

Copyrighted Material

"Our ideas of cooperation will never be the same."
—*The Wall Street Journal*

REVISED EDITION

THE EVOLUTION OF
COOPERATION

Robert Axelrod

With a new Foreword by Richard Dawkins

Copyrighted Material

Praise for *The Evolution of Cooperation*

"I never expected to find wisdom or hope for the future of our species in a computer game, but here it is, in Axelrod's book. Read it."

—LEWIS THOMAS, State University of New York, Stony Brook

"Our ideas of cooperation will never be the same again. . . . This book, if read, grasped and applied, could have a profound effect."

—DANIEL KORNSTEIN, Wall Street Journal

"A fascinating contribution to the theory of cooperation, and written in a clear, informal style that makes it a joy to read."

—*Times Literary Supplement*

"This is an exceptionally rich book and should be useful to anyone interested in promoting or inhibiting cooperative behavior."

—*Journal of Policy Analysis and Management*

"A remarkable mixture of theoretical analysis, anecdotal evidence, and a most unusual mode of empirical research. . . . In it he applies the prisoner's dilemma to topics ranging from collusion among large corporations to US involvement in Vietnam."

—James L. Gould and Carol Grant Gould, "The Sciences"

THE EVOLUTION OF COOPERATION

Robert Axelrod

**Foreword To The New Edition of *The Evolution of Cooperation*
By Richard Dawkins**

THIS IS A BOOK OF OPTIMISM. But it is a believable optimism, more satisfying than naive, unrealistic hopes of pie in the sky (or rapture in the revolution).

To be believable, an optimism must first acknowledge fundamental reality, including the reality of human nature, but also the nature of all life. Life as we know it, and probably throughout the universe if there is life elsewhere, means Darwinian life. In a Darwinian world, that which survives survives, and the world becomes full of whatever qualities it takes to survive. As Darwinians, we start pessimistically by assuming deep selfishness at the level of natural selection, pitiless indifference to suffering, ruthless attention to individual success at the expense of others. And yet from such warped beginnings, something can come that is in effect, if not necessarily in intention, close to amicable brotherhood and sisterhood. This is the uplifting message of Robert Axelrod's remarkable book.

My own credentials for writing this foreword have been peripheral but recurrent. In the late 1970s, a few years after publishing my own first book, *The Selfish Gene*, which explained the pessimistic principles mentioned above, I received out of the blue a typescript from an American political scientist whom I didn't know: Robert Axelrod. It announced a "computer tournament" to play the game of Iterated Prisoner's Dilemma and invited me to compete. To be more precise—and the distinction is an important one for the very reason that the computer programs don't have conscious foresight—it invited me to submit a computer program that would do the competing. ■ afraid I didn't get around to sending in an entry. But I was hugely intrigued by the idea, and I did make one valuable, if rather passive, contribution to the enterprise at that stage. Axelrod was a professor of political science, and in my partisan way, I felt that he needed to collaborate with an evolutionary biologist. I wrote him an introduction to W. D. Hamilton, probably the most distinguished Darwinian of our generation, now sadly dead after an ill-fated expedition to the Congo jungle in 2000. In the 1970s, Hamilton was a colleague of Axelrod in a different department of the University of Michigan, but they didn't know each other. Upon receiving my letter, Axelrod immediately contacted Hamilton, and they collaborated on the paper that was the forerunner of this book and is abridged as Chapter 5. It had the same title as the book, was published in *Science* in 1981, and won the Newcomb-Cleveland prize of the American Association for the Advancement of Science.

The first American edition of *The Evolution of Cooperation* was published in 1984. I read it as soon as it appeared, with mounting excitement, and took to recommending it with evangelical zeal, to almost everyone I met. Every one of the Oxford undergraduates I tutored in the years following its publication was required to write an essay on Axelrod's book, and it was one of the essays they most enjoyed writing. But the book was not published in Britain, and in any case, the written word sadly has a limited constituency compared with television. So I was pleased when, in

1985, I was invited by Jeremy Taylor of the BBC to be the presenter of a Horizon program largely based upon Axelrod's work. We called the film Nice Guys Finish First. I had to speak my lines from such unaccustomed locations as a football pitch, a school in Britain's industrial midlands, a ruined medieval nunnery, a whooping cough vaccination clinic, and a replica of a First World War trench. Nice Guys Finish First appeared in the spring of 1986 and it enjoyed some critical success, although it was never shown in America—whether that is because of my unintelligible British accent I don't know. It also brought me temporary standing as a public partisan of "forgiving," "nonenvious," "nice guys"—a welcome relief, at least, from notoriety as the alleged high priest of selfishness, and salutary testimony to the power of title over content; My book had been *The Selfish Gene*, and I was regarded as an advocate of selfishness. My film was called Nice Guys Finish First, and I was hailed as Mr. Nice Guy. Neither accolade was borne out by the content of book or film. Nevertheless, in the weeks after Nice Guys was broadcast, I was lunched and consulted on niceness by industrialists and manufacturers. The chairman of Britain's leading chain of clothes shops gave me lunch in order to explain how nice his company was to its employees. A spokeswoman from a leading confectionery company also took me to lunch on a similar mission, in her case to explain that her company's dominant motivation in selling chocolate bars was not to make money but literally to spread sweetness and happiness among the population. Both, I fear, had slightly missed the point.

I was invited by the world's largest computer company to organize and supervise a whole day's game of strategy among their executives, whose purpose was to bond them together in amicable cooperation. They were divided into three teams—the reds, the blues, and the greens—and the game was a variant on the prisoner's dilemma game that is the central topic of this book. Unfortunately, the cooperative bonding that was the company's goal failed to materialize—spectacularly. As Robert Axelrod could have predicted, the fact that the game was known to be coming to an end at exactly 4 ■■■ precipitated a massive defection by the reds against the blues immediately before the appointed hour. The bad feeling generated by this sudden break with the previous day-long goodwill was palpable at the postmortem session that I conducted, and the executives had to have counseling before they could be persuaded to work together again.

In 1989, I acceded to Oxford University Press's request for a second edition of *The Selfish Gene*. It contains two chapters based upon the two books that most excited me during the intervening dozen years. It will come as no surprise that the first of these chapters was an exposition of Axelrod's work, again called Nice Guys Finish First. But I still felt that Axelrod's own book should be available in my own country. I took the initiative by approaching Penguin Books and was pleased that they accepted my recommendation to publish it, and they invited me to write a foreword to their British paperback edition. I am doubly pleased that Robert Axelrod himself has now invited me to update that foreword for this new edition of his book.

In the twenty-two years since *The Evolution of Cooperation* was first published, it is no exaggeration to say that it has spawned a whole new research industry. In 1988, Axelrod and a colleague, Douglas Dion, compiled an annotated bibliography of research publication more or less directly inspired by *The Evolution of Cooperation*. They listed more than 250 works up to that date under the following headings: "politics and law," "economics," "sociology and anthropology," "biological applications," "theory (including evolutionary theory)," "automata theory (computer science)," "new tournaments," and "miscellaneous." Axelrod and Dion collaborated on another paper published in *Science* (Volume 242, 1988, 1385-1390) with the title "The Further Evolution of Cooperation" summarizing the progress of the field in the four years since 1984. Since that review, nearly two decades have gone by and the growth of research fields inspired by this book has continued apace. The graph gives the numbers of annual citations of Robert Axelrod in the scientific literature, and it clearly shows the impact that one influential book can have on the development of a field. Note the steep upturn of the graph after 1984, the publication date of *The Evolution of Cooperation*. Extensions of cooperation theory are found in books on prevention of war (Huth 1988), social evolution (Trivers 1985), cooperation among animals (Dugatkin 1997), human history (Wright 2000), evolutionary game theory (Gintis 2000), networks of trust and reciprocity that build social capital (Putnam 2000), microeconomics (Bowles 2004), science fiction (Anthony 1986), as well as books by Axelrod himself (1997 and 2001).

But in contemplating the welter of new research, the main impression I am left with is how little the basic conclusions of the book need to be changed. Ancient Mariner-like, I have continued over the years to press it upon students, colleagues, and passing acquaintances. I really do think that the planet would be a better place if everybody studied and understood it. The world's leaders should all be locked up with this book and not released until they have read it. This would be a pleasure to them and might save the rest of us. *The Evolution of Cooperation* deserves to replace the Gideon Bible.

RICHARD DAWKINS
Oxford, June 2006

REFERENCES

Anthony, Piers. 1986. *Golem in the Gears*. New York: Ballantine Books.

Axelrod, Robert. 1997. *Complexity of Cooperation: Agent-Based Models of Competition and Cooperation*. Princeton, NJ; Princeton University Press.

Axelrod, Robert, and Michael D. Cohen. 2001. *Harnessing Complexity: Organizational Implications of a Scientific Frontier*. New York: Free Press.

Bowles, Samuel. 2004. *Microeconomics: Behavior, Institutions, and Evolution*. New York; Russell Sage Foundation and Princeton University Press.

Dugatkin, Lee Alan. 1997. *Cooperation Among Animals: An Evolutionary Perspective*. New York and Oxford: Oxford University Press.

Gintis, Herbert. 2000. *Game Theory Evolving: A Problem-Centered Introduction to Modeling Strategic Interaction*. Princeton, NJ: Princeton University Press.

Huth, Paul K. 1988. *Extended Deterrence and the Prevention of War*. New Haven, CT and London: Yale University Press.

Putnam, Robert D. 2000. *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon & Schuster.

Trivers, Robert. 1985. *Social Evolution*. Menlo Park, CA: Benjamin/Cummings.

Wright, Robert. 2000. *Non-Zero: The Logic of Human Destiny*. New York: Pantheon.