford biologists:

Laurence Hurst and William Hamilton. In their discourse, as reported by Anderson (1992*a*), the concepts of 'survival' and 'competition' have indeed been transmogrified into warfare and murder. These terms are used to support an essentially conflictual interpretation of sexual reproduction, and what should be a simple description of cell behaviour is turned into a theory of the moral nature of biology, by the addition of this unwarranted and unwieldy anthropomorphic baggage.

Hurst and Hamilton's fable derives from the observation that when, in sexual reproduction, the two cells (ovum and sperm) fuse, both contribute equal shares of genetic material, but only the ovum passes on the organelles of its female 'host' organism to the new generation. The latter have been eliminated from the tiny male sex cell. In asexual reproduction, as in the paramecium, the two cells do not fuse but simply exchange genetic material, maintaining equality of cellular identity. It is reasonable to hypothesize, as Hurst and Hamilton do, that the function of the former arrangement, where cell fusion is involved, is the avoidance of competition or incompatibility between organelles of different origins, which could lead to destruction of the cell. After all, the phenomenon of meiosis in sex cells, as opposed to mitosis in other cells, appears to achieve a similar end for the chromosome and DNA neo-combination.

Instead of the neutral words I have used – 'competition', 'incompatibility', etc. – the hypothesis is put forward in *Science* in the language of starwars, citing the risk of 'war breaking out between the two sets of organelles', of 'the emergence of a murderous mutant mitochondrion', and of a 'killer chloroplast'. Even though there is no evidence that this disruption has ever occurred, the observed process of only one sex cell contributing organelles is described as 'unilateral disarmament' and 'surrender' by the male sex, such that the female 'exercises the right to hand down organelles'.

This fanciful, anthropomorphic language distracts from, rather than contributes to, what Hurst and Hamilton really have to say, and is purely a matter of taste (or rather, conformity to the Oxford school of biological science fiction). If one must anthropomorphize, then the state of affairs appears to be better described as cooperation than as competition. The conflict which might have occurred in asexual reproduction by cell fusion is avoided by the development of sexes and the 'altruistic' behaviour of one party to the arrangement: the male sex, which withdraws its organelles from the field. Of course this dramatization, as war or philanthropy, is, scientifically, entirely redundant.

Similarly, the Dawkins complexion of selfishness and self-interest is superimposed on the battle of the sexes to inform David Haig's theory of maternal-foetal conflict in pregnancy (Anderson 1992*b*). In a breath-taking leap from observations of differences in the morphological expression of certain genes in the foetus, depending on their maternal versus paternal origin, Haig hypothesizes a battle between foetus (conceived as a Machiavellian ambassador for the father's genes)

and mother, over the maximization of foetal growth, which latter Haig sees as advantaging the foetus and disadvantaging the mother. Separable male and female genetic contributions to foetal growth have been identified, whose operation Haig interprets as an expression of the father's plus the foetus', versus the mother's, 'interests' in survival of their selfish genes, producing a tug-of-war ending in a stalemate.

Quite apart from the co-opting of language, beyond the requirements of empiricism, to create a redundant meta-theory, Haig's suppositions regarding the advantages of maximizing foetal size, and its effect on the mother, are epidemiologically incorrect, at least as far as humans are concerned. The supposition that the heavier the foetus the greater its chance of survival is simplistic and inaccurate. There is a middle range of weights at which survival is maximized, and in the upper extremes, heavier babies have lower survival rates. Furthermore, the survival of the baby depends on the survival of the mother, and to the extent that larger size creates risk for the mother at delivery, it is a disadvantage for the baby. I am also unaware of any findings that show that women who produce larger babies within the normal range have lower life expectancies. Even in terms of selfish gene theory, it would not benefit the father's genes to curtail the mother's life through overtaxing her during pregnancy, because her presence is optimally required to raise the offspring to reproductive age (if the genes are to be transmitted further).

Epidemiological studies show that a baby's size at birth is predominantly determined by the mother's size and not the father's size (Ounsted 1965, 1986; Morrison *et al.* 1991), and that it is not closely related to eventual (post-uterine) size of the baby. The baby's survival of birth is dependent on a match of size with the mother's body. A process of interaction of mother's and father's contribution to growth can as readily be constructed as cooperation for the survival of baby, mother and species, as in terms of conflict between father and baby, on the one hand, and mother and her future offspring on the other. The 'stalemate' is a mutually beneficial balance.

Daedalus (Jones 1993), under the same ubiquitous conceptual influence, is unable to contemplate the fact that a woman has two ovaries, only one of which (usually) produces an ovum in each cycle, without translating the process into a competition for genetic survival (this time between poker-players not armies). It was a relief to see this fantasy smartly knocked on the head by Robert Jansen, a specialist in IVF, with the observation that the competition, if so it is considered, is not between the two ovaries, but among the 300 000 follicles usually present at the first ovulation (Jansen 1994). As all the genes involved belong to the female host, it would be interesting to see what selfish-gene theorists might make of the complicated hormonal processes which eventually bring one ovum to fruition.

Finally, on a different level, Emlen & Wrege (1994) describe the mating behaviour of white-fronted bee-eaters as evolutionarily produced decision-making, designed to maximize the reproduction of each individual's own genes. Not all birds mate, or if mated,

reproduce successfully, and birds that have not reproduced often act as helpers in raising the offspring of others. The mating pattern is one of female exogamy, with the female leaving her own 'extended family' and joining that of her mate. Emlen and Wrege found that both males and females act as helpers in their own (original) extended families, but females which have not mated or reproduced successfully do not act as helpers in the families of their would-be partners. Thus, both sexes are seen to be assisting in the promulgation of the gene pool which they most nearly share.

However, again there is a coexisting contrary story, for here we find an interesting transformation of the supposed processes of gene selfishness into behavioural altruism. At the level of a society, as here, selfish gene theory ceases to function as a model for individualistic selfishness, but instead predicts social cooperativeness and helpfulness. True, the altruism is kinship-based, but it is altruism nevertheless. After all, no one regards Shaftesbury as selfish rather than philanthropic because his legislative efforts were on behalf of English children, rather than, say, French children. Indeed, selfish-gene theory could well be entirely rewritten as a theory of consanguineally based altruism. Where fable-writing is concerned, we are entitled to our personal preferences.

#### THE MISMATCH OF DAWKINISM AND DARWINISM

Both accounts, however, represent a regression to pre-Darwinian thought. When Emlen & Wrege, for example, explain that evolutionary biologists view organisms as optimizing agents which maximize some utility of interest, and go on to explain that 'the utility being maximized is fitness (survival and reproduction), measured in terms of the number of offspring equivalents produced during an individual's lifetime', they sound more like Lamarckians than Darwinians.

The notion of genes developing to subtend traits which will maximize their survival implies a purposiveness which is a throwback to pre-Darwinian biological theory. Although one can switch the mirror and, in Darwinian fashion, conceive of the genes as surviving because they embody traits which secure their survival, this cannot then sit with the appellation of 'selfish'. Moreover, this version of the relationship loses its explanatory power. There is no explanatory gain in invoking genes, as distinct from the traits they represent, apart from the fact that we now, unlike Darwin, understand traits as genetically determined. One might as well speak of a selfish trait, with the implication that this says something more than that it has survival value.

In fact there is an explanatory loss, for there is an unreconciled contradiction between the conception of genes competing for survival via morphological and behavioural expressions which will favour their transmission, and Darwin's proposal of random mutation and natural selection. There is no obvious reason why

genes which, in their morphological expression, are good at competing with the genes of other members of that particular species should be good at surviving in competition with genes of other species, also at their morphological level of expression, at least when the former competition is viewed mainly in terms of reproductive success, which is the turn the selfish-gene theory has taken.

Evolution is not primarily a theory of intraspecies competition, but of interspecies competition. Although it is conceived that within a species the fittest individuals will survive, the major emphasis is not on successful competition in reproduction, but on superior exploitation of an ecological niche. Darwin saw evolution as adaptation to changing ecological niches – to changes created by interspecies competition and species development – via individual random mutation preserved through its adaptiveness to the conditions of competition from other species. The significance of mutation for evolution is improved competitiveness, not within the species, but in relation to other species, or else a redirection of functioning so as to be less in competition with the dominant *modus vivendi* within the species. The occasional morphological and behavioural extravagances observed in animals, which were interpreted as having their function through a conferral of purely reproductive advantages, were aberrations requiring explanation so as not to detract from the central theory of ecologically adaptive change. Intraspecies competition has only a secondary function in the theory of evolution.

The mutations that are instrumental in evolution, and the superior fitness which they achieve, are not, in Darwin's theory, primarily conceived as directed at achieving dominance and success in intraspecies competition. The intraspecies winner per se may be an interspecies loser, and the species, with all its selfish genes, will die out.

Returning to sociology, I would like to hypothesize that what we are seeing in the current concentration on sexual competition, interestingly conceived of as between the sexes, rather than within one sex for the favours of the other (which is the more Darwinian version), is an expression, within science, of the sexual antagonism fostered by feminism. As such, it is a nice illustration of the 'will o' the wisps' which can easily lead science astray if its practitioners relax and flirt with anthropomorphism.

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