Reality rules

Andrew Pomiankowski

Games of Life: Explorations in Ecology, Evolution and Behaviour. By Karl Sigmund. *Oxford University Press: 1993. Pp. 244. £49.95 (hbk); £17.95 (pbk).*

GAMES are a way of thinking. They lie at the foundation of much theoretical work, especially recent developments in evolutionary biology. Insight has come from asking abstract and — at first sight — silly questions. What if inheritance was blending? How do populations evolve with three sexes? What is the fate of a gene that recognizes copies of itself in others by the presence of green beards? Thought experiments, by their distance from reality, allow general principles to be sought beyond the tangle of details. Playful investigation is not intended to deny reality but to help us come to grips with it. By creating a comprehensible half-way reality we may end up with a better understanding of the real thing.

The best introduction to this way of evolutionary thinking remains Richard Dawkins' *The Selfish Gene*. On the face of it *Games of Life* is an updated and advanced *Selfish Gene*. Although Sigmund is a mathematical biologist, he has made life easy for his readers by removing all mathematical technicalities. Simulations, diagrams and metaphors have replaced a glut of Greek symbols. At times the rewriting goes a bit too far and simple mathematics would have been easier to understand than the elaborate wordplay. But the result is a book accessible to all readers, whatever their level of numeracy.

There are excellent chapters on the foundations of Mendelian genetics, games of chance, John Horton Conway's computer game Life and the evolution of cooperation. Sigmund's aim is to promote "mathematical imagination". By this he means a willingness to think in abstract terms, using games and playing as a basis for thought experiments to start investigating problems such as the age of our youngest common gene or the advantage of sexual recombination. The approach makes these difficult questions seem easy and fun. He sells mathematics not as formulae, calculation and precision but as a way of thinking about the possible as well as the actual.

At times Sigmund gets a little carried away with his metaphors. In describing *Drosophila* segregation distortion, he ask readers to imagine two men (chromosomes) in a balloon (primordial sperm cell) who have to cross a mountain before landing, separating (meiosis) and then rushing off (sperm) to fertilize an egg. A primordial form of meiotic drive occurs if one man parachutes out of the balloon before landing, thereby reaching the egg first. Parachutists spread even if they risk breaking their necks. But more sophisticated two-locus meiotic drive can now evolve. Non-jumpers who burn all parachutes will get rid of their parachuting companions who jump to their death. I'm not sure this makes meiotic drive completely transparent.

The content of *Games of Life* does not always live up to the promise of its style. For instance, the chapter on "Evolution and Sex" covers a lot of ground — mate choice, sex ratios, the reason why there are two sexes and the evolution of sex — but these topics have been well covered many times before and their appearance here has a slight textbook feel. Sigmund's games-eye view does not really constitute a novel perspective or lead to any new insights. Nevertheless, *Games of Life* is an excellent introduction to what theoretical biologists get up to in trying to understand evolutionary and ecological ideas. □

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Minds in the making

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Inventing the Feeble Mind: A History of Mental Retardation in the United States. By James W. Trent Jr. *University of California Press: 1994. Pp. 356. $30.*

IN the nineteenth and twentieth centuries, Americans often set the standard for ways of treating — and institutionalizing — people labelled as mentally deviant, including those with mental retardation and developmental disabilities. Ten years ago, Peter Tyor and Leland Bell published a scholarly historical account, *Caring for the Retarded in America* (Greenwood, 1984), which is still useful for the basic narrative.

James W. Trent has now supplemented and to some extent reinterpreted their account. In contrast to Tyor and Bell's psychiatric orientation, he focuses on education and social work and is interested in how certain Americans became labelled with a disability and how the consequences of labelling changed over time.

Trent uses many primary sources, including two extensive archival collections, and he has also searched out secondary works. Written at a time of great change in historical scholarship, however, his account remains transitional.

The book falls into two parts. The longer part covers the period from the 1840s to the 1930s. Trent portrays the superintendents of institutions for the mentally defective as motivated to achieve 'control', that is, to deprive their charges of liberty and to enlarge and protect their institutions and personal professional perks. This 'presentist' stance, combined with romantic individualism emphasizing elements of normality in retarded people, follows a pattern set in the 1970s by David Rothman's depictions of other kinds of institutionalization. The second part of the book, covering the period since the Second World War, is more sophisticated and explores the ironies of deinstitutionalization.

One of the main changes in which Trent is caught is the rapid retreat of social constructionism. Particularly in the history of science, of which his book is, broadly speaking, a part, advocates of the idea that scientific concepts are merely social artefacts are now recanting and admitting that scientists and doctors must incorporate nature into their attempts to understand the world. Indeed, right to the end of the first part of the book, after Trent has shown clearly how hereditary and environmental theories have alternated over generations, one expects him to conclude that mental retardation is in fact not real but simply a label imposed on victims of circumstance — that the new hereditarianism, popular in mainstream psychiatry, is an unpleasant (and 'conservative') social artefact. Yet in the last part, in which he is suddenly evenhanded, Trent leaves no doubt that mental retardation is a distressing fact of nature with which families, humanitarians and social policymakers must contend.

Both parts of the book are closely argued, although, curiously, along the lines of historical analysis rather than sociological theory. Indeed, the author uses concepts such as deviance, institutionalization and labelling without any obvious interest in the underlying theory. His central concept, control, remains undefined and largely rhetorical, so that the analysis, particularly in the first part, is incomplete. ('Control' does not appear in the index, which consists mostly of proper names.)

A constant feature in the history of mental retardation — apart from labelling — is underfunding. In the 1840s, some retarded children moved out of traditional family and almshouse settings and into training schools. By the late nineteenth century, schools had broadened their admission criteria and become custodial institutions. To attract state funding, they admitted adult residents and those with multiple disabilities. To have workers, they admitted the merely backward, who could work with supervision. Hereditarian beliefs provided the justification for the custodial movement (although Trent does not fully understand the details of degeneracy and Lamarckianism). As