

# *The Selfish Gene<sup>+</sup> and Richard Dawkins: How a Scientist Changed the Way We Think\**

**\*By Richard Dawkins**

**\*Edited by Alan Grafen and Mark Ridley**

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If you are not interested in how evolution came about, and cannot conceive how anyone could be seriously concerned about anything other than human affairs, then do not read it: it will only make you needlessly angry," wrote John Maynard Smith about *The Selfish Gene*. Richard Dawkins' classic exposition of modern evolutionary biology was published in 1976 and has recently been reissued as a 30<sup>th</sup> anniversary edition with a new introduction by the author. Why should anyone get angry about a book on evolutionary biology? Maynard Smith's cautionary comment is interesting, if only because he is one of the four biologists cited in the introduction to the first edition of *The Selfish Gene* as providing its intellectual basis (along with R.A. Fisher, G. C. Williams, and W. D. Hamilton). But Maynard Smith's warning to the non-biologist is strangely at odds with Dawkins' express intention "to examine the biology of selfishness and altruism" – what could be closer to human affairs? In his preface to this edition, Harvard biologist Robert Trivers supports Dawkins' claim of universal relevance when he writes that "natural selection has built us,

and it is natural selection we must understand if we are to comprehend our own identities."

This quote gives us a taste of the kind of hyperbole that has accompanied public debates of evolution since the mid-19<sup>th</sup> century. To imply that people who do not understand natural selection have no comprehension of their own identities is so pompous that anger might well be the reaction of a reader unaware of the rules of popular science writing.

But I do not want to suggest for an instant that Dawkins' book is in any way cheap. In fact, it is a lucid statement of what turned out to be a paradigm shift in evolutionary biology. Before the publication of *The Selfish Gene*, many biologists were happy to accept the idea that natural selection acted to maximise the success of a species or a group. For example, Nobel laureate Konrad Lorenz advocated this view in his once immensely popular book *On Aggression*, published in 1963. According to Dawkins, Lorenz "got it totally and utterly wrong" because he "misunderstood how evolution works".

Hamilton was the first to argue that instead of maximising the good of the

species, evolution works by maximising what he referred to as an individual's "inclusive fitness". Starting from the simple idea that, genetically speaking, my own survival is equivalent to that of two of my siblings, this suggests that fitness calculations should include not only direct offspring but also relatives, because they too carry copies of an individual's genes. This gene-centred – rather than group-centred – perspective leads to neat explanations for a wide range of animal behaviour, including the altruism of worker bees, which under the new theory turns out to be a strategy for maximising their genetic progeny.

Inclusive fitness also implies that animals should be capable of quantifying the degree of relatedness between themselves and others. In a paper published in *Nature* on 15 February 2007, Debra Lieberman and colleagues show for the first time that humans do indeed possess a kin detection system that influences their disposition towards others. The relevance of inclusive fitness to human affairs has become a lot clearer since Hamilton postulated it in 1964 in the context of social insect societies and

*The Selfish Gene* was the place where a new generation of biologists first learned about it.

Thirty years ago, Dawkins advocated a set of ideas that were mature enough to coalesce into a coherent view of evolution but still new enough to be confined to a select group of mainly English and American biologists. The whiff of revolution, combined with deep insights into the mechanics of altruism, is what makes the book exciting to read even today.

The context is very different for the authors contributing to the volume of essays published simultaneously with the anniversary edition of *The Selfish Gene*. *Richard Dawkins: How a Scientist Changed the Way We Think – Reflections by Scientists, Writers, and Philosophers*, edited by Alan Grafen and Mark Ridley, is a rather mixed collection of short pieces. Too many are of the ‘Dawkins is brilliant’ school of writing, which is true in some respects but ultimately boring. There are exceptions, though, and I particularly recommend David Haig’s musings on ‘The Gene Meme’. This takes up the idea of a meme as a unit of cultural evolution, proposed by Dawkins in the last chapter of *The Selfish Gene*. The concept of the gene might be such a meme and Haig traces its evolution to conclude that a gene-centred view of biology is more fruitful than a meme-centred perspective on culture. If this leaves you intrigued, go and (re)read Dawkins’ original – but don’t get angry.

## Details

### The Selfish Gene

Publisher: Oxford University Press

Publication year: 2006

ISBN: 0199291152

### Richard Dawkins: How a Scientist Changed the Way We Think

Publisher: Oxford University Press

Publication year: 2006

ISBN: 0199291160



# ChemMatters CD-ROM

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*ChemMatters* is an award-winning magazine published quarterly by the American Chemical Society for secondary-school students. Each issue is full of readable articles about the chemistry used in everyday life, and is of interest to budding chemists and their teachers alike. The ChemMatters CD-ROM (version 3.0) contains two decades of the magazine from February 1983 (volume 1, number 1) to December 2003 (volume 21, number 4).

This archive of more than 300 articles is a useful resource for students, whether they are working on specific projects or undertaking general research. All the material is suitable for school students studying pre-university chemistry and much of it would be accessible to bright 15-year-olds.

For teachers, it is a great source of background information for enlivening lessons with snippets of information that hook students. Whether your students want to know the chemistry involved in measuring ground-level ozone (September 2001 issue) or what the atmospheres on other planets in our Solar System are like (October 2003 issue), then this is the right resource for you.

Users can search the whole CD-ROM for keywords in articles, or browse the magazine issues one page at a time. The articles are in Adobe PDF format and can be printed easily.

The American Chemical Society website<sup>w1</sup> includes a free archive of samples from more recent magazine issues (February 2003 to December 2006), plus a full archive of the teach-

ers’ guides. These magazine supplements contain additional information, comprehension questions, laboratory activities related to articles, and other activities such as instructions for building a methane ice model out of card (October 1995 issue).

## Web references

w1 - For the free archive of articles, see:

[www.chemistry.org/portal/a/c/s/1/acdisplay.html?DOC=education\curriculum\chemmatters\issue\\_arch.html](http://www.chemistry.org/portal/a/c/s/1/acdisplay.html?DOC=education\curriculum\chemmatters\issue_arch.html)

## Ordering

The ChemMatters CD-ROM costs US\$25 for a single user or US\$99 for a single school site licence, which allows all the information to be shared across a school or library network. It can be purchased online from <http://chemistry.org/chemmatters/cd3.html>

