

Cambridge University Press
0521829496 - Debating Design: From Darwin to DNA
Edited by: William A. Dembski and Michael Ruse
Frontmatter
[More information](#)

Debating Design
From Darwin to DNA

This volume provides a comprehensive and even-handed overview of the debate concerning biological origins. This has been a controversial debate ever since Darwin published *On the Origin of Species* in 1859. Invariably, the source of controversy has been design. Is the appearance of design in organisms as exhibited in their functional complexity the result of purely natural forces acting without prevision or teleology? Or does the appearance of design signify genuine prevision and teleology, and, if so, is that design empirically detectable and thus open to scientific inquiry? Four main positions have emerged in response to these questions: Darwinism, self-organization, theistic evolution, and intelligent design.

In this unique survey, leading figures in the debate argue for their respective positions in a nontechnical, accessible style. Readers are thus invited to draw their own conclusions. Two introductory essays furnish a historical overview of the debate.

There is no comparable collection of this kind. *Debating Design* will eagerly be sought out by professionals in philosophy, the history of science, biology, and religious studies.

William A. Dembski is Associate Research Professor in the Conceptual Foundations of Science at Baylor University and a Senior Fellow of the Discovery Institute's Center for Science and Culture.

Michael Ruse is Lucyle T. Werkmeister Professor of Philosophy at Florida State University.

Cambridge University Press
0521829496 - Debating Design: From Darwin to DNA
Edited by: William A. Dembski and Michael Ruse
Frontmatter
[More information](#)

Debating Design
From Darwin to DNA

Edited by
WILLIAM A. DEMBSKI
Baylor University

MICHAEL RUSE
Florida State University



CAMBRIDGE
UNIVERSITY PRESS

Cambridge University Press
0521829496 - Debating Design: From Darwin to DNA
Edited by: William A. Dembski and Michael Ruse
Frontmatter
[More information](#)

PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE
The Pitt Building, Trumpington Street, Cambridge, United Kingdom

CAMBRIDGE UNIVERSITY PRESS
The Edinburgh Building, Cambridge CB2 2RU, UK
40 West 20th Street, New York, NY 10011-4211, USA
477 Williamstown Road, Port Melbourne, VIC 3207, Australia
Ruiz de Alarcón 13, 28014 Madrid, Spain
Dock House, The Waterfront, Cape Town 8001, South Africa
<http://www.cambridge.org>

© Cambridge University Press 2004

This book is in copyright. Subject to statutory exception
and to the provisions of relevant collective licensing agreements,
no reproduction of any part may take place without
the written permission of Cambridge University Press.

First published 2004

Printed in the United States of America

Typeface ITC New Baskerville 10/12 pt. *System* L^AT_EX 2_ε [TB]

A catalog record for this book is available from the British Library.

Library of Congress Cataloging in Publication data available

ISBN 0 521 82949 6 hardback

Contents

<i>Notes on Contributors</i>	<i>page vii</i>
INTRODUCTION	
1. General Introduction <i>William A. Dembski and Michael Ruse</i>	3
2. The Argument from Design: A Brief History <i>Michael Ruse</i>	13
3. Who's Afraid of ID? A Survey of the Intelligent Design Movement <i>Angus Menuge</i>	32
PART I: DARWINISM	
4. Design without Designer: Darwin's Greatest Discovery <i>Francisco J. Ayala</i>	55
5. The Flagellum Unspun: The Collapse of "Irreducible Complexity" <i>Kenneth R. Miller</i>	81
6. The Design Argument <i>Elliott Sober</i>	98
7. DNA by Design? Stephen Meyer and the Return of the God Hypothesis <i>Robert T. Pennock</i>	130
PART II: COMPLEX SELF-ORGANIZATION	
8. Prolegomenon to a General Biology <i>Stuart Kauffman</i>	151
9. Darwinism, Design, and Complex Systems Dynamics <i>Bruce H. Weber and David J. Depew</i>	173

10. Emergent Complexity, Teleology, and the Arrow of Time <i>Paul Davies</i>	191
11. The Emergence of Biological Value <i>James Barham</i>	210
PART III: THEISTIC EVOLUTION	
12. Darwin, Design, and Divine Providence <i>John F. Haught</i>	229
13. The Inbuilt Potentiality of Creation <i>John Polkinghorne</i>	246
14. Theistic Evolution <i>Keith Ward</i>	261
15. Intelligent Design: Some Geological, Historical, and Theological Questions <i>Michael Roberts</i>	275
16. The Argument from Laws of Nature Reassessed <i>Richard Swinburne</i>	294
PART IV: INTELLIGENT DESIGN	
17. The Logical Underpinnings of Intelligent Design <i>William A. Dembski</i>	311
18. Information, Entropy, and the Origin of Life <i>Walter L. Bradley</i>	331
19. Irreducible Complexity: Obstacle to Darwinian Evolution <i>Michael J. Behe</i>	352
20. The Cambrian Information Explosion: Evidence for Intelligent Design <i>Stephen C. Meyer</i>	371
<i>Index</i>	393

Notes on Contributors

Francisco J. Ayala was born in Madrid, Spain, and has been a U.S. citizen since 1971. Ayala has been president and chairman of the board of the American Association for the Advancement of Science (1993–96) and was a member of the President's Committee of Advisors on Science and Technology (1994–2001). Ayala is currently Donald Bren Professor of Biological Sciences and of Philosophy at the University of California at Irvine. He is a recipient of the National Medal of Science for 2001. Other honors include election to the National Academy of Sciences, the American Academy of Arts and Sciences, the American Philosophical Society, and numerous foreign academies, including the Russian Academy of Sciences and the Accademia Nazionale dei Lincei (Rome). He has received numerous prizes and honorary degrees. His scientific research focuses on population and evolutionary genetics, including the origin of species, genetic diversity of populations, the origin of malaria, the population structure of parasitic protozoa, and the molecular clock of evolution. He also writes about the interface between religion and science and on philosophical issues concerning epistemology, ethics, and the philosophy of biology. He is author of more than 750 articles and of 18 books.

James Barham was trained in classics at the University of Texas at Austin and in the history of science at Harvard University. He is an independent scholar who has published some dozen articles on evolutionary epistemology, the philosophy of mind, and the philosophy of biology in both print and electronic journals, including *BioSystems*, *Evolution and Cognition*, *Rivista di Biologia*, and *Metanexus.net*. His work consists of a critique of the mechanistic and Darwinian images of life and mind, as well as an exploration of alternative means of understanding value, purpose, and meaning as objectively real, natural phenomena, in both their human and their universal biological manifestations. He is working on a book to be called *Neither Ghost nor Machine*.

Michael J. Behe graduated from Drexel University in Philadelphia in 1974, with a B.S. degree in chemistry. He did graduate studies in biochemistry at the University of Pennsylvania and was awarded a Ph.D. in 1978 for his dissertation research on sickle-cell disease. From 1978 to 1982, he did post-doctoral work on DNA structure at the National Institutes of Health. From 1982 to 1985, he was an assistant professor of chemistry at Queens College in New York City. In 1985 he moved to Lehigh University, where he is currently a professor of biochemistry. In his career he has authored more than forty technical papers and one book, *Darwin's Black Box: The Biochemical Challenge to Evolution*, which argues that living systems at the molecular level are best explained as being the result of deliberate intelligent design. *Darwin's Black Box* has been reviewed by the *New York Times*, *Nature*, *Philosophy of Science*, *Christianity Today*, and more than eighty other publications and has been translated into eight languages. He and his wife reside near Bethlehem, Pennsylvania, with their eight children.

Walter L. Bradley, Ph.D., P.E., received his B.S. in engineering science and his Ph.D. in materials science, both from the University of Texas at Austin. He taught for eight years as an assistant and associate professor at the Colorado School of Mines in its Metallurgical Engineering Department before assuming a position as professor of mechanical engineering at Texas A&M University in 1976. He served as head of his department of 67 professors and 1,500 students from 1989 to 1993. He also served as the director of the Texas A&M University Polymer Technology Center from 1986 to 1990 and from 1994 to 2000. He has received more than \$5 million in research contracts from government agencies such as NSF, NASA, DOE, and AFOSR and from major corporations such as Dupont, Exxon, Shell, Phillips, Equistar, Texas Eastman, Union Carbide, and 3M. He has published more than 125 technical articles in archival journals, conference proceedings, and as book chapters. He was honored by being elected a Fellow of the American Society for Materials in 1992. He has received one national and five local research awards and two local teaching awards. He coauthored a seminal work on the origin of life entitled *The Mystery of Life's Origin: Reassessing Current Theories* in 1984, has published several book chapters and journal articles related to the origin of life, and has spoken on more than sixty university campuses on this topic over the past ten years. He took early retirement from Texas A&M University in 2000 and now holds the title of Professor Emeritus of Mechanical Engineering.

Paul Davies was born in London in 1946 and obtained a doctorate from University College, London, in 1970. He held academic appointments at Cambridge and London Universities until, at the age of thirty-four, he was appointed professor of theoretical physics at the University of Newcastle upon Tyne. From 1990 until 1996 he was professor of mathematical physics,

and later of natural philosophy, at the University of Adelaide. He currently holds the positions of visiting professor at Imperial College, London, and honorary professor at the University of Queensland, although he remains based in south Australia, where he runs a science, media, and publishing consultancy called Orion Productions. Professor Davies has published more than 100 research papers in specialist journals in the areas of cosmology, gravitation, and quantum field theory, with particular emphasis on black holes and the origin of the universe. In addition to his research, Professor Davies is well known as an author, broadcaster, and public lecturer. He has written more than twenty-five books, including *God and the New Physics*, *The Cosmic Blueprint*, *The Mind of God*, *The Last Three Minutes*, *About Time*, *Are We Alone?* and *The Fifth Miracle*. Davies's commitment to bringing science to the wider public includes a heavy program of public lecturing in Australia, Europe, and the United States. In addition to addressing scientific topics, Davies lectures to religious organizations around the world and has had meetings with the Pope and the Dalai Lama. He frequently debates science and religion with theologians. Paul Davies is married and has four children.

William A. Dembski is an associate research professor in the conceptual foundations of science at Baylor University and a senior Fellow with Discovery Institute's Center for Science and Culture in Seattle. He is also the executive director of the International Society for Complexity, Information, and Design <www.iscid.org>, a professional society that explores complex systems apart from programmatic constraints such as naturalism. Dr. Dembski previously taught at Northwestern University, the University of Notre Dame, and the University of Dallas. He has done postdoctoral work in mathematics at MIT, in physics at the University of Chicago, and in computer science at Princeton University. A graduate of the University of Illinois at Chicago, where he earned a B.A. in psychology, an M.S. in statistics, and a Ph.D. in philosophy, he also received a doctorate in mathematics from the University of Chicago in 1988 and a master of divinity degree from Princeton Theological Seminary in 1996. He has held National Science Foundation graduate and postdoctoral fellowships. Dr. Dembski has published articles in mathematics, philosophy, and theology journals and is the author of several books. In *The Design Inference: Eliminating Chance through Small Probabilities* (Cambridge University Press, 1998), he examines the design argument in a post-Darwinian context and analyzes the connections linking chance, probability, and intelligent causation.

David J. Depew is professor of communication studies and rhetoric of inquiry at the University of Iowa. He is the coauthor, with Bruce H. Weber, of *Darwinism Evolving: Systems Dynamics and the Genealogy of Natural Selection* (1994). He is currently at work, with Marjorie Grene, on a history of the philosophy of biology to be published by Cambridge University Press.

John F. Haught is the Landegger Distinguished Professor of Theology at Georgetown University. Dr. Haught received his Ph.D. from Catholic University of America. He served as chair of the Georgetown Department of Theology from 1990 to 1995. He is now also director of the Georgetown Center for the Study of Science and Religion. Dr. Haught has published many articles and lectured widely, especially on topics related to religion and science, cosmology and theology, and ecology and theology. He is the author of many books, including *Responses to 101 Questions on God and Evolution* (2001), *God After Darwin* (2000), *Science and Religion: From Conflict to Conversation* (1995), *The Promise of Nature: Ecology and Cosmic Purpose* (1993), *Mystery and Promise: A Theology of Revelation* (1993), *What Is Religion?* (1990), *The Revelation of God in History* (1988), *What Is God?* (1986), *The Cosmic Adventure* (1984), *Nature and Purpose* (1980), and *Religion and Self-Acceptance* (1976), and he is the editor of *Science and Religion in Search of Cosmic Purpose* (2000).

Stuart Kauffman is an external professor for the Santa Fe Institute in New Mexico. He received his M.D. degree from the University of California at San Francisco in 1968 and was a professor in biochemistry and biophysics at the University of Pennsylvania until 1995. Since 1985, he has been a consultant for Los Alamos National Laboratory, and from 1986 to 1997 he was a professor at the Santa Fe Institute. Dr. Kauffman is also a founding general partner of the Bios Group in Santa Fe. He has served on the editorial boards of numerous scientific journals, including the *Journal of Theoretical Biology*. He is the author or coauthor of more than 100 scientific articles and the author of three books: *Origins of Order: Self-Organization and Selection in Evolution* (1993), *At Home in the Universe* (1995), and *Investigations* (2000).

Angus Menuge is associate professor of philosophy and program associate of the Cranach Institute at Concordia University, Wisconsin <www.cuw.edu/institutes/Cranach/>. He received his B.A. in philosophy from the University of Warwick and his Ph.D., on action explanation, from the University of Wisconsin–Madison. Dr. Menuge is editor of three books – *C. S. Lewis: Light-bearer in the Shadowlands* (1997), *Christ and Culture in Dialogue* (1999), and *Reading God's World: The Vocation of Scientist* (forthcoming). With the help of William Dembski, Menuge hosted the Design and Its Critics conference in June 2000, which inspired the present volume. Dr. Menuge has written a number of recent articles on Intelligent Design and is currently writing a book defending a robust notion of agency against reductionist theories, entitled *Agents Under Fire: Materialism and the Rationality of Science*.

Stephen C. Meyer is director of the Discovery Institute's Center for Science and Culture in Seattle, Washington, and serves as University Professor, Conceptual Foundations of Science, at Palm Beach Atlantic University in West Palm Beach, Florida. He received his Ph.D. in the history and

philosophy of science from Cambridge University, where he did a dissertation on the history of origin-of-life biology and the methodology of the historical sciences. Meyer worked previously as a geophysicist for the Atlantic Richfield Company and as a professor of philosophy at Whitworth College. He is coauthor of the book *Science and Evidence of Design in the Universe* (Ignatius 2002) and coeditor of the book *Darwinism, Design and Public Education* (Michigan State University Press 2003). Meyer has contributed scientific and philosophical articles to numerous scholarly books and journals and has published opinion-editorial columns for major newspapers and magazines such as *The Wall Street Journal*, *The Los Angeles Times*, *The Chicago Tribune*, *National Review*, and *First Things*. He has appeared on national television and radio programs such as Fox News, PBS's *TechnoPolitics* and *Freedom Speaks*, MSNBC's *Hardball with Chris Matthews*, and NPR's *Talk of the Nation* and *Science Friday*. He coauthored the film *Unlocking the Mystery of Life*, which recently aired on PBS stations around the country.

Kenneth R. Miller is professor of biology at Brown University. Dr. Miller has a Sc.B. in biology from Brown University (1970) and a Ph.D. in biology from the University of Colorado (1974). He has taught at the University of Colorado, Harvard University, and Brown University, where he has been full professor since 1986. He is the recipient of numerous honors for teaching excellence. Dr. Miller is a member of the American Association for the Advancement of Science and the American Society for Cell Biology, and he has been chairman and council member of the ASCB, editor of *The Journal of Cell Science*, and general editor of *Advances in Cell Biology*. Dr. Miller's scientific interests include the structure, composition, and function of biological membranes, electron microscopy and associated techniques, and photosynthetic energy conversion. He has published a large number of technical scientific papers and essays, edited three volumes of *Advances in Cell Biology*, and is author or coauthor of several high school and college biology textbooks, including *Biology: The Living Science* and *Biology: Discovering Life*. Recently, Dr. Miller has produced a general-audience work defending evolution and its compatibility with Christian faith and critiquing Intelligent Design: *Finding Darwin's God: A Scientist's Search for Common Ground between God and Evolution* (1999).

Robert T. Pennock is associate professor of science and technology studies and philosophy at Michigan State University's Lyman Briggs School and in the Philosophy Department. He is also on the faculty of MSU's Ecology and Evolutionary Biology and Behavior program. He has published numerous articles that critique Intelligent Design creationism, including one that won a Templeton Prize for Exemplary Paper in Theology and the Natural Sciences. He is the author of *Tower of Babel: The Evidence against the New Creationism* (1999).

Cambridge University Press
 0521829496 - Debating Design: From Darwin to DNA
 Edited by: William A. Dembski and Michael Ruse
 Frontmatter
[More information](#)

John Polkinghorne was professor of mathematical physics at Cambridge University, working in theoretical elementary particle physics. He was elected a Fellow of the Royal Society in 1974. In 1982 he was ordained to the priesthood in the Church of England. He is the author of a number of books about science and theology. In 1996 he retired as president of Queens' College, Cambridge, and in 1997 he was made a Knight of the British Empire.

Michael Roberts studied geology at Oxford and spent three years in Africa as an exploration geologist. He studied theology at Durham and was ordained into the Anglican Church in 1974 (along with Peter Toon). He is now vicar of Chirk, near Llangollen in North Wales. He is a keen mountain walker and has written articles on science and religion (one, on Darwin and design, received a Templeton Award in 1997) and on Darwin's British geology. In June 2000 he was a plenary speaker at the conference on Intelligent Design at Concordia University Wisconsin. He is married to Andrea, and they have two almost-grown-up children.

Michael Ruse is Lucyle T. Werkmeister Professor of Philosophy at Florida State University. He received his B.A. in philosophy and mathematics from Bristol University, an M.A. in philosophy from McMaster University, and his Ph.D. from Bristol University. He was full professor of philosophy at Guelph from 1974 to 2000. Dr. Ruse is a Fellow of the Royal Society of Canada and of the American Association for the Advancement of Science. He has received numerous visiting professorships, fellowships, and grants. Michael Ruse's many publications include *The Philosophy of Biology; Sociobiology: Sense or Nonsense?; The Darwinian Revolution: Science Red in Tooth and Claw; Darwinism Defended: A Guide to the Evolution Controversies; Taking Darwin Seriously: A Naturalistic Approach to Philosophy; But Is It Science? The Philosophical Question in the Evolution/Creation Controversy; and Monad to Man: The Concept of Progress in Evolutionary Biology*. His most recent works include *Mystery of Mysteries: Is Evolution a Social Construction?* and *Can a Darwinian Be a Christian? The Relationship between Science and Religion* (Cambridge University Press, 2000). Michael Ruse was the founding editor of the journal *Biology and Philosophy* and is now on the editorial board of several major journals, including *Zygon, Philosophy of Science*, and the *Quarterly Review of Biology*. On a more public level, Ruse has appeared on many television programs, including *Firing Line*, and was a witness for the ACLU in the 1981 Arkansas hearings that overturned a creation science law. His latest book is *Darwin and Design: Does Evolution have a Purpose?*

Elliott Sober is Hans Reichenbach Professor of Philosophy and Henry Vilas Research Professor at the University of Wisconsin–Madison, where he has taught since 1974. His research is in the philosophy of science, especially in the philosophy of evolutionary biology. Sober's books include *The Nature of Selection: Evolutionary Theory in Philosophical Focus* (1984, 2nd ed. 1993);

Reconstructing the Past: Parsimony, Evolution, and Inference (1988); *Philosophy of Biology* (1993); *From a Biological Point of View: Essays in Evolutionary Philosophy* (Cambridge University Press, 1994); and, most recently, *Unto Others: The Evolution and Psychology of Unselfish Behavior* (with David Sloan Wilson) (1998). Sober is a past president of the American Philosophical Association Central Division and a Fellow of the American Academy of Arts and Sciences.

Richard Swinburne has been Nolloth Professor of the Philosophy of the Christian Religion at the University of Oxford since 1985. For the twelve years before that he was a professor of philosophy at the University of Keele. Since 1992, Dr. Swinburne has been a Fellow of the British Academy. His books include *Space and Time* (1968, 2nd ed. 1981), *The Concept of Miracle* (1971), *An Introduction to Confirmation Theory* (1973), *The Coherence of Theism* (1977, 2nd ed. 1993), *The Existence of God* (1979, 2nd ed. 1991), *Faith and Reason* (1981), *Personal Identity* (with Sidney Shoemaker) (1984), *The Evolution of the Soul* (1986, 2nd ed. 1997), *Responsibility and Atonement* (1989), *Revelation* (1991), *The Christian God* (1994), *Providence and the Problem of Evil* (1998), *Is There a God?* (1996), and *Epistemic Justification* (forthcoming).

Keith Ward is a philosopher and theologian. He has taught philosophy at Glasgow, St. Andrews, London, and Cambridge Universities. He was ordained in the Church of England in 1972. Dr. Ward has been dean of Trinity Hall, Cambridge; professor of moral theology, London; professor of the history and philosophy of religion, London; and is presently Regius Professor of Divinity, Oxford. His books include *God, Chance and Necessity*; *God, Faith and the New Millennium*; and *Divine Action*.

Bruce H. Weber is professor of biochemistry at California State University at Fullerton and Robert H. Woodworth Professor of Science and Natural Philosophy at Bennington College. His is coauthor (with David Depew) of *Darwinism Evolving: Systems Dynamics and the Genealogy of Natural Selection* (1995), coauthor (with John Prebble) of *Wandering in the Gardens of the Mind: Peter Mitchell and the Making of Glynn* (2003), and coeditor (with David Depew) of *Evolution and Learning: The Baldwin Effect Reconsidered* (2003). He is also director of the Los Angeles Basin California State University Minority International Research Training Program.

Cambridge University Press
0521829496 - Debating Design: From Darwin to DNA
Edited by: William A. Dembski and Michael Ruse
Frontmatter
[More information](#)

Debating Design
From Darwin to DNA