

NEW GOD SURVEY · FREE ENERGY? · NUCLEAR DETERRENCE · FLAT EARTHERS

SKEPTIC

Extraordinary Claims, Revolutionary Ideas & the Promotion of Science—Vol. 23 No. 2 2018 \$6.95 USA and Canada
www.skeptic.com

THE RISE OF THE NONES

IS ORGANIZED RELIGION
ON THE DECLINE?



CLOSEOUT SALE!! LECTURE DVDS—SAVE 70 to 90%

Limited Quantities • Order now for best selection • While they last

The more you buy the more you save. For U.S. destinations we will also offer a generous shipping discount. Visit www.skeptic.com or call our office for quantity and shipping discounts. (626) 794-3119 See page 80 and the inside back cover for selected lecture descriptions.

FREE

with every DVD order: Brain, Mind & Consciousness Conference. 3 DVD SET. See page 80 for details

1. TOP PICKS

RICHARD DAWKINS: The Ancestor's Tale: A Pilgrimage to the Dawn of Evolution **av139DVD**

RICHARD DAWKINS: GOD DELUSION **av169DVD**

DANIEL DENNETT: Breaking the Spell: Religion As A Natural Phenomenon **av157DVD**

DANIEL DENNETT: Freedom Evolves: Free Will, Determinism, and Evolution **av119DVD**

JARED DIAMOND: The Great Leap Forward: The Evolution of Human Creativity & Language **av015DVD**

JARED DIAMOND: TAPE III-97 • 1997 AWARDS. Guns, Germs and Steel: A masterpiece! Why did Europeans conquer Native Americans, Africans and Aborigines, rather than the reverse? ALSO ON THIS TAPE: MICHAEL SHERMER: How to Bridge the Science Gap. **av055DVD**

JARED DIAMOND: How to be Rich & Successful: Lessons from History's Experiments in Organizing Human Groups **av077DVD**

JARED DIAMOND COLLAPSE! How Societies Choose to Fail or Succeed **av142DVD**

STEPHEN JAYGOULD: Evolution Revolution: Festschrift 2000 **av095DVD**

MICHIO KAKU: PARALLEL WORLDS: The Science of Creation, Black Holes, Superstrings, and Higher Dimensions **av143DVD**

STEVEN PINKER: THE BLANK SLATE: The Modern Denial of Human Nature **av113DVD**

STEVEN PINKER: THE STUFF OF THOUGHT: Language as a Window into Human Nature **av178DVD**

RICHARD WISEMAN: Luck, ESP, and Magic: How Science Tests the Unusual **av152DVD**

STUDY OF EVIL: ZIMBARDO: The Lucifer Effect: Understanding How Good People Turn Evil **av175DVD**

ROBERT WRIGHT: THE EVOLUTION OF GOD. From Stone Age to the Information Age **av203DVD**

2. PSEUDOSCIENCE

PSEUDOSCIENCE & THE PARANORMAL: FACTS BEHIND THE FICTION—1/2 DAY SEMINAR By Dr. Michael Shermer. Facts behind extraordinary claimss: ESP, UFOs, cults, much more. **av018DVD**

CAN HISTORY BE A SCIENCE? Conference 1997, Part II. Dr. Frank Sulloway • James "the Amazing" Randi on his Million Dollar Challenge **av054DVD**

THE KING OF URBAN LEGENDS: DR. JAN HAROLD BRUNVAND **av088DVD**

Dr. PHILIP PLAAT: popular astronomical misunderstandings. Entertaining **av107DVD**

Abducted! How People Come to Believe They Were Kidnapped by Aliens. By psychologist Dr. Susan Clancy. **av153DVD**

TESTING THE UNUSUAL by Dr. RICHARD WISEMAN: Luck, ESP, and Magic: How Science Tests the Unusual. Great tape for students, groups **av152DVD**
da VINCI CODE Decoding the da Vinci Code, The Gospel of Judas & Other Biblical Mysteries by Tim Callahan **av160DVD**

3. PSYCHICS ESP & MAGIC

MENTALISM/PSYCHIC POWER: Mind Power: Fact, Fiction & Fakery by mentalist Ian Rowland **av126DVD**

SCIENCE-BASED MAGIC TRICKS II THE MADMAN OF MAGIC Bob Friedhoffer **av097DVD**

PSYCHIC POWER DEMONSTRATED: The Magic of the Psychic & the Psychology of the Believer by Mark Edward **av016DVD**

PSYCHIC STING OPERATION: The Alpha Project and The Magic of Steve Shaw by Steve Shaw **av027DVD**

ESP DEMONSTRATED: ESP Demonstration. Magician & skeptical author Bob Steiner **av062DVD**

SCIENCE-BASED MAGIC TRICKS I: Magic Tricks & Science Facts by Bob Friedhoffer, The Madman of Magic **av073DVD**

The Psychology of Magic, by Dr. Tony Barnhart **av287DVD**

4. ENVIRONMENT & GLOBAL WARMING

The Great Environmental Debate: Are ecological problems exaggerated? by Dr. Bjorn Lomborg and Frank Miele. A very lively audience Q & A. **av103DVD**

HUMAN CLIMATE CHANGE HISTORY Global Warming, Climate Change, and the Future of the Environment—Ploughs, Plagues, and Petroleum. By climate scientist Dr. William Ruddman **av149DVD**

WARMING IS SERIOUS: DR. TIM FLANNERY The Weather Makers: How Humans are Changing the Climate and What it Means for Life on Earth by environmental scientist Dr. Tim Flannery. **av159DVD**

ENVIRONMENTAL WARS CONFERENCE Environmental Wars Part I: Dr. Michael Shermer: "Conversion of an Environmental Skeptic"; Nobel Laureate Dr. David Baltimore: "Science & Politics: An Uneasy Relationship" Dr. David Goodstein: "Out of Gas: The End of the Age of Oil"; Dr. Tapio Schneider: "Global Climate Change" **av161DVD**

ENVIRONMENTAL WARS CONFERENCE Environmental Wars Part 2: DEBATE: Chris Mooney v. Ronald Bailey "Distorting Science: Who is Worse—the Left or Right?"; Ronald Bailey Global Warming and other Eco Myths. Panel discussion and Q & A with the two speakers above, and climate scientist Dr. Tapio Schneider. **av162DVD**

ENVIRONMENTAL WARS CONFERENCE Environmental Wars Part 3: Dr. Donald Prothero: "Catastrophes" Dr. Brian Fagan: "Climate Change and Ancient Societies";

Dr. Gregory Benford: "Stabilizing the Future Greenhouse Earth" **av163DVD**

ENVIRONMENTAL WARS CONFERENCE Environmental Wars Part 4: Jonathan H. Adler: "Fables of Federal Environmental Regulation"; Gregory Arnold "Can Markets Save the Planet?"; Market-based Solutions to Environmental Problems; Dr. Paul MacCreedy: "Doing More with Less for a World that Works" **av164DVD**

ENVIRONMENTAL WARS CONFERENCE Environmental Wars Part 5: JOHN STOSSEL: MICHAEL CRICHTON **av165DVD**

Earth-Shattering Disasters! by Donald R. Prothero. Fascinating. **av232DVD**

Here on Earth: A Natural History of the Planet, by Tim Flannery **av231DVD**

5. BIOLOGY, EVOLUTION & CREATIONISM

Dr. EUGENIE SCOTT and Dr. MICHAEL SHERMER Reinventing Evolution: Creationism and Contingency. Conference 1999. Tape I by Dr. Eugenie Scott and Dr. Michael Shermer. Dr. JACK HORNER and Dr. DONALD PROTHERO **av079DVD-**

Reinventing Evolution: Dinosaurs and Punctuated Equilibrium. Conference 1999. Tape II Dr. ROBERT PENNOCK **av096DVD**

EVOLUTION REVOLUTION Festschrift 2000 FOR STEPHEN JAY GOULD PART III Dr. DONALD PROTHERO; Dr. Michael Shermer; Dr. Frank J. Sulloway **av093DVD**

Dr. MICHAEL SHERMER: In Darwin's Shadow: The Life and Science of Alfred Russel Wallace by Michael Shermer **av115DVD**

RICHARD DAWKINS: The Ancestor's Tale: A Pilgrimage to the Dawn of Evolution Renowned Evolutionary Biologist, Richard Dawkins **av139DVD**

Dr. DONALD PROTHERO: Evolution: How We Know it Happened and Why it Matters. By Dr. Donald Prothero **av154DVD**

EVOLUTIONARY ORIGIN OF LOVE: Dr. WALTER GOLDSCHMIDT: The Bridge to Humanity Argues for a separate evolutionary origin of what we call love **av158DVD**

Dr. MICHAEL SHERMER: Why Darwin Matters: the Case for Evolution and Against Intelligent Design **av168DVD**

EVOLUTION/CREATIONISM: DONALD PROTHERO: Geology, Creationism, and Evolution: The Breathing Inanity of Flood Geology **av181DVD**

Geology, Creationism & Evolution, by Dr. Donald Prothero **av181DVD**

The Greatest Show on Earth, by Richard Dawkins **av219DVD**

NEANDERTHAL MAN GENOME by Dr. Svante Pääbo **av277DVD**

Thank God for Evolution, by Michael Dowd **av202DVD**

Beautiful Minds: The Parallel Lives of Great Apes & Dolphins by Dr. Craig Stanford **av184DVD**

Extraordinary Differences Between the Sexes in the Animal Kingdom, by Dr. Daphne J. Fairbairn **av269DVD**

Moral Origins: The Evolution of Virtue, Altruism, & Shame by Dr. Christopher Boehm **av259DVD**
Death, Sex and Evolution. how we read fossils by Dr. John Long **av215DVD**

Adventures Among Ants, by Dr. Mark Moffett **av214DVD**

Greenhouse of the Dinosaurs, by Dr. Donald Prothero **av208DVD**

H1N1: The Evolution of a Deadly Virus by Carl Zimmer **av206DVD**

Abominable Science and Reality Check, by Donald R. Prothero **av272DVD**

6. RELIGION: BIBLE ANALYSIS; RELIGIOUS HISTORY, ANTHROPOLOGY, PSYCHOLOGY

NEAR-DEATH EXPERIENCES: Altered States and the Quest For Transcendence. Dr. Michael Shermer **av004DVD**

CHRISTMAS STAR: SCIENCE V. RELIGION The Christmas Star. Science and Religion in the Modern Age by John Mosley **av008DVD**

SCIENCE SUPPORTS WITCHCRAFT? Dr. Richard Olson: ironically, rationalism increased belief in witches **av009DVD**

PURPOSE, ORIGIN OF SATAN - The Devil and Demonology: Who Needs Satan? by Dr. Henry Ansgar Kelly **av037DVD**

HISTORICAL JESUS-Dr. BURTON MACK-The Search for the Historical Jesus **av040DVD**

ACCURACY OF BIBLE PROPHECY- Bible Prophecy by Tim Callahan **av050DVD**

THE HEBREW BIBLES ODD TALES EXPLAINED by JONATHAN KIRSCH: Forbidden Tales In The Bible **av074DVD**

Dr. RICHARD ELLIOTT FRIEDMAN: The Hidden Book In The Bible **av076DVD**

MYTHIC ORIGINS OF BIBLE STORIES: Secret Origins of the Bible. Tim Callahan **av110 DVD**

RATIONAL MYSTICISM by John Horgan. The Border between Science & Spirituality **av120DVD**

SCIENTIFIC STUDY OF THE SOUL: The End Of The Soul: Atheism and Anthropology by Dr. Jennifer Michael Hecht **av128DVD**

HISTORY OF MONOTHEISM: Jonathan Kirsch. GOD AGAINST THE GODS. **av136DVD**

ATHEIST ACTIVIST: Dr. MIKE NEWDOW The Church, the State, the Pledge, and the Law: Adventures in Skeptical Activism. **av141DVD**

REALITY BEHIND SOME MYTHS: How the Human Mind Shapes Myth. Dr. Elizabeth Wayland Barber. **av144DVD**

PURPOSE OF RELIGION: Dr. DANIEL DENNETT Breaking the Spell: Religion As A Natural Phenomenon **av157DVD**

MOTIVES FOR SOCIAL BEHAVIOR: How Affect Hunger Trumps the Selfish Gene. Dr. Walter Goldschmidt **av158DVD**

Decoding the da Vinci Code, The Gospel of Judas & Other Biblical Mysteries by Tim

Callahan. **av160DVD**
RICHARD DAWKINS-GOD DELUSION **av169DVD**

STUDY OF EVIL: The Lucifer Effect: Understanding How Good People Turn Evil By Dr. Philip Zimbardo. **av175DVD**

BOOK OF REVELATION: How the Most Controversial Book in the Bible Changed the Course of Western Civilization by Jonathan Kirsch **av173DVD**

WHY THE BIBLE CONTRADICTS ITSELF: The Bible Against Itself: Who Wrote It, and Why it Seems to Contradict Itself. by Dr. Randal Helms **av173DVD**

DEBATE: DINESH D'SOUZA v. MICHAEL SHERMER Is Religion a Force for Good or Evil? **av180DVD**

7. THE NATURE OF HUMAN NATURE (THE SCIENCE OF WHO WE ARE)

EVOLUTION OF CREATIVITY & LANGUAGE The Great Leap Forward: The Evolution of Human Creativity and Language by Dr. Jared Diamond. **av015DVD**

False Memory Syndrome and the Recovered Memory Movement by Dr. John Hochman. **017DVD**

GUNS, GERMS & STEEL: SKEPTIC MAGAZINE AWARDS. JARED DIAMOND: *Guns, Germs and Steel*: A masterpiece! **av055DVD**

WHY IS SEX FUN? -by Dr. Jared Diamond. With wit and a wealth of fascinating examples **av058DVD**

RECOVERED V. FALSE MEMORY: by Dr. Pamela Freyd and Eleanor Goldstein. **av070DVD**

HISTORY'S EXPERIMENTS: DR. JARED DIAMOND. How to be Rich and Successful: Lessons from History's Experiments in Organizing Human Groups **av077DVD**

NEANDERTHALS V. HOMO SAPIENS: The Dawn Of human Culture by paleoanthropologist Dr. Richard Klein. **av108DVD**

LINGUISTIC EVOLUTION: Power of Babel: A Natural History of Language by linguist Dr. John McWhorter **av109DVD**

DR. STEVEN PINKER: The Blank Slate: The Modern Denial of Human Nature by evolutionary psychologist and linguistic theorist **av113DVD**

NEUROBIOLOGICAL APPROACH TO CONSCIOUSNESS: The Quest for Consciousness: A Neurobiological Approach by Caltech neuroscientist Dr. Christof Koch. **av122DVD**

ANTHROPOLOGY ON EASTER ISLAND: A Skeptic On Easter Island: Sex, Lies & Fieldnotes by archeologist Dr. Joanne van Tilburg. **av124DVD**

LATEST RESEARCH INTO MALENESS: "Y": The Descent Of Men, Revealing the Mysteries Of Maleness by British geneticist and science author Dr. Steve Jones. **av125DVD**

PHANTOM WORDS & AUDITORY ILLUSIONS. Music perception expert Dr. Diana Deutsch. **av129DVD**

SCIENCE FACT & FICTION by Nonfiction and SIFI author Dr. David Brin. **av130DVD**

BRAIN RESEARCH & SOCIAL ADAPTATION
NEW BRAIN SCIENCE by Caltech neuroscientist Dr. Stephen Quartz. **av131DVD**

LSD, SPIRITUALITY, CREATIVITY by medical anthropologist Dr. Marlene Dobkin de Rios. **av132DVD**

DR. MICHAEL SHERMER: The Science of Good & Evil: Why People Cheat, Gossip, Share, Care & Follow the Golden Rule **av134DVD**

WHY WE LIE: The Evolutionary Roots of Deception & the Unconscious Mind by Dr. David Livingstone Smith. **av138DVD**

HOW THE HUMAN MIND SHAPES MYTH.
Dr. Elizabeth Wayland Barber **av144DVD**

Indivisible by Two: Lives of Extraordinary Twins (and What They Teach Us About Human Nature) by Dr. Nancy Segal **av148DVD**

SOCIETIES IN CRISIS: DR. JARED DIAMOND
Crisis Management by People and Nations: How Individuals and Societies in Crisis Do (or Don't) Reappraise Core Values. **av155 DVD-**

STRANGE PSYCHOLOGY BEHIND ALIEN ABDUCTION; How People Come to Believe They Were Kidnapped by Aliens by Dr. Susan Clancy. **av153DVD**

FOOD MYTHS: The Gospel of Food. by sociologist Barry Glassner **av172DVD**

UNDERSTANDING EVIL: DR. PHILIP ZIMBARDO
The Lucifer Effect: Understanding How Good People Turn Evil **av175DVD**

BAD DECISIONS: DR. CAROL TAVRIS. Mistakes Were Made (But Not by Me): Why We Justify Foolish Beliefs, Bad Decisions, and Hurtful Acts **av176DVD**

THE STUFF OF THOUGHT: DR. STEVEN PINKER
Language as a Window into Human Nature by one of the most influential thinkers of our time **av178DVD**

MORAL MARKETS & THE MIND OF THE MARKET. Economist Dr. Paul Zak and Dr. Michael Shermer debunk economic myths **av182DVD**

EVOLUTION OF INTELLIGENCE: Beautiful Minds: The Parallel Lives of Great Apes and Dolphins by Dr. Craig Stanford **av184DVD**

ROBOTS AND CYBORGS: Beyond Human: Living with Robots & Cyborgs with biologist Dr. Elisabeth Malarre & physicist and SIFI author Dr. Greg Benford **av185DVD**

HOW VIRUSES EVOLVE: H1N1: The Evolution of a Deadly Virus: What Evolution Tells Us About Disease - Carl Zimmer **av206DVD**

ECOLOGY FROM A POLITICAL PERSPECTIVE: Stewart Brand sees everything in terms of solvable design problems **av205DVD**

HOW INFANTS THINK: What Children's Minds Tell Us About Truth, Love, and the Meaning of Life. Dr. Alison Gopnik **av204DVD**

PSYCHOLOGY OF EVIL: WHY PEOPLE BEHAVE BADLY. DR. BARBARA OAKLEY. **av201DVD**

Alan Turing: The Enigma, by Dr. Andrew Hodges **av288DVD**

Do Zombies Dream of Undead Sheep? by Dr. Bradley Voytek **av286DVD**

Plato at the Gogolplex: Why Philosophy Won't Go Away by Dr. Rebecca Newberger Goldstein **av281DVD**

Humble Before The Void: Western Science Meets Tibetan Buddhism by Dr. Chris Impey. **av280DVD**

Trying Not to Try: The Art and Science of Spontaneity, by Dr. Edward Slingerland **av279DVD**

Surnames and the History of Social Mobility, by Dr. Gregory Clark **av278DVD**

Searching for the Science of Self by Jennifer Ouellette **av275DVD**

Give and Take: the Psychology of Human Interactions by Dr. Adam Grant **av268DVD**

How the Mind Makes Meaning, by Dr. Benjamin K. Bergen **av266DVD**

THE VISIONEERS: How a Group of Elite Scientists Pursued Space Colonies, Nanotechnologies, and a Limitless Future by Dr. W. Patrick McCray **av265DVD**

The World Until Yesterday: What Can We Learn from Traditional Societies? by Dr. Jared Diamond **av264DVD**

The Moral Molecule: The Source of Love & Prosperity by Dr. Paul Zak **av263DVD**

The Wisdom of Psychopaths: What Saints, Spies, and Serial Killers Can Teach Us About Success by Dr. Kevin Dutton **av260DVD**

MORAL ORIGINS: The Evolution of Virtue, Altruism, and Shame by Dr. Christopher Boehm **av259DVD**

Born Together-Reared Apart: The Landmark Minnesota Twin Study by Dr. Nancy Segal **av258DVD**

Consciousness: What Links Conscious Experience to Bioelectrical Activity In the Brain? by Dr. Christof Koch **av256DVD**

Subliminal: How Your Unconscious Mind Rules Your Behavior by Leonard Mlodinow **av255DVD**

FREE WILL by Sam Harris **av253DVD**

How the Digital Revolution Will Create Better Health Care by Dr. Eric Topol **av250DVD**

ABUNDANCE: Why the Future Will Be Much Better Than You Think by Dr. Peter Diamandis **av249DVD**

Free Will and the Science of the Brain: DO WE HAVE FREE WILL or are our lives simply determined by the same physical laws that control the world around us? by Dr. Michael Gazzaniga **av245DVD**

The Logic of Deceit and Self-Deception in Human Life by Robert Trivers **av244DVD**

Thinking: Fast and Slow. A challenge to the rational model of judgment and decision making by Dr. Daniel Kahneman **av243DVD**

The Better Angels of Our Nature: Why Violence Has Declined by DR. STEVEN PINKER **av242DVD**

Someone Else's Twin: The True Story of Babies Switched at Birth by Nancy Segal **av239DVD**

The Future of Science, Technology, and Education, by Bill Nye and James Randi **av235DVD**

THE BELIEVING BRAIN: From Ghosts and Gods to Politics and Conspiracies by Michael Shermer **av233DVD**

QUANTUM MAN: Richard Feynman's Life in Science, by Lawrence Krauss **av230DVD**

The World in 2050, by Laurence Smith **av222DVD**

WHAT TECHNOLOGY WANTS: why we have a love/hate relationship with new inventions, and why technology is an extension of life by Kevin Kelly **av221DVD**

THE RATIONAL OPTIMIST: How Prosperity Evolves by Dr. Matt Ridley **av216DVD**

HOW THE ECONOMY WORKS: Confidence, Crashes, and Self-fulfilling Prophecies, by Dr. Roger E. Farmer **av213DVD**

The Philosophical Baby:What Children's Minds Tell Us About Truth, Love, and the Meaning of Life by Dr. Alison Gopnik **av204DVD**

Why People Behave Badly: why some people intentionally inflict emotional and physical pain on others by Barbara Oakley **av201DVD**

A DARWIN DAY 200TH BIRTHDAY CELEBRATION **av197DVD**

The Enemy Within: 2,000 Years of Witch-Hunting in the Western World by Dr. John Demos **av194DVD**

Origins & The Big Questions: Conference 2008. Part 5 **av192DVD**

Origins & The Big Questions: Conference 2008. Part 4 **av191DVD**

Origins & The Big Questions: Conference 2008. Part 3 **av190DVD**

Origins & The Big Questions: Conference 2008. Part 2 **av189DVD**

Origins & The Big Questions: Conference 2008. Part 1 **av188DVD**

Beyond Human: Living with Robots & Cyborgs, by Dr. Elisabeth Malarre & Dr. Gregory Benford **av185DVD**

Moral Markets & the Mind of the Market, with Dr. Paul Zak and Dr. Michael Shermer **av182DVD**

8. THE COSMOS: SPACE EXPLORATION

CARL SAGAN TRIBUTES: A Tribute by Sagan biographers Keay Davidson, William Poundstone; and by Michael Shermer **AV086DVD**

THE CASE FOR GOING TO MARS: DR. ROBERT ZUBRIN Entering Space: From Mars to the Stars **av087DVD**

THE SEARCH FOR ET INTELLIGENCE: SETI Institute scientist Dr. Seth Shostack **av089DVD**

SENDING MESSAGES INTO THE FAR FUTURE: Deep Time: Communicating Across the Millennia by physicist Dr. Gregory Benford **av090DVD**

Astrobiology and The Life and Death of Planet Earth Fascinating! by Dr. Peter Ward and Dr. Donald Brownlee **av118DVD**

HUMAN SPACE EXPLORATION: Dr. Robert Zubrin. NASA and the Future of Human Space Exploration: A Skeptical View **av133DVD**

Near-Earth Objects, by Dr. Donald Yeomans **av262DVD**

Wizards, Aliens, and Starships, by Dr. Charles Adler **av276DVD**

How To Boldly Go Into Space, by Drs. Linda and Thomas Spilker **av273DVD**

Strange New Worlds, by Dr. Ray Jayawardhana **av229DVD**

NASA's Dawn Mission to the Asteroid Belt, by Dr. Marc Rayman **av267DVD**

9. THE COSMOS: PHYSICS

The Universe & the Tea Cup-The Mathematics of Truth and Beauty by Award-winning science writer K.C. Cole **av061DVD**

THEORIES OF EVERYTHING: The Hole in the Universe: The Physics of Nothing and Theories of Everything by K.C. Cole **av099 DVD**

TOPOLOGY OF THE UNIVERSE: DR. JANNA LEVIN How the Universe Got Its Spots: cosmology & topology **av106DVD**

AMATEUR ASTRONOMY REVOLUTION: TIMOTHY FERRIS Seeing in the Dark- amateur astronomy-**av111DVD**

EXPANDING UNIVERSE/DARK ENERGY: Extravagant Universe: Exploding Stars, Dark Energy, & the Accelerating Cosmos by supernova expert Dr. Robert Kirshner **av114DVD**

MICHIO KAKU: The Physics of the Future **av228DVD**

How Old is the Universe? by Dr. David Weintraub; The Shape of Inner Space by Dr. Shing-Tung Yau **av225DVD**

From Particles to People by Dr. Sean M. Carroll **av224DVD**

The Grand Design by Leonard Mlodinow **av223DVD**

The Myth of Mirror Neurons by Dr. Gregory Hickok **av283DVD**

Cosmic Cocktail: Three Parts Dark Matter by Dr. Katherine Freese **av282DVD**

The Medea Hypothesis: Is Life on Earth Ultimately Self-Destructive? by Dr. Peter Ward **av200DVD**

The Crowded Universe The Search for Living Planets by Alan Boss **av199DVD**

Knocking on Heaven's Door, by Dr. Lisa Randall **av241DVD**

Physics on the Fringe, by Margaret Wertheim **av246DVD**

The Particle at the End of the Universe, by Dr. Sean M. Carroll **av261DVD**

Black Holes Sing, by Dr. Janna Levin **av196DVD**

MICHIO KAKU: Physics of the Impossible **av183DVD**

10. SCIENCE HISTORY, SCIENCE PHILOSOPHY & SCIENCE ETHICS

15 MYTHS OF SCIENCE by Dr. William McComas **av056DVD**

FRAUD & SCIENCE: The Baltimore Case: Fraud & Science by Caltech historian of science by Dr. Daniel J. Kevels **av071DVD**

The "Mad Scientist" in Modern Culture by David Skal. **av072DVD**

Cutting-Edge Science and Technologies: What is a Skeptic to Believe? by David Naiditch **av116DVD**

SCIENCE WRITERS NEEDED: Who is Science Writing For? by science writer Margaret Wertheim **av117DVD**

EDWARD TUFTS:THE RENOWNED THEORIST OF ANALYTICAL DESIGN Beautiful Evidence: The Art of Science and the Science of Art by Dr. Edward Tufte **av140DVD**

UNUSUAL SCIENCE TESTS: DR. RICHARD WISEMAN Luck, ESP, & Magic: Science Tests the Unusual **av152DVD**

Beyond Human: Living with Robots and Cyborgs with Dr. Elisabeth Malarre and Dr. Greg Benford **av185DVD**

11. SCIENCE AND RELIGION

How Darwin Became An Agnostic by Dr. Mario Di Gregorio, historian of science **av044DVD**

NEW IDEAS OF HEAVEN: Heaven and the Internet by Dr. Margaret Wertheim **av085DVD**

EVOLUTIONARY THEORY OF RELIGION: Darwin's Cathedral: Evolution, Religion, and the Nature of Science by anthropologist and

evolutionary theorist Dr. David Sloan Wilson **av112DVD**

RATIONAL MYSTICISM: THE BORDER BETWEEN SCIENCE & SPIRITUALITY by John Horgan. **av120DVD**

SCIENCE LOOKS AT THE GOD QUESTION by physicist and author Dr. Taner Edis **av121DVD**

BILL NYE THE SCIENCE GUY Cool Science and the "Eyes of Nye." **av145DVD**

Why We Believe in God(s) by Dr. Andy Thomson **av248DVD**

On Science, Religion & Morality by Michael Shermer **av234DVD**

Losing my Religion, by William Lobbell **av198DVD**

The Grand Inquisitor's Handbook: A History of Terror in the Name of God, by Jonathan Kirsch **av187DVD**

Reinventing the Sacred, by Dr. Stuart Kauffman **av186DVD**

THE GREAT DEBATE: HAS SCIENCE REFUTED RELIGION? Physicist Sean Carroll & Michael Shermer v. Dinesh D'Souza & MIT physicist Ian Hutchinson **av252DVD**

Revelations: Visions, Prophecy, and Politics by Dr. Elaine Pagels **av251DVD**

36 Arguments for the Existence of God (this is a novel) by Rebecca Goldstein **av209DVD**

The Evolution of God, by Robert Wright **av203DVD**

The Limits of Science & the Search for Meaning, by Dr. Marcelo Gleiser **av285DVD**

12. EXTREMISM, RACE, CULTS

CULTS: MIND CONTROL, & RECOVERY by Steven Hassan. Hassan, cult expert **av091DVD**

WHAT MOTIVATES EXTREMISTS? by social historian Dr. John George. **av105DVD**

JEWISH DNA; RACE IDENTITY by John Entine on the connection between genetics and identity **av179DVD**

13. MATH AND STATISTICS

TWO MODES OF MATH THINKING: The Art of the Infinite: The Pleasures Of Mathematics by Drs Robert & Ellen Kaplan **av123DVD-**

SCIENTIFIC HISTORY OF "NOISE" Noise: a fuzzy logic perspective: Dr. Bart Kosko **av170DVD**

MATH AS A PROBLEM SOLVER The Universe & the Tea Cup-The Mathematics of Truth and Beauty by K.C. Cole **av061DVD**

The Calculus Diaries, by Jennifer Ouellette **av218DVD**

The Drunkard's Walk, by Dr. Leonard Mlodinow **av211DVD**

Secrets of Mental Math by Art Benjamin **av257DVD**

14. SATIRE/SONGS

SINGER SATIRIST ROY ZIMMERMAN (plus JAMES RANDI!) **av147DVD**

ATHEIST ACTIVIST: Dr. MIKE NEWDOW The Church, the State, the Pledge, and the Law: Adventures in Skeptical Activism **av141DVD**

MR. DEITY AND FRIENDS by Brian Dalton **av237DVD**

Skeptics Society Officers

Michael Shermer
Pat Linse

Publisher & Editor-in-Chief

Michael Shermer

Co-publisher & Art Director

Pat Linse

Senior Editor

Frank Miele

Junior Skeptic Editor

Daniel Loxton

Director of Development

Steven Ridley

Senior Scientists

David Naiditch
Claudio Maccone
Liam McDaid
Thomas McDonough

Contributing Editors

Tim Callahan
Harriet Hall, M.D.
Donald Prothero
Carol Tavis

Webmaster

William Bull

Editorial Assistant

Diane Fisher
Sara Meric

Photographer

David Patton

Audiovisual Services

Brad Davies

Database Circulation

Jerry Friedman, J.D.

Printed and bound in the USA

Skeptic (ISSN 1063-9330) is published quarterly by Millennium Press, Inc., and is a benefit of membership to anyone who joins the Skeptics Society, a 501(c)(3) nonprofit scientific and educational corporation. Copyright © 2018 by Millennium Press, Inc. All rights are reserved. Reproduction or use of the contents in whole or in part without permission of the publisher is prohibited. The following are registered trademarks, and use of them without permission is prohibited: Millennium Press, Millennium Books, Skeptics Society, Skeptic, Junior Skeptic and the Skeptics Society logo. Statements on any subject, institution, or person made by authors may not reflect the opinions of and are not the responsibility of the staff or editorial board members of Skeptic, or the Skeptic Society. Cover art and interior illustrations may not be reproduced without permission. Canadian Publications Agreement #1468103. Skeptic is indexed in: EBSCO; Gale Directory of Publication and Broadcast Media; ISIS; UMI; Bibliography of the History of Science Society; The Readers Guide to Periodicals; The Serials Directory: An International Reference Book; Ulrich's; Sociological Abstracts; Index to Social Sciences and Humanities Proceedings; Exceptional Human Experience Network; Religion Index One: Periodicals, and The Index to Book Reviews in Religion and Information Access.

About the Skeptics Society

The Skeptics Society is a nonprofit 501 (c)(3) educational organization that promotes science literacy and critical thinking, and investigates fringe science and paranormal claims. Supported by leading scientists, scholars, journalists and magicians, we

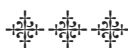
- ♦ publish science-based content in *SKEPTIC* magazine, *JUNIOR SKEPTIC* (for kids), and *eSkeptic* (our free, weekly email newsletter)
- ♦ distribute *Skepticality* and *Monster Talk*, our free podcast
- ♦ sponsor a science lecture series at the California Institute of Technology and make recordings available in our online store
- ♦ promote and sell science and critical thinking books, DVDs and CDs
- ♦ organize scientific conferences and events for research and educational purposes
- ♦ provide media with information on controversial claims
- ♦ maintain an educational website where one can find information on all of the above.

The Skeptics Society and *SKEPTIC* magazine investigate pseudoscientific and paranormal claims. With regard to statements, hypotheses, theories, and ideologies examined by the Skeptics Society, the organization adopts the view of the 17th-century Dutch philosopher Baruch Spinoza:

"I have made a ceaseless effort not to ridicule, not to bewail, not to scorn human actions, but to understand them."

With regard to its procedure of examination of all claims, the Skeptics Society uses the scientific method first developed in the 16th and 17th centuries. While it recognizes the limitations and socio-cultural influences on science, it adopts the philosophy of Albert Einstein:

"All our science, measured against reality, is primitive and childlike—and yet it is the most precious thing we have."



Advertise in this magazine

For a current rate card with prices and dimensions, contact our office by phone at 626-794-3119 or by email at skepticsociety@skeptic.com

Contribute to this magazine

Read our submission guidelines at www.skeptic.com/contribute

Subscriptions, orders and address changes

Send address changes in an email to office@skeptic.com or call 626-794-3119. Order products from our online store, Shop Skeptic, at www.skeptic.com/shop

Get eSkeptic, our free weekly email newsletter

Sign up for *eSkeptic*—our free, weekly electronic companion to *Skeptic* magazine at www.skeptic.com/eskeptic

EDITORIAL / ADVISORY BOARD

Arthur Benjamin
Professor of Mathematics,
Harvey Mudd College, Magician

Roger Bingham
Science Author & Television Essayist

Napoleon Chagnon
Professor of Anthropology, U.C. Santa Barbara

K.C. Cole
Science Writer, Los Angeles Times

Richard Dawkins
Emeritus Professor, University of Oxford

Jared Diamond
Professor of Geography &
Environmental Health Sciences, UCLA

Clayton J. Drees
Professor of History, Virginia Wesleyan College

Mark Edward
Professional Magician & Mentalist

Gregory Forbes
Professor of Biology,
Grand Rapids Community College

John Gribbin
Astrophysicist & Science Writer

William Jarvis
President, National Council Against Health
Fraud, Professor, Loma Linda University

Lawrence M. Krauss
Theoretical Physicist,
Arizona State University

Christof Koch
Professor of Cognitive & Behavioral Biology
California Institute of Technology

William McComas
Director, project to advance Science Education
University of Arkansas

Bill Nye
Executive Director, The Planetary Society

Leonard Mlodinow
Physicist, Caltech

Richard Olson
Professor of History of Science, Harvey
Mudd College, Claremont Graduate School

Donald Prothero
Professor of Geology, Cal Poly, Pomona

Nancy Segal
Professor of Psychology, CSU, Fullerton

Eugenie Scott
(Retired) Executive Director,
National Center for Science Education

Julia Sweeney
Writer, Actor, Comedian

Frank Sulloway
Research Scholar, MIT

Carol Tavriss
Social Psychologist/Author

Stuart Vyse
Behavioral Scientist, Author

CONTENTS

COLUMNS

- 4 The SkepDoc**
*Premature Ejaculation in the News:
How Headlines Influence Our Thinking*
BY HARRIET HALL, M.D.
- 6 The Gadfly**
Please Touch
BY CAROL TAVRIS

64 Authors & Contributors

SKEPTIC INVESTIGATES:

- 8 Is the Earth Flat?**
*Flat Earthers Are Back—How do You Best
Make the Argument for a Round Earth?*
BY DANIEL LOXTON

ARTICLES

- 14 Conspiracy Theorists,
and the Harm They Do**
BY JAMES K. LAMBERT
- 20 The Last One Forgotten**
*Bruce Perkins and Another Terrible
Tragedy of the Recovered Memory
Movement*
BY L KIRK HAGEN
- 30 The Rooney Rule**
*The Value of Diversity In Birds, Bees,
and People*
BY TODD M FREEBERG
- 46 Deterrence and Its
Discontents**
*Now That Nuclear War Seems to
Be Getting More Likely Again, It's
Time to Turn a Skeptical Eye on
Deterrence*
BY DAVID BARASH
- 42 Humbling Humanity**
*Reality Need Not Diminish Our
Concept of Our Place In the Cosmos*
BY STEPHEN B. GRAY
- 52 Skeptical of the Multiverse**
BY ARTURO SANGALLI

SPECIAL SECTION THE RISE OF THE NONES

- 32 Imagining No Heaven**
*The Rise of the Nones and the
Decline of Religion*
BY MICHAEL SHERMER
- 38 Never Doubting God**
Surveys on Belief in God's Existence
BY CHARLES S. REICHARDT

EXCERPT

- 26 Persistence of Belief
In a Purposeful Universe**
BY RALPH LEWIS

REVIEWS

- 55 Honor, Dignity, Victim**
*A review of The Rise of Victimhood
Culture: Microaggressions, Safe
Spaces, and the New Culture Wars*
BY BRADLEY CAMPBELL AND
JASON MANNING.
REVIEWED BY KEVIN MCCAFFREE
- 58 Reason (and Science)
for Hope**
*A review of Enlightenment Now: The
Case for Reason, Science, Humanism,
and Progress* BY STEVEN PINKER.
REVIEWED BY MICHAEL SHERMER
- 59 Realizing Rawls' Just Society**
*A review of It's Better Than It Looks:
Reasons for Optimism in an Age of
Fear* BY GREGG EASTERBROOK
REVIEWED BY MICHAEL SHERMER
- 60 Unsubstantiated**
*A review of Unacknowledged. A new
Netflix documentary purports to
provide proof of alien visitation but
fails to deliver.*
REVIEWED BY TIM CALLAHAN

JUNIOR SKEPTIC

- 65 Perpetual Motion**
BY DANIEL LOXTON

COVER ILLUSTRATION BY PAT LINSE.

The SkepDoc

Premature Ejaculation in the News: How Headlines Influence Our Thinking

BY HARRIET HALL, M.D.



NO, THIS IS NOT ABOUT SEX. EJACULATION doesn't only mean discharge of semen, it also means "a short, sudden emotional utterance." People make verbal ejaculations when they're excited or have something important to say. Headlines are frequently ejaculations. They often express premature enthusiasm, hyping the questionable results of a new research study as if it were already well established truth. They may trumpet "Cancer cured!" when the accompanying article describes a minor improvement (not a cure) in laboratory rats. The headline is designed not for accuracy, but to entice the reader to read on. In a recent example, Tissue Nanotransfection (TNT) was hyped as a one-time, one-second, noninvasive cure for everything. It was a clear case of premature ejaculation.

Stem Cells are Promising

Stem cells have captured the imagination of the public. They are "sexy." They offer the hope of eventually being able to fix anything that might go wrong with the body from injury, disease, or aging. Unscrupulous clinics in the U.S. and around the world are already offering various kinds of stem cell treatments. In most cases, the treatments they offer have not been tested for effectiveness or safety and they can be harmful, even deadly. The FDA is cracking down and has warned the public to avoid stem cell treatments that are not FDA approved or part of a clinical trial. But questionable and illegal stem cell treatments are still being offered in the U.S. and medical tourism to stem cell clinics in other countries is thriving.

Initially, stem cell research was highly controversial because the cells

were obtained from human embryos. But now there are other sources. Researchers have succeeded in transforming skin cells into stem cells that could potentially develop into any tissue. Before this technique could become an effective treatment for anything, we would have to be able to direct the stem cells to develop into the specific tissue we want, and we would have to get the new tissue cells to the right place in the body. Even if they do what we want, they might also do something we don't want, like causing cancer. The concept is promising, but the technological obstacles are immense.

A New Approach

Recently, researchers have found a way to avoid the stem cell phase and its attendant concerns. Transcription factors and short snippets of RNA have been used to directly convert skin cells to the desired cell type, to make the skin cell's genes stop expressing "skin" and start expressing "blood vessels" or whatever is wanted. This concept has been used to transform human fibroblasts into spinal motor neuron.¹ In the lab. This is very preliminary research. No tested treatments are available for humans.

Now there is a new technology called Tissue Nanotransfection (TNT). The headline reads:² "Breakthrough device heals organs with a single touch." It can allegedly generate any cell type and replace injured or compromised organs. A nanotechnology-based chip is placed on the skin and zapped with an electrical current, thereby reprogramming adult skin cells into another type of cell. It only needs to be done once and it takes less than a second. This astounding news provoked an ejaculation of my own: WOW!!

The Tissue Nanotransfection Study (TNT)

The study behind the headlines was done at Ohio State University and published in *Nature Nanotechnology*.³ It did *not* "heal organs with a single touch." Far from it. It was a study done on mice. They cut the femoral artery to produce ischemic damage in the leg. Then they applied a nano-channeled device to the skin, inserting a positive electrode into the skin and a negative electrode into the device's cargo solution of DNA and transcription factors. Then they applied a pulsed electric field (10 pulses of 10 milliseconds each). This created tiny pores in the skin cell membranes (nanoporation) and electrophoretically drove the solution directly into the cytoplasm of the cells. Within a week, the skin cells were transformed into blood vessel cells and the new blood vessels connected to the existing circulation so that the ischemic limbs developed an adequate blood supply and healed faster than in untreated control mice. The researchers hypothesize that cells of any organ could be created in the skin and then transferred to that organ to restore its function.

This is fascinating stuff, but I'm skeptical. I don't know enough about how those transcription factors work, but something about this doesn't quite ring true to me. It sounds like science fiction. Is the injected DNA somehow incorporated into the cell's chromosomes? Do the transcription factors affect cells beyond the original recipient cells? If this really works, would it be safe? Changing the expression of genes can affect the expression of other genes and have unintended consequences. Genes are part of a complicated interlocking web, and

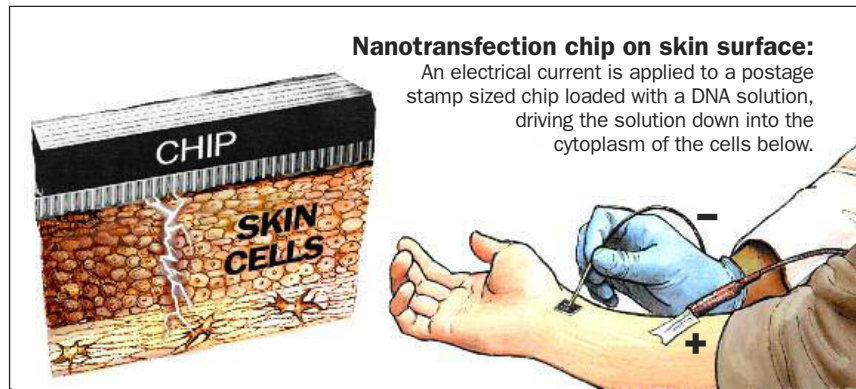
making changes without fully understanding their impact seems a bit foolhardy.

In the article, the lead researcher is quoted as saying it works about 98 percent of the time, but there's no explanation of where that figure came from or what "works" means. He calls it noninvasive; but that's technically not true, since the electrode pierces the skin and a solution is driven through the skin into the body. He describes being surprised that it worked so well. He says they plan to start clinical trials next year to test this technology in humans.

If this pans out, it will be sensational. Imagine being able to grow replacement cells for any damaged or aging organ by simply applying a device to the skin for less than a second. A miracle cure! An end to aging! Different news articles have suggested TNT may be a solution for essentially every health problem. Just imagine how wonderful it would be if we could fix everything that goes wrong in the human body. What if we could produce new, healthy brain cells for patients with Alzheimer's or new, healthy pancreas cells for patients with diabetes? Imagine living forever with no illness and no deterioration. There are already conspiracy theories saying Big Pharma will suppress TNT because it threatens their profits. It sounds too good to be true, so it probably is. But we can hope. We can dream. And journalists can ejaculate headlines.

That other TNT, the explosive one, could definitely put a permanent end to people's health problems. Will this new TNT live up to its promise? Time will tell...

It's premature to accept the results of this one study before any other lab has tried to replicate it. We should never rely on the results of a single study. There are too many things that can go wrong in research and produce misleading results, and promising early studies are often followed by failures. Many unanswered questions remain. The Health News Review website evaluates the quality of news stories. They gave this story a score of 4 out of 9.⁴ They said it buried key information, there were missing pieces, caveats were needed, and the language was unjustified and sensational.



Why Headlines Matter

Maria Konnikova, a psychologist and writer who frequently speaks at skeptic conferences, wrote an article for *The New Yorker* titled "How Headlines Change the Way We Think."⁵ We know headlines determine how many people will read an article, but we may not realize that they also determine *the way* people read an article and the way they will remember it. Headlines frame the experience and set the tone. First impressions matter. The choice of phrasing shifts perception of the text by drawing attention to certain details and affecting what existing knowledge is activated in your mind. Even if the text includes caveats and explanations, it may not be enough to correct the headline's misdirection.

Konnikova describes recent research showing that a misleading headline decreased readers' recall of details in the article that didn't support the headline and reduced their ability to make accurate inferences. In a follow-up study, readers were asked to rate people whose pictures accompanied an article. A story about an art theft might feature a picture of the gallery owner or of the criminal, and the headline made a difference in how readers rated the faces of those individuals for attractiveness, trustworthiness, dominance, and aggression. We are being subtly manipulated. The manipulation is usually not deliberate, but more often a matter of sloppiness or inconsideration.

Journalists are frequently aggravated by negative reactions to their articles that appear to be based only on the headline. They want to scream "Read

the article." But the research shows that reading the article may not be enough. Konnikova concludes, "It's not always easy to be both interesting and accurate... but it's better than being exciting and wrong."

Some Bad Examples

The Bad Press Awards feature some real doozies. The *Daily Mail* had an article about a lorry-load of migrants denied entry into the UK. The headline read, "We're from Europe, Let Us In!" In fact, they were from Iraq and Kuwait and had only travelled through Europe on their way to the UK. A headline in *The Sun* said, "Gunman screaming 'Al-lahu Akbar' opens fire in Spanish supermarket." Turns out he was a Basque who said something in the Basque language (Euskara) that witnesses didn't understand.

My favorite medical example was the reporting of a study on glucosamine and chondroitin for knee osteoarthritis. Some headlines said it was effective and others said it wasn't. The study showed it didn't work, but one small subgroup seemed to show a benefit and some headline writers chose to emphasize that subgroup.

The bottom line: Headlines can mess with your head. Beware premature ejaculations in the news. **S**

REFERENCES

1. <http://bit.ly/2FAONIL>
2. <http://bit.ly/2fnuA83>
3. <http://go.nature.com/2t2t5mk>
4. <http://bit.ly/2EW8XUj>
5. <http://bit.ly/2ERUOM1>

The Gadfly

Please Touch

BY CAROL TAVRIS



HERE ARE A FEW SMALL STUDIES YOU CAN do on your own to introduce this column's subject:

- Sit in a coffee shop and watch people who are eating together. Count how many times one person touches the other as they converse. If you live in a large city, you should have a wealth of diverse individuals to observe; if your coffee shop is monocultural, you might have to do a little traveling. Many years ago, Sidney Jourard did this in San Juan (Puerto Rico), Paris, London, and Gainesville (Florida).¹ His scores were: San Juan, 180; Paris, 110; London, 0; and Gainesville, 2.
- Examine the photos of survivors of any horrible event—a natural disaster, such as flood or fire, or a human-made disaster, such as a mass shooting or bomb. Try to find an image of survivors standing apart from one another, arms crossed in front of them. You can't, can you? Total strangers as well as neighbors will be hugging each other, whether stoically or in tears, for comfort and support.
- If you can find some little kids to watch, your own or anyone else's (or if you remember being a little kid yourself), observe what they typically do when they fall and hurt themselves, have a scary nightmare, or feel lonely: run to a loved adult for a comforting cuddle.
- Listen to what people say when a gift or experience moves them emotionally and when they reconnect with old

friends: "I'm touched," they say, and "I'm sorry we lost touch." Notice they don't say "I'm hearing" or "I'm sorry we lost smell." What is the touch that has touched them?

- Observe all the signs in museums that say "don't touch." If touching were not a natural impulse, why tell us repeatedly (and often uselessly) not to do it?

Touch is the often the last, but not the least, of what are considered the five basic senses, following vision, hearing, smell, and taste. But it is just as crucial for human survival; the need to touch and be touched emerges the minute a baby is hatched. Babies are born with a grasping reflex—they will cling to any offered finger—and it's abundantly clear, from the pioneering research of the British psychiatrist John Bowlby and the psychologist Harry Harlow, that babies crave as much "contact comfort" as they can get. Infants who get little touching and cuddling will grow more slowly and release less growth hormone than their amply cuddled peers, and throughout their lives, they will have stronger reactions to stress and be more prone to depression and its cognitive deficits.²



Babies who are raised with "creature comforts" but not contact comfort may be physically healthy but emotionally despairing, remote, and listless.

The pleasure of being touched and held, and of touching others, is crucial not only for newborns, but also for everyone throughout life, because it releases a flood of pleasure-producing and stress-reducing endorphins. It calms the stress response we feel after tragedy, loss, or fear. In hospital settings, even the mildest touch by a nurse or physician on a patient's arm or forehead is reassuring psychologically and lowers blood pressure. Gestures emerge in infancy, before speech, and touch and gestures remain a central part of human communication: we touch to say hello and goodbye, to warn, to sympathize, to express affection, to be reassured, to get attention, and, most of all, to feel connected.

Tiffany Field, director of the Touch Research Institute at the University of Miami School of Medicine, and her lab have been studying the physiology and psychology of touch for decades. Among their important findings: American preschoolers are touched less than French children, American adolescents

touch each other less than French teenagers do, and—though causality can't be strongly determined—American children of all ages behave more aggressively toward their peers than French preschoolers and adolescents. But Field's research shows that "massage therapy" helps everyone by lowering blood pressure and improving immune function, and has special benefits for target groups—infants,

Sculpture by Gustav Vigeland, Frogner Park, Oslo, Norway: "Man and Children."

pregnant women, people with HIV, children with autism, patients suffering fibromyalgia pain. A laying on of hands literally, not just religiously, soothes and heals. For that reason, the current medical experience for most patients—in which the doctor spends most of his or her time entering their data into a computer, barely looking at, let alone touching, the poor worried patient sitting there—is not only over-tech, it's under-human.

To be sure, the human need for touch, like every other aspect of human behavior, is profoundly affected by culture, gender, learning, and the individual's own temperament. Some individuals are touch-averse, and so are some entire cultures. In his classic book *Touching: The Human Significance of the Skin*, anthropologist Ashley Montagu noted that “There are whole cultures that are characterized by a ‘*Noli me tangere*,’ a ‘Do not touch me,’ way of life. There are other cultures in which tactility is so much a way of life, in which there is so much embracing and fondling and kissing it appears strange and embarrassing to the nontactile peoples.”³

Much of American culture falls into the category of “nontactile peoples”—Gainesville, 2!—and those who suffer most from this cultural norm are men. Many males grow up thinking that touch has only two functions: sex and violence. Touch is for grabbing a woman by the pussy or punching another guy on the nose; any other kind of touching—certainly male-male affectionate touching—is evidence of being “feminine,” gay, or weak. Look how hard it was for Andrew Reiner to say farewell to his dying father with a loving gesture of touch:

I had thought about reaching for my father's hand for weeks. He was slowly dying in a nursing home, and no one who visited him...held his hand. How do you reach for something that, for so many decades, hinted at violence and, worse, dismissal? ... I finally did it. I touched my father's hand, which I hadn't held since I was a young boy. His curled fingers opened, unhinging some

long-sealed door within me, then lightly closed around mine. Before I left, I did something else none of the males in my family had ever done before. I leaned close to my father's ear and whispered, “I love you.”⁴

After the brief flutter of a “sexual revolution” in the 60s and 70s, which explicitly encouraged the breaking down of touch barriers, tactility took a major hit in the 1980s and 1990s, in the wake of the nationwide panic over non-existent pedophiles in daycare centers and the entirely-too-existent pedophile priests. Almost overnight teachers and other adults were forbidden to touch children in any way, even to comfort little ones with scraped knees. And even when not officially forbidden, many adult men stopped touching children to comfort them, fearing that their caring gesture would be misunderstood by suspicious passersby. Today, in the aftermath of “#MeToo,” touch has taken another hit, as many men worry about friendly, platonic touches of their female friends and colleagues; will these be construed as inappropriate, sexist power ploys?

I got to thinking wistfully about Ashley Montagu and Tiffany Field after reading a news story about the students at Antioch College and their latest crusade on behalf of rules for sexual consent. Having pioneered a policy of “affirmative sexual consent,” since adopted at colleges across the country, Antioch students, the reporter wrote, “are moving the conversation beyond sex to discussions of consent in platonic touch.”⁵ At Antioch now, you don't tap someone on the shoulder to get their attention; you ask permission for shoulder tapping. You don't impulsively hug a friend; you get consent first. Even your mother has to get your permission. When one third-year student came home for her first visit after starting college, she told the reporter that she was taken by surprise when her mother hugged her. “If you don't want to be touched and your mom wants to hug you, you should be allowed to say no,” the student said proudly. “It's about having autonomy over your own body.”

She was *taken by surprise*? A loving hug is now a surprise? Sure, no one should have to submit to unpleasant squeezes and slobbery kisses and unwanted hugs—from relatives, dates, strangers, or coworkers. But “your own body” doesn't only want autonomy; it also craves community and connection with other bodies. The constant refrain of “me, me, me” drowns out “us” and smothers empathy. Maybe this student's mother is a toxic hugger, but maybe she just loves her daughter, freshly home from college, has missed her desperately, and simply wants, well, a hug. How about thinking of your mom's feelings for 30 seconds, Ms. Autonomous Student? How about considering the cost of relentless consent-seeking—the loss of spontaneity, a joyful sharing of a moment of affection and intimacy, a touch on a nervous friend's arm to convey reassurance?

I appreciate how conflicted and unsettled many men are these days, not knowing which gestures, embraces, or touches a female colleague will regard as welcome or as unwelcome. The difference is abundantly, nonverbally clear to me and I think to most women, but it obviously is not clear to the many men who think that touch = sex and only sex. Therefore, the solution is obvious: for men to learn to appreciate the joys and benefits of nonviolent, nonsexual touch, they need to start practicing on other men: their brothers, their sons, their friends...their fathers. **S**

REFERENCES

1. Jourard, Sidney. 1996. “An Exploratory Study of Body-accessibility.” *British Journal of Social and Clinical Psychology*, 114, 135-136.
2. Field, Tiffany. 2009. “The Effects of Newborn Massage: United States.” In T. Field et al. (Eds.), *The Newborn as a Person: Enabling Healthy Infant Development Worldwide*. Hoboken, NJ: Wiley.
3. Montagu, Ashley. 1986. *Touching: The Human Significance of the Skin*. (3rd ed.) New York: Harper, 1986, p. 292.
4. Rosman, Katherine. 2018. “Thank You for Asking.” *The New York Times*, Feb. 24.
5. Reiner, Andrew. 2017. “The Power of Touch, Especially for Men.” *The New York Times*, Dec. 5.

Is the Earth Flat?

Flat Earthers Are Back—You Know the Earth Is Round, But How do You Best Make the Argument?

BY DANIEL LOXTON

RECENT NEWS STORIES,¹ CELEBRITY ENDORSEMENTS, and Google search trends² have highlighted an apparently growing conspiracy theory belief that the Earth is not a globe, but instead a flat disc. According to believers, government forces promote a completely fictitious model of the cosmos in order to conceal the true nature of the Earth. Are these claims true?

No. The Earth is Round

The evidence for a spherical Earth is overwhelming.³ Most obviously, there are many thousands of images and videos of the Earth from space, including a continually changing live stream view of the globe from the International Space Station—not to mention all the astronauts who have personally seen the Earth from orbit. Flat Earthers claim that all images of the globe are fraudulent inventions, and all testimony from astronauts is false. It is unreasonable to dismiss all of the evidence from the entire history of space exploration, especially when there is zero evidence for a decades long “globularist” conspiracy. However, we do not need to rely on evidence from modern space agencies to confirm the roundness of the Earth for ourselves.

The globe has been clearly understood for thousands of years. Indeed, this was one of the first cosmic facts to be worked out correctly by ancient people because evidence of a spherical Earth is visible to the naked eye.

By the time of the philosopher Socrates and his student Plato, many Greeks understood that the Earth could only be a sphere. Sailors would have noticed that the sails of approaching ships appeared be-

fore the hulls of the ships became visible because the surface of the sea is slightly curved, like the surface of an enormous ball.⁴ When you sail toward a ship, island, or lighthouse, their tallest points are the first thing to peek up over the curve of the horizon.

Plato’s student Aristotle offered further “evidence of the senses” to support his own conclusion that the Earth “must necessarily be spherical.” First, there was the evidence of lunar eclipses. When the Moon passes through the shadow of the Earth, that shadow is always the circular shadow of a sphere. Also, Aristotle argued, “our observations of the stars” make it clear “not only that the Earth is circular, but also that it is a circle of no great size.” He pointed out that “quite a small change of position to south or north” significantly changes “the stars which are overhead, and the stars seen are different, as one moves northward or southward.” Just as ships can be hidden from view by the curvature of the horizon, so too can the stars.⁵

The debate about the shape of the Earth has been settled for over two thousand years. An ancient scholar named Eratosthenes—the head of the famous library of Alexandria in Egypt—even correctly approximated the circumference of the Earth using experimental measurements of shadows in two cities and some geometry.⁶ (Figure 1)

Despite modern legends about Medieval backwardness, there never was a time when educated people went back to thinking the Earth was flat. Once discovered, the true shape of the globe was too simple and useful a fact to be forgotten. Sailors were reminded of the planet’s roundness every time they climbed a mast to see further over the horizon

This article draws some of the material from an earlier JUNIOR SKEPTIC article on the topic in SKEPTIC Vol. 19, No.4.

SKEPTIC INVESTIGATES

or looked to the stars to determine their position. By the time of Columbus, his crew and even his critics understood that our world is a globe.⁷ It had been an established fact for centuries. For example, here's a passage from the popular astronomy textbook *On the Sphere of the World* (Figure 2), published over 250 years before Columbus sailed:

That the earth, too, is round is shown thus. The... stars do not rise and set the same for all men everywhere but rise and set sooner for those in the east than for those in the west; and of this there is no other cause than the bulge of the Earth.⁸

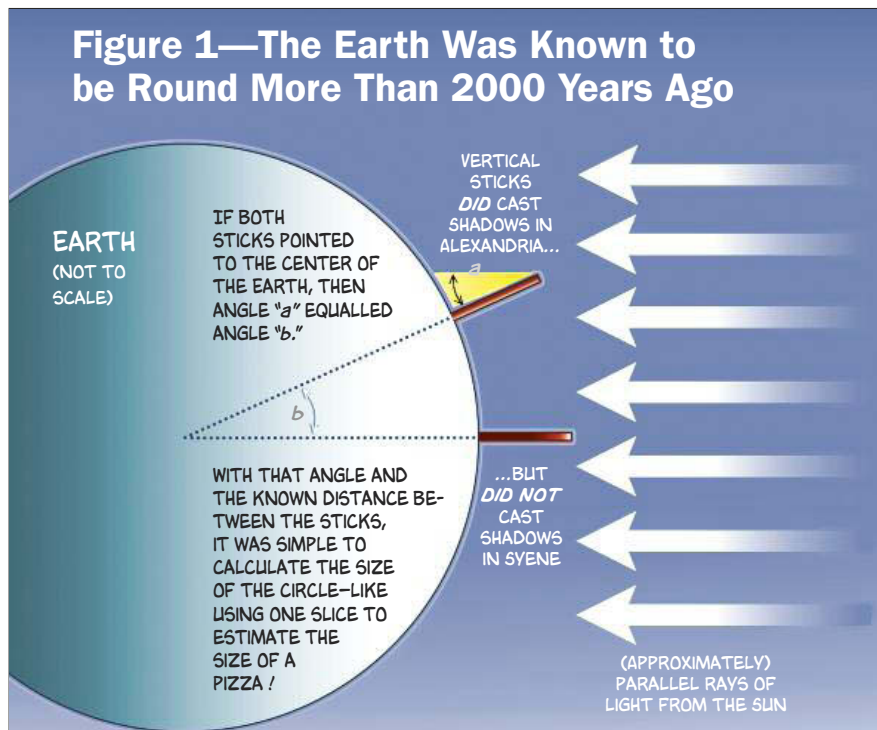
The Nature of Flat Earth Beliefs

Flat Earth beliefs vary, but usually involve a large disc-shaped world with a relatively tiny Sun and Moon circling above it like lamps above a table. Flat Earth maps rearrange the continents and seas to radiate outward from the North Pole, which is imagined to be at the center of the disc. Everything we think of as the Southern Hemisphere is spread out around the outer circumference. It is usually claimed that Antarctica does not exist at all. Instead, the entire disc is encircled by a vast wall of ice that we mistake for a frozen southern continent.⁹ (Figures 3 and 4)

The people who make these claims are not always sincere. There is a long tradition of humorous trolling by people who merely pretend to think the Earth is flat.¹⁰ However, genuine, passionate Flat Earth believers certainly do exist. They typically base their beliefs on two things: intuition and fundamentalist religious faith. The world seems pretty flat when we go about our daily lives. The Bible also contains passages that suggest that our world could be a flat surface covered by a dome (the "Firmament").¹¹ (Figure 5)

Throughout the 19th and 20th centuries, Flat Earthism was primarily motivated by Biblical literalism.¹² Believers saw the globe and astronomy as threats to faith. "No one can believe a single doctrine or dogma of modern astronomy and accept Scriptures as divine revelation," argued 19th century Flat Earth author John Hampden.¹³

This idea remains the position of many Flat Earthers today (although the Internet apparently also fosters a new, more secular¹⁴ conspiracy theory strain alongside traditional Christian Flat Earthism). Flat Earth believers have long occupied a fringe within the Christian creationism movement, and have been a source of embarrassment for other creationists. For example, the creationist ministry Answers in Genesis has published several articles



While Aristotle reported that mathematicians in his day had tried to calculate the circumference of the Earth, he didn't mention which methods they used.

A century later, Eratosthenes, head of the famous library of Alexandria in Egypt, read that on the first day of summer in Syene (a town in the south of Egypt), a staff held upright would cast no shadow at noon. The sun in Syene at that moment was positioned so directly overhead that it even shone straight down into deep wells and reflected off the water. Eratosthenes tested a vertical stick on the summer solstice at noon to see if it would cast a shadow in his own town of Alexandria, some 500 miles (800 km) to the North. It did! He used the length of that shadow, the known distance between the two towns, and the rules of geometry to calculate a circumference for the Earth of around 250,000 stadia. Astronomer Carl Sagan marvelled:

Eratosthenes' only tools were sticks, eyes, feet and brains, plus a taste for experiment. With them he deduced the circumference of the Earth with an error of only a few percent, a remarkable achievement for 2,200 years ago.

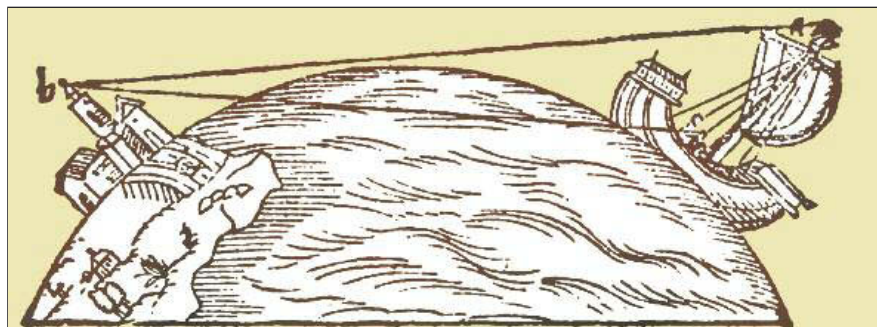




Figure 3—Flat Earth illustration by Daniel Loxton. The Sun and Moon are shown much larger than imagined by Flat Earthers. Most believe that the Sun and Moon are around 32 miles across, which would make them tiny pinpoints of light relative to the size of the disk they circle over.

correctly debunking Flat Earth beliefs,¹⁵ only to be accused of hypocrisy for accepting astronomy while rejecting geology and biology. “The Flat Earth position is first based upon Scripture,” shot back one Christian Flat Earther.¹⁶

Flat Earth beliefs almost require creationist faith because the Flat Earth could not be a natural object. If such a world existed, it could only be an artificial environment constructed on purpose and maintained by forces we do not understand. Left to itself, a disc-world would collapse under its own gravity, forming a sphere like other planets, large moons, and stars.

Since the dawn of the Space Age, Flat Earth beliefs have necessarily also entailed believing that a vast conspiracy deceives us about the nature of the world.¹⁷ “The space program is a scientific plot to hoodwink the public,” claimed Charles and Mar-

jory Johnson,¹⁸ the most prominent Flat Earth advocates during the 1970s, 80s, and 90s.¹⁹ If they were correct about the shape of the Earth, it would follow that a conspiracy must exist to falsify evidence of Moon landings and images of the Earth from space.

However, this claim of a worldwide conspiracy suffers from the same serious flaws as other similar grand conspiracy narratives (such as the “chemtrails” conspiracy theory that aircraft contrails are actually part of a secret global spraying program designed to poison the Earth). First, there is no evidence that any such conspiracy exists. Second, it is implausible to suppose that a conspiracy could exist at that scale for decades without any of the countless thousands of conspirators ever leaking the truth. Third, if a conspiracy was so powerful as to hide itself successfully forever, it would

SKEPTIC INVESTIGATES

surely also be able stop Flat Earthers from constantly blabbing about it on the Internet, newspapers, and television. Finally, it is unclear what could possibly motivate the sustained worldwide effort and expense necessary to conceal the shape of the Earth.

Christian Flat Earthers consider the conspiracy Satanic, which again places Flat Earth beliefs firmly within the sphere of religious fundamentalism. The assumed goal of the round Earth conspiracy is to lead believers astray from their salvation. This has a certain internal logic given their prior assumptions (on faith) of a Flat Earth, a conspiracy, and ongoing spiritual warfare between God and Satan. A round Earth conspiracy seems difficult to justify in secular terms. Why bother pretending the Earth is one shape rather than another? It stretches credibility to accept the motivation that one Flat Earth organization proposes: space agencies are “most likely motivated by greed...and using only some of their funding to continue to fake space travel saves a lot of money to embezzle for themselves.”²⁰

Flat Earth Ideas Make No Sense and Explain Nothing

Like other creationists, Flat Earthers base their arguments on perceived flaws in mainstream science while ignoring major problems with their own claims. They do not provide scientific evidence for their radical alternative model. Nor do Flat Earth models explain the broad range of natural phenomena that are well explained by the modern scientific understanding of the globe and its place in our solar system: planetary formation, volcanoes, tides, seasonal changes, the phases of the Moon, plate tectonics, earthquakes, the coldness of the poles, the magnetic field that compasses rely upon, auroras, and so on.

The Flat Earth model fundamentally conflicts with the things we see in nature. For example, why would the southern hemisphere’s stars be visible from the opposite edges of a Flat Earth, while people in the central region of the disc instead see the constellations of the northern hemisphere? Shouldn’t the same stars hang over everyone on a Flat Earth like a ceiling hangs over a kitchen table?

Why do the Sun and Moon and stars appear to rise and set? Most Flat Earthers believe that the Sun and Moon are fairly close objects, each just a few miles across, which always hang above the Flat Earth. Supposedly both objects circle around the North Pole on a plane parallel to the Earth’s flat surface while shining down like lamps to illuminate

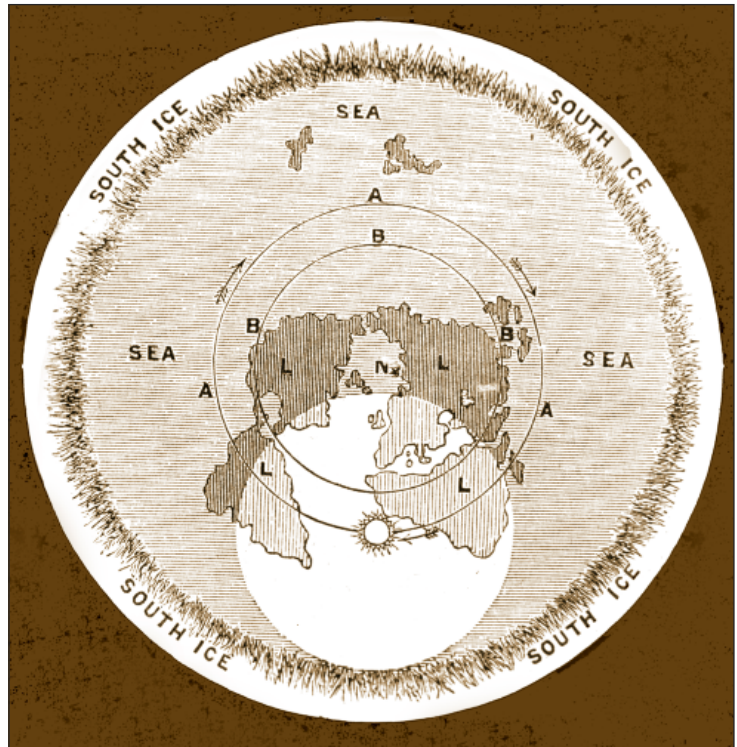


Figure 4—A Flat Earth map from Samuel Birley Rowbotham’s book *Zetetic Astronomy* (1865).

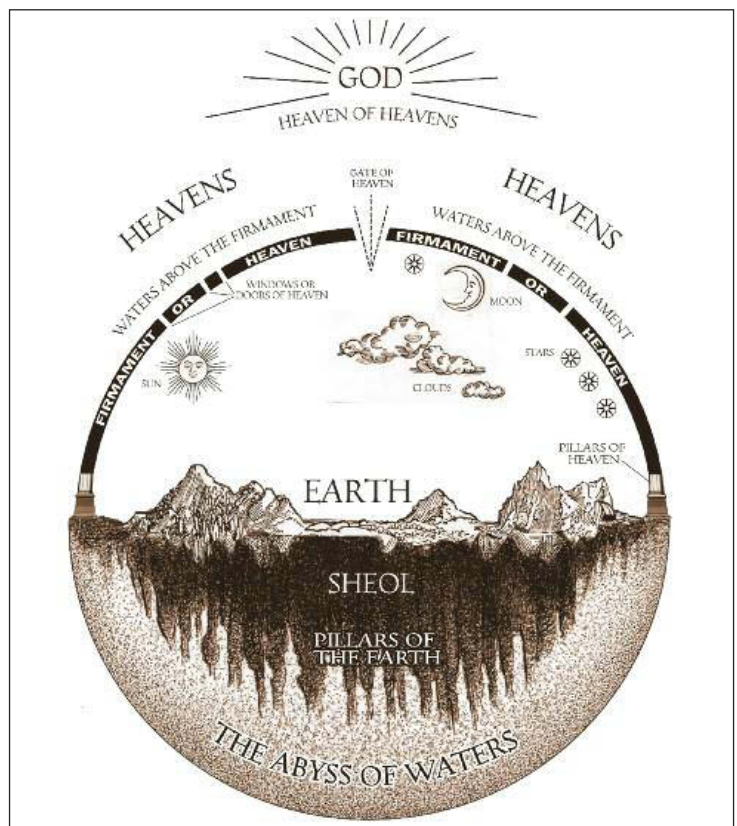


Figure 5—The ancient Hebrew concept of the cosmos.

different parts of the disc. (The Sun and Moon they argue are illuminated and kept moving by unknown forces; neither object orbits anything.) If so, the Sun and Moon should be visible all the time from every part of the Earth's surface. How could such a world ever experience a sunset? We never see the Sun grow noticeably dimmer or smaller with distance as we would in this Flat Earth model; instead, as the globe turns, the Sun passes out of view over the curvature of the horizon.

Flattening the globe also would severely distort the shapes of oceans and continents and the distances between them. Most notably, all proposed Flat Earth maps greatly expand the distances between southern landmasses. Countries that are relatively close together on a globe would be repositioned many times further away on opposite sides of a flat disc-world. In reality, for example, the distance between the northern countries of China and the USA is similar to the distance between the southern countries of Australia and South Africa—and so are the flight times to travel between them. That would not be true if Flat Earth maps were accurate.

All routes for planes and ships would be different on a Flat Earth, especially in the Southern Hemisphere. According to many Flat Earth maps, the shortest flight route between South America and Australia would cross over the North Pole!²¹ A conspiracy to conceal the flatness of the Earth would therefore have to include hundreds of thousands of airline pilots and ship captains as well as governments, space agencies, mapmakers, and Antarctic explorers.

Gravity, Handwaving, and the Supernatural

Flat Earth advocates rely upon made-up excuses and invented forces to explain away the problems of their model. They claim that light, perspective, and gravity work differently from what we understand from the evidence of science and our senses. Many claim that gravity does not exist at all. This claim is necessary because everyone on every part of the Earth's surface feels a roughly equal gravitational pull straight down toward their feet, which only makes sense on a globe: gravity pulls everyone down toward the planet's center of mass. Gravity would feel very different on a Flat Earth. A disc-world's center of mass would not be located straight down from most parts of the surface. People standing at the central North Pole would feel a vertical downward pull, but everyone further from the center of the disc would feel gravity pull at an angle. At the edges of the disc, the pull of gravity

would be almost horizontal. This would pull the oceans and atmosphere inward toward the center of the disc, drowning the center and leaving the outer edges airless and uninhabitable. Standard gravity would also pull down the Flat Earth model's tiny nearby Sun and Moon to crash into the North Pole. Since none of these things happen, we know the world is not flat.

Rather than confront the problem of gravity, Flat Earthers respond by dismissing gravity altogether. If the "traditional theory of gravitation" is "incompatible with the Flat Earth Model," then gravity must be weak or nonexistent.²² But if that were the case, wouldn't you be floating out of your chair right now? Why would objects fall when you drop them? According to one common Flat Earth claim, objects fall because the Earth "is constantly accelerating up at a rate of 32 feet per second squared (or 9.8 meters per second squared). This constant acceleration causes what you think of as gravity."²³ This handwaving explanation doesn't work. If our world is accelerating upward, why doesn't the Flat Earth crash into the tiny Sun and Moon above us? What force could cause the Flat Earth—an entire world—to constantly accelerate at a perfectly even rate? How would the flat surface remain perfectly oriented with the direction of acceleration without ever tumbling (or even slightly wobbling)?

There are no coherent natural explanations for anything in the Flat Earth model. Even when presented in secular language, Flat Earth claims describe an impossible and necessarily artificial world created and maintained through unexplainable miracles. A Flat Earth could only exist through supernatural or technological forces beyond our comprehension.

The Bottom Line

Believing that the Earth is flat requires not only a worldwide conspiracy to fake decades of space exploration, but also the wholesale denial of many branches of science and the evidence of our senses. It requires the invention of new forces and laws of nature without evidence, and implicitly relies upon the actions of a deity-like being or beings.

Despite the rising prominence of Flat Earth ideas, there has never been evidence to suggest that the world could be flat. Advocates simply assume the "obvious truth" of a Flat Earth on the basis of religious faith, intuition, or humor, and then invent a reality to match.²⁴ Although surprisingly frustrating, the rhetoric of Flat Earthers does nothing to change the simple fact, definitively proven for centuries: we live on the surface of a globe. **S**

REFERENCES

1. See for example Sebastian Kettley. "SpaceX flat Earth SHOCK: Was Falcon Heavy launch faked to conceal planet's shape?" Express.co.uk, Feb 7, 2018. <https://www.express.co.uk/news/science/915948/spacex-flat-earth-falcon-heavy-launch-fake-elon-musk> (Accessed March 13, 2018).
2. Google Trends suggest that Google searches for "flat earth" have been climbing since early 2015, with interest since late 2015 remaining consistently higher than any previous period back to 2004.
3. "Spherical" is here used in an approximate sense. For a discussion of the finer complexities of describing the slightly irregular shape of the globe, see Isaac Asimov. "The Relativity of Wrong." *The Skeptical Inquirer*, Fall 1989, Vol. 14, No. 1. pp. 35-44.
4. The curvature of bodies of water has also been demonstrated experimentally, most famously by Alfred Russel Wallace to settle a wager with Flat Earther John Hampden in 1870. See Richard Milner and Michael Shermer. "Wallace and the Flat Earthers." SKEPTIC, 2015, Vol. 20 No. 3. pp. 34-36; and, Daniel Loxton. Junior Skeptic #53, "Flat Earth?! The Convoluted Story of a Flatly Mistaken Idea." SKEPTIC, 2014, Vol. 19, No. 4. pp. 70-71.
5. Aristotle, translated by J. L. Stocks. *On the Heavens*. (Oxford: Clarendon Press, 1922.) As transcribed at <http://classics.mit.edu/Aristotle/heavens.2.ii.html>
6. Carl Sagan. *Cosmos*. (New York: Random House, 1983.) pp. 14-15.
7. Jeffrey Burton Russell. *Inventing the Flat Earth: Columbus and Modern Historians*. (New York: Praeger, 1991.)
8. Johannes de Sacrobosco. Lynn Thorndike, trans. *Tractatus de Sphaera (On the Sphere of the World)*. (c. Early 13th century, translation published 1949.) As transcribed at <http://www.esotericarchives.com/solomon/sphere.htm>
9. This alternative cosmos was fully developed by 19th century Flat Earth proponent Samuel Birley Rowbotham. "Parallax." *Zetetic Astronomy. Earth Not a Globe! An Experimental Inquiry Into the True Figure of the Earth: Proving It a Plane, Without Axial or Orbital Motion; and the only Material World in the Universe!* (London: Simpkin, Marshall, and Co., 1865.) pp. 20-22, 79-80, 85-87.
10. For a prominent example, see the tongue-in-cheek Flat Earth Society of Canada founded by philosophy professor Leo Ferrari and other mischievous intellectuals in 1970. It would be best, schemed one founding member, if people were "not quite sure whether they should take us literally or not." Christine Garwood. *Flat Earth: The History of an Infamous Idea*. (London: Pan Books, 2008) pp. 280-314.
11. Robert Schadewald. "The Flat Earth Bible." *Bulletin of the Tychoonian Society*, No. 44, July, 1987. pp. 27-39.
12. As skeptical scholar of Flat Earth ideas Bob Schadewald observed in 1982, "to my knowledge, every English-speaking flat earther who has ever lived has actually been a flat Earther because of the Bible."
13. Robert Schadewald. Lois Schadewald, Ed. *Worlds of Their Own: A Brief History of Misguided Ideas: Creationism, Flat-Earthism, Energy Scams, and the Velikovsky Affair*. (Xlibris, 2008.) 130 Robert J. Schadewald. "Scientific Creationism, Geocentricity and the Flat Earth." *Skeptical Inquirer*, Winter 1981-82, Vol. 6, No. 2. pp. 41-48.
14. For example, contemporary Flat Earth Society president Daniel Shenton evidently accepts evolution by natural selection. David Adam. "The Earth is flat? What planet is he on?" *The Guardian*, Feb 23, 2010. <https://www.theguardian.com/global/2010/feb/23/flat-earth-society> (Accessed March 12, 2018)
15. See for example "They Think the Earth is Flat?" August 9, 2008. <https://answersingenesis.org/astronomy/earth/they-think-earth-is-flat/> (Accessed March 13, 2018.) The article dismisses Flat Earth proponents as a "tiny minority of untrained, pseudoscientific hacks who—partially based on an overly literal interpretation of Scripture—buy into a disproven, centuries-old myth rather than accepting well-established modern science."
16. Philip Stallings. "The Biblical Flat Earth: A Response To Answers In Genesis." <http://www.philipstallings.com/2016/03/the-biblical-flat-earth-response-to.html> (Accessed March 13, 2018)
17. This became an especially dominant theme during the 1960s as the International Flat Earth Research Society led by Samuel Shenton struggled to rebut news of manned spaceflight into orbit and to the Moon. See Garwood. (2008.) pp. 219-279
18. "Flat Earth Proponent Decries Shuttle Fake." *The Vancouver Sun*, November 6, 1981
19. Schadewald. (2008.) pp. 111-112; Douglas Martin. "Charles Johnson, 76, Proponent of Flat Earth." *The New York Times*, March 25, 2001. <http://www.nytimes.com/2001/03/25/us/charles-johnson-76-proponent-of-flat-earth.html> (Accessed March 12, 2018)
20. "Frequently Asked Questions." Flat Earth Society. https://wiki.tfes.org/Frequently_Asked_Questions (Accessed March 7, 2018)
21. This would be the case, for example, if the influential maps published by Samuel Birley Rowbotham were accepted. See "Parallax." (1865.) pp. 21, 35
22. "Universal Acceleration." https://wiki.tfes.org/Universal_Acceleration (Accessed March 14, 2018)
23. https://wiki.tfes.org/Frequently_Asked_Questions. (Accessed March 7, 2018)
24. As affirmed by Daniel Shenton in 2009, "The Earth is flat. This is a belief I hold as the beginning of an ongoing search for truth and certainty. It is a starting point—an intellectual foundation on which I feel further knowledge can soundly be built." Daniel Shenton. "In Defense of the Flat Earth." (Flat Earth Society, 2009.) http://library.tfes.org/library/daniel_shenton_flat_earth_essay.pdf (Accessed March 12, 2018)

Conspiracy Theorists, and the Harm They Do

BY JAMES K. LAMBERT

THE MORE ONE EXPLORES HISTORY, THE MORE YOU can see how it does not line up with the ahistorical, wild stories that conspiracy theorists prefer to tell. “History,” as Former National Security Adviser Zbigniew Brzezinski once put it, “is much more the product of chaos than of conspiracy,” with competing groups and divisions within groups often at odds with one another and unpredictable individuals frequently changing the course of human events for good and for ill. No event in the twentieth century did more to popularize conspiracy theories and confuse the general public than the assassination of President Kennedy, and it has served as a model for how to misrepresent the past ever since.

Lee Harvey Oswald, for example, was an oddball loner, raised by a conspiracy obsessed mother who seems to have been truly delusional. He was a man so reckless and impulsive that he defected to the Soviet Union and then tried to kill himself when they would not allow him to stay. This perpetual loser couldn’t hold down a job or keep his wife from repeatedly leaving him. These shortcomings, however, did not keep him from having visions of grandeur—he told his wife he would be “Prime Minister of America” someday. But this pattern of instability and incompetence doesn’t work for the yarns that conspiracy theorists weave together. They need Oswald to be a CIA agent, a KGB agent, a double agent, or perhaps an agent of a group so secret we do not even know its name. At the very least, they need him to be the fall guy (a patsy) for others, with whom he allegedly had a great deal of contact, so they could string him along and put him in the right place at the right time. The fact that Oswald barely hung out with anyone and was completely unreliable to be anywhere or do anything that others wanted from him presents no problem for conspiracy theorists. They just assume that we don’t know the real story about who Oswald “really” was and what he “really” did.

Jack Ruby was also an oddball. A strip club owner who loved John F. Kennedy so much he would carry a picture of the president in his pocket and kiss it, as one might kiss a photograph of a newborn baby. For conspiracy theorists, Ruby was a well connected Mafia hitman sent to silence Oswald before he could talk. In reality, Oswald had already spent many hours talking to the authorities. And Ruby, despite the fact that he had his gun on him as he always did, had previously walked right past Oswald at the police station and did nothing but say, “He looks like Paul Newman.” It was only later that Ruby decided on an impulse to shoot the assassin of his beloved President, completely forgetting that he had left his dog alone in his car.

Then there is Supreme Court Chief Justice Earl Warren, the Chairman of the President’s Commission on the Assassination of President Kennedy (aka the Warren Commission). This former District Attorney and California Attorney General had many years of experience with murder cases and a stellar reputation as a man of impeccable integrity. In fact, he was so well respected and liked by the people of California that he is the only person to have been elected Governor three times in a row. He was also one of the most independent minded and powerful Chief Justices the nation has ever seen, overseeing the desegregation of schools and the removal of mandatory prayer in schools, among other dramatic and often unpopular decisions. There is no reason to think that such a man would risk his legacy by covering up the murder of any President, let alone one he was friendly with and seems to have admired. But conspiracy theorists need Warren to be the chief lackey in charge of the official cover up, and so that is what he becomes in their stories, along with the four hundred people who worked on the commission’s report and the countless others who came in contact with them. For the conspiracy theorists, these people are nothing more than nameless

henchmen who might as well be working for a super villain in a James Bond film—every one of them too cowardly or stupid to think for themselves. Before his death, Warren tried to point out the absurdity of such conspiracy fiction in his 1977 *Memoir*:

In the assassination of President Kennedy, there are no facts upon which to hypothesize a conspiracy. They simply do not exist in any of the investigations made by the Federal Bureau of Investigation, the Secret Service, the Central Intelligence Agency, or the Departments of State, Defense, and Justice. The last was headed by the late Robert F. Kennedy, brother of our assassinated President, who certainly wanted nothing short of the truth. In addition, the authorities of the state of Texas, of the city of Dallas, and law enforcement agencies of other cities throughout the country were anxious to be helpful in every possible way. All of this was supplemented by nine months of arduous work by our own staff of outstanding lawyers independent of all of these official agencies. And none of us could find any evidence of conspiracy. Every witness who could be found was examined, and it is revealing to note at this late date—nine years after the Commission Report was filed—that not a single contrary witness has been produced with convincing evidence. Practically all the Cabinet members of President Kennedy’s administration, along with Director J. Edgar Hoover of the FBI and Chief James Rowley of the Secret Service, whose duty it was to protect the life of the Presi-

dent, testified that to their knowledge there was no sign of any conspiracy. To say now that these people, as well as the Commission, suppressed, neglected to unearth, or overlooked evidence of a conspiracy would be an indictment of the entire government of the United States. It would mean the whole structure was absolutely corrupt from top to bottom, with not one person of high or low rank willing to come forward to expose the villainy, in spite of the fact that the entire country bitterly mourned the death of its young President and such a praiseworthy deed could make one a national hero.

Now, 40 years later, when so many people in the government are too young to even remember President Kennedy’s death, the criticism that Warren laid out has only sharpened because anyone who might have any information that might “crack the case” would have a huge incentive to share it. Think of the book and movie deals that would come to them, as well as the potential political career. Conspiracy theorists simply ignore the fact that personalities and motivations change in any organization over time. They prefer to think in terms of “the CIA,” “the Government,” etc., as if these were monolithic, eternal entities in their own right, whose goals and near absolute power never changes.

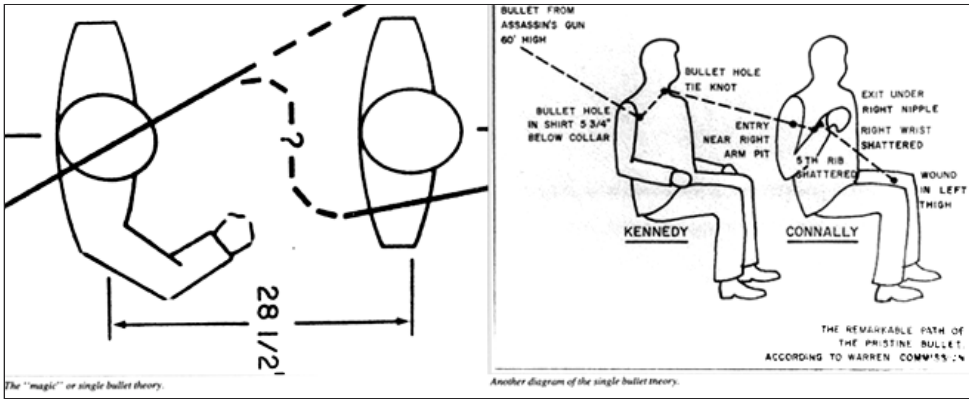
Conspiracy theorists’ causal concern for reality and truth can be seen in nearly every claim they make. Consider the following five examples related to President Kennedy’s assassination:



The so-called magic or pristine bullet—while it appears relatively undamaged from the side view, the bottom view shows considerable distortion that only makes sense if the bullet was rolling, end over end. Left—sideview.

Below—end view.
National Archives no. CE 399 and FBI C1.





These diagrams are presented as if they were taken from the Warren Commission even though they completely misrepresent the Warren Commission's findings. From Robert Groden's book, *High Treason: The Assassination of President John F. Kennedy* (1989).



The Warren Commission's findings are also grossly misrepresented during the infamous "magic bullet" sequence in Oliver Stone's film *JFK*. From a screenshot of *JFK* (1991).



By contrast, in Exhibit 903 from the Warren Commission's Final Report the path of the bullet is roughly estimated with a metal rod to be a straight line. The rod is held by Arlen Specter, a lawyer working for the Commission who went on to be a U.S. Senator.

1. One of the most impactful scenes in Oliver Stone's 1991 film *JFK* is the courtroom presentation by Jim Garrison (Kevin Costner) depicting the path of the "magic bullet" that passed through both President Kennedy and Governor Connally. This is the keystone in the bridge that Stone builds to conspiracyland and one of the most often repeated reasons why people do not believe the Warren Report. I agree that the so-called magic bullet is "One of the grossest lies ever forced on the American people," but it was not the Warren Commission that created this lie—it was conspiracy theorists.

One of the earliest JFK conspiracy theorists, Mark Lane, coined the term "magic bullet" in his 1966 book, *Rush to Judgement*. I first saw this misrepresentation of reality in a graphic (Top left) published in the 1989 printing of Robert Groden's book, *High Treason: The Assassination of President John F. Kennedy*.

Notice how this "remarkable path" is labeled in the lower right hand corner as "according to Warren Commission," suggesting that these drawings appeared in the original report. Similar graphics appear in the background of Stone's courtroom scene, which is no surprise, since both Lane and Groden were advisers on Stone's film.

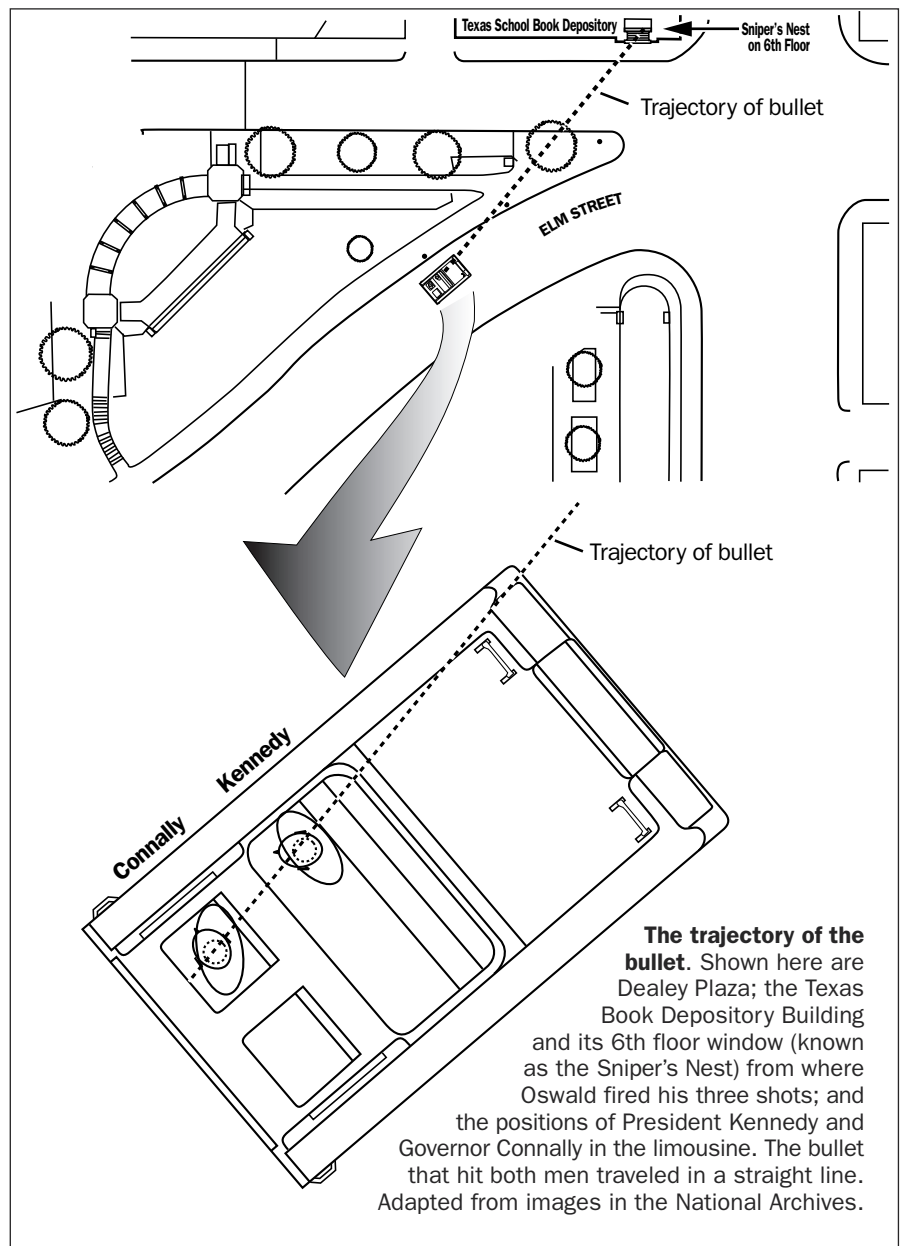
If the Warren Commission had claimed that this bullet needed to zig and zag to pass through these two men, then it would be foolish to believe them. However, the Warren Commission made no such claim. They said the bullet traveled in a straight line.

Stone's courtroom staging of the shooting and the phony graphics that nearly every JFK conspiracy theorist points to make you think that Kennedy and Connally were seated at the same height, as if they were in chairs of the same

size on a flat floor, facing the same direction. In reality, Connally was in a pull-down jump seat, set in from the side of the limo and lower than Kennedy's seat. Additionally, the car was traveling downhill to go under the railroad tracks at the triple underpass. To make matters worse, conspiracy theorists often make it seem as if Oswald was further to the President's right than he actually was and they ignore the fact that Connally turned toward the right when both men were hit. When you correctly position both men with the vehicle in its proper location on the road, you can see that no magic is required for a single bullet to pass through both of them.

There is yet another problem for the conspiracy theorists—reality keeps getting in their way. The entry wound on Connally's back was an oval, rather than a circle. This is because the bullet that struck him was tumbling end over end, through the air the way a bullet often does after it has passed through human flesh and exited back into open space. If Connally had been hit by a different bullet than the one that passed through Kennedy, there would not be an oval wound—unless you want to believe that this second gun malfunctioned in a very odd manner that just happened to make the bullet yaw.

The conspiracy theorists also have no good explanation for where all these other alleged bullets went. If one passed through Kennedy but did not hit Connally, who was the next person directly in the bullet's path, then what did it hit? If Kennedy was hit in the back and the neck and neither bullet passed through him, where did they go? His entire body was X-rayed at the autopsy. But the most important question of all is why did conspiracy theorists choose to make up this phony misrepresentation of what the Warren Commission found? Why have they repeated this for decades, with false graphics, public demonstrations, and a dramatic movie reenactment? If they had a substantive case to make against the Warren Commission, they would have made it, and they wouldn't need to grossly misrepresent what the Warren Commission actually found.



2. Besides making up “facts,” conspiracy theorists like to fixate on actual details taken out of context. I remember former Minnesota Governor, actor, and professional wrestler Jesse Ventura going on about the word “patsy” when I met him in 2003 at the 40th anniversary of the assassination in Dealey Plaza. Why did Oswald refer to himself as “just a patsy?” Why would he choose that word? The real question is why do conspiracy theorists never bother to look at or cite the full quote?

When reporters asked Oswald if he had killed the President, he replied, “No, they’ve taken me in because of the fact that I lived in the Soviet Union. I’m just a patsy.” The first sentence is key to understand what Oswald was actually claiming. He was not alluding to a vague, unknown group, he is pointing fingers at the Dallas Police and saying “they’ve taken me in because of the fact that I lived in the Soviet Union.” It is no different from if a Black man had been arrested and said, “they’ve taken me in because I’m Black. I’m just a patsy.” You wouldn’t conclude from this that he was suggesting a massive conspiracy set him up. You would understand that he was claiming the police were wrongfully targeting him out of bigotry.

Oswald was claiming that the police were wrongfully targeting him because he was a communist and the police were anti-communists. He was claiming to be innocent, which was a lie, but he was not claiming that any outside party or parties had set him up before the shooting took place or that he knew of any conspiracy to murder the President, as conspiracy theorists wish to imagine.

3. Besides making things up and taking things out of context, conspiracy theorists downplay the weight of the evidence that was available to the Dallas Police and later investigations like the Warren Commission. One frequently repeated claim is that no one saw Oswald shoot Officer Tippit and the police found spent cartridge shells at the scene of Tippit’s murder. If you just killed a cop, the conspiracy theorists say, you wouldn’t stop and unload empty cartridges, then leave them right there for anyone to find. Therefore the cartridges must have been planted by someone.

In reality, there were several witnesses who either saw Oswald with Officer Tippit, saw him shoot Officer Tippit, saw him standing over Officer Tippit’s mortally wounded body, with a gun in his hand, or saw him flee the scene holding a gun. Multiple witnesses also said that they saw Oswald unloading and reloading his weapon, or fiddle with his gun in some

way, as he left the scene. It sounds stupid (in hindsight) for a criminal to leave evidence at the scene of a crime but criminals do it all the time. If you have already shot a cop, in a residential neighborhood, in the middle of the afternoon, with multiple witnesses nearby, after shooting the President of the United States, you might not be all that concerned about leaving cartridge shells on the ground. In fact, it might be the last thing on your mind, with your only thoughts being “Get out of here” and “reload.” It should also be noted that when Oswald was caught in a nearby movie theater with the hand gun on him, he pulled it out and tried to shoot another officer. Luckily there were enough police this time to overpower him.

4. When faking and misrepresenting the evidence fails, many conspiracy theorists turn to the question of motive. If Oswald was a true believer in communism, they claim, who shot President Kennedy to advance his cause, or if Oswald was a



Oswald posing in his backyard with a holstered pistol, a Carcano rifle, and two Marxist newspapers, *The Militant* and *The Worker*. https://en.wikipedia.org/wiki/Lee_Harvey_Oswald

nut looking for attention, wouldn't he proudly admit to what he had done?

There is little in the way of evidence when trying to determine "normal" behavior for a presidential assassin, since it doesn't happen all that often, and the people who succeed at it tend to be mentally unbalanced. What an assassin would or would not say, if he was truly guilty, is highly speculative. Oswald's wife, Marina, who knew him better than anyone in the last few years of his life, felt Lee's lack of indignation after being arrested proved he was guilty. Lee was not a man to take any slight or perceived wrong without great protest. The fact that he was not yelling about the injustice of the police trying to pin these crimes on him told Marina all she needed to know about her husband's guilt. Similarly, his brother and only sibling, Robert, was convinced that Lee committed this heinous act in a desperate attempt to feel like he was important, which isn't all that different from many other shootings of public figures and innocent groups of people that have taken place before and since the assassination.

It should also be noted that Oswald lied, over and over again, while in custody. He claimed he never owned any guns, even though he was arrested with one on him. He claimed the backyard photos of him holding his weapons, taken by his wife at his request, were faked by the police or someone else. He claimed he took no package into work the morning of the assassination, despite the fact that the guy who drove Oswald to work that day said Oswald had a package which he claimed contained "curtain rods" (about the size of a disassembled rifle). No matter how obvious the lie, Oswald would still try to get away with it and then just laugh when the police caught him telling another. All of the authorities who interrogated Oswald agreed that he was the most unusual suspect they had ever seen. He almost seemed to be enjoying all the attention, rather than being worried or upset, and he may have wished to prolong being the center of attention. After all, the longer he held his cards close to his vest, the more everyone longed to see them.

It is true that teenaged Oswald had been professing Marxist beliefs even before he went into the Marines or tried to defect to the Soviet Union, but that does not mean that he necessarily saw the advancement of the communist cause as his motive. Who can say what Lee might have done had he lived longer and gone to trial. His refusal to admit his crimes upfront doesn't prove his innocence or a conspiracy. In fact, Oswald's behavior on this point

is similar to Timothy McVeigh, the Oklahoma City Bomber, who did not come right out and admit to his crime either, but certainly believed in his causes every bit as much as Oswald, if not more so.

5. In a last ditch effort to appear reasonable, conspiracy theorists claim that Congress completely refuted the Warren Report in the late 1970s and said there was a conspiracy. It is true that a Congressional Committee, the House Select Committee on Assassinations (HSCA), did reopen the case in the 70s, spending a couple million dollars of taxpayer money and a great deal of manpower on the effort. This was a highly political investigation spearheaded mostly by people trying to advance their own careers in public office and desperate to find anything at all that would make themselves look like heroes. They were highly critical of the Warren Commission and did their best to present their own work as more diligent and scientific.

Nevertheless, the overwhelming weight of what they found did not change the basic facts of the case or support any of the nutty conjecture and wild claims that conspiracy theorists wish to believe. The HSCA concluded that Oswald fired three shots and one bullet missed the limo, one traveled through both the President and the Governor, and one killed President Kennedy with a fatal head wound. They also concluded that, "on the basis of the evidence available to [them]," none of the usual suspects were involved with Oswald or with the assassination in any way—not the Soviets, the Cubans, anti-Castro Cuban groups, or organized crime. The HSCA went even further and said flat out "The Secret Service, Federal Bureau of Investigation, and Central Intelligence Agency were not involved in the assassination of President Kennedy," with no qualifications or reservations whatsoever. The one piece of alleged evidence that the HSCA did find in favor of an unknown co-conspirator with Oswald was later refuted by every scientific expert who examined it.

From 9-11 to Sandy Hook, the paranoid and divisive view of the world that conspiracy theories promote has been gaining in popularity since the first false "facts" about President Kennedy's death became widely accepted. Perhaps if we can educate people about what actually happened to JFK and how conspiracy theorists have deliberately lied about it, we can also get the general public to better see the lies (aka "fake news") of today. That may be overly optimistic but one thing I know for certain is that no society has ever been made great by abandoning truth. **S**

The Last One Forgotten

Bruce Perkins and Another Terrible Tragedy of the Recovered Memory Movement

BY L KIRK HAGEN

ON OCTOBER 6, 2017, BRUCE PERKINS CELEBRATED his 73rd birthday in the Louis Powledge prison unit near Palestine, Texas. His fellow inmates at Powledge include Warren Jeffs, the convicted pedophile, former head of the Fundamentalist Church of Latter-day Saints, and Eddie Ray Routh, who was convicted in 2015 of murdering Christopher Kyle, the military sniper featured in Clint Eastwood's film *American Sniper*. Unlike Jeffs and Routh, Perkins does his time in anonymity rather than in infamy, his case having been completely ignored by the press for a quarter-century. In 1993, Perkins was sentenced to four 30-year terms for aggravated sexual assault, based on testimony from what were almost certainly false memories. He is the longest-serving, and last-remaining prisoner in the U.S. whose conviction was facilitated by therapists during the moral panic of the 1990s, when the American mental health industry seemed to have lost its mind.

The panic was part of a broader aberration in clinical psychology, a discipline that in the 1980s and 1990s still lingered in a Freudian cloud. Those were also the years of alien abductions, multiple personality disorders, and satanic cults. All of those strange ideas obsessed over unconscious and repressed/recovered memories. And they all disappeared astonishingly fast. By the 2000s, extraterrestrials had stopped abducting people, devil cults had disbanded, the American Psychiatric Association had downgraded Multiple Personality Disorder (MPD) to "dissociative identity disorder," and psychologists had quit recovered memory therapy. Bruce Perkins, on the other hand, has never quit prison. He's a reminder that the abuse of a pseudoscience often outlives the pseudoscience itself.

Texas v. Perkins

Bruce Perkins' ordeal began in 1990, when his daughter-in-law Trish Perkins started seeing a therapist for treatment of a mood disorder. According to

Perkins' first attorney, during her therapy Trish claimed to have recovered memories of abuse from when she was younger. She was also distressed about her children's preoccupation with what a second therapist called "normal exploratory curiosity" with other children. Five therapists would get involved in the Perkins case before it was over.¹

Eventually, Bruce's two daughters-in-law, Trish and Patty Perkins, became convinced their children had been molested. Suspicion initially fell on the children's playmates. At least six were singled out. The reasons why suspicions shifted to adults are unclear. Patty recalls it was Therapist #2, Carolyn Kammholz, who first insisted that an adult male was responsible. Trish, and Kammholz herself, did not remember that. Either way, the list of suspects grew. Detective Don Bynum of the Harris County Sheriff's Office later noted that "it seems as if every male in the family must have been considered (a suspect) at one time or another." There is no record in the trial testimony of Kammholz or Bynum having urged the parents to arrange a pediatric examination of the children.²

On October 6, 1991, Bruce's wife Carol held a birthday party for her husband at their home in Waller, Texas, near Houston. Their sons Larin and Lann were there with their wives Trish and Patty, and Bruce's three grandchildren. Carol remembers about 30 guests attending. Bruce and Carol's home was spacious but not enormous; a two-story, 2,500 square foot house on about six acres. The children played inside and out, upstairs and down. The adults stayed mostly downstairs; eating, talking, and watching football. At some point, Bruce and Carol allegedly went upstairs to the master bedroom and sexually assaulted their grandchildren. Some accounts had it that seven children were abused. But it turned out that four of the seven were not even at the party. None of the adults noticed anything amiss that day or



Bruce Perkins in the Louis Powledge prison unit near Palestine, Texas

the next. Almost a year would pass before Bruce Perkins was accused.³

In July 1992, the sons and their wives shared their suspicions of abuse with the extended family during the funeral for Carol's father. Trish Perkins confided in Carol, who supposedly told her "I hope you don't blame us." When Larin confided in his father, Bruce supposedly offered the same answer, verbatim. Larin and Trish later said that Bruce and Carol soon began pressuring them to sign a release granting them access to the records of the children's therapist. Kammholz testified she never spoke to Bruce or Carol. Larin said his parents' behavior at the funeral "bothered him emphatically."⁴

Yet two months later, there was allegedly a second assault under nearly identical circumstances. The grandchildren were again with Bruce Perkins in his upstairs bedroom during a get-together on the Waller property, and were again allegedly violated. By then, Bruce had installed intercoms in his house. Some time in the afternoon, his grandson cried out over the intercom from upstairs "I need you Mom" while the adults were lounging downstairs. His mother found his incessant intercom chatter "pretty annoying." His aunt Patty said "it would drive you crazy." Larin testified that he ordered someone—it is not clear whom—to "get him off the damn intercom." The parents never went upstairs to check on the children. But the next day they discovered that two of the children had developed what looked like a serious diaper rash. Trish Perkins, a registered nurse, said she had never seen anything like it. Lann said his daughter "looked like she got scorched." The parents again decided not to

contact a physician. Two weeks later, however, they did contact Detective Bynum.⁵

The parents were present during the subsequent interviews with Bynum, and were free to coach their children at will. In one particularly jarring exchange, Bynum told one of Bruce's granddaughters that her cousin needed help "cause somebody has done something to her." The granddaughter replied "Papa Bruce has." When Bynum asked her if she had ever seen "Papa Bruce" do that, she said "no." When Bynum asked "How do you know that?" the child answered "Cause momma told me." Bynum also asked her if Bruce had ever put anything on her vagina. It was the child's mother, not the child herself, who replied "a toy." The child merely repeated the mother's answer.⁶

Pointing at an anatomically detailed doll, Bynum asked the child: "Who has touched you there?" The child named a playmate. Bynum then asked a second time, and the child identified a neighbor. When he asked a third time, the child said "no." So he asked a fourth time. The child named other playmates. When Bynum asked a fifth time "Has there ever been any *big* person there when they were touching?" the child identified a different playmate. Bynum then asked a sixth time: "...no big man, huh, OK, well has anybody ever been, a *big person* been near, when you have been touched here?" The child mentioned an older relative, not her grandfather. Bynum asked a seventh time: "Has there been a *great big person* like me ever touched you there...?" Bruce Perkins is 6'1" and weighs 275 pounds. But the child still did not identify him. Bynum asked his eighth question; this time, if

the child had ever seen a big person's privates. The child finally said "My Paw Paw," a nickname the kids used to refer to Bruce Perkins. The detective then moved on to other matters.⁷

As the children worked with therapists over the next 10 months, their recollections grew more extravagant. Therapist #4, Margaret McCollum, complicated matters by engaging her patient in conversations about "magical kinds of imaginary friends or magical ponies or kind of magical anything." Therapist #5, Connie Nelke, added another thread to what was becoming a bizarre entanglement of charges. Nelke agreed to accept payments from victim's compensation funds, contingent upon a successful prosecution. Once an indictment was secured, the magical stories became too costly to be doubted.⁸

By the time Bruce's trial was underway, those stories were so outrageous as to beggar belief. Bruce allegedly stripped himself and the children naked, tied them up, wiped cake, ice cream, and ketchup on them, and sprayed them with some unidentified red liquid. He made the children abuse each other. He was said to have castrated the family dog, and to have violated one victim with a dog's paw, a bottle, and Lego toys. He was wearing "Granny's" tap shoes during the assault. Bruce wears shoe size 11EEEE. "Granny" Carol Perkins is a petite woman who wears a size 6. Carol was accused of participating in and photographing the assault. Bruce and Carol then supposedly cleaned up the children, redressed them, and sent them back downstairs, all without attracting the attention of the children's parents and the 30 guests. The peculiar and grotesque details about castration, Lego toys, and the smearing of food on victims had figured in an earlier, highly publicized recovered memory case involving Kelly Michaels, a teacher at the Wee Care Nursery in New Jersey. Michaels was in prison while Perkins was under investigation. An article about her case had appeared in the *Houston Chronicle* in 1988. The *Chronicle's* staff never noticed the similarities between the Michaels case and the Perkins case. In fact, the *Chronicle* has never reported on the Perkins case at all.⁹

The tale of the castrated dog is a good example of how narratives in recovered memory cases can veer into incoherence. Patty Perkins testified that in 1991, around the time of Bruce's birthday party, her daughter had recounted nightmares of Bruce having assaulted her with a "chopped-off penis." Her daughter would have been three years old at the time. Neither mother nor daughter mentioned these dreams to Kammholz when the family started therapy in March 1992. In her grand jury testimony seven

months later, Patty told the more extravagant story about the castration of Bruce's dog. That incident had supposedly happened not in Bruce's house, where it would have left irrefutable evidence, but in a shed on the Waller property. Patty didn't know when it had happened, although she admitted she would have been present when it did. There had been only one occasion when she had left her daughter alone, for six hours, in Bruce and Carol's care.¹⁰

When prosecutor Marie Munier cross-examined Bruce's wife Carol, she asked her if she owned sex toys. Munier tried to justify her odd question by arguing that jurors might think the castration story "sounds crazy." She pointed out that "there are items that can be purchased that look like chopped-off penises." Patty claimed she had once found a sex toy in Bruce and Carol's bedroom. That was what the child was referring to, Munier suggested. She explained that "children are not able to communicate to us like we think." Munier was thus telling the court what the child really remembered, not what she thought she remembered. Therapist Nelke had already testified that Patty's daughter had told a much different story that placed Bruce's dog in the bedroom during the alleged birthday party assault. That story was just as perverse, but did not include castration. No one else mentioned either incident during interviews with Bynum, or during therapy sessions.¹¹

The most stupefying explanation of this tale came from therapist Robert McLaughlin. Munier asked him about the significance of bizarre stories in accounts of abuse. McLaughlin said that "as hard as it is to believe, the significance is that's true, that those things actually happen." Bruce's attorney asked Nelke if a child who has *not* been abused is more likely to recount preposterous details than a child who has been. Nelke said yes. By trial's end, jurors had heard two improbable and contradictory stories about Bruce's dog. They had heard from a parent who said the stories were literally true, and from a prosecutor who said they were not. They had heard from one therapist who encouraged the children to express memories in imaginary terms, from another who said bizarre stories are usually true, and from another who said the opposite. Long after the trial, two of Bruce's neighbors signed an affidavit swearing they had seen the dog after the October 1991 party. He had not been castrated.¹²

The State's account of the second assault on August 23, 1992 was not so outlandish, but it was not any more consistent. Lann Perkins remembered his father being upstairs with the children "at least an

hour and fifteen minutes, an hour and 30 minutes.” The time stamps on a VHS tape Lann himself recorded that day didn’t support his testimony. Larin said he “couldn’t put a time limit” on when Bruce was upstairs with the children but suggested, after cajoling from the prosecutor, that it was “a good 10 or fifteen minutes.” Patty testified that she recalled Bruce being upstairs, but couldn’t say for how long. When Trish Perkins was asked when she thought the molestation occurred, her responses included *I’m not sure, I feel very confused, I don’t recall, I don’t know, and I cannot give you a time.*¹³

The VHS tape was one of the most troubling exhibits in the State’s case. The first clip seems to be time stamped at “PM 12:00,” but the AM/PM notation is illegibly blurred. It lasts only 26 seconds. The next one is stamped “PM 2:23,” without the blur. Various witnesses testified that during the two-and-a-half hours in between: (1) the grandchildren gathered eggs and harvested vegetables, (2) the adults started watching football at 12:30, (3) Bruce’s sons went for a half hour drive in Larin’s new Lexus, (4) Bruce and his grandson fixed a flat tire on a tractor, (5) the family made barbecue, and (6) everyone sat down for lunch around 2:00. The next clip at “PM 2:36” shows Carol, Bruce, and all three grandchildren feeding Bruce’s pet goat. The children show no sign of distress or apprehension about being with their grandparents.¹⁴

Then, in a single frame, the video goes black while the soundtrack continues. In a sworn affidavit, a video expert said the tape appeared to have been deliberately erased. The audio track continues for 36 minutes, during which the children can be heard in the background. The longest segment without children’s voices runs just 11 minutes. When the video track reappears, the children are riding on Bruce’s tractor, smiling and waving at the camera, and still showing no signs of distress. After that, everyone went home. When Munier introduced a copy of the tape into evidence on July 23, 1993, she sheepishly told the court “I just haven’t had time to check this tape.” That was 13 days after the trial had begun. Ultimately, Munier disposed of the timeline problem by offering no timeline at all.¹⁶

The only physical evidence consisted of two pages of crude drawings and handwritten notes from a Dr. Hammill. Hammill examined two of the children and claimed to have documented evidence of assault. As part of Bruce’s latest appeal, Dr. Astrid Heger, a pediatrician with the Violence Intervention Program at the USC Medical Center, reviewed those findings and flatly contradicted Hammill. Heger

wrote to Perkins’ new attorney Keith Hampton that “it is clear that [Hammill’s] examination was inadequate and his conclusions were mistaken and based in inadequate training and knowledge.” Ironically, Heger had testified for the prosecution in the infamous McMartin preschool case in the mid 1980s. Her refutation came too late for Bruce Perkins. On August 2, 1993, he was sent to prison.¹⁷

Our Weirdest Ever Witch Hunt

All the while, other landmark recovered memory cases were simmering across Texas. A month after Bruce’s 1991 birthday party, a Dallas police department employee named Laura Pasley walked into a law firm, desperate for help. Her therapist had convinced her that her family was involved in a murderous satanic cult. In September 1992, when Detective Bynum began his investigation of Bruce Perkins, the Texas Department of Health began investigating the dissociative disorders unit of Spring Shadows Glen psychiatric hospital in Houston. The unit was practicing an unusually cruel form of recovered memory therapy that included the physical restraint of patients and the use of psychotropic drugs. The Department of Health decided not to pass judgment. On November 26, 1992, one day after Connie Nelke began treating one of Bruce’s grandchildren, Fran and Dan Keller of Austin, Texas, were convicted in a child abuse case whose details were even more incredible than those in the Perkins case. The CIA, Satanists, and “bad sheriffs” were involved in that one. A demon possessed child supposedly sodomized a cat with his finger. Therapist McCollum had made the same charge against Bruce Perkins, although she too admitted she heard the story from the child’s mother, not from the child herself. The Perkins trial lasted three and a half weeks; the Keller trial, only six days. The Kellers were sentenced to 48 years in prison. One year after Perkins’ conviction, four lesbians from San Antonio, Texas were arrested for abusing two children during what prosecutors called “cult-type activities” that involved “a certain perversion.” All four were sentenced to long prison terms.¹⁸

The number of people wrongly accused during this moral panic is staggering. In a single case in Wenatchee, Washington in the mid 1990s, 43 people were accused of abuse. The poor and mentally retarded were particularly vulnerable, but all were eventually exonerated. In Jordan, Minnesota, 25 people were accused. All charges were dropped. In Kern County, California, 27 people were convicted in one case in the 1980s, 25 of them were exonerated and

two died in custody. In Edenton, North Carolina, 20 adults were accused of 429 instances of abuse. Seven of them were sentenced to life in prison. All were exonerated in 1995. In the year when Bruce Perkins went to prison, there were 103 civil suits and 23 criminal cases in the U.S. based on recovered memory claims. Pamela Freyd, the founder of the False Memory Syndrome Foundation (FMSF), says the number of people who have contacted her organization for help is over 10,000.¹⁸

The cultural upheavals that gave rise to the moral panic are controversial. The origins are not. Between 1893 and 1910, Sigmund Freud wrote a series of papers that explain everything one needs to know about recovered memory therapy. Freud claimed we repress memories of painful experiences as a psychic defense mechanism (“saints, nuns, abstinent women, and well-bred children” are particularly susceptible). Sexual trauma is the most common cause of repression. Symptoms disappear when a patient, in the care of a therapist, undergoes a catharsis by reawakening lost memories. Freud even managed to slip in references to “occultistic streams of thought,” as if presaging the American hysteria a century later. He did not study large numbers of patients, possibly because he was, by his own admission, so mathematically inept that he would have been unable to make sense of even simple data sets. Freud preferred case studies, and rarely hesitated in drawing sweeping conclusions from them. Even then, as biographer Frederick Crews recently pointed out, Sigmund Freud was a serial fabricator of his research.¹⁹

None of that matters anymore, because psychoanalysis sheds not one ray of light on the human memory problem: Our perceptions of the world are astonishingly rich and detailed, but our brains faithfully encode only the tiniest portion of them. Normally that is not a problem, because much of what we experience is redundant or irrelevant. It’s nice to remember approximately where in the airport lot you parked your car a week ago. But you probably don’t remember the make, model, color, and tag number of every car you walked past on your way to the terminal, even though at the time you were able to perceive those details effortlessly. Your brain is reasonably good at predicting which experiences will likely be informative in the future. We tend to remember extraordinary events and forget ordinary ones, because one ordinary event isn’t more helpful than every other of its kind. We all remember what happened on 9/11/2001. We don’t remember what we had for lunch on 9/10/2001.

Actually, most of us don’t remember 9/11 that specifically. Karim Nader, himself a neuroscientist and memory expert, told the *Smithsonian* about his recollection of seeing live video of AA Flight 11 flying into the north tower of the World Trade Center that morning. There was no such video. Nader’s mistake is surprisingly common. Kathy Pezdek of Claremont Graduate University studied more than 500 students nationwide, and found that by 2003, 73 percent of them also remembered the video that doesn’t exist. This example is instructive because nearly everyone correctly remembers 9/11 as an attack that caught us totally unawares. Reason would tell us how unlikely it would be that TV stations in New York had fixed live cameras on the WTC at exactly 8:46 that morning for no particular reason. We sometimes retain pseudo-memories even when they are easily contradicted by facts.²⁰

At the height of the moral panic, experimental psychologists such as Elizabeth Loftus, Maggie Bruck, and Stephen Ceci were already documenting how easy it is to manipulate someone’s memory. When we mentally reconstruct events from fragmentary recollections, we fill in the blanks with inferences, suppositions, confluences of memories and, worst of all, with suggestions from others. Humans can be manipulated into remembering entire events that never happened; a skill at which therapists had become dangerously adept during the moral panic. None of us is immune, although children are especially susceptible. Their brains are learning machines in overdrive that lack the experiential background necessary to make sense of the world in the way that an adult does.²¹

Ultimately, the sheer number and exhausting implausibility of accusations brought an end to the moral panic. The McMartin Preschool Trial was the longest and most expensive in American history, and led to no convictions. Kelly Michaels spent five years in a New Jersey prison, but she too was exonerated. Laura Pasley of Dallas recanted the accusations against her family, and later won a settlement against her therapist. In 1997, the federal government filed criminal charges against five Spring Shadows employees in Houston, and shut the facility down. On November 23, 2016, the Texas Court of Criminal Appeals exonerated the San Antonio Four after they had been in prison for years. Fran and Dan Keller of Austin spent 21 years behind bars before they were exonerated on June 20, 2017. Texas has agreed to pay them \$3.4 million in compensation. In a 2011 interview with *Capital Times*, Pamela Freyd of the False memory Syndrome Foundation

(FMSF) said her organization was ready to declare victory. “The world has changed,” she said. “I think we can slowly disappear.”²²

However, Bruce Perkins’ world has not changed. He and Carol are still married. Carol travels to Powledge every weekend to visit her husband, and still unequivocally supports his claim of innocence. Bruce is currently in the middle of what will likely be his final appeal. He has some reason for optimism. His appellate attorney, Keith Hampton, worked on the defense of the San Antonio Four and Kellers. Errors by medical examiners played a key role in the reversal of convictions in both cases, and are now front-and-center in Bruce’s case.

Still, the Perkins case faces serious obstacles.

When Harris County Texas went Democratic in 2016, its new DA fired 37 veteran prosecutors, and the Perkins case fell into limbo. Bruce is aging, and time is on the State’s side. He has come before the Texas Board of Pardons and Paroles four times, and has categorically refused to admit guilt. “I will never, ever admit guilt,” he says. “I didn’t do these things. I don’t want my family ever to see my name on a piece of paper saying I did those things. If I die here, so be it.” He is resigned to the possibility that a poorly trained detective, a zealous prosecutor, and a horde of self-serving and fantasy prone therapists took advantage of his dysfunctional family to create a legal and moral fog so thick that justice may be irretrievably lost.²³ **S**

REFERENCES

1. Texas v. Perkins. 1993. *Transcripts of Trial Court Nos. 644,534 & 644,535, 174th Judicial District of Harris County, Texas*, pp. 675, 1081, 413, 505-506; Perkins v. State of Texas. 1995, June 8. Court of Appeals of Texas 902 S.W.2d 88, <http://bit.ly/2y8DKTd>.
2. Texas v. Perkins (1993), pp. 494, 534-538, 619, 627, 1331-1332, 1695, 2558; Bynum, D. 1992. *Transcripts of Audio Tapes*, PP-99.B/624 pp. 6-9, 17; E/624 p. 6.
3. Perkins, C. 2017, August 4, Interview with the author; Bynum, D. 1992a. *Detail Report for Harris County Law Enforcement*, September 10, p. 26; Texas v. Perkins (1993), pp. 625-627.
4. Texas v. Perkins (1993), pp. 210, 538, 544, 222, 392.
5. Texas v. Perkins (1993), pp. 556, 238, 1342.
6. Bynum (1992), E/624 pp. 8-9.
7. Bynum (1992), B/624 pp. 5-7 (emphasis mine); Bruck, M. 2000, May 15. *Affidavit*, pp. 24-25.
8. Texas v. Perkins (1993), pp. 1024, 1338.
9. Bynum (1992), C/624, p. 4; Texas v. Perkins (1993), pp. 60-73; 775-789, 996-997, 1369-1370, 1391-1396; United Press International. 1988, April 16. “Ex-teacher convicted of sex abuse.” *Houston Chronicle*, Section 1, p. 10; New Jersey v. Michaels. 1993. 625 A.2d 489 (*N.J. Super. Ct. App. Div.*), <http://bit.ly/2ASDyE1>.
10. Texas v. Perkins (1993), pp. 1377, 1458, 1461-1465.
11. Texas v. Perkins (1993), pp. 784-785, 859-860, 1465, 1825-1826, Vol. 17. pp 49-50.
12. Texas v. Perkins (1993), pp. 2605, 2612; Schulz, D. and A. Schulz, 1999, December 10. *Affidavit*.
13. Texas v. Perkins (1993), pp. 1529, 237, 1359, 666, 696.
14. Texas v. Perkins (1993), pp. 1341-1342, 1346, 1354, 1935, 1947.
15. Van Cleve, B. 1997, January 17. *Affidavit*. Texas v. Perkins (1993), p. 1355; see as well Bujnoch, K. 1997, January 17. *Affidavit*.
16. Heger, A. 2016, May 20. *Letter to Keith Hampton, Esq.*
17. Pasley, L. 1994. “Misplaced Trust.” *SKEPTIC* 2(3), pp. 62-77; Gangelhoff, B. 1995, July 6. “Diagnosis.” *Houston Press*, <http://bit.ly/2wZQ0F7>; Cartwright, G. 1994, April. “The Innocent and The Damned.” *Texas Monthly*, <http://bit.ly/2Axe4Jn>; Leight, E. 2016, November 23. Cited in Esquenazi, D. 2016. *Southwest of Salem* [Documentary Movie] Brooklyn: Motto Pictures.
18. Egan, T. 1995. “Pastor and Wife Are Acquitted on All Charges in Sex-Abuse Case.” *New York Times*, <http://nyti.ms/2wZCj14>; Ogintz, E. 1985, February 15. “Jordan Sex Case Is Over,” *Chicago Tribune*, <http://trib.in/2y3wv6Q>; Henry, L. 2013, March 25. “Kern County settles last of molestation conviction suits,” *Bakersfield Californian*, <http://bit.ly/2h23ssv>; Elbow, S. 2011, April 27. “Crime and Courts: Rethinking the ‘false memory’ controversy.” *The Capital Times*, <http://bit.ly/2hT2hj8>; Leight, E. 2016. “San Antonio 4’ Declared Innocent by Texas Court of Appeals,” *Rolling Stone*, <http://rol.st/2y0WwGO>; Lipton, L. 1999. “Recovered Memories in the Courts.” In S. Taub (Ed.) *Recovered Memories of Child Sexual Abuse* (Springfield, IL: Charles C Thomas), pp. 165-211; Elbow, S. 2011, April 17. “Crime and Courts: Rethinking the ‘false memory’ controversy.” *The Capital Times*, <http://bit.ly/2hT2hj8>.
19. See, for example, Freud, S. 1893. *The Psychic Mechanism of Hysterical Phenomena*. In A. A. Brill (Trans.) *Selected Papers on Hysteria and Other Psycho-neuroses*. Kindle locations 109, 229, 1867, 2020; Crews, F. 2017. *Freud: The Making of an Illusion* (New York: Henry Holt).
20. Miller, G. 2010, May. “How Our Brains Make Memories,” *Smithsonian*, <http://bit.ly/2h9wtGX>; Pezdek, K. 2003. “Event Memory and Autobiographical Memory for the Events of September 11, 2001.” *Applied Cognitive Psychology* 17, pp. 1033-1045, doi: 10.1002/acp.984.
21. See Ceci, S. and M. Bruck. 1995. *Jeopardy in the Courtroom: A Scientific Analysis of Children’s Testimony* (Washington D.C.: American Psychological Association); Loftus, B. and K. Ketchum, 1994. *The Myth of Repressed Memory* (New York: St. Martin’s).
22. Elbow (2011).
23. Perkins, B. 2017, August 16. Interview with the author.

Persistence of Belief in a Purposeful Universe

BY RALPH LEWIS

OVER THE LAST FEW CENTURIES RELIGION HAS BEEN slowly eroding in Western societies—a process that has accelerated in the last few decades, especially in recent years. Despite this decline, many people still cling to vague notions of some sort of purposeful universe by way of a higher power and higher plan.

I see this in many of my patients, like Liam (the patient's identifying details have been altered to preserve his anonymity). He was referred to me for psychological support after his wife Angie had been diagnosed with metastatic breast cancer two months earlier. He had taken on the massive responsibility for devising a cure for Angie and this had left him overwrought with anxiety and exhaustion from staying up night after night researching alternative cancer therapies and spiritual healing. This had also left him with no energy to devote to the couple's two preschool children during the day. Initially fired up with motivation and optimism by taking this on, his feeling of responsibility had rapidly turned into a crushingly heavy burden. He felt that her life depended on his getting it right.

Liam was a devotee of Deepak Chopra and Eckhart Tolle, taking to heart Chopra's claim that 95 percent of our genes can be influenced by our consciousness and Tolle's exhortation to undergo a transformation of consciousness and spiritual awakening to achieve a life of health and bliss. Liam and Angie had stopped attending their Catholic church years before, partly out of disillusionment and disgust about sex abuse scandals and partly because they felt they had outgrown what they considered an outdated system of beliefs inherited from naïve ancient cultures. They had come to consider themselves spiritual but not religious: They believed in a higher purpose and

higher power in the universe, but not the personal God of the Bible. To them, the universe was at some profound level suffused with consciousness—some sort of eternal universal consciousness that was the primary driving force underlying everything—the force that had brought everything into existence. Liam was persuaded by Chopra that we live in a “human universe”—one that depends upon humans for its very existence, making us not just an accidental byproduct in some remote corner of a vast indifferent cosmos. Liam was also impressed by Chopra's theory that our minds are the creators of external reality at all levels, from the creation of the universe as a whole to the genetic mutations causing cancer.

So Liam pored over spiritual health websites trying to discover what kind of spiritual dissonance had caused Angie's cancer. He reasoned that something must have caused her mind-body energy fields—her chakras—to lose their state of harmonic resonance. Perhaps it was something emotionally unresolved from her past. He strongly suspected a particular incident in their relationship might have caused it. When I gently suggested to him that the causes of Angie's cancer were in all probability essentially random, he could not at first get his head around this seemingly radical idea. Randomness implied meaninglessness, he protested; even worse, it implied powerlessness. “I can't just go along passively with the odds her oncologists pronounce. She's not a statistic. She's the most special human being in the world to me. Are you telling me all this is just an accident? Not just her cancer but her very existence, all of our existence. Everything?! Man, how nihilistic is that! And that implies that if she dies, then it's simply

Excerpt from *Finding Purpose in a Godless World: Why We Care Even if the Universe Doesn't* by Ralph Lewis. From Chapter 4. “Persistence of Belief in a Purposeful Universe.” With permission of the author.

over—her beautiful spirit and life just evaporates? I just can't accept that this is all there is."

My initial attempt to persuade Liam of the randomness of Angie's cancer was mistimed. The idea felt too pessimistic to him at that early stage of the crisis, when he needed to feel a sense of control. But I was afraid for him: what would happen when Angie succumbed to her cancer, which she inevitably would, even though conventional treatments might control the cancer for some time. I knew Liam had a history of harsh self-blame and feelings of failure predating all of this. I feared he would be psychologically destroyed by his inability to save Angie. And he was wasting precious time and energy on the futile quest for spiritual healing while there was urgent work to be done in their marital relationship—a relationship that had difficulties long before Angie's cancer. What she really needed was for him to be there for her, practically and emotionally. Most important, their young children desperately needed Liam to be present and active as a parent while Angie was incapacitated by fatigue and other side effects of her chemotherapy.

Slowly, Liam was able to see all this for himself and he gradually came to understand that his belief that Angie's cancer was a manifestation of spiritual dissonance within a purposeful universe was already leading to self-blame and feelings of failure. He was slowly but surely liberated and empowered by an understanding and acceptance of the randomness of her disease. He began to devote more of his time and efforts to the crucial practical priorities of building his relationship and parenting his children.

Liam's story demonstrates the fairly common persistence of "spiritual-but-not-religious" beliefs accompanying the decline of religion in the West. And it reveals some of the reasons why this is happening, among the most common being the assumption that complete abandonment of all spiritual belief and acceptance that the universe is random and purposeless would render life meaningless and would leave us feeling powerless. More implicitly, it also hints at anxiety about the finality of our own mortality, a topic which I explore further in *Finding Purpose in a Godless World*.

The decline of religion in the West began with the Enlightenment. The 18th century European Enlightenment marked the first serious questioning of religious faith within Western societies, although the Church's absolute power and



Illustration by Ástor Alexander

authority had already been partially undermined during the 16th century Protestant Reformation. Immanuel Kant, perhaps the most influential of all Enlightenment philosophers, argued that the European Enlightenment marked a separation between childhood and adulthood for humankind, a readiness to question authority and think for oneself. Kant felt that “religious immaturity” was “pernicious” and “dishonourable.” In his 1784 essay, *What is Enlightenment*, Kant wrote (<https://ntrda.me/2Gzwifi>):

Enlightenment is man’s emergence from his self-imposed immaturity...it is all too easy for others to set themselves up as their guardians. It is so convenient to be immature! If I have a book to have understanding in place of me, a spiritual advisor to have conscience for me, a doctor to judge my diet for me, and so on, I need not make any efforts at all. I need not think, so long as I can pay; others will soon enough take the tiresome job over for me. The guardians who have kindly taken upon themselves the work of supervision will soon see to it that by far the largest part of mankind (including the entire fair sex) should consider the step forward to maturity not only as difficult but also as highly dangerous. Having first infatuated their domesticated animals, and carefully prevented the docile creatures from daring to take a single step without the leading-strings to which they are tied, they next show them the danger which threatens them if they try to walk unaided.

He went on to argue that freedom and courage are needed to overcome this immaturity and that reason should be used publicly in all matters. His motto for a meaningful life was “Dare to know!”

Since the Enlightenment and the era of modernity that it ushered in, Western scholars have been questioning ancient authority and ancient wisdom. They have questioned why so much authority has been given to the writings of unsophisticated people of the Ancient Near East, given their highly limited, narrow knowledge of the world. Scholarly biblical criticism in the 19th century began to provide evidence confirming what many had begun to suspect: that the revered scriptures were entirely the product of people, not God, and were situated within specific historical contexts (in more recent years, archaeology has provided more definitive substantiation of this).

The Enlightenment had been inspired by the scientific revolution, which had begun in the 17th

century. As science advanced, it systematically contradicted or disproved various tenets of faith, undermining trust in religious authority. This process began with Galileo’s proof of Copernicus’s hypothesis that the Earth revolves around the Sun, contradicting Church doctrine that the Earth is the center of the universe. Galileo was persecuted by the Church in Rome for heresy, and was forced to recant. It took an embarrassingly long time before the Roman Catholic Church finally officially admitted in 1992 that Galileo was right.

Modern science became spectacularly successful, leading not only to new insights about the nature of reality, but producing useful technologies that revolutionized every aspect of day-to-day life. Quality of life and health were greatly improved, and people began to trust science more than religious authority, at least on nonspiritual matters. Initially, scientists did not necessarily consider themselves antagonistic to traditional religion. Newton, for example, felt that he was delineating the laws of nature and the regularities of the universe that God had ordained. Only later did modern scientific naturalism seek to explain the world in terms of fully natural, rather than supernatural, processes. Darwinian evolution was the most dramatic example of this, fatally undermining the foundation for traditional religious beliefs about Creationism within the field of biology.

Several other factors that focus more squarely on the negative impact of religion have also contributed to the steady erosion of faith in Western societies over the last few centuries. These include the increasing recognition of the mixed legacy of religions, especially with respect to (1) fostering compassion versus fueling intolerance, brutality, and war and (2) providing insight into the human condition versus impeding rational free-thinking enquiry. In addition there has been growing disillusionment with institutional religions due to realization of their role as instruments of societal control and patriarchal power, which are prone to corruption and abuse.

It’s important to note that the modern movement away from religiosity in Western societies has been accompanied by counter-trends, most notably the rise of Christian evangelism in the United States in the late 20th century. Also, a sizeable minority of Jews in Israel and elsewhere is returning to Orthodoxy. However, these counter-trends have been occurring against the backdrop of larger

secularizing trends within Christianity and Judaism.

Beyond just a questioning of religion, outright nonbelief has increased in the first part of the 21st century, and many Westerners are now willing to publicly declare their atheism. This process gained momentum after 9/11, with widespread public revulsion to religious fundamentalism. Another important factor related to the spread of atheism (and agnosticism) is the pace of new scientific insights within the past couple of decades, which have radically shifted worldviews among those who understand their full significance.

The Pew Research Center's 2014 Religious Landscape Study (<http://pewrsr.ch/1FhDs1C>) found that "nones" (people who self-identify as atheists or agnostics, or say their religion is "nothing in particular") made up roughly 23 percent of the U.S. adult population. This was a dramatic increase from 16 percent in their 2007 study. In 2014, a third of nones were atheists, answering "no" to the question "Do you believe in God or a universal spirit?" Younger Americans are even more likely to be religiously unaffiliated and more likely to be atheists. For example, the General Social Survey (GSS) reported that 20 percent of a nationally representative group of Americans reported no religious preference in 2012 compared with just 8 percent in 1990 (<http://bit.ly/2sbZYJj>). The GSS also found that lack of religious preference was more common among younger Americans. Corresponding statistics in other Western countries reveal similar trends toward loss of religious belief (<http://bit.ly/1VprJc2>).

Like Liam, many people still cling to a basic notion of some kind of higher power with a plan or purpose for the universe. For example, the 2012 General Social Survey, despite finding a high percentage of religious non-affiliation, found that only 3 percent of Americans identified as atheist and that the percentage answering yes to the question: "I don't believe in a personal God, but I do believe in a Higher Power of some kind" actually increased from 6.6 percent in 1991 to 11.6 percent in 2013 (<http://bit.ly/2sbZYJj>). Even in the Pew study, which reported a higher percentage of atheists (a third of the 23 percent of nones), most of the religiously unaffiliated respondents answered "yes" to the question "Do you believe in God or a universal spirit?"

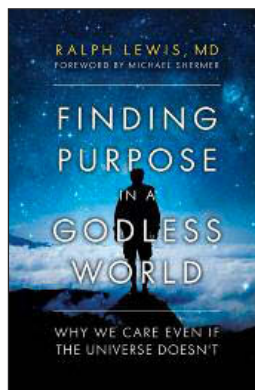
There are many other forms of post-religious beliefs besides New Age spirituality that attract people and that involve some sort of idea that the

universe is inherently purposeful. For example, my own previously held notion (fairly widely but loosely held by many secular-oriented educated people) that there is some form of intentionality underpinning the laws of nature—I vaguely imagined some kind of non-anthropomorphic abstract force that gave rise to the universe and that possibly continues to guide it in some poorly-defined way.

In my book I consider some of the reasons why many people in modern societies are increasingly questioning the fundamental basis of religious beliefs or now find them untenable, and consider why belief in a purposeful universe persists despite a decline of religious faith. Specifically, I consider the "big questions" that most compel people to search for purpose in the universe:

- "Why is there something rather than nothing?" and "How could something come from nothing?"
- "How could order arise from disorder?"
- "How could matter become alive, let alone become conscious and self-aware, and how could this happen spontaneously and unguided?"
- "How is it possible that our conscious selves could have formed as temporary phenomena and then just evaporate into utter nonexistence?"
- "How could human purpose, morality, and meaning have arisen in the absence of a higher power, and without being completely arbitrary?"
- "Would loss of belief in a higher power and a higher plan result in nihilism?"

It is the assumption that the big questions are beyond the realm of science, and the related assumption that a world reducible to scientific explanations would be a nihilistic world, that is the primary focus of the book. ■



Finding Purpose in a Godless World: Why We Care Even if the Universe Doesn't
by Ralph Lewis.
Prometheus Books,
2018, 352 pages,
\$26. ISBN-13:
978-1633883857

The Rooney Rule

The Value of Diversity in Birds, Bees, and People

BY TODD M. FREEBERG

DAN ROONEY PASSED AWAY IN APRIL OF 2017 AT THE age of 84. An Ambassador to Ireland under the Obama Administration, he was perhaps best known for being President and Chairman of the Pittsburgh Steelers National Football League team. He was also known for the “Rooney Rule” that required each NFL team to interview at least one underrepresented minority candidate in the process of searching for a new head coach. The rationale was simple: the rule would help create a fairer and more representative coaching structure in the league. For Rooney, increasing the diversity of coaches was the morally correct path to take. Many organizations beyond the NFL have made, and continue to make, similar arguments for diversity, grounded in the uplifting sense of equity and justice. Are there also scientific reasons for increasing diversity in our schools, workplaces, and communities? There are.

We are inundated with calls for increasing diversity and inclusion in schools, agencies, and workplaces. Although these calls often are built upon moral arguments, there are also practical bottom line benefits of diversity to human groups. Might such benefits of diversity exist in non-human animal groups as well? Although research into this question is in its infancy, a number of recently published studies suggest that animals gain fitness benefits from diversity in their groups. We can use this research to further reinforce the scientific reasons for encouraging greater diversity in society.

For example, in scientific studies of our own species, we have now acquired considerable evidence to indicate that we can benefit when we study and work in groups with diverse members.¹ In educational settings, students can do better when their environment supports diversity.² In courtroom settings, juries deliberate over facts more effectively and justly when those juries are more diverse.³ In marketplace settings, teams of traders make better decisions about the value of commodities when those teams are more diverse.⁴ In general workplace settings, workers are more satisfied about their own work and their place in the organization when their working environments support diversity and inclusion.⁵ As Dr. Deborah Welsh, Pro-

fessor and Head of the Department of Psychology at the University of Tennessee, told me in an interview, in groups with diversity “people bring different perspectives and those different perspectives will lead to different ideas, solutions, and ways of looking at situations so that the group is likely to have better functioning—better decisions.”

Perhaps it is only in our big brained species that such benefits of difference could emerge. Or could the benefits of diversity be something of a truism that extends to the other animal species with which we share the planet?

Not surprisingly—given that we are an evolved species of animal—we find such evidence in non-human primate species. As just one example, both Campbell’s monkeys and Diana monkeys gain foraging and anti-predator benefits by being in mixed-species groups with one another.⁶ We also find such benefits of diversity in the birds and the bees. Let’s start with the bees.

Honeybee colonies typically have just one queen, but that queen can have more than one male mate. Individuals in colonies with more than one mate for the queen are therefore more genetically diverse than individuals in colonies with just one mate for the queen. One major benefit of genetic diversity relates to hive temperature regulation. Hives function best in a narrow range of temperatures, yet the temperatures outside the hives can vary enormously over time, even within a single day. Bees vary their densities inside the hives, as well as a wing-fanning behavior, to regulate internal hive temperatures. And genetically diverse hives regulate internal hive temperatures better than do genetically homogeneous hives, as discovered by Dr. Julia Jones of the University of Sydney, who experimentally manipulated those outside-the-hive temperatures.⁷

But surely bees are an exception, right? They have an atypical mating system that results in fairly high levels of genetic relatedness. Perhaps the genetic oddity of such a “superorganism” is not the best example for thinking about benefits of diversity. What about birds?

On the island of Barbados, individual Zenaida doves benefit by being in groups of birds that include carib grackles. In these mixed-species flocks, the doves don't need to spend as much time being vigilant and watching for predators. The doves can spend more time foraging because they can capitalize on the anti-predator behavior of the grackles in their midst.⁸

Such mixed-species flocks occur regularly in birds. A common mixed-species flock in North America involves chickadee, titmouse, and nuthatch species. A recent study of such mixed-species flocks tested whether flock members might benefit from diversity of species composition. The researchers (full disclosure: I was one of them) exposed the flocks to a novel feeder to determine if flocks could solve the motivational problem—a fear of novelty—to obtain seed from the new food source. The researchers found that the flocks that solved the problem were more diverse than flocks that failed to solve the problem.⁹ Additionally, for successful chickadee flocks, the more diverse their mixed-species flocks were, the more seeds they were able to obtain from the novel feeder. Increased group size did not seem to predict success at solving the novel feeder task, as had been observed in other studies.¹⁰ It was flock diversity specifically that predicted success.

Despite all this evidence, most of us find ourselves studying, working, and living in fairly homogeneous groups of people who are a lot like us. And many of us find ourselves questioning the need for diversity and inclusion, especially when we are in the majority culture. Why? The benefits of diversity are potentially there for the taking. For Scott Page, Professor at the University of Michigan, as long as the members of a group have enough in the way of shared interests, and as long as individuals in the group communicate effectively, the group is virtually guaranteed to benefit from diversity.¹¹

To this finding, Deborah Welsh adds the notion of emergent properties in diverse groups—that the whole can be greater than the sum of its different parts: “You might have an idea based on experiences and perspectives you had from your life experiences and I could hear your idea and that could trigger a different idea in me and, because of my experiences and understanding and perspective, together we could build something that would be so much stronger—a better idea, a better product—than either one of us could build alone.”

Just possibly, we could learn a lot about the benefits of diversity if we understood the birds and the bees better. **S**

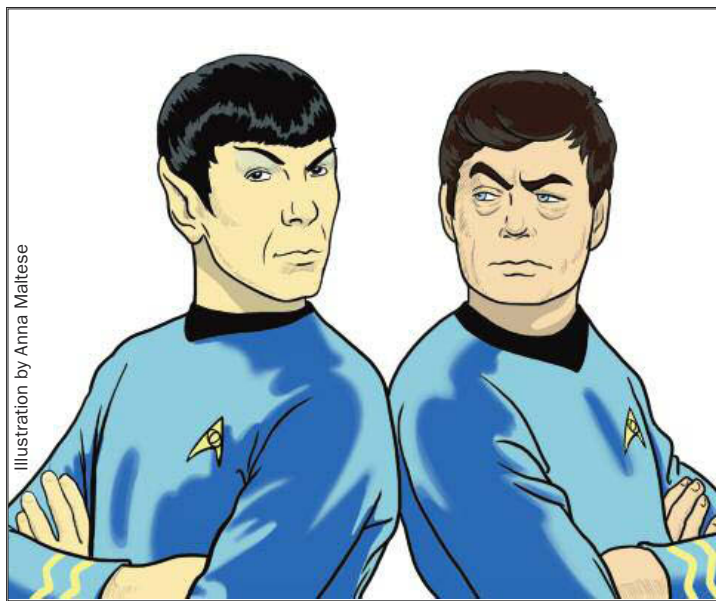


Illustration by Anna Malfrese

REFERENCES

1. Page, S. E. 2007. *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies*. Princeton University Press, Princeton NJ.
2. Gurin, P., E. L. Dey, S. Hurtado, and G. Gurin. 2002. “Diversity and Higher Education: Theory and Impact on Educational Outcomes.” *Harvard Educational Review*, 72: 330-366.
3. Sommers, S. R. 2006. “On Racial Diversity and Group Decision Making: Identifying Multiple Effects of Racial Composition on Jury Deliberations.” *Journal of Personality and Social Psychology*, 90: 597-612.
4. Levine, S. S., E. P. Apfelbaum, M. Bernard, V. L. Bartelt, E. J. Zajac, and D. Stark. 2014. “Ethnic Diversity Deflates Price Bubbles.” *Proceedings of the National Academy of Sciences*, 111: 18524-18529.
5. Downey, S. N., L. van der Werff, K. M. Thomas, and V. C. Plaut. 2015. “The Role of Diversity Practices and Inclusion in Promoting Trust and Employee Engagement.” *Journal of Applied Social Psychology*, 45:35-44.
6. Wolters, S. and K. Zuberbühler. 2003. “Mixed-species Associations of Diana and Campbell’s Monkeys: the Costs and Benefits of a Forest Phenomenon.” *Behaviour*, 140: 371-385.
7. Jones, J. C., M. R. Myerscough, S. Graham, and B. P. Oldroyd. 2004. “Honey Bee Nest Thermoregulation: Diversity Promotes Stability.” *Science*, 305: 402-404.
8. Griffin, A. S., R. S. Savani, K. Hausmanis, and L. Lefebvre. 2005. “Mixed-species Aggregations in Birds: Zenaida Doves, Zenaida Aurita, Respond to the Alarm Calls of Carib Grackles, *Quiscalus lugubris*.” *Animal Behaviour*, 70: 507-515.
9. Freeberg, T. M., S. K. Eppert, K. E. Sieving, and J. R. Lucas. 2017. “Diversity in Mixed Species Groups Improves Success in a Novel Feeder Test in a Wild Songbird Community.” *Scientific Reports*, 7:43014. DOI: 10.1038/srep43014.
10. Morand-Ferron, J. and J. L. Quinn. 2011. “Larger Groups of Passerines are More Efficient Problem Solvers in the Wild.” *Proceedings of the National Academy of Sciences*, 108: 15898-15903.
11. Page, 2007, op cit.

Imagining No Heaven

The Rise of the Nones and the Decline of Religion

BY MICHAEL SHERMER

*“Imagine there’s no heaven...and at once the sky’s the limit.”—Salmon Rushdie, “Imagine No Heaven,” *The Guardian*, 1999¹*

WHAT IS YOUR RELIGIOUS AFFILIATION? IF YOU DON’T have one that makes you a member of the fastest growing religious cohort in America today, the *Nones*, or those who check the box for “none” on surveys of religious affiliation. A 2009 study by the American Religious Identification Survey (ARIS), for example, found that between 1990 and 2008 the number of nonreligious persons in the U.S. grew by 19,838,000.² A 2013 Harris poll on 2,250 adults found that 23 percent of all Americans and 34 percent of Millennials (those born after 1980) have forsaken religion altogether.³ Predictably, rates of belief in God, the soul, and the afterlife, along with other beliefs, are also trending downward for U.S. adults since 2005, presented in *Table 1*.

Reaching back even further to 2003, the Harris pollsters found an 12 percent decline in those who said they were “absolutely certain that there is a God,” from 66 percent to 54 percent, and an increase

from 9 percent to 16 percent among people who said they do not believe in God (atheists), and from 12 percent to 16 percent who said they were uncertain as to God’s existence (agnostics). The raw numbers based on these percentages are staggering. With the U.S. adult population (age 18 and older) in 2013 at 240 million, 23 percent religiously unaffiliated translates into 55.2 million. Now, not all of these *Nones* are atheists or agnostics (many are deists, pantheists, and spiritualists of various stripes who embrace many New Age beliefs), but by the Harris poll data the 16 percent for each of these cohorts amounts to 38.4 million atheists and 38.4 million agnostics for a combined cohort of 76.8 million people. Whatever the percent overlap between the religiously unaffiliated and the combined atheists/agnostics, it still represents a powerful voting block that politicians can no longer afford to ignore.⁴

To those of us who are atheists, agnostics, or “spiritual but not religious,” and who prefer to keep the Constitution and the Bible in separate drawers, in 2015 the Pew Research Center released a massive representative survey of 35,000 adult Americans, confirming the 2013 Harris Poll data that the fastest growing religious group in America continues to be the *Nones*. According to the Pew researchers, these 56 million religiously unaffiliated adults in the U.S. are “more numerous than either Catholics or mainline Protestants,” not to mention Jews, Buddhists, Muslims, and Hindus, and “second in size only to evangelical Protestants” at 25.8 percent.⁵

The trend lines are as unmistakable as they are consequential. As the religious goat makes its way through the generational python, the number of non-religious coming out the other end is growing. From the Silent Generation (born 1928-1945) at 11 percent, to Baby Boomers (born 1946-1964) at 17 percent, to Generation X (born 1965-1980) at 23 percent, to Older Millennials (born 1981-1989) at 34 percent, to Younger Millennials (born 1990-1996) at 36 percent, the decline is deep and wide. And as the sociologist of religion Phil Zuckerman pointed out to me, it is important to note that “earlier generations—that is,

Table 1
The Rise of the Nones
and the Decline in Religious Belief

	2005	2013	Change
No Religious Affiliation	12%	23%	+ 11%
Somewhat Religious	49%	40%	-9%
God	82%	74%	-8%
Heaven	75%	68%	-7%
Survival of the Soul	69%	64%	-5%
The Devil and Hell	62%	58%	-4%
Miracles	79%	72%	-7%
Resurrection of Jesus	70%	65%	-5%
Jesus is God/Son of God	72%	68%	-4%
Angels	74%	68%	-6%
Creationism	39%	36%	-3%

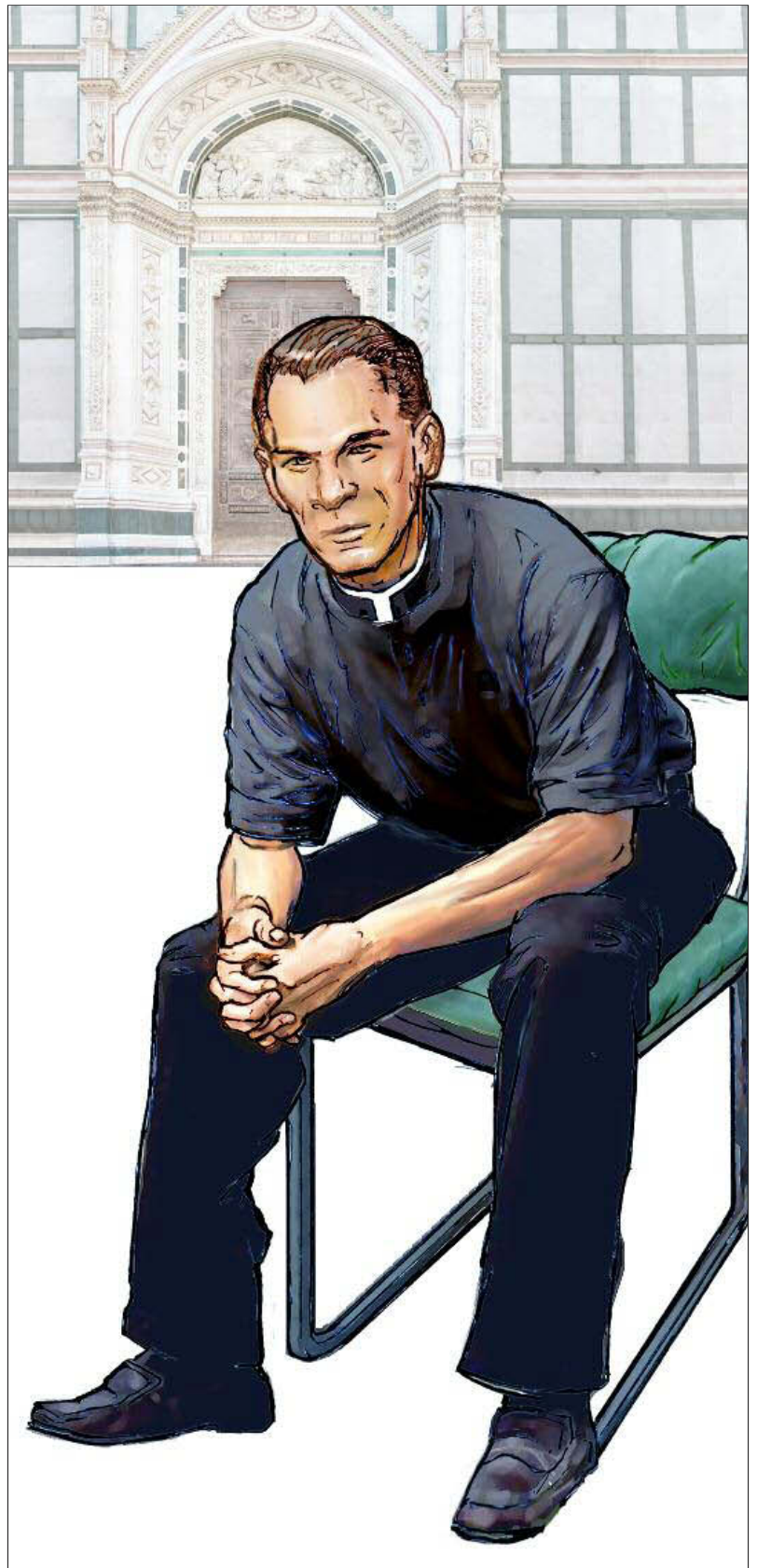
Source: The Harris Poll. 2013. “Americans’ Belief in God, Miracles, and Heaven Declines.” December 16.

THE RISE OF THE NONES

people who were 18-25 years old back in the 1990s, or in the 1980s, or in the 1970s, were not as irreligious, and those cohorts did not have such a high rate of unaffiliation. This point is important because people often say, 'Well, young people are always irreligious, but they come back to the fold as they get older, get married, have kids,' etc. And while such a trend is observable—to a degree—the fact remains that it hasn't always been the case that 36 percent of young adults have been non-religious in decades past. So secularization is definitely happening."⁶

That's not all. People are also changing religions. The Pew poll found that 34 percent currently adhere to a religion different from the one in which they were raised, further eroding the antediluvian notion of there being One True Religion. Yes, some people raised with no religion became religious (4.3 percent of U.S. adults), but four times as many went the other direction. Curiously, 24 percent of Americans said they believe in reincarnation, that is, that they were once another person. That's up 3 percentage points since 2005, but is still lower than that of other supernatural or paranormal beliefs such as witches (26 percent), astrology (29 percent), UFOs (36 percent), ghosts (42 percent), and the devil (58 percent). And it is significantly lower than in countries such as India, where belief in reincarnation carries majority support. Encouragingly, belief in Darwin's theory of evolution increased from 42 to 47 percent, although at less than half it is not time to break out the champagne in celebration.

As to the religious tenet that God is actively involved in the world and in our lives, in the 2013 Harris poll 37 percent of Americans said they believe that God controls what happens on Earth, which is down from 50 percent a decade prior in 2003. Believing that problems here are not going to be solved by help from elsewhere is key to taking responsibility for our own actions—individually and collectively as a society—although this idea too can backfire when the unattainable goal of utopia is the endgame. The point is reinforced by the across-the-board decline in the percentage of people in 2013 who said they believe their holy book represents the Word of God: 6 percent fewer for the Old Testament, 6 percent fewer for the New Testament, 4 percent fewer for the Torah, 1 percent fewer for the Qur'an, and 1 percent fewer for the Book of Mormon. Not believing that God speaks directly to humans through the written word is another shift toward personal and social accountability. It's up to us to effect change for the better and to bend the moral arc further toward justice by our choices and actions, not by prayers and



supplications, and to work for a heaven on Earth, not a heaven above the firmament.

As a final reality check, the Harris and Pew data have been independently corroborated by the 2014 General Social Survey (GSS), the gold standard of social science data funded by the National Science Foundation and utilized by scientists the world over. The GSS found 21 percent of the population declaring that they have no religion, and another 13 percent who said they never go to church (other than for weddings and funerals), for a total of 34 percent. That's a three-point increase just from 2012, each point representative of about 2.5 million people.⁷

Who are the Nones?

There's a big difference between, say, nonbelieving atheists and New Age spiritualists—both of whom may tick the “none” box for religious affiliation—so we need to dig deeper into the data to learn more. In the Pew Forum survey that recorded 20 percent of Americans as Nones, for example, there were more men than women, more whites than blacks or Hispanics, more unmarried than married, more from the West and Northeast than the South and Midwest, and more Democrats than Republicans or Independents.

To understand Nones better, the sociologist of religion Kevin McCaffree, myself, and the psychologist Frank J. Sulloway analyzed data from “The Morality Test” (designed Sulloway and myself⁸) which also served as the database for McCaffree's doctoral dissertation on “Faith, Christianity, and Non-Affiliation in the United States.”⁹ From this database we culled a sample size totaling nearly 12,000 respondents (N=11,883), and through data cleaning left us with an N of 10,861. Non-affiliation was measured using a single indicator—that of the option for “none” on the question measuring respondents' religious affiliations. Out of the 10,861 people in our sample there were 5,551 non-affiliated respondents. Non-affiliates were then further coded into subtypes based on their level of self-reported spirituality (belief in God or a “higher power”) and religiosity. Specifically, respondents were asked “Do you believe there is a God (a purposeful higher intelligence that created the universe)?” and were given five Likert-scale response options ranging from “Definitely No” to “Definitely Yes,” with higher scores representing higher levels of agreement that a God or higher power exists. Respondents were also asked to place themselves on a continuum from 1 to 7 based on how religious they considered themselves to be, with 1 representing “Very Religious” and 7

“Not at all religious.” From this analysis we found three types of Nones:

1. *Nonbelievers-Nonspiritual Nones* (atheists and agnostics). These are people with the lowest scores on spirituality (<2) and religiosity (<2), meaning that they are “definitely” certain that a higher power or God does not exist and they reported the lowest scores on religiosity. These Nones are unconvinced of the existence of a higher spiritual authority and uninterested in religiosity.
2. *Spiritual-but-not-Religious Nones* (belief in a higher power). These are people with high scores on spirituality (>4) but low scores on religiosity (<2), meaning that they reported being “very likely” or “definitely” sure that a God or higher power exists, while giving scores of 2 or lower on religiosity (out of 7). These Nones are fairly certain about the existence of a God or higher power while at the same time uninterested in being religious.
3. *Unchurched-Believer Nones* (belief in a traditional God but not church going). These are people with high scores for spirituality (>4) and high scores for religiosity (>5), meaning that they gave a self-report score of 5, 6, or 7 for religiosity (out of 7) and reported that it was “very likely” or “definitely” true that a God or higher power exists. These Nones represent religiously non-affiliated people with favorable attitudes towards spirituality, or a connection to a higher power or God.

Compared to *Nonbelievers-Nonspiritual*, both the *Spiritual-but-not-Religious* and *Unchurched-Believers* have less formal education, less interest in science, are more likely to see morality as God-given, and more conservative in their politics in opposing euthanasia, birth control access, freedom of speech and religion, and marijuana legalization. An explanation for these differences may be found in the fact that both groups are more likely to attend religious services than *Nonbelievers-Nonspiritual*, so even though they are not affiliated with a religion, they are still subject to the influence of being in church.

Contrasting *Spiritual-but-Not-Religious* with *Unchurched-Believers* we find the former are more likely to see morality as not being God-given and are more liberal in their politics in their support of homosexuality, premarital sex, and stem cell research. This may be explained by the fact that they are more interested in science and less likely to go to church.

THE RISE OF THE NONES

Comparing the Nones in general to traditional religiously affiliated believers and churchgoers in our dataset, Nones are more likely to be unmarried and later-born, are less likely to see morality as God-given, and are more socially liberal in supporting euthanasia, birth control access, freedom of speech and religion, and marijuana legalization. Nones have more education than the religiously affiliated in the sample, they also score higher on a 7-point scale ranging from “Not very interested in science” to “Very interested in science.” On average each 1-unit increase in interest in science decreased the likelihood that the respondent was affiliated with a religion by 33 percent.¹⁰

A great deal of personal, moral and political variation exists among Nones, as one might expect given the differences in the three types of Nones we delineated. What our data suggest is that both religious and nonreligious pluralism, along with education, interest in science, and liberal values emphasizing individual rights and freedoms are gradually but ineluctably leading to the decline of religion.¹¹

The Decline of Religion

Determining the deeper causes of the shift away from religiosity is a difficult problem for social scientists, given the complex web of causal variables operating at any given time on something as multifarious as religion. Phil Zuckerman, the sociologist who also created the first Secular Studies program in the country (at Pitzer College in Claremont, California), points to four factors that may be at work in driving people away from religion:¹²

1. *The rise of the Religious Right* and their influence on politics that has painted Christianity as homophobic, racist, sexually repressive, anti-abortion, anti-women, and anti-science. This characterization is surely exaggerated by the left but it carries enough truth to do damage to the religion. Polls in states where Evangelicals have been most influential show that Millennials in particular have responded critically, but instead of moving toward the more liberal branches of Christianity they abandoned the religion altogether. “These were the kids who were coming of age in the America of the culture wars,” writes the Harvard sociologist of religion Robert Putnam, “in the America in which religion publicly became associated with a particular brand of politics, and so I think the single most important reason for the rise of the unknowns is that

combination of the younger people moving to the left on social issues and the most visible religious leaders moving to the right on that same issue.”

2. *The works of the religious more than their words*, from abortion clinic bombers and Islamic terrorists to pedophile priests and televangelists cavorting with prostitutes and living the high life on the Church’s bank account (think Jim and Tammy Faye Baker, Jimmy Swaggert, and Ted Haggard). The hypocrisy of these Christians exposed a weakness in Christianity itself: anyone can talk the talk, fewer can walk the walk. You shall know them by their deeds.
3. *The rise of the internet and social media* not only exposed Christians to other points of view but revealed to them communities of other believers—and nonbelievers, secularists, and other reasonable people—who seemed to be doing just fine without Christianity.
4. *The ascendancy of women in the work force*. Research shows that women are in charge of the family religion, particularly in conservative Christian families. With the economic and demographic shifts that led women out of this traditional role in particular, their children (mostly Millennials) could see that religion was not necessary to live a fulfilling life of family and career.

An additional reason for the shift toward nonbelief, suggested by Steve Bruce in *God is Dead*, is more quotidian: “Most people did not give up being committed Christians because they became convinced that religion was *false*. It simply ceased to be of any great importance to them; they became indifferent.” One word for this is *apathy*—an amalgam of apathy and theism—or those who simply don’t care. Another descriptor is *secularization*, which Bruce defines as declines in: 1) the importance of the role of religion in state and economic institutions and functions, 2) the status of religion, and 3) individual participation in religious practices.¹³ One study, for example, found that non-churchgoers do not attend church because, they said, they are “too busy” (44 percent), “not interested” (41 percent), or that church services are “boring” (35 percent).¹⁴ (As Dorothy Parker allegedly quipped when asked why she doesn’t go to church Sunday mornings: “I’m too fucking busy, and vice versa.”¹⁵)

As such, the psychologist James Allan Cheyne calls attention to the chronic underreporting problem in self-report data on religious beliefs, on the order of 60-100 percent, leaving him to conclude



Figure 1. The Secularization of Churches

A cathedral in the Hague closed for religious services but available to rent for corporate functions. This is the fate of a growing number of European churches as religion continues its precipitous decline. Source: Author's collection.

“that less than one in four Americans are sufficiently committed to their claimed status as Christians to go to church regularly.”¹⁶ Indeed, in my regular travels around Europe, in which I make it a point to visit cathedrals, I often find them closed for business or rented out to museum collections and even, in the case of one in the Hague, for corporate events (see Figure 1).

How far can this trend toward secularization go? At the rate of the poll number shifts over the past decade, I project the Nones to reach 100 percent in the year 2220. Although this is surely hyperbole, based as it is on a linear projection of current trends into the future (problematic the further out the time horizon), there is at the very least a strong trend toward returning America to where it began.

Come again? Wasn't America born a “Christian nation”? No. According to the highly respected sociologists of religion Roger Finke and Rodney Stark, in their classic 1992 book *The Churching of America*, in 1776 only 17 percent of Americans belonged to religious congregations.¹⁷ It's a myth that America was a Christian nation at its founding and has now lost its way. Quite the opposite, and its “spiritual health” is improving as a consequence, following that of Euro-

pean nations that gave up on religion decades ago.

The secularization trend around the world, in fact, has been under way for centuries. As Phil Zuckerman reveals in his 2016 comprehensive study of *The Nonreligious*, coauthored with the psychologist Luke Galen and anthropologist Frank Pasquale, “there are more secular people in the world today than ever before, and their numbers are increasing in various countries on every continent.” In America, the increase in the Nones rose from 8 percent in 1990 to 23 percent today. Further, their data shows that between 12 percent and 21 percent of Americans are now atheist or agnostic, “the highest rate of non-belief ever recorded.” Nearly a third (30 percent) of Americans consider religion “to be largely old-fashioned and out of date.” And to the point of the changing demographics of religiosity over time, less than 4 percent of Americans born between 1925 and 1943 were raised with no religion, which nearly doubled to 7 percent for those born between 1956 and 1970, and climbed to 11 percent for those born between 1971 and 1992. Globally, the religion scholars note, “for perhaps the first time in history, there are now some societies that are extremely secular, and most of these highly secular societies are also among the

THE RISE OF THE NONES

most societally healthy and successful societies on earth.” Their research also demonstrates that secularism increases as a function of economic and political security, which is strongest in the West, particularly Europe. Secularity is also more common among men than women, younger people than old, is supported more by whites, Asians, and Jews than other demographic groups, is “correlated with intellectualism and cognitive styles characterized by a tendency to think in a more complex, analytical, and critical manner,” is more popular among the political left than the right, is more common among those raised in secular homes, and is supported by more public organizations.¹⁸ Nonbelievers even got a shout-out from President Barack Obama in his first inaugural address when, on January 20, 2009, he described the U.S. as a nation of “Christians and Muslims, Jews and Hindus—and nonbelievers.”

Further evidence may be found in a 2016 study by David Voas and Mark Chaves, in which the sociologists of religion focused on long-term trends instead of levels of religious belief. In so doing they discovered that “for two straightforward empirical reasons, the U.S. should no longer be considered a counterexample [to the secularization thesis]. First, it has recently become clear that American religiosity has been declining for decades. Second, this decline has

been produced by the generational patterns underlying religious decline elsewhere in the West: each successive cohort is less religious than the preceding one. The United States is not an exception.”¹⁹ This is not to say that the U.S. is European in religiosity; far from it in *levels* of belief, but the *trend lines* show that parity will eventually be reached as future generations realize the all-embracing value of the secularization of society.

This process, called “generational replacement,” is gradual. One that can experience short-lived religious revivals. But the trend is unlikely to be reversed. The reason, Voas and Chaves aver, is that “Children are raised by parents who are less religious than their parents were, and the culture is gradually reshaped with the passing of each successive generation.” It began in the early 20th century, in which “strong religious affiliation, church attendance, and firm belief in God have all fallen from one birth cohort to the next,” and the generational replacement has been unstoppable ever since. The religious reawakening in the 1980s through the 2000s, then, was an anomaly. The long-term trend is away from religion and toward secularization. If these trends continue we should be thinking long and hard about the deeper implications for how people will find meaning if the traditional source of it goes extinct. ■

REFERENCES

1. <http://bit.ly/1SKoeGF>
2. Kosmin, B. A. and A. Keysar. 2009. ARIS 2008. “American Religious Identification Survey.” *Summary Report*, March.
3. The Harris Poll. 2013. “Americans’ Belief in God, Miracles, and Heaven Declines.” December 16. <http://bit.ly/1W29oPk>
4. I computed the U.S. adult population by taking the current population of about 314 million, and the figure from the U.S. census bureau that 76.3% of the U.S. population are age 18 and over: <http://1.usa.gov/1jAtEVk>
5. Pew Research Center. 2015. “America’s Changing Religious Landscape.” May 12. <http://pewrsr.ch/1FhDsIC>
6. Personal correspondence, June 29, 2016.
7. Hout, Michael and Tom W. Smith. 2015. “Few Americans Affiliate with Organized Religions, Belief and Practice Unchanged: Key Findings from the 2014 General Social Survey.” <http://bit.ly/28J3EZk>
8. <http://www.outofservice.com/morality/>
9. McCaffree, K. J. 2014. *Faith, Christianity, and Non-Affiliation in the United States*. (Doctoral Dissertation). Retrieved from: University of California, eScholarship: <http://bit.ly/28LTUV>
10. All effects cited here are statistically significant at the $p < .0001$ level, meaning there is a less than one in 10,000 probability of the differences being due to chance.
11. See McCaffree’s book length treatment of the subject, an expansion of his doctoral dissertation: McCaffree, Kevin. 2017. *The Secular Landscape: Religious Non-affiliation in the 21st Century United States*. New York: Palgrave Macmillan.
12. Zuckerman, Phil. 2014. *Living the Secular Life: New Answers to Old Questions*. New York: Penguin Press.
13. Bruce, S. 2002. *God is Dead*. Oxford; Blackwell, 235.
14. Thomas, R. 1999. “Too Busy for God.” *The Door*, May, 10-11. The percentages sum to greater than 100 percent because survey takers could select more than one option, for example, bored and busy.
15. Like so many famous quotes this one is probably apocryphal, and comes in many varieties of context, such as Parker’s editor demanding copy. <http://bit.ly/28KuG0q>
16. Cheyne, James Allan. 2011. “The Rise of the Nones and the Growth of Religious Indifference.” *Skeptic*. Vol. 14, No. 4.
17. Finke, Roger and Rodney Stark. 1992. *The Churching of America, 1776-2005: Winners and Losers in Our Religious Economy*. Rutgers University Press.
18. Zuckerman, Phil, Luke W. Galen, and Frank L. Pasquale. 2016. *The Nonreligious: Understanding Secular People and Societies*. New York: Oxford University Press, 4, 224-225.
19. Voas, David and Mark Chaves. 2016. “Is the United States a Counterexample to the Secularization Thesis?” *American Journal of Sociology* 121, no. 5 March. <http://bit.ly/28U16bX>

Never Doubting God

What Surveys on Belief in God's Existence Reveal

BY CHARLES S. REICHARDT

WHAT DO AMERICANS BELIEVE ABOUT GOD'S existence? This article examines who most believes in God's existence and who has shown the greatest reduction in their unquestioning beliefs about God.

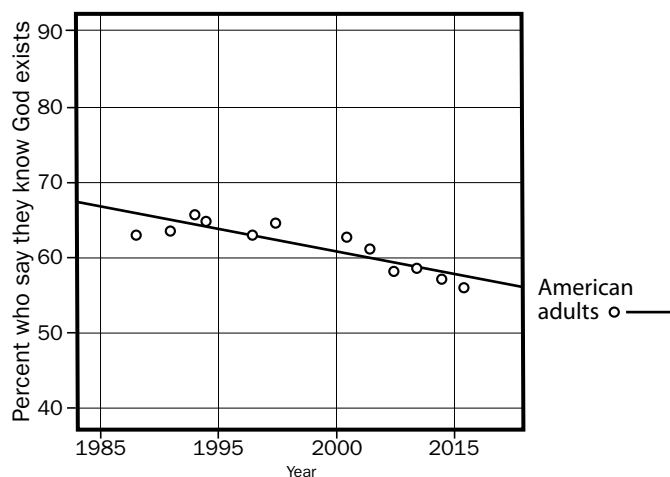
The General Social Survey

The results presented in this report come from the General Social Survey (GSS), which contains independent, random samples of American adults collected roughly every two years since 1972. Starting in 1988, the GSS asked respondents what they believe about God with the response options being:

1. I don't believe in God.
2. I don't know whether there is a God and I don't believe there is any way to find out.
3. I don't believe in a personal God, but I do believe in a Higher Power of some kind.
4. I find myself believing in God some of the time, but not at others.
5. While I have doubts, I feel that I do believe in God.
6. I know God really exists and I have no doubts about it.

This report presents the percentages of respondents who chose the last option—the percentage of those who have no doubts that God exists. To the extent a skeptic is someone who “maintains a doubting attitude,” those who believe without doubts that God exists are not skeptics. The present report documents who is currently least skeptical, and which categories of people are becoming more skeptical, in their beliefs about God. (It is important to conceptualize the results in terms of categories of people because the data are not longitudinal—they do not track the same individuals over time—but are cross sectional, where different people comprise the samples at each year. Also note that when averaging across years, the most recent years are given greater weight because they tend to have larger sample sizes in the GSS.)

Figure 1: American adults. Percentage of American adults who said they have no doubt that God exists.



Overall Changes in Beliefs about God

Figure 1 shows the gradual decline, from 1988 to 2016, in the percentage of American adults who said they “have no doubts God exists.” In 1988, 63% of American adults reported they had no doubts God exists. In 2016, the number was 57%. Based on the regression line, the decline in the percentages who said they have no doubts God exists is 2.8 percentage points per decade (all trends discussed are statistically significant)—this amounts to a total decline of 8 percentage points.

Gender Differences

Women are more unquestioning in their beliefs about God than are men. For example, in 2016 62% of women, compared to 49% of men, said they have no doubts God exists. (Whenever I describe a difference between or among groups, a test of statistical significance rejects the null hypothesis that all the percentages are essentially the same for all groups.)

THE RISE OF THE NONES

In addition, both genders show declines in their beliefs over time, as can be seen in *Figure 2*. Based on the regression lines, men and women exhibited declines of 9 and 7 percentage points, respectively, from 1988 to 2016.

Age Differences

Unquestioning belief in God increases with age. Averaged across the years from 1988 to 2016, the percentages of Americans who said they have no doubts God exists were 52%, 61%, 65%, and 70% for those aged 20-29, 30-49, 50-69, and 70-89 years, respectively. *Figure 3* presents the differences in percentages over time. Each age group shows a decline, over time, in the percentage of those who said they have no doubts God exists. However, the decline is greatest among the 20-29 year old age groups. Based on the regression line, 20-29 year olds exhibited a decline of 17 percentage points.

Education Differences

Unquestioning belief in God decreases with educational attainment. Averaged across the years from 1988 to 2016, the percentage of those who said they have no doubts God exists was 72%, 63%, 52%, and 47%, respectively, for those with less than high school educations, high school diplomas, bachelor's degrees, and graduate degrees. In addition, the decline in the percentages over time was greatest for those with either a high school or a bachelor's degree. Based on the regression lines in *Figure 4*, those with a high school diploma exhibited a decline of 8 percentage points and those with a bachelor's degree exhibited a decline of 6 percentage points.

An astute reader might wonder how an overall decline of 8 percentage points from 1988 to 2016 is possible (see *Figure 1* and the section titled "Overall Changes in Beliefs about God") when the largest declines from 1988 to 2016 in *Figure 4* are only 8 and 6 percentage points and the other declines are much less. The explanation is that the percentage of American adults who had less than a high school education declined substantially while the percentage of Americans with advanced degrees increased substantially (see my 2016 article "Trends in scientific knowledge, education, and religion." *Skeptical Inquirer*, January/February, 40 (1), 42-45). Because those with less than high school educations had the largest percentages claiming to have no doubts God exists, and because the population shifted away from those with less than a high school education, the overall population exhibited a greater decline in

Figure 2: By gender. Percentage of American adults by gender who said they have no doubt that God exists.

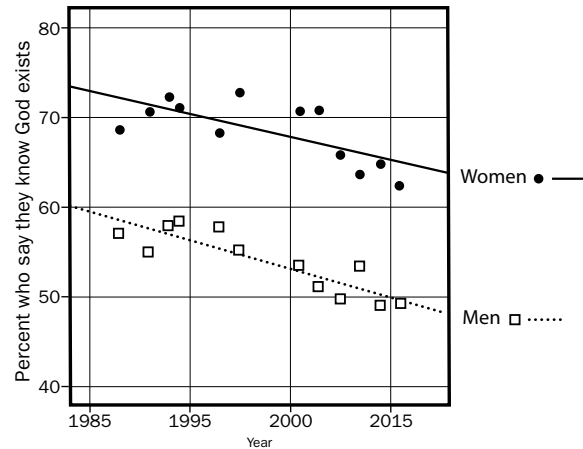


Figure 3: By age. Percentage of American adults by age who said they have no doubt that God that exists.

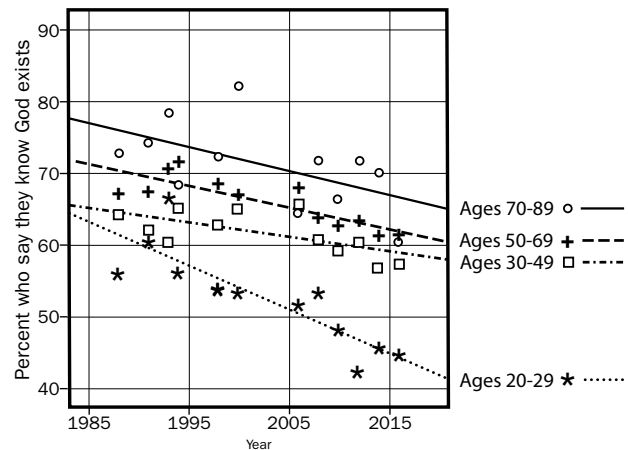


Figure 4: By education. Percentage of American adults who said they have no doubt God exists, by educational degree.

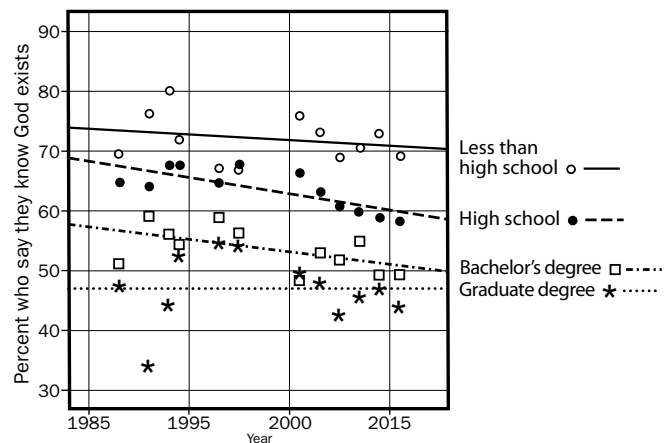


Figure 5: By religion. Percentage by religious affiliation of American adults who said they have no doubt God exists.

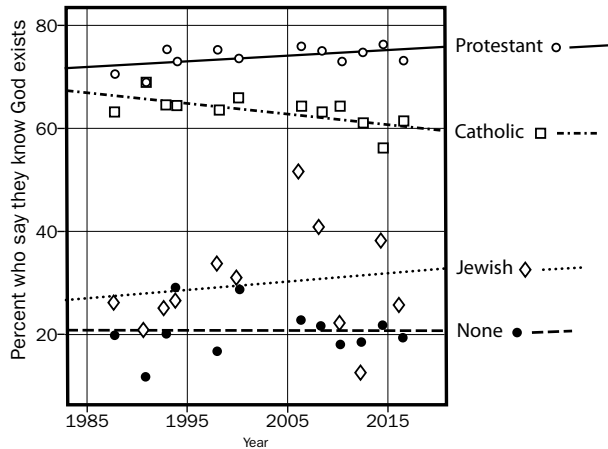


Figure 6: By race. Percentage by race of American adults who said they have no doubt God exists.

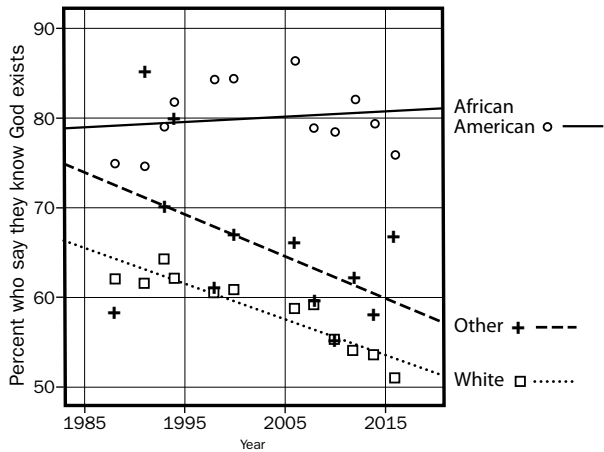
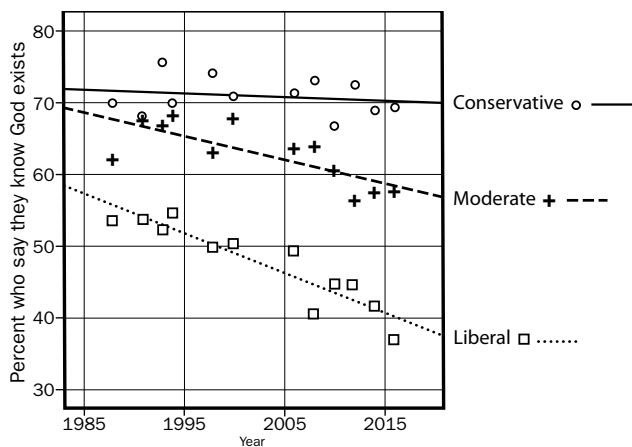


Figure 7: By political preference. Percentage of American adults who said they have no doubt God exists by political views.



the percentage claiming to have no doubts God exists (as evidenced in *Figure 1*) than evidenced by the regression lines in *Figure 4*.

Differences among Religious Preferences

Unquestioning beliefs in God vary by religious preference. Averaged across the years from 1988 to 2016, the percentage of those who said they have no doubts God exists are 74%, 63%, 31%, and 21%, respectively, for Protestants, Catholics, Jews, and those with no religious preferences. *Figure 5* presents the difference in percentages over time. Based on the regression lines, only Catholics showed a substantial decline in the percentages of those who said they have no doubts God exists (which was a decline of 5 percentage points). (Because of small sample sizes and great variability over time, the results for “Jewish” should be interpreted cautiously.)

An astute reader might again wonder how an overall decline of 8 percentage points from 1988 to 2016 is possible (see *Figure 1* and the section titled “Overall Changes in Beliefs about God”) when the largest decline in *Figure 5* is only 5 percentage points, and other trends are positive or flat. The explanation is that the percentage of American adults who were Protestants declined substantially in that time frame, while the percentages of those with no religious affiliation increased substantially. Because Protestants had the largest percentage claiming to have no doubts God exists while those with no religious affiliation had the smallest percentage claiming to have no doubts God exists and because the population shifted from Protestants to those with no religious affiliation, the overall population exhibited a greater decline in the percentage claiming to have no doubts God exists (as evidenced in *Figure 1*) than evidenced by the regression lines in *Figure 5*.

Racial Differences

Unquestioning beliefs in God vary by race. Averaged across the years from 1988 to 2016, the percentage of those who said they have no doubts God exists are 80%, 58%, and 63% for African Americans, Whites, and Others, respectively. *Figure 6* presents the differences in percentage over time. Based on the regression line, the percentage of whites who said they have no doubts God exists decreased 11 percentage points. (Because of small sample sizes in the early years and great variability over time, the results for the “Other” racial category should be interpreted cautiously.)

THE RISE OF THE NONES

Differences among Political Preferences

On average, Conservatives were more likely to say they have no doubts God exists than were Moderates. Moderates were more likely to say they have no doubts God exists than were Liberals. For example, averaged across the years from 1988 to 2016, the percentage of Conservatives, Moderates, and Liberals who said they have no doubts God exists were 71%, 62%, and 46%, respectively. Based on the regression lines in *Figure 7*, the percent of Moderates who said they have no doubts God exists decreased by 9 percentage points while the percent of Liberals who said they have no doubts God exists decreased by 15 percentage points.

* * *

Summary

A majority of American adults say they have no doubts God exists. Women say they have no doubts God exists more than do men. Older Americans say they have no doubts God exists more than younger Americans do. Those with less formal education say they have no doubts God exists more than those with more formal education. Protestants say they have no doubts God exists more than do Catholics who say they have no doubts God exists more than do Jews and those with no religious preferences. African Americans say they have no doubts God exists more than do Whites or Others. Conservatives say they have no doubts God exists more than Moderates. Moderates have fewer doubts about God's existence than do Liberals.

Concatenating the categories can reveal dramatic differences. For example, averaged across the years from 1988 to 2016, 89% of female African American conservatives said they have no doubts God exists while only 32% of male white Liberals said the same. The point is that Americans are far from homogeneous in their views about God.

Along with average differences across groups in their beliefs about God, there are also differences in the rates of change in beliefs about God. Overall, the percentage of Americans who said they have no doubts God exists has decreased modestly over the past few decades. Substantial declines have occurred among both men and women, twenty-year olds, those with either high school or college educations, Catholics, Whites, and both Moderates and Liberals. Skepticism about God's existence has been on the rise among American adults even if only incrementally. **S**

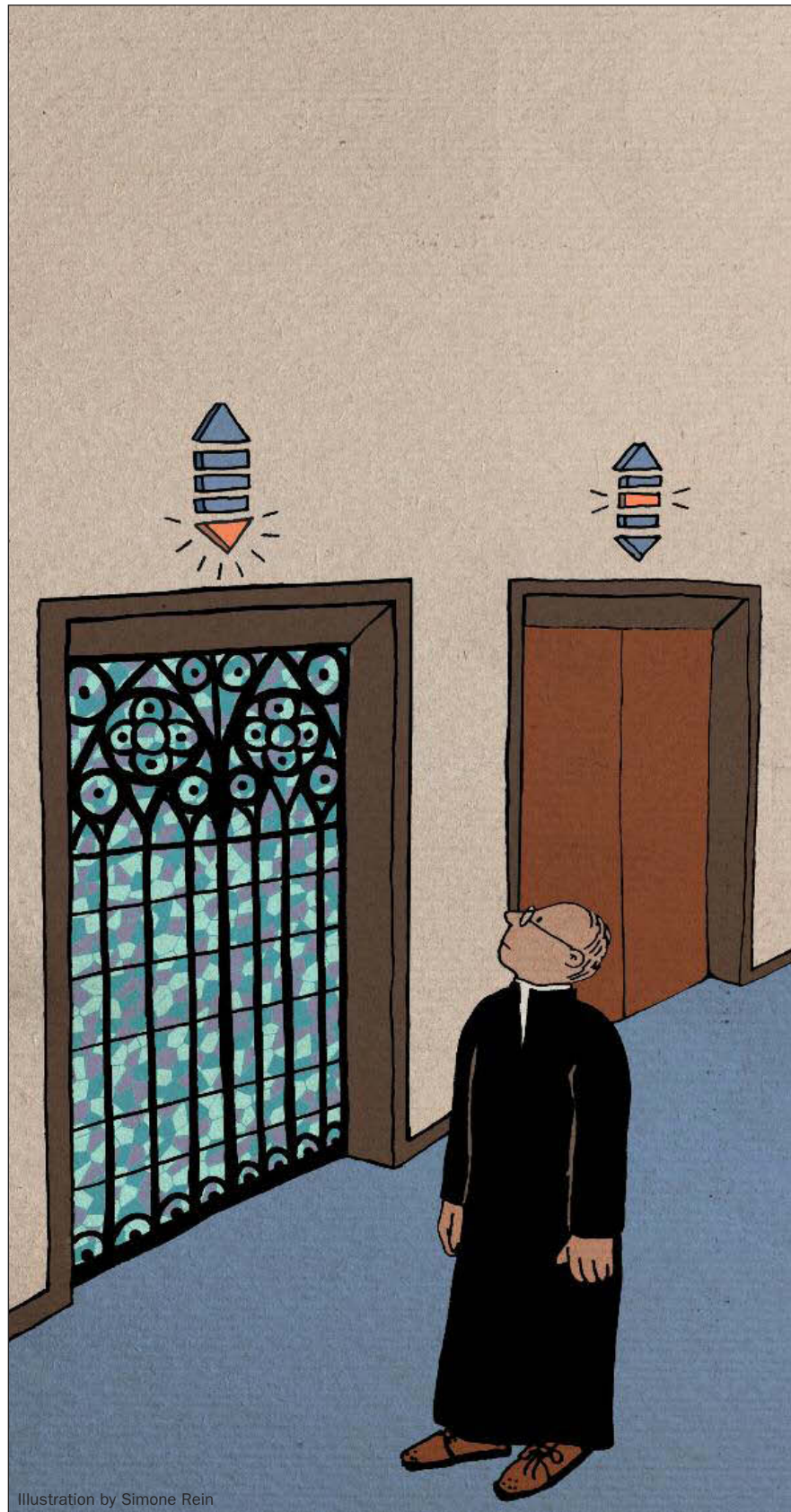


Illustration by Simone Rein

Humbling Humanity

Reality Need Not Diminish Our Concept of Our Place In the Cosmos

BY STEPHEN B. GRAY

IN THE INTELLECTUAL CHILDHOOD of *Homo sapiens*, before the appearance of science a few centuries ago, most of the Western world held the egocentric view that we are the center and purpose of the universe, created and cared for by God. As scientific knowledge grew, this notion became obsolete, but many monotheists still think we are uniquely favored.

The initial (and biggest) shocks to this anthropocentric view were heliocentrism and Darwinian evolution. Both had influences far beyond their initial scientific implications, and both were strenuously opposed by religious believers. But those humbling developments were only two of many that upset the traditional picture. Here are a few of the ways that scientific discoveries have put our place in the cosmos into perspective.

Earth's size: The ancient Greeks proved that the Earth is a sphere of immense size. They also estimated even greater distances, such as the distance to the Moon.¹ The realization of our insignificance had begun.

Earth's Shape: Aristotle (384-322 BCE) found that the Earth is not flat by noting that as one travels north, different parts of the heavens are visible. He also observed that during an eclipse of the Moon, the Earth's shadow on it is a circular arc.² The literal biblical view was flatly contradicted.

Larger Distances: Ptolemy (c. 87-150 CE) computed the first truly great size of the cosmos. Using assumptions that we now know to be false, he made a calculation that the universe, which he thought was limited to Earth, Sun, Moon, and five planets, has a radius of about 75 million miles. His measurement was much too small, but it was the first sign that the universe is incomparably larger than the Earth.³



The Universe Does Not Revolve Around Us: During the Scientific Revolution, Copernicus, Kepler, and Galileo demonstrated that the Earth is not the stationary center of the Solar System. Galileo's 1610 observations of Jupiter's moons proved that they orbited that planet, hence not all astronomical bodies revolve around the Earth. The new concept that the Earth was not fixed, but orbited around the stationary Sun

and stars was a revolutionary step in deflating anthropocentrism.⁴

Even Larger Distances: Friedrich Bessel (1784-1846) was the first to accurately measure the distance to a star.⁵ To get an idea of scale, let us start with the height of a human and compound distances outward. Earth's diameter (7,917.5 miles or 41,804,400 feet) is slightly more than 7,600,000 times larger than a person (5.5 feet average). The Sun's diameter is 109 times the Earth's. The distance to the nearest star is 29,000,000 times the sun's diameter. Our galaxy's diameter is 24,000 times the distance to that star. Edwin Hubble discovered that the Andromeda nebula is a galaxy separate from our own and its distance from us is about two million light-years (1 light-year = 5.88 trillion miles).⁶ The observable universe's diameter is 270,000 times our galaxy's diameter. In terms of ratios, we are much closer to the size of a proton than to that of the universe. Our presence by comparison to these scales is truly insignificant.

The Observable Universe: The potentially visible universe extends in all directions from Earth and is, by one calculation, 46 billion light-years in radius.⁷ The universe has no center, and we occupy an unremarkable position in it. This is called the "Copernican principle," or the "principle of mediocrity," where

mediocre here means unexceptional. If God fine-tuned everything to make human life important, he misled us with evidence that we do not matter at such cosmic scales. And if we're the purpose of the universe, what was the point of the 13.8 billion years that came before we arrived? And what is the purpose of all the other stars and planets?

The Number of Stars: There are an estimated 10^{24} stars (one trillion trillion) just in the observable universe, and quite possibly many more in more distant parts.⁸ If we represent each potentially visible star by a typical grain of sand,⁹ the sand would fill the Grand Canyon more than twice! If you've seen the Grand Canyon, imagining that number of sand grains is nearly impossible. Are we to believe that the creator of the universe is concerned with a single planet surrounding just one of these grains-of-sand stars?

The Universe is Expanding: Hubble's observations of galaxies showed that the universe is expanding in a way that allows its time of origin to be computed.¹⁰ The Big Bang origin occurred about 13.8 billion years before the present, trivializing our familiar scale of time. It was probably not an instantaneous singularity that would need a supernatural cause, such as God.¹¹

Time Scales: Some Fundamentalist Jews and Christians utilize Old Testament genealogies to prove that the age of the Earth is less than 10,000 years. That figure disagrees drastically with ages determined from geology, physics, paleontology, and astronomy. The actual ages, now known within two percent, are about 13.8 billion years for the universe and about 4.54 billion for the Earth.¹² If we take 100,000 years before the present for the origin of *Homo sapiens*, we have existed for less than $1/100,000$ the age of the universe. Recorded history began about 5000 years ago, roughly one-millionth the age of the Earth. Such enormous cosmic time scales can have no divine purpose.

Other Planets: Astronomers have found more than 3,000 planets in other solar systems, with more being discovered regularly.¹³ The search for signs of life elsewhere is ongoing, but we have found nothing yet. If we are extremely lucky and find a transmitting civilization, the effect on Christian biblical literalists will be interesting to see. Would extraterrestrials have heard of Jesus, God's "only begotten son" who came to Earth to save our species? In the unlikely event that they have, they would undoubtedly wonder why God's attention was restricted to one tiny planet and to only one small, undistinguished ethnic group.

Dark Matter and Energy: The presence of dark matter is inferred by otherwise unexplained gravitational effects. Dark energy was postulated by noting that the expansion of the universe is accelerating. Their exist-

tence shows that the Earth and every familiar form of matter, including our bodies, are composed of something that comprises perhaps less than 0.5 percent of the mass-energy of the universe; the rest is something alien. Due to the accelerating expansion, the entire universe will eventually be a cold, empty vacuum. Where's the divine significance for us in this view?

Fantastic Cosmic Entities: The universe contains a variety of phenomena that are vastly larger and more energetic than the human scale. Besides the expanding universe, other phenomena include planet collisions, multiple star systems, white dwarfs, red dwarfs, supergiant stars, cosmic rays, pulsars, quasars, blazars, neutron stars, novae, supernovae, hypernovae, magnetars, black holes, black hole collisions, gravity waves, monster galaxies, galaxy clusters and superclusters, galaxy mergers, galactic lensing, gamma ray bursts, and radio wave bursts. In light of this array of phenomena, the quaint notion that the universe was created by a magic being who watches and attends to humans is beyond bizarre.

General Relativity (GR) and Quantum Theory (QT): These two 20th-century developments drive a wedge between human intuition and proven theory. Both theories are completely successful at prediction, but are impossible to grasp intuitively—especially QT. Their practical success, contrasted with their philosophical opacity, shows that our minds cannot really understand the world. The fact that QT and GR are incompatible at a basic level shows that our minds may not be fully equipped to deal with reality on these scales.^{14,15}

Extra Dimensions: Cosmologists and physicists speculate about the existence of more dimensions than the familiar three plus time. String Theory, an effort to combine GR and QT, requires more dimensions. If they exist, our existence and understanding are further marginalized.

The Multiverse: There may even be other universes in a hypothetical multiverse—of which our universe is just one of many, perhaps an infinite number, all very likely beyond our powers of observation. This concept is speculative, but prominent cosmologists take it seriously.¹⁶

Future of the Earth and Universe: Well before the "heat death" of the universe,¹⁷ the Sun's output will increase and cause the Earth's oceans and atmosphere to boil off.¹⁸ Our planet will become red-hot and sterile. If intelligent life still exists, it will have to continue elsewhere, such as Mars or beyond, eventually migrating to other star systems if necessary. It's hard to imagine a quaint religious perspective being grafted onto this future.

Extraterrestrial life: There may be primitive life,

existing either now or in the distant past, on Mars and/or certain moons of Jupiter and Saturn. That finding would quickly put an end to the notion, favored by many Christians, that the origin of life must have come from an act of God. As life on Earth is found in increasingly extreme environments, the chance of finding that life exists elsewhere is improving.¹⁹ More revolutionary, both for religion and humankind, would be the discovery of extraterrestrial intelligences.²⁰ That would revolutionize philosophy, religion, and science. That and/or finding a multiverse would be the ultimate humbling of humanity.

Evolution. Charles Darwin (1809-1882) and Alfred R. Wallace (1823-1913) found that evolution occurred by natural selection, a process sometimes called “survival of the fittest.” The theory changed the status of *Homo sapiens*, from a supernatural creation of God to the result of purely natural processes. This was the greatest demotion of humanity since the Earth was removed from the center of the universe. Evolution proves that the biblical Adam and Eve did not exist. Their “original sin” was therefore impossible, so there would be no need for a messiah to save us from our sins.

Evolved defects. The theory of evolution correctly predicts that the human body contains defects. Some are well known to the informed public, but some are not, such as the reproductive systems in both sexes, serious problems in the eye, mouth and throat, and the bizarre routing of certain veins and nerves. The designer, if any, should have flunked design class.²¹ Supposedly omniscient, he could have done much better.

Biodiversity. The estimated number of species ranges from 5 million to 100 million, with only a small minority having been described thus far. Further reducing our uniqueness, recent research shows that certain species of primates and large marine mammals share some of our higher mental functions. There is a continuous set of abilities and features in the entire animal kingdom, all the way to humans.²² Our “uniqueness” is a matter of degree.

Science and the Soul. In yet another demotion, neuroscientists have found no evidence of a soul or any other supernatural essence in the brain or body. It is well established that specific brain areas accomplish specific types of mental processes, such as recognizing faces or generating speech, further supporting the monist (*contra* dualist) position that the mind and the brain are one. When a part of the brain is injured, the function carried out by that part is diminished or eliminated, and when the brain dies, the mind dies with it. Also, the body degrades soon after death, so physical resurrection is impossible. There is no evidence that anyone has ever returned to life after dying. Mortal-

ity is the definitive reduction of our status.

This situation need not be depressing. It should encourage us to value our present lives rather than waiting for death and a nonexistent afterlife. We have no importance at the cosmic scale. But we should feel proud to be an integral part of this colossal structure. So far as we know, we are alone, so our purpose in life should be kindness to our fellow humans, to our fellow species, and to our planet. The humbling of humanity increases our real value, which is to each other. That is all we need to lead a rewarding and worthwhile life.²³ ■

REFERENCES

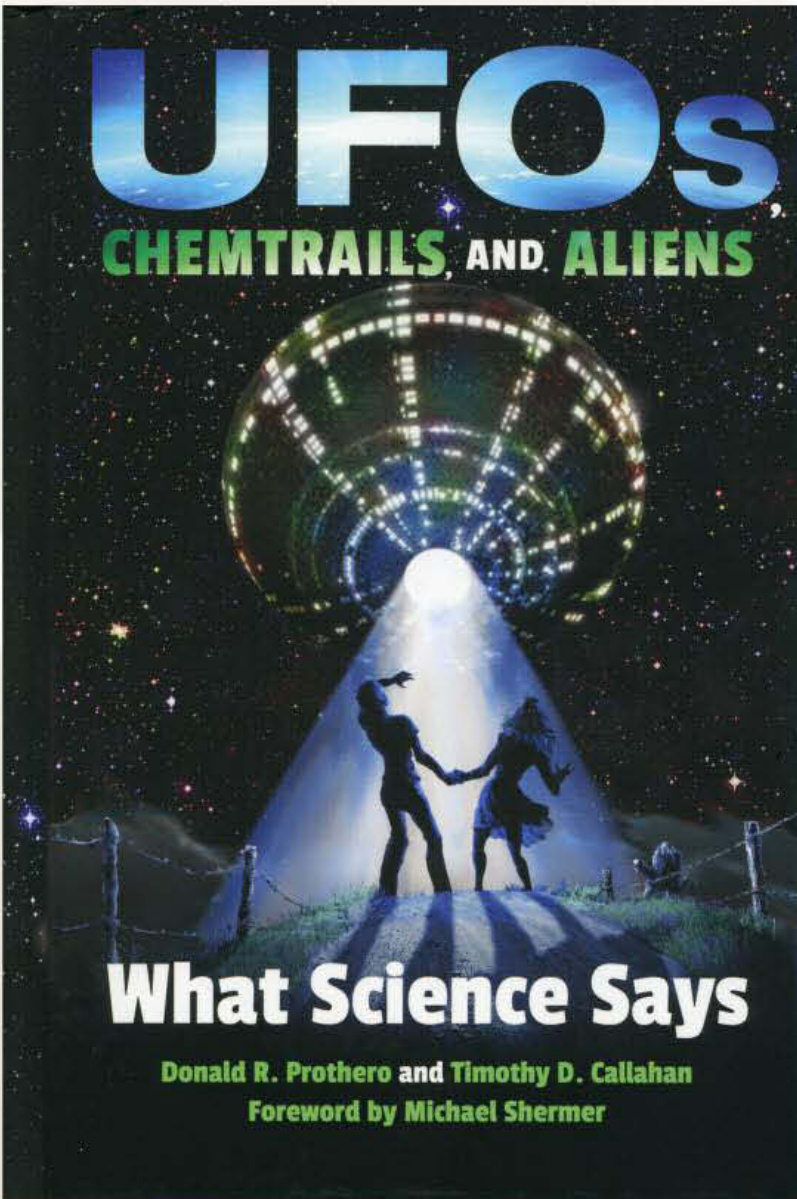
1. “Measuring the Solar System,” <https://at.virginia.edu/2Hgn6wa>
2. “Determining the Earth’s Size,” <http://bit.ly/2tpGCob>
3. “An Earth-Centered View of the Universe,” KhanAcademy, <http://bit.ly/1Qef04X>
4. “History of the Center of the Universe,” Wikipedia, <http://bit.ly/2oY3oOI>
5. “61 Cygni,” Wikipedia, <http://bit.ly/2HcLSh2>
6. “Distance to Andromeda,” Universe Today, <http://bit.ly/2FJUSUX>
7. “How Big is the Universe?” Space.com, <http://bit.ly/2oxEuHx>
8. “How Many Stars Are in the Universe?” <http://bit.ly/SIRBXP>
9. I define a typical sand grain to be $\frac{1}{3}$ mm in diameter, packed to about 35,000 grains per cubic centimeter.
10. “The Expanding Universe,” Sloan Digital Sky Survey, <http://bit.ly/1oduzPO>
11. “No Big Bang? Quantum Equation Predicts Universe Has No Beginning,” <http://bit.ly/2k8YOZ7>
12. “IPS Official Statement on the Ancient Age of the Earth and Universe,” International Planetarium Society, Inc., <http://bit.ly/2FI1UJc>
13. “1284 New Planets: KeplerMission Announces Largest Collection Ever Discovered,” Phys.org, <http://bit.ly/2oR8RYa>
14. “List of Unsolved Problems in Physics,” <http://bit.ly/2bsq5Y3>
15. Halper, Phil and Ali Nayeri. 2016. “Before the Big Bang,” p. 119-139 in John W. Loftus, editor, *Christianity in the Light of Science*, Prometheus Books.
16. “5 Reasons We May Live in a Multiverse,” <http://bit.ly/17QgEtL>
17. “What Exactly Is the Heat Death of the Universe and Where Can I Find Out More?” <http://bit.ly/2lao8v1>
18. “When Will the Earth Lose Its Oceans?” <http://bit.ly/2G2PSRE>
19. “Extremophiles and the Search for Extraterrestrial Life,” <http://bit.ly/2G4FZ5Z>
20. “The Search for Extraterrestrial Intelligence,” <http://bit.ly/2nMD6hb>
21. Juan, Stephen. “What’s the Best Way to Improve the Human B0ody?” *TheRegister*, <http://bit.ly/2D8ijL8>
22. Gazzaniga, Michael. 2008. *Human: The Science of What Makes Us Unique*. HarperCollins.
23. Some of this material is explained more completely in my 935-page encyclopedia, *Christianity in Ruins*, available through Amazon. Also see the companion Web site, www.fight-religion.com

“UFOs, Chemtrails, and Aliens is a model of scientific reasoning, rational analysis, and elegant prose that reveals a phenomenon every bit as interesting as the possibility of alien life landing here on Earth or existing somewhere out there in the cosmos—the fact that we can conceive of such a concept, study it scientifically, and understand that we are part of the universe as evolved sentient beings capable of such sublime thought.” —Michael Shermer

CSI
Committee for Skeptical Inquiry

ROBERT P. BALLE

*Annual Award In
Critical Thinking*



UFOs. Aliens. Strange crop circles. Giant figures scratched in the desert surface along the coast of Peru. The amazing alignment of the pyramids. Strange lines of clouds in the sky. The paranormal is alive and well in the American cultural landscape. In *UFOs, Chemtrails, and Aliens*, Donald R. Prothero and Timothy D. Callahan explore why such demonstrably false beliefs thrive despite decades of education and scientific debunking.

“Prothero and Callahan explore the modern myths of UFO sightings and alien encounters and the evidence for them that never quite adds up. . . . With their book’s brisk pace and energetic writing, Prothero and Callahan offer entertainment as well as wisdom for everyone who’s ever wondered what’s behind so many conspiracy theories and paranormal phenomena.”
—*Publishers Weekly*
(Starred Review)

Deterrence and Its Discontents

Now That Nuclear War Seems to Be Getting More Likely Again, It's Time to Turn a Skeptical Eye on Deterrence

BY DAVID BARASH

“STRIKE, STRIKE THROUGH THE MASK!” SO URGED Captain Ahab, in one of his most famous lines. Admittedly, the said captain isn't the finest role model one can imagine, but I've long thought that his demand is precisely what good skeptics are called to do: to strike through the mask of nonsense, false logic, and appeals to misleading passions so as to reach the substance underneath—if there is any—and to reveal its absence if such is the case. When it comes to skeptical unmasking, nuclear deterrence is long overdue. Just ask the citizens of Hawaii the second week of January 2018 when they were alerted by the government to run for cover with an ICBM incoming, possibly containing a nuclear warhead. It was a false alarm, but a stark reminder—with video footage filling the evening news of masses of peoples scrambling to find cover—that this is no theoretical game for intellectuals to play.

Deterrence is a remarkably simple concept, based on threat: If you attack me, I'll retaliate so strongly that you'd wish you hadn't started it. Therefore, you won't attack me in the first place and both of us will be better off. Simple enough, or so it might seem—until it comes to *nuclear* deterrence. For many people, threatening to retaliate with nuclear weapons (following an initial attack) is a necessary evil, the only safe and secure way to live in a world with nuclear weapons. For others, it's downright wonderful, a guarantor of peace and, moreover, a confirmation of the power and influence of their country. For me, however—and a growing number of deterrence detractors—it's an immense evil, a downright dunderheaded, dastardly dangerous, double dose of deception. It's also ethically dubious (make that “despicable”), strategically incoherent and misleadingly marketed pile of nightmarish, nuclear nonsense.

You now know where I stand. Clearly many others are not so skeptical. To advocates of deterrence, nuclear weapons are not only justified, their existence seems to have worked, and to be working, right now. After all, they point out, nukes haven't been used in conflict since August of 1945. Why, then, should one be so skeptical of nuclear deterrence?

Let's start with a bit of biology, where deterrence, in its non-nuclear incarnation, is widespread and not always malign. It emerges in day-to-day affairs, in the animal world and even among plants. Roses and blackberries have thorns, saying in effect “Don't touch me—or else!” Confront a spider, perhaps one that has accidentally strayed indoors and is thus on human turf rather than its own. The tiny creature will likely rear back on its hindmost legs and assume a threatening posture, one that is ridiculous given that it can easily be squashed with a shoe. Yet, everyone understands the gesture, even though to locate the most recent common ancestor shared by a spider and a human being one must go back more than 500 million years.

Threats have an ancient pedigree in the human imagination, too. Among the most iconic and oft repeated tales are explicit prohibitions: in the ancient Hebrew Bible, Yahweh warns Adam and Eve not to partake of the fruit of the Tree of Knowledge of Good and Evil, lest you “surely die.” (They do, anyway.) Prometheus gives fire to human beings, despite Zeus's explicit order to the contrary. Also from Greek mythology, Pandora gets a box (originally, a jar) that she is forbidden to open. Bluebeard's young wife is warned not to open a particular basement door. The list goes on—and inevitably, deterrence fails.

There is no doubt, however, that in some cases, it works. Lions have large canines, not only for killing their prey but also for threatening other



Troops at the Nevada Proving Grounds observe a nuclear bomb blast from about 6 miles away during the first of a series of tests—conducted 1951-1957—used to train troops to operate on the nuclear battlefield. Photo by Corporal Alexander McCaughey, U.S. Army Photographic Signal Corps, <https://bit.ly/2jqNJVn>.

lions; they are notably silent when stalking zebras, reserving their impressive roar for discouraging other lions from invading their territory. When threatening another animal, the standard procedure is for the threatener to make him or herself seem larger, more imposing, more dangerous than it really is, in an effort to deter an opponent from taking its food, nest site, mate, or, quite simply, from attacking. Deterrence is far less costly than actual combat but you have to signal that you are willing to use your weapons for the deterrence to work.

Nature isn't only "red in tooth and claw," as Tennyson wrote. Living things are typically equipped with a range of intimidating options: not just teeth and claws, but also horns, antlers, poison fangs, bony shields, scary hisses and formidable roars, often wrapped up in a package designed to make themselves seem as ferocious and intimidating as possible. All the better to deter you.

At the same time, a would-be deterrer must be prepared "if deterrence fails" (a frequent and terrifying phrase within the community of nuclear strategists), but something that is not uncommon in nature. In that event, a fight ensues, which might be

harmful for one or both parties, but most often results in the loser slinking, slithering, flying, climbing, or running away—to fight, or at least threaten, another day. Unlike nuclear deterrence, failure of natural deterrence is rarely disastrous. Often the result is a standoff, with a would-be aggressor held at bay, the status quo maintained and individuals settling down on their territories, their nests, and with their mates and lives more or less intact.

Even if push does come to shove, antler to antler, beak to beak, tooth to tooth, or claw to claw, and if, as a result there are winners and losers, the former enjoy the fruits of their (sometimes temporary) victory while the latter, albeit defeated and disappointed, are only rarely annihilated. In the worst case, at least their ecosystems are still intact. Not so if *nuclear* deterrence ever fails.

I am not opposed to all uses of deterrence. Our ten-acre farm in western Washington state is patrolled by an aggressively territorial 140 lb. Anatolian Shepherd Dog—and we have never been burglarized. We also maintain an electric fence around the perimeter of our property, to keep our animals in (including the Anatolian), and others out. Even

if we could, however, we wouldn't seek to deter intruders by threatening to blow up the neighborhood. Aside from the insuperable practical and moral constraints, such a threat would lack credibility (an enormous and consequential problem when it comes to nuclear deterrence, which, as I'll describe later, has led to such dangerous absurdities as doctrine and weapons designed for fighting "limited nuclear wars"), and also because on occasion, accidents happen.

Thus, we have sometimes inadvertently touched our "hot wire," and although painful, such events simply reinforce our subsequent caution; the effect is unpleasant but far from lethal. More than once our big dog has misfired and in a fit of excessive, redirected exuberance—for example, when a coyote is tantalizingly close but on the other side of our fence—he has attacked one of our smaller dogs. The outcome has been financially beneficial for our local veterinarian, but the canine victim has always recovered—unlike the all but certain consequence of a nuclear response to a misfiring computer or satellite false alarm, or an ostensibly "limited" nuclear war.

My opposition to various alternative forms of deterrence is thus less than absolute, and yet herein lies part of the problem when it comes to nuclear deterrence. Although carrots are generally better than sticks, and threats are less effective (also less ethical) than rewards, the fact that threats sometimes work—that indeed, they are baked into much of the animal and human world—readily leads to the unspoken assumption that what's good, at least occasionally, in the interpersonal and conventional domain is also good when it comes to nuclear weapons. It ain't necessarily so. In fact, it is downright wrong.

Here is a basic rule: when you multiply something by a million, you not only change it quantitatively, but also qualitatively. You might currently have, say, \$40 in your wallet; multiply this by ten, and your newfound \$400 would have a genuine impact, but would not likely make a deep change in your life. Multiply it by a million, however, and with \$40 million in your pocket there's a good chance that your future would be radically altered. Most people walk at about two miles per hour. Increase this by a factor of ten, and you're riding a bicycle at 20 mph, or perhaps in a car going slowly. Multiply by a million, and you've exceeded escape velocity and are heading for outer space. A change, not just of degree, but of kind.

TNT is a powerful but conventional explosive.

A ton of it can do enormous damage. Atomic bombs are measured in kilotons (thousands of tons of TNT) and hydrogen bombs in megatons, or millions of tons. The difference, once again—in this case between conventional and nuclear munitions—is qualitative, not merely quantitative. The temperature inside a nuclear explosion is similarly a thing unto itself: in the range of millions of degrees, something not otherwise found on Earth. Not surprisingly, although deterrence exists in both the conventional and nuclear world, when it comes to things nuclear, its implications and its dangers are also qualitatively discontinuous.

Nuclear deterrence isn't normally discussed in polite civilian conversation, but start looking for non-nuclear deterrence and you will find it almost everywhere. "Don't make me say this a second time, or else," "If you hit your sister again, you'll be timed out." From Pink Floyd's *The Wall*: "You can't have any pudding if you don't eat your meat!" Strong doors and locks are intended to deter crime. So are police. But although a policeman on the corner may well deter criminals, recent well-publicized events make it clear that sometimes the police resort to lethal force when it is not called for. A saving grace is that such occasions, although tragic, do not result in destroying an entire city, or country. Not so in a nuclear context.

In its non-nuclear manifestation, deterrence is fundamental to law enforcement, with the expectation that the threat of condign punishment will inhibit malefactors. (Whether it does so, on the other hand, is another matter.) By the end of the 18th century, English law specified 220 different offenses—most of them involving theft of property—that were punishable by death. The expressed intent of the infamous Bloody Code was deterrence: "Men are not hanged for stealing horses," wrote the Marquis of Halifax, "but that horses may not be stolen." Horses were stolen nevertheless, and people—poor people, especially—were hanged for stealing a quill pen or a bolt of cloth.

European reformers—notably Cesare Beccaria—sought a more effective social policy by making "the punishment fit the crime," and shortly thereafter, Jeremy Bentham argued strongly for similar adjustments. This corresponds to strategists' "ladder of escalation," by which U.S. presidents are supposed to have a variety of punishing nuclear options instead of simply an all-out, insensate, devastating response to any aggressive transgression.

Structured levels of punishment make sense in the world of criminology, not only because it is

widely seen as immoral to execute someone for stealing a loaf of bread, but for practical reasons: before the relaxation of England's Bloody Code, judges and prosecutors often ignored or understated a crime so as to avoid becoming complicit in overly draconian punishment. There is no punishment more draconian—for an aggressor, but extending inexorably to the entire planet—than nuclear retaliation.

What follows is a brief survey of some of the skeletons in the closet of nuclear deterrence.

Skeleton #1: No Limits. Deterrence is a psychological maneuver whose avowed goal is to pose unacceptable damage to a would-be attacker. Rarely acknowledged, however, is that no one knows how much threatened damage is sufficient. During his tenure as JFK's Defense Secretary, Robert McNamara attempted to oversee a logical analysis of "how much is enough." Graphing percentage destruction against megatonnage "delivered" against the USSR, the curve showed a levelling off—essentially, diminishing returns—at destruction of a quarter of the population and two-thirds of the industrial capacity. This was then arbitrarily announced to be sufficient for deterrence; just to be "safe," however, it was decreed that each leg of the strategic triad (land based ICBMs, submarine launched ballistic missiles, and strategic bombers) should independently have this capability.

Given the current anxiety in the U.S. over the prospect of a handful of North Korean nuclear armed missiles, it seems reasonable that effective deterrence could be achieved with a very small number of such weapons. (China has calculated similarly, having capped its arsenal at about 300 nuclear warheads, carried by roughly 100 missiles.) A single U.S. Trident submarine can carry 24 D-5 missiles, limited to 20 by current treaty. Each missile has eight independently targetable warheads, of about 465 kilotons (thousands of tons of TNT equivalent), with each such warhead being about 30 times the destructive power of the Hiroshima bomb. Thus, a single Trident sub packs $20 \times 8 \times 30 = 4,800$ Hiroshimas. If this alone seems excessive, consider that the U.S. has 18 Trident submarines, not to mention the bombers and ICBMs—and yet the Trump Administration claims that much more is needed! Suffice it to say that there is no logical way to cap the size

of an adequate deterrence force.

The lack of limits is a serious economic and political problem, and a blank check for what Eisenhower called the military-industrial complex. But this particular skeleton is not in itself perilous. The remaining ones, however, are.

Skeleton #2: Credibility. Let's say you want to deter your child from poking the cat. You might threaten a loss of dessert, or of screen time, etc. Or, you might announce that the next time the cat is assaulted, you'll blow up the house. Since such a threat would likely lack credibility, you might enhance your would-be deterrent by planting sticks of dynamite throughout the house. Your deterrent's credibility would still likely be low, however, and most psychologists would probably argue against such a child-rearing tactic.

Similarly, people who invest in a home security system are understandably reluctant to install one that responds to a burglary by blowing up the house—even if such a threat were advertised on a conspicuous lawn sign, just as a guard armed with a backpack nuclear bomb is unlikely to stop a thief: "Halt, or I'll blow us all to bits!" This speaks to one of the most intractable skeletons in the closet of nuclear deterrence: its incredibility. Decades ago, McNamara noted that it is impossible to make a credible threat out of an incredible act, a problem that long vexed NATO planners, summarized by one general's complaint that West German towns were "only two kilotons apart." It wasn't credible that NATO would destroy western Europe in order to save it from a potential Warsaw Pact invasion. The result was—and continues to be—the design and deployment of smaller, more accurate nuclear weapons, whose use is therefore more believable. The intractable problem, however, is that insofar as nukes are made more usable, in order to be more credible they are unavoidably more likely to be used, and thereby dangerous. Incredibly so.

The credibility skeleton has led to no end of hair-raising attempted work-arounds. For example, since the heart of deterrence—nuclear retaliation after a first strike—is itself lacking credibility, not only because of its ethical problems as well as the fact that doing so might contribute to the worldwide catastrophe

of nuclear winter, there has been continuing pressure to take people “out of the loop” and rely on “launch on warning,” whereby satellites and computer systems would automatically launch retaliation upon warning of an incoming attack. However, such a move would itself be perilous, given the documented high frequency of false alarms, computer malfunctions, and so forth, as in the Hawaii example most recently.

Skeleton #3: Vulnerability. The issue here is vulnerability of the weapons themselves, not of the population. Seemingly more ethical than threatening population centers, “counterforce” doctrines target a potential opponent’s weapons (particularly ICBMs), bringing to mind the Lone Ranger on 1950s TV, who would neatly shoot the pistol out of a bad guy’s hand...without even hurting him! A key problem, however, is that such a capability—aside from being technically impossible—suggests that the Lone Ranger might be planning a disarming first strike, which, in times of stress, could result in a never-ending cycle of instability in which each side endeavors to attack first.

Skeleton #4: The Assumption of Rationality. Nuclear deterrence makes the peculiar assumption that we can scare the hell (or more) out of opponents by threatening the most unimaginable horror and then expect them to behave with exquisite cognitive control. This problem is immensely enhanced if and when the leader of a nuclear armed country ever happens to be mercurial, thin-skinned and quick to anger, vindictive, indifferent to facts, impulsive, unreflective, ego-threatened, politically and militarily inexperienced, ethically challenged, untaught and unteachable, and so forth. This potentially catastrophic weakness isn’t only found in today’s political leaders, although it seems especially developed in the current president of the United States. No human being is rational all the time. Isn’t it therefore rational to turn a deeply skeptical eye on the proposition that we can trust the animal called *Homo sapiens* to never, ever screw up?

Skeleton #5: Ethics. Nuclear deterrence is widely justified because it is preventative, and as such “much better than nuclear war.” This ignores the conundrum that the only way this doctrine could prevent nuclear war is if anyone brandish-

ing deterrence is fully prepared to engage in nuclear war if pushed or sufficiently provoked (see Skeleton #2, Credibility). And there would be nothing ethical about such a war. The most influential ethical analysis of war in the Western tradition can be found in the Catholic Church’s “Just War” doctrine, which is divided into *jus ad bellum* (the legitimacy of fighting a given war, regardless of how said war is fought) and *jus in bello* (the legitimacy of the tactics employed). Each of these, in turn, is divided into several subcomponents, and nuclear war violates every one. As to being a Just War, nuclear war simply wouldn’t be Just Another War.

Skeleton #6: Efficacy. But hasn’t deterrence worked? Maybe. But maybe not. The fact that the Cold War never went hot might have been due to deterrence, or to the fact that the U.S. and USSR had nothing worth warring about. And of course, correlation is different from causation. In ancient China, it was widely believed that solar eclipses were caused by a dragon swallowing the sun, so people responded to sudden darkening by making as much noise as possible: banging pots and gongs, yelling loudly and guess what? It worked! Every time. If for some reason the villagers had refrained from all that noise-making and the eclipse resolved anyhow, the worst outcome would have been a loss of confidence in the role of dragons. But if nuclear deterrence had failed, I likely wouldn’t be around to write this, or you to read it, so neither of us would be congratulating ourselves on the efficacy of deterrence.

In some cases, it only takes one failure for an entire scaffolding, previously thought to be safe, to come crashing down. The Concorde Supersonic Transport entered service in 1976 and flew flawlessly throughout the late 1970s and 1980s. In fact, it was lauded as not only the fastest but the safest passenger plane of all, having a zero accident and fatality rate. Then, in 1990, one of them crashed on a runway in Paris, killing all 109 people on board and ultimately grounding the entire fleet, which was subsequently abandoned. Its safety record instantly jumped from the safest to the most dangerous (because only a handful of the planes were ever built and flown). Failure of the Chinese dragon myth wouldn’t have been catastrophic; failure of the Concorde was, but “only” for the passengers (and the plane’s investors);

failure of deterrence—just once—would be catastrophic for hundreds of thousands, more likely millions and perhaps billions, not to mention the rest of the innocent natural world. Such considerations should mitigate against celebratory confidence as to the reliability of deterrence, and the fact that it has always worked...thus far.

Moreover, you cannot prove a counterfactual: why something has *not* happened. Maybe there was no U.S.-Soviet nuclear war because of the *Howdy Doody Show*, or the invention of air conditioning. To be sure, The Cuban Missile Crisis of 1962—when by most accounts we were closest to nuclear Armageddon—is sometimes cited as an example of successful deterrence. But, in fact, this crisis was *caused* by nuclear weapons, specifically the Soviet attempt to base nuclear missiles in Cuba. And according to many historians, the major reason Khrushchev backed down was because the Soviets were greatly inferior to the U.S. in conventional military forces in the Caribbean. In any event, it is not unlikely that the Cuban Missile Crisis was resolved short of nuclear war was not *because* of nuclear deterrence, but *despite* it. It may seem a truism that absent nuclear weapons there wouldn't have been any crisis, but that is precisely the point: Khrushchev's move to install nukes in Cuba in 1962 was a direct consequence of the Soviet perception that such weaponry was needed. Why? To deter the U.S., which had deployed intermediate range Thor missiles in the UK in 1959, and Jupiter missiles in Turkey in 1961. And why had the U.S. done that? To deter the Soviet Union. (An initially unpublicized part of the agreement that ended the Cuban Missile Crisis was for these Soviet and U.S. missiles—i.e., mutual provocations—to be removed. In that limited sense, deterrence was successful: as a prod toward giving up on one aspect of itself.)

What about North Korea? The thousands of artillery pieces maintained by the North and aimed at Seoul and environs have almost certainly dampened any potential enthusiasm from aggressive militarists in the South to march north, just as the South's well oiled military machine plus the deployment of U.S. "tripwire" forces have constrained aggression from the North. In short, conventional deterrence worked and showed no signs of failing... until the Kim regime, fearing that it needed yet more deterrence, began vigorously pursuing a full fledged nuclear arsenal, which touched a nerve in what Senator Bob Corker aptly called the "adult playpen" at the White House. The currently unstable situation on the Korean Peninsula is frightening testimony to deterrence run amuck.

Okay, but haven't nuclear weapons and their deterrent threats enabled nuclear armed countries to get their way in the world? Hardly. The U.S. wasn't able to bend North Vietnam to its will, or the Viet Cong in South Vietnam. Our atomic arsenal didn't benefit us in Korea, Iraq, Afghanistan, Libya, or against ISIS, nor did the Soviets gain similarly in Afghanistan, or in keeping control of its East European satellites, or even in maintaining its territorial integrity. France's nukes didn't help them keep Algeria. And when it comes to protecting them from attack by non-nuclear aggressors, forget it: In 1951, China's non-nuclear status didn't inhibit Mao from sending hundreds of thousands of soldiers against a nuclear-armed U.S. in Korea, nor was non-nuclear Argentina inhibited from invading nuclear Britain's Falkland Islands in 1982. There are many other examples, to which the following must be added: nukes didn't deter terrorist attacks against the U.S. on 9/11, or subsequently against the UK or France, attacks that in the future are far more likely to be conducted *with* nuclear weapons than deterred *by* them.

Overall, perhaps the most pernicious skeleton rattling in the closet of deterrence—and the most cogent reason to be skeptical of the whole enterprise of nuclear deterrence—is that it has served as the bedrock justification for the ongoing development, deployment, maintenance and escalation of nuclear weapons themselves...the whole shebang. It is because of nuclear deterrence that we have all been condemned to live under what President Kennedy called a nuclear sword of Damocles, liable to descend at any time. To be sure, Trump in the White House is especially terrifying; he is a national and international emergency. But *no one* should ever have the opportunity to unleash nuclear war: not Trump, not Pence, not Theresa May, Emmanuel Macron, Vladimir Putin, Xi Jinping, Kim Jong-un—nobody!

There is a story, said to be of Cherokee origin, in which a young girl was frightened by a recurring dream in which two wolves viciously fought each other. She described this to her grandfather, a tribal elder, renowned for his wisdom, who explained that everyone has both peaceful and violent wolves within them, and they struggle for control. At this, the child was even more worried and asked who wins. Her grandfather replied: "The one you feed."

It's time to stop feeding the nuclear wolf, to unmask the unacceptability of deterrence, and turn a skeptical eye on the whole rotten enterprise. **S**



Skeptical of the Multiverse

BY ARTURO SANGALLI

SPECULATIONS AND THEORIES ABOUT THE EXISTENCE of other worlds have a long history. In recent times, the arguments have shifted away from their typical philosophical and theological character to supposedly become more objective thanks to their scientific underpinnings. A prime example of this trend is the current multiverse theory, which has the support of a number of famous cosmologists, for example, Max Tegmark. But are these arguments more credible than counterarguments based on philosophical and metaphysical considerations?

Ourselves in Other Universes

The multiverse suggests that what we call the “universe” is, in fact, just one among a possible infinite number of other universes, so far away from, or inaccessible to ours, that they are impossible to observe. In one variant of these “parallel” universes, there are exact or nearly exact living copies of you and me; in still other multiverse theories there are universes that obey different laws of physics. Although Max Tegmark is not alone in promoting the multiverse idea, in his 2014 book, *Our Mathematical Universe: My Quest for the Ultimate Nature of Reality*,¹ the MIT physicist argues that the multiverse is a prediction of certain theories. For instance, those parallel universes, including our doppelgängers, would be a logical consequence of cosmic inflation, a theory developed in an attempt to solve some serious problems that afflict the Big Bang cosmological model. Tegmark (emphasis added):

It feels extremely unlikely that your life turned out exactly as it did, since it required so many things to happen: Earth had to form, life had to evolve, the dinosaurs had to go extinct, your parents had to meet, you had to get the idea to read this book, etc. But the probability of all these outcomes happening clearly isn't zero, since it in fact happened right here in our Universe. *And if you roll the dice enough times, even the most unlikely things are guaranteed to happen.* With infinitely many Level I parallel universes created by inflation, *quantum fluctuations effectively rolled the dice infinitely many times, guaranteeing with 100% certainty that your life would occur in one of them. Indeed, in infinitely many of them, since even a tiny fraction of an infinite number is still an infinite number. And an infinite space doesn't contain only exact copies of you. It contains many people that are almost like you, yet slightly different.* (p. 122)

To reach such stunning conclusions Tegmark appears to be applying some result from probability theory; which one, we can only guess, but his reference to dice being rolled infinitely many times points to the Borel-Cantelli lemma, a theorem frequently used concerning infinite sequences of trials. Although Tegmark never mentions it, the lemma is worth discussing if only to illustrate the question of the interpretation of probability when applied to reality—in particular if infinity is involved.

Probability and Reality

The following version of the lemma is due to Émile Borel:

Let $T_1, T_2, \dots, T_n, \dots$ be an infinite sequence of random “trials”, each of which has one of two possible outcomes: Success or Failure. Let p_n be the probability of T_n resulting in Success. If the infinite series $p_1 + p_2 + \dots + p_n + \dots$ converges, then the probability for Success to occur infinitely many times is equal to 0; if the series diverges, then this probability is equal to 1.²

Reflecting on his theorem, Borel cautiously warns us about the perils of applying his result outside the domain of mathematics: “It is easy to conceive that results such as the above can only be applied in the realm of mathematics, where we can effortlessly imagine the possibility of repeating an experiment infinitely many times.” But what if we ignored Borel’s advice and applied his theorem to other domains such as, for example, a random sequence of letters? The following proposition is a logical consequence of Borel’s theorem:

If symbols from the usual 26-letter alphabet plus a “blank” symbol (or space) are chosen at random to generate an infinite sequence $S: a_1, a_2, a_3, \dots$, then the probability for any given string of k letters (for any k) to occur infinitely many times in S is equal to 1.

Suppose that, through some sort of mechanism or device, we would be able to actually generate such a sequence—I must admit that the “infinite” part would be a problem: there are no infinite sequences in nature, but we can imagine one through a sort of thought experiment. What would the above proposition tell us about our sequence? In particular, would it guarantee with 100% certainty that, say, the sentence “*we are by now so used to seeing reality accommodate itself to numerical rules that it is at times difficult to appreciate the astonishing fact that those rules should exist at all*” occurs an infinite number of times? Or, for that matter, that the complete works of Shakespeare will be recreated, not just once but over and over, with chance replacing the mind of the literary genius?

There is reason to doubt it. First of all, we cannot guarantee that “random” in the proposition and “random” in the generating mechanism mean the same thing—the former is theoretical; the other, well, we don’t really know what it is or how to manufacture it. In fact, in the proposition, “random” simply means that every symbol has the same probability of being chosen, where “probability” is just a name for a number between 0 and 1—in this case $1/27$ —and therefore “the probability of event E is equal to 1” does not necessarily have as factual

counterpart “event E took (or will take) place”.

Theorems in probability—and *a fortiori* those involving the elusive notion of infinity—are mathematical results; on the other hand, assuming that for a given physical system there is a sample space satisfying the hypotheses of the theorem is an empirical claim. Confidence in predictions based on probability is no substitute for observation and verification.

The point I’m trying to make with this example is that existence in the real world cannot convincingly be established on the basis of a probabilistic result (on this, see for example, Mario Bunge’s 2012 book *Evaluating Philosophies*,³ p. 157). But that is exactly what Max Tegmark appears to do to “guarantee with 100% certainty” the existence of infinitely many copies of the Earth and each of its inhabitants. Of course, Tegmark’s reference to dice being rolled is not to be taken literally. But what is then his argument? By way of explanation, he offers the following (p. 127): “We’ve observed that these random-looking seed fluctuations exist, so we know that some mechanism [not necessarily inflation] made them” and that this mechanism “operated such that any region could receive any possible seed fluctuations.” And he adds: “We’ve measured their statistical properties using cosmic-background and galaxy maps, and their random properties are consistent with what’s known to statisticians as a ‘Gaussian random field’”

From this, and the assumption of an infinite space and infinite matter, there would follow the property of the Level I multiverse that “everything that can happen according to the laws of physics does happen”, and it happens an infinite number of times (p. 123): “This means that there are parallel universes where you never get a parking ticket, where you have a different name [...] where Germany won World War II, where dinosaurs still roam Earth, and where Earth never formed in the first place.”

But where is the evidence, either experimental or derived from some physical principle, that the random properties of these seed fluctuations would produce every possible universe—assuming that “every possible universe” is a meaningful concept? Tegmark does mention experimental data (cosmic-background and galaxy maps, measured statistical properties, and so forth). However important these data might be, his far-reaching conclusions about the existence of parallel universes “where Germany won World War II, where dinosaurs still roam Earth”, etc., hinge crucially on a probabilistic argument.

Incredible Luck

Do we owe the existence of our planet and its

inhabitants to a stroke of luck of cosmic proportions—to “outrageous fortune,” as the title of an article in *Nature* put it?⁴ This question is prompted by the fact that certain physical constants, such as the masses of elementary particles, the strengths of the fundamental forces, and so forth, appear to have been “fine-tuned” precisely for life on Earth to exist. Had those numerical values been ever so slightly different, terrible things would have happened—the universe would have collapsed or atoms would never have formed, for example—preventing the formation of life. Is it just incredible luck, or did some higher entity (a deity or an advanced universe-simulating life form) design our universe deliberately fine-tuned to allow intelligent life?

Tegmark asks this very question and his answer is: neither. As inflation keeps eternally propagating through space, he tells us, it creates an infinite collection of Level I multiverses referred to as the Level II multiverse. Now, according to Tegmark (pp. 138-139):

If there are laws or constants of nature that can in principle vary from place to place, then eternal inflation will make them do so across the Level II multiverse. [...] A theory where the knobs of nature take essentially all possible values will predict with 100% certainty that a habitable universe like ours exists, and since we can only live in a habitable universe, we shouldn't be surprised to find ourselves in one.

Put simply: laws and fundamental constants of physics can be what they are here in our universe because they can be different in infinitely many other universes. In other words, using the dice-rolling analogy, it's next to impossible to get all the constants exactly right in just one throw of the dice—this idea is asserted as a self-evident truth. However, if the dice were rolled infinitely many times, one should expect with “100% certainty,” according to Tegmark, that in some cases the throw would result in a habitable universe just like ours. But where does the “100% certainty” come from? From experience or some physical principle? From a hidden assumption or postulate? We are not told.

To sum up: it is not the existence of other, far-away universes—either as a prediction of inflation or as a mere possibility—that is hard to conceive, but the claim that the entire history of our universe, leading up to each of our own lives, played out in exactly the same way in infinitely many of them. In the absence of experimental evidence in support, such a possibility is much too implausible to be accepted as a consequence of inflation theory on the basis of probability arguments involving in-

finity. Seen in this light, Tegmark's claims appear, at best, as not much more than a gamble.

A Literary Digression

In his short story “The Immortal,” Jorge Luis Borges imagines a society whose members live forever. “Taught by centuries of living...” he writes (emphasis added):

...the republic of immortal men had achieved a perfection of tolerance, almost of disdain. They knew that *over an infinitely long span of time, all things happen to all men*. As reward for his past and future virtues, every man merited every kindness—yet also every betrayal, as punishment for his past and future iniquities. Much as the way in games of chance heads and tails tend to even out, so cleverness and dullness cancel and correct each other. Viewed in that way, all our acts are just, though also unimportant. There are no spiritual or intellectual merits. Homer composed the *Odyssey*; *given infinite time, with infinite circumstances and changes, it is impossible that the Odyssey should not be composed at least once.*”

Max Tegmark's assertions about infinity, stated as if they were self-evident truths, are reminiscent of those found in the above passage. But then Borges' is a literary work of fiction, not a scientific one.

Conclusion

It is possible that my criticism of Tegmark's multiverses due to his questionable probabilistic arguments could be unfounded, and that all those parallel universes, in which “everything that can happen according to the laws of physics does happen,” really exist. If such were the case, I could take some consolation in the fact that in infinitely many of those universes the flaws in my own argument would not be discovered—not noticing reasoning errors is surely compatible with the laws of physics—and I would then be (undeservedly) praised for debunking a grandiose theory that (rightly) claimed to have elucidated the ultimate nature of reality. ■

REFERENCES

1. Tegmark, M. 2014. *Our Mathematical Universe: My Quest for the Ultimate Nature of Reality*. New York: Alfred A. Knopf.
2. Borel, É. 1941. *Le jeu, la chance*. Paris: Gallimard.
3. Bunge, M. 2012. *Evaluating Philosophies*, Boston Studies in the Philosophy of Science. New York: Springer.
4. Brumfiel, G. 2006. “Outrageous Fortune” *Nature*, January, 10-12.

Honor, Dignity, Victim

A review of *The Rise of Victimhood Culture: Microaggressions, Safe Spaces, and the New Culture Wars* by Bradley Campbell and Jason Manning.

REVIEWED BY KEVIN MCCAFFREE

A Tale of Three Moral Cultures

Sociologists Bradley Campbell and Jason Manning have produced the first systematic theoretical analysis of the moral culture of “victimhood” emerging on university campuses. Central to their interesting and thought-provoking investigation is the claim that moral cultures tend to take one of three forms: honor cultures, dignity cultures and victim cultures.

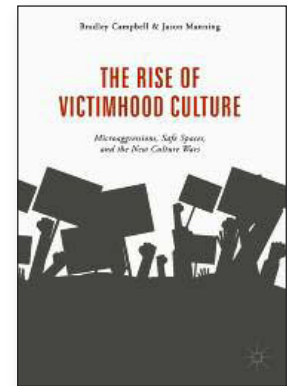
Honor cultures emerge when a centralized state authority is not present or not legitimate and when people are extremely materially vulnerable. Under these conditions, individuals will take offense very easily, grow quickly fearful, and engage in higher rates of defensive, preemptive aggression as well as vigilante justice, in order to settle their disputes. In the worst-case scenario this preemptive aggression can develop into bloody feuds enveloping whole families, gangs, or lineages. Physical bravery, deferential respect to the powerful, and an unwillingness to appear weak and vulnerable consequently become paramount values.

Citing Steven Pinker, Donald Black, and others,¹ Campbell and Manning suggest that slowly over the last 500 years, state authority (police, courts and jails) has come to supplant vigilante justice as a powerful and reasonably fair system of adjudicating disputes regardless of their severity. Over the last 500 years societies have not only become more reliant on state authority to resolve disputes, but also materially wealthier due to machine technology and market economies, relatively more equitable in terms of the distribution of resources, power and prestige, as well as more diverse due to

the formal legal rights and benefits extended to women and minorities.

In a *dignity culture*—a more modern form of society—individuals resort to legal authority when disputes and wrongdoings are sufficiently severe, but for minor offenses they make an effort to resolve the dispute privately in a nonviolent manner. All citizens are assumed to have a sense of dignity and self restraint, and everyone is expected to, at least at first, give the benefit of the doubt to a disputant to see if a conflict can be resolved peacefully. However, Campbell and Manning contend that when state authority begins to exert monopolizing control over a population of increasingly diverse, legally “equal” people, a victim culture may emerge.

Victim cultures share a sensitivity to slights or insults with honor cultures. While those in an honor culture might try to retaliate (physically or otherwise), individuals in a victim culture instead appeal to a powerful, omnipresent state/legal authority. Classic examples are Mao’s China and Stalin’s Russia. In contrast to honor cultures that expect victims to be strong and stern enough to defend themselves, and dignity cultures that expect victims to be calm and charitable when in a dispute or disagreement, victim cultures emphasize how complainants are emotionally or physically fragile, vulnerable, and weak. In order to have high status in a victim culture, one must perfect and dramatize a personal “narrative of suffering.”² Espousing one’s own weakness, frailty, and suffering might seem dishonorable or shameful from an honor culture perspective, or gratu-



Palgrave Macmillan.
278 pp. \$34.99
ISBN-13: 978-3319703282

itous and self-absorbed from a dignity culture perspective.

Campbell and Manning find such a victim culture emerging anew in Western society, particularly on university campuses and especially in elite ivy-league schools. Institutions like these contain all of the components necessary for a victim culture to arise: (1) campuses tend to be racially/ethnically diverse (relative to other institutions in society), (2) an ethic of equal treatment under a shared identity (“student”) is emphasized, (3) students tend to come from relatively comfortable middle-class backgrounds, and (4) universities are largely run by powerful administrative bureaucracies given to extending their authority (in Title IX offices, student conduct offices, or multicultural/diversity offices, for example). Such administrative bureaucracies serve as “state”-like authorities on university campuses, justifying their existence through the allegedly necessary enforcement of speech codes, dress codes, sex codes, etc. And, indeed, this administrative bureaucracy grows larger by the year—over the last half decade or so, faculty and student enrollment has increased by about 50 percent, while administrative staff has increased a staggering 240 percent.³

Victim Culture’s Discontents

As sociologists, Campbell and Manning are interested not only in the correlates and structure of “victim culture,” but also in the consequences of the spread

of this culture's influence. They point out early in the first chapter that seeking out offense in order to complain to third parties and garner support was actually, up until recently, considered a distinctly unusual and non-normative way to handle minor frustrations. For adults, the authors argue, mainstream modern American society has expected a degree of thick skin, restraint, and a willingness to charitably interpret the intentions of others (dignity culture).

By contrast, contemporary victim culture narratives assert that institutions in the West are cesspools of white supremacist, patriarchal, transphobic, exploitive oppression, and therefore anyone who is perceived to be "in power" (the usual suspects are heterosexual white males) must therefore be benefitting from or perpetuating systems of heterosexist white supremacist misogynist fascism. But here is the twist: anyone who takes offense or considers themselves "harmed" in some way by those in power, and who is bold enough to complain to authorities about it, is therefore a messenger of emancipatory justice. As Campbell and Manning explain the process: "People identified as victims thus receive recognition, support, and protection. In these settings victimhood becomes increasingly attractive" (106). To take offense ever more easily is to demonstrate a righteous eagerness to vanquish evil.

As a result, according to Campbell and Manning, individuals in victim cultures engage in competitive victimhood displays. They will relay true, partly-true, and sometimes completely fabricated "atrocious stories," about how people and institutions (whites, men, media, government, family, education and so on) in Western society are so brutally bigoted that they must be destroyed or remade. These extraordinary, comprehensively hopeless claims easily invite extremism, and as the fervor boils over, it becomes difficult to "distinguish between rumors and realities." Given the horrific implications of living in a sexist, racist,

fascist society, "no one is interested in this distinction" (10).

Campbell and Manning argue that victim cultures produce "crybullies" who find evermore subtle ways to become offended and morally outraged. The more seemingly innocuous the behavior, the more important it is for crybullies to be offended by it—being offended by extremely minor behaviors or words demonstrates how "educated," "insightful," or "woke" one is to heterosexist patriarchal white supremacy. The more easily offended one can be, the more knowledgeable they must be about oppression and bigotry. And if a member of a victim culture is not the one who found offense at something but instead simply wants to foment outrage, they can engage in what Greg Lukianoff and Jonathan Haidt call "vindictive protectiveness."⁴

Vindictive protectiveness involves supporting the complainant (no "evidence" needed because it is axiomatic that the West is brutally oppressive) with encouragement and resources, while attempting to take the job or tarnish the reputation of the accused person. If the accused is disgraced, their reputation destroyed, and their job lost, the offended person has won a great victory against Western oppression. Of course, this vindictive protectiveness and competitive victimhood quickly turn into a "purity spiral" where members of victim cultures accuse *one another* of being racist, sexist, transphobic bigots in order to appear even more victimized or vulnerable and therefore more deserving of support and resources than their peers.

Following Jonathan Haidt's work on the topic, Campbell and Manning point out that victim cultures may produce higher rates of mental illness by encouraging members to magnify negative interpretations of social encounters, assume sinister intent in others, and by labeling entire groups of people such as whites or males as white supremacist or toxically masculine. Victim cultures confer status based on how hostile, paranoid, and cynical members are capable of being. In this

way, victim cultures might initiate mental illness symptomology, or exacerbate underlying depressive and anxiety disorders.⁵

Victim Culture's Future

Campbell and Manning find that victim culture is relatively less common among poor women and minorities; indeed, the most prominent bastions of victim culture are elite university campuses such as Oberlin, Brown, Yale, Claremont McKenna, or Occidental College. They note, for example, that the median family income at Middlebury College, where student protestors recently shut down a speaker they deemed to be racist, sexist, anti-gay fascist, is \$240,000, almost five times as much as the average U.S. family. On this account, middle and upper middle class women and minorities, with their own aspirations to elite positions, might be using claims of victimization to garner legal/bureaucratic support and resources in an attempt to secure a valuable advantage over the wealthy white males they see as dominating positions of power.

Much victim culture, as a result, is not so much a critique of oppression and bigotry as it is a critique of white men and a valorization of those who are not white men. In support of such a contention, Campbell and Manning cite instances of victim culture members insisting that only whites can be racist (minorities can never be racist because they are not in power), only men can be sexist (women can't be sexist, as their existence is a constant struggle for survival against male violence exploitation), and that the oppressed cannot act unlawfully (because the oppressed are merely seeking protection and safety). Campbell and Manning provide many interesting examples, such as the UC Berkeley assistant professor of education who argued that whiteness is intrinsically violent, or the Oklahoma high school teacher who said that "To be white is to be racist, period" (90).

Such direct attacks on whites, males, and anyone else deemed privileged or powerful spark a process that

Campbell and Manning refer to as “opposition leading to imitation.” Attacking whites or males for the sin of being white or male produces a backlash of identity politics whereby white nationalists and truly misogynistic groups join forces in combating perceived threats to their identity. As a consequence, people on the political Right begin mimicking the victim culture of their adversaries, claiming that being white or male are now victimized identities in need of rallied support.

Once whites, males, and anyone else perceived to have power comes to see themselves as being victimized by social justice warriors they become motivated to investigate the veracity of victim culture ideology. The fact that, for example, people categorized as “Asian” in the U.S. Census actually have higher per capita incomes than Whites, undermines the notion that whites uniformly benefit from a “white privilege” rooted in the oppression of minorities. When a victim culture’s narrative of suffering becomes so ideological that it begins to reveal itself as inaccurate, more reasonable and legitimate claims of discrimination and inequality might be doubted or ignored. In this way, a victim culture can become so enamored with its own suffering that its clearly gratuitous demonization of groups perceived as powerful leads normal people to be unduly skeptical of actual, legitimate claims of inequality and abuses of power.

Consequently, Campbell and Manning do not have a terribly optimistic view of the future. They remark that, “the vilification of whites and males might lead to greater support for those who champion the superiority of these groups,” and that “it is likely that the influence of white identity politics is beginning to grow and will continue to gain in popularity as victimhood expands” (159). And, expand it will. Due to victim culture being more common at prestigious private and Ivy League universities, students indoctrinated into victim cultures are likely to join and shape the occupations they eventually enter, including influential jobs in

media, medicine, law, and politics. Also, in a very incisive point, Campbell and Manning note that upwardly mobile young parents who want their children to go to good universities might feel pressured to adopt the values of victim culture. Such widespread adoption of victim culture by parents hoping to assimilate their children into the middle class would further the culture’s general spread among the population.

An Important Work at an Important Time

Campbell and Manning understand that their efforts to analyze victim culture will be criticized by members of victim cultures as racist, sexist, transphobic, and so on. They respond that, while this would otherwise deter them from wading into this area of research, such accusations are actually a standard, expected reaction from members of victim cultures. Understanding this, Campbell and Manning continue to explore the phenomenon, fully aware that regardless of their conclusions, many will treat the very attempt at inquiry as racist, sexist, and all the rest.

Though the book may at times seem polemical, the reality is that the subject matter is itself polemical, and Campbell and Manning do a good job of stating their scientific intent. The authors hope to provide an honest and careful sociological account of a newly emerging moral culture. In the first chapter, for example, they insist that their analysis, “does not imply that any particular victim sought out or enjoys whatever status victimhood conveys. It does not imply that this status outweighs other disadvantages they might have. And it does not imply that anyone’s grievances are illegitimate or that those who point out their marginality are being dishonest” (24).

This book is an important addition to the sociology of morality in its documentation of the contours of a newly emerging moral culture. It is worth considering, though, whether this “victim culture” is really something new, or if it is simply the result of a new generation adopting the vexatious litigation

common of Americans for at least the last 40 years. People seem to sue, or threaten to sue, everyone for everything and this behavior is very similar to the tendencies Campbell and Manning find in victim culture. Victim culture might really be just a variant of honor culture that emerges in a relatively materially comfortable, strong-state social system.

Lastly, while victim culture’s insistence on the presence of constant horrific abuses of power is overdrawn and clearly strategically exaggerated, it may still be a unique historical case of a culture ostensibly motivated to reduce abuse and inequality. By Campbell’s and Manning’s own admission, neither honor cultures nor dignity cultures are so concerned with equality and fairness. On a Nietzschean account, this empathic orientation is a result of the Far Left’s increasingly secular interpretation of Christianity’s obsession with a tortured messiah. Christianity was, for Nietzsche, a “slave morality,” which regarded suffering and weakness as virtuous—such a view is typified in the Christian aphorism that the meek shall inherit the earth. Through this lens, victim culture is a secularizing strain of Christianity. This line of analysis is noticeably absent from Campbell’s and Manning’s work, though this omission is small given the otherwise careful nuance of the book. **S**

REFERENCES

1. Pinker, Steven. 2011. *The Better Angels of Our Nature: Why Violence Has Declined*. New York: Viking; Black, Donald. 2011. *Moral Time*. New York: Oxford University Press.
2. Schwyzer, Hugo. 2006. “‘Narratives of Suffering Overcome’: Admissions Essays and a Lamentable Trend.” *History News Network*, November 27.
3. Ginsberg, Benjamin. 2011. *The Fall of the Faculty*. New York: Oxford University Press.
4. Lukianoff, George, and Jonathan Haidt. 2015. “The Coddling of the American Mind.” *The Atlantic*, 316 (2), 42-52.
5. Lilienfeld, Scott O. 2017. “Microaggressions: Strong Claims, Inadequate Evidence.” *Perspectives on psychological science*, 12(1), 138-169.

Reason (and Science) for Hope

A review of *Enlightenment Now: The Case for Reason, Science, Humanism, and Progress* by Steven Pinker.

REVIEWED BY MICHAEL SHERMER

How much better can you imagine the world being than it is right now? How much worse can you imagine the world being than it is right now?

For most of us, it is easier to imagine the world going to hell in a handbasket than it is to picture some rosy future, which explains why there are far more dystopian and apocalyptic books and films than there are utopian. We can readily conjure up such incremental improvements as increased Internet bandwidth, improved automobile navigation systems, or another year added to our average lifespan. But what really gets imaginations roiling are the images of nuclear Armageddon, AI robots run amok, or terrorists mowing down pedestrians in trucks.

The reason for this asymmetry is an evolved feature of human cognition called the *negativity bias*, explored in depth by the Harvard psychologist and linguist Steven Pinker in his magisterial new book *Enlightenment Now*, an estimable sequel to his *The Better Angels of Our Nature*, which Bill Gates called “the most inspiring book I’ve ever read.” This is not hyperbole. *Enlightenment Now* is the most uplifting work of science I’ve ever read. Pinker begins with the Enlightenment because the scientists and scholars who drove that movement took the methods of reason and science developed in the Scientific Revolution and applied them to solving problems in all fields of knowledge: physical, biological, and social. “Dare to know” was Immanuel Kant’s oft-quoted one-line summary of the age he helped launch, and with knowledge comes power over nature, starting with the Second Law of Thermodynamics and entropy, which Pinker fingers as the cause of our natural-born

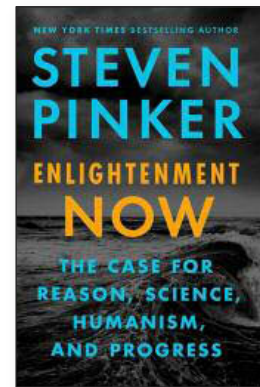
pessimism. In the world in which our ancestors evolved their cognition and emotions that we inherited, entropy dictates that there are more ways for things to go wrong than right, so our modern psychology is tuned to a world that was more dangerous in our evolutionary past than it is today. Your life depends on all systems working, so the good news of experiencing another pain-free day goes unnoticed, whereas painful catastrophic failures can spell the end of your existence, so we focus on the latter more than the former. “The Law of Entropy is widely acknowledged in everyday life in sayings such as ‘Things fall apart,’ ‘Rust never sleeps,’ ‘Shit happens,’ ‘Whatever can go wrong will go wrong,’” Pinker writes (p. 16).

But instead of interpreting misfortunes like accidents, plagues, famine, and disease as the result of angry gods, vengeful demons, or bewitching women like our medieval ancestors did, we know that they’re just entropy taking its course. We don’t need an explanation for poverty, for example, because that is what you get if you do nothing to manipulate your environment to produce wealth. The application of knowledge to solving problems of survival that result from entropy is what propelled us to unimaginable levels of progress, which Pinker documents in 75 charts and graphs and thousands of statistics in 14 chapters covering life, health, sustenance, wealth, inequality, the environment, peace, safety, terrorism, democracy, equal rights, knowledge, quality of life, and happiness.

On average, since the time of the Enlightenment more people in more places more of the time live longer, healthier, happier, and more meaningful lives filled

with enriching works of art, music, literature, science, technology, and medicine, not to mention food, drink, clothes, cars, houses, international travel, and instant and free access to all the world’s knowledge. Exceptions are no counter to Pinker’s massive data set. Follow the trend lines, not the headlines. “War between countries is obsolescent, and war within countries is absent from five-sixths of the world’s surface,” (p. 322) Pinker notes in just one of dozens of areas in which life has improved. “Genocides, once common, have become rare. In most times and places, homicides kill far more people than wars, and homicide rates have been falling as well.” (p. 323). And we are safer than ever. “Over the course of the 20th century, Americans became 96 percent less likely to be killed in a car accident, 88 percent less likely to be mowed down on the sidewalk, 99 percent less likely to die in a plane crash, 59 percent less likely to fall to their deaths, 92 percent less likely to die by fire, 90 percent less likely to drown, 92 percent less likely to be asphyxiated, and 95 percent less likely to be killed on the job.” (p. 323)

Each area of progress has specific causes that Pinker carefully identifies, but he attributes the overall progressive picture to Enlightenment humanism, the worldview that encompasses science and reason. It is a heroic journey, Pinker concludes with rhetorical flair. “It is glorious. It is uplifting. It is even, I daresay, spiritual.” How? “We are born into a pitiless universe, facing steep odds against life-enabling order and in constant jeopardy



Viking, 2018.
576 pp. \$35.
ISBN-13: 978-0525427575

of falling apart.” Nevertheless, our species has faced entropy like no other. “Yet human nature has also been blessed with resources that open a space for a kind of redemption. We are endowed with the power to combine ideas recursively, to have thoughts about our thoughts. We have an instinct for language, allowing us to share the fruits of our experience and

ingenuity. We are deepened with the capacity for sympathy—for pity, imagination, compassion, commiseration.” (p. 452) This is our story, not vouchsafed to any one tribe but to all humanity, “to any sentient creature with the power of reason and the urge to persist in its being. For it requires only the convictions that life is better than death, health is better

than sickness, abundance is better than want, freedom is better than coercion, happiness is better than suffering, and knowledge is better than superstition and ignorance.” (p. 453)

That’s a fact that offers us reason (and science) for hope. **S**

A shorter version of this review was published in the February 13, 2018 issue of the journal *Science*.

Realizing Rawls’ Just Society

A Review of *It’s Better Than It Looks: Reasons for Optimism in an Age of Fear* by Gregg Easterbrook.

REVIEWED BY MICHAEL SHERMER

In his 1971 book *A Theory of Justice*, the Harvard philosopher John Rawls argued that in the “original position” of a society we are all shrouded in a “veil of ignorance” of how we will be born—male or female, black or white, rich or poor, healthy or sick, slave or free—so society should be structured in such a way that laws do not privilege any one group because we do not know which category we will ultimately find ourselves in.

Writing during a time when civil unrest over centuries of injustice was spilling out into the streets in marches and riots, Rawls’ work was as much prescriptive as it was descriptive. But 45 years later, at a 2016 speech in Athens, Greece, President Barack Obama affirmed that a Rawlsian society was becoming a reality: “If you had to choose a moment in history to be born, and you did not know ahead of time who you would be—you didn’t know whether you were going to be born into a wealthy family or a poor family, what country you’d be born, whether you were going to be a man or a woman—if you had to choose blindly what moment you’d want to be born you’d choose now.” As Obama explained to a German audience earlier that year: “We’re fortunate to be living in the

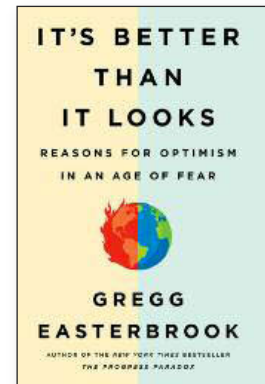
most peaceful, most prosperous, most progressive era in human history,” adding “that it’s been decades since the last war between major powers. More people live in democracies. We’re wealthier and healthier and better educated, with a global economy that has lifted up more than a billion people from extreme poverty.”

Data supporting this observation is now readily available through such sites as Hans Rosling’s Gapminder.org, Max Roser’s ourworldindata.org, and Marian Tupy’s humanprogress.org, and in books such as Steven Pinker’s *Enlightenment Now* (2018), Johan Norberg’s *Progress* (2016), my own *The Moral Arc* (2015), Peter Diamandis’ and Steven Kotler’s *Abundance* (2012), Matt Ridley’s *The Rational Optimist* (2011), and others. Apparently it’s not enough as pessimism is as prominent as it ever was, if not more during the recent uptick of identity politics and economic nationalism.

Thus, Gregg Easterbrook’s masterful and comprehensive exposition on why we should be optimistic in an age of pessimism, *It’s Better Than it Looks*, comes at a propitious moment. Easterbrook backs his sanguine perspective with copious data, and at the same time he demon-

strates how a pessimistic perspective can not only lead people to despair but it can nudge voters to elect a man who growled that our economy “is always bad, down, down, down” even as it was climbing up, up, up out of the gravity well of the 2008/2009 recession. Since emotions trump information, apocalyptic political rhetoric crowds out data dumps of positive trends in the spaces of our mind’s decision tree. On average, Easterbrook shows in this rich narrative packed with statistics, while the declinists were bemoaning our miserable lives during the last election, “at no juncture in American history were people better off than they were in 2016: living standards, per-capita income, buying power, health, safety, liberty, and longevity were at their highest, while women, minorities, and gays were free in ways they’d never been before. There had been no juncture in history at which the typical member of the global population was better off either.”

A potent counter to today’s unwarranted pessimism, the author claims, is not just the evidence that can be seen



PublicAffairs, 2018.
352 pp. \$28.
ISBN-13: 978-1610397414

(rising employment, wages, wealth, health, lifespans and so on) but what has not been seen. Granaries, for instance, are not empty: The many predictions made since the 1960s that billions would die of starvation have not come true. “Instead, by 2015, the United Nations reported global malnutrition had declined to the lowest level in history. Nearly all malnutrition that persists is caused by distribution failures or by government corruption, not by lack of supply.” In fact, obesity is rapidly becoming a global problem.

Similarly, even though there are occasional panics, “resources have not been depleted despite the incredible proliferation of people, vehicles, aircraft, and construction.” Instead of oil and gas running out by the year 2000, as some in the 1970s predicted, both “are in worldwide oversupply” along with minerals and ores. Likewise, there are no runaway plagues. “Unstoppable outbreaks of super-viruses and mutations were said to menace a growing world; instead, nearly all disease rates are in decline, including the rates of most cancers.” Western nations are also no longer choking on pollution. Smog in major cities like Los Angeles, for example, is in free fall as measured by the number of air-quality alerts. Sulfur dioxide, the main source of acid rain, is down by 81% in the U.S. since 1990, and forests in Appalachia “are in the best condition they have been in since the eighteenth century.”

In America as well as the rest of the world, crime and violence are getting less, not more, frequent, Mr. Easterbrook points out. Homicide rates have plummeted since their post-World War II high in 1993, while “the frequency and intensity of combat have gone down worldwide.” And despite worries about rising authoritarianism, the dictators aren’t winning. In the 1980s, dictators ravaged countries on nearly every continent; today, the Kim family’s lock on North Korea stands out as an aberration.

Easterbrook’s aim in this important book is to prove that life is more auspicious than most people believe, to show why life did not deteriorate as predicted, to identify what we’ve been doing right so we can do more of it, and consider what we can do about the still pressing problems we face, most notably the “impossible” challenges of inequality and climate change, along with others that social commentators kvetch about: marriage, social security, health care, artificial intelligence, poverty, nuclear weapons, and others, all soluble if we make the effort. Easterbrook reminds us that while it is easy to see (and remember) bad things that happen, it is impossible to see what hasn’t happened (as predicted in previous decades): resources are not exhausted, there are no runaway plagues, Western nations are not choking on pollution, the economy keeps functioning, crime and war are not getting worse, and dictators

(what few are left) are not winning.

The cause of this salubrious turn of events in human history was the result of human action and problem solving, not historical tides on which we helplessly ride. “History is not deterministic, teleological, or controlled in any manner,” Easterbrook concludes. Instead, each of the many areas of progress that he documents were the result of individuals and organizations—both private and public—deciding to solve particular problems, as President Franklin Roosevelt prophesied in 1938 when the world was much darker than it is today: “We observe a world of great opportunities disguised as insoluble problems.” It is a fitting quote Easterbrook notes with some irony, since it was early 20th century progressives who were the optimists who envisioned an America the Beautiful in which “alabaster cities gleam undimmed by human tears.” Today’s progressives take an opposite tack of gloomy pessimism, matched by the Right’s nostalgia for the “Good Ole Days”—you know, when life was Hobbesian nasty, brutish, and short. Easterbrook wants to make optimism intellectually respectable again, and he has done so with cogent arguments and bountiful numbers, showing that “history has an arrow, and the arrow of history points forever upward.” **S**

A shorter version of this review was published in the *Wall Street Journal* on February 28, 2018 under the title “Why Things Are Looking Up”.

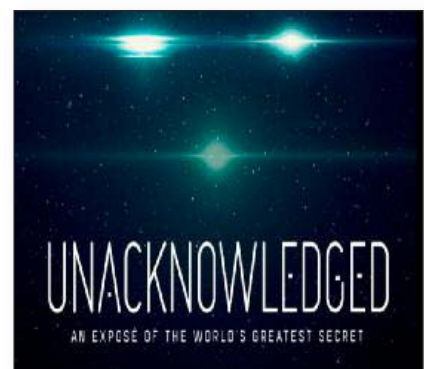
Unsubstantiated

A new Netflix documentary purporting to provide proof of alien visitation fails to deliver:
A review of the film *Unacknowledged*

REVIEWED BY TIM CALLAHAN

WITH ITS HIGH PRODUCTION VALUES, *Unacknowledged* may at first seem to provide substantial evidence that space aliens have visited the Earth—and in particular that the Roswell incident in-

volved an actual crashed spaceship, bodies of an alien crew, and a massive cover-up of these facts by the government of the United States. The documentary also asserts the



A Sirius Disclosure Film in collaboration with The Orchard Auroris Media Productions. Runtime: 1hr 43 mins. May 9, 2017. Director: Michael Mazzola. Screenwriters: Stephen Peek, Michael Mazzola

reason for the cover-up: it's part of the suppression of the science and technology of zero-point or quantum vacuum energy, which would give us unlimited, pollution free energy, and eliminate poverty and starvation throughout the world. The perpetrators of this evil conspiracy are, according to the film, those in charge of "Black Programs," which gobble up either \$40 to \$80 billion a year (suggested early in the film) or \$100 to \$200 billion (as the narrator states later in the documentary).

To anyone of a skeptical mindset a red flag pops up early in the film when a flood of witnesses claim to have seen the crashed spaceship and the dead aliens at Area 51. I didn't initially recognize many of the names of witnesses but one stood out—Lt. Col. Philip Corso, who authored a book titled *The Day After Roswell*. Here is what the noted UFO investigator Stanton Friedman had to say in his review of that book:

The first part of the book, with the exception of the strange Ft. Riley, Kansas warehouse scene with an alien body being observed by Corso on July 6, seems to have nothing to do with him. He admits he wasn't involved at all in the recovery, investigation, or evaluation of what happened near Roswell. It is almost certainly based on the many Roswell books already published by Randle and Schmitt, Moore and Berlitz, and Don Berliner and myself, but with no attempt to validate or critically evaluate anything and no credits being given.

In the second half of the book Corso seems to be taking credit for the single-handed introduction of a whole host of new technologies into American industry. All this is supposedly derived from the filing cabinet of Roswell wreckage over which he was given control by General Trudeau. He is very vague about details, and there is no substantiation for any of the claims on fiber optics, Kevlar, laser weapons, microcircuits, etc.¹

That none other than Stanton Friedman is taking Corso to task and implying that he is a fraud is quite telling, since Friedman is perhaps the foremost advocate for the Roswell alien spaceship crash

and subsequent government cover up.

Another witnesses they provided who claimed to have seen alien bodies from the Roswell crash site is Richard C. Doty. His testimony would seem to represent a turn around, since Doty originally appears to have spread disinformation to lead UFO enthusiasts on wild goose chases. According to one article:

The UFO community has been familiar with Richard C. Doty, self-proclaimed "disinformation agent" who used to work as an AFOSI officer in Kirtland Air Force Base in Albuquerque, New Mexico.²

The article quotes Doty as saying:

I do not have anything to do with UFO research or investigations. I attempted to perform certain duties which would enable our team to trap possible foreign agents working against the interest of the United States. My supervisors, however, saw my actions as being unauthorized. Therefore, I was asked to leave AFOSI, which I did voluntarily.³

Is a man who has spread deceptive information and who at one time says he had nothing to do with UFO research to be trusted when he now says he saw the crashed Roswell spaceship?

Another of the witnesses giving important testimony in the film is Maj. George A. Filer III, who claims to have chased a UFO over Stonehenge. If we were to judge the credibility of a witness based on kooky beliefs he or she might hold, Filer would not come out well. When UFO skeptic Robert Schaeffer visited a MUFON (Mutual UFO Network) symposium in 2011, he reported that Filer gave a presentation in which he made some rather startling claims about the planet Mars:

Mars, according to Filer, used to be teeming with life until it was mostly wiped out in a nuclear holocaust some 180 million years ago. He showed NASA photos of Mars that purport to contain tubes (possibly water pipes, or trains) that extend for miles, as well as underground cities. There are numerous faces on Mars, and some of them look similar to Egyptian Pharaohs. But

some life still exists among the ruins. The green colors on Mars represent growths of moss and algae.⁴

Considering that, according to NASA, the atmosphere of Mars is about 100 times thinner than that of Earth, and that it is over 95% carbon dioxide and only 0.13% oxygen,⁵ if humanoid Martians still exist, one wonders what they are breathing.

Similar to the assertion above by George Filer is the claim by Sgt. Karl Wolfe, another of the film's witnesses, that he saw photos taken by the Lunar Orbiter of a base on the far side of the Moon. In an online article titled "3 Dumbest Dark Side of the Moon Conspiracy Theories" Harrison Preston says of this claim:

Another prime candidate for our plain dumb category is one Karl Wolfe, a former sergeant in the United States Air Force. According to his own testimony for the Disclosure Project before the National Press Club in Washington DC in 2010, Wolfe claims to have been assigned to HQ Tactical Air Command in Langley, Virginia.

One day in "1965, mid-1965", whilst assigned to the Lunar Orbiter Program, Wolfe says he saw "clear structures, buildings, mushroom shaped buildings, spherical buildings, towers" in a series of photographs of the far side of the Moon shown to him by an airman in a lab he was working in.

He also stated the other airman told him "we've found a base on the far side of the Moon." Wolfe is very clear on the year this supposedly happened, and also the project he was a part of. It is this clarity which also serves to show why he couldn't possibly be telling the truth.

The Lunar Orbiter Program ran from 1966 through to 1967, but the first images of the far side of the Moon weren't captured until the Lunar Orbiter 4 mission in May 1967—a full two years after Wolfe claims to have seen the structures and buildings! Lunar 4 photographed 9% of the far side, with Lunar Orbiter 5 imaging the rest in August that same year.⁶

A NASA report on the Lunar Orbiter missions notes that a total of 419 high

resolution and 127 medium resolution photos were taken by the Lunar Orbiter missions, covering over 99% of the lunar surface.⁷ Despite all of that, no alien bases show up in these photos.

Not all of the witnesses in the film can be dismissed as fraudulent or part of the lunatic fringe. Edgar Mitchell, the sixth astronaut to walk on the Moon, believed that aliens had contacted us and that the government had covered it up.⁸ However, he also believed in remote healing, specifically that a young psychic in Canada named Adam Dreamhealer had cured him of kidney cancer, as reported by Julie Neimark:

Edgar Mitchell, one of Adam's strongest proponents, told me quite openly on the phone that he never had biopsy-proven cancer. "I had a sonogram and MRI that was consistent with renal carcinoma," Mitchell recalled when I interviewed him, "which is about the best they can do without a biopsy. I didn't have the biopsy." Adam worked on Mitchell from December of 2003 until June, when the "irregularity was gone and we haven't seen it since." But he didn't have the biopsy. Is Mitchell convinced it was cancer? Sure. Is there any definitive proof? No.⁹

Thus, even respected and intelligent persons can hold beliefs that are irrational.

Another astronaut who would seem to support the film's assertion of widespread knowledge of alien visitors—at least to the solar system—is Buzz Aldrin, the second man to walk on the Moon. The movie shows a clip in which Aldrin says of the Martian moon Phobos:

There's a monolith, a very unusual structure on this little potato-shaped object that goes around Mars once in every seven hours. They're going to say, "Who put that there? Who put that there?"

It would seem, from this clip, that Aldrin is saying that this is an artificial structure placed on Phobos by extraterrestrial beings. However, when one views Aldrin's actual video, the integrity of *Unacknowledged* must be challenged. Here is Aldrin's actual statement, with the material edited out

by *Unacknowledged* shown in italics:

There's a monolith, a very unusual structure on this little potato-shaped object that goes around Mars once in every seven hours. They're going to say, "Who put that there? Who put that there?" *Well, the universe put it there. If you choose, God put it there.*¹⁰

Skeptics are familiar with this tactic of deliberately quoting someone out of context to make it seem like they are advocating the opposite of what they are actually saying. It is a common ploy used by creationists to attempt to discredit evolutionary biologists. Here it has been used to falsely make people believe that Buzz Aldrin is saying there's an alien artifact on Phobos. The "monolith" Aldrin refers to, by the way, bears no resemblance to the monolith in the movie *2001: A Space Odyssey*. While it is strange looking—a thin, vertical piece of rock—it is irregular enough to plainly be a natural object.

It might, at this point, seem as though this review is nothing more than an attack on the character of the witnesses. However, there is really nothing of substance in the film except the testimony of these people, many of who provide evidence of questionable veracity. Despite claiming there are "Black Programs" that secretly control information about extraterrestrial contacts and suborning the scientific establishment and the press, the documentary provides no evidence to support this assertion beyond witness testimony. Thus, the film asserts that since mainstream media has been suborned, the truth about UFOs has been forced onto the pages of the tabloids. This is almost comical, since this was one of the gags in the movie *Men in Black*.

From time to time the narrator does read from what appear to be redacted secret documents released through the Freedom of Information Act. However, their headings are never shown. One reason we might doubt their authenticity is that they are coupled with yet another statement taken out of context. Victor Marchetti, former Special Assistant to the Executive Director of the CIA is quoted as saying:

We have, indeed, been contacted—perhaps even visited—by extraterrestrial beings, and the U.S. Government, in collusion with other national powers of the Earth, is determined to keep this information from the general public.

The quote is from a 1979 article by Marchetti in a no longer published magazine called *Second Look*, titled "How the CIA Views the UFO Phenomenon." While that magazine is defunct, the article is available on a number of websites. In it Marchetti first admits that he has no firsthand experience with UFOs, has never seen one, and has no empirical or physical evidence of their existence. He then says the following, and here the material edited out in the quote above is added in italics:

My theory is that we have, indeed, been contacted—perhaps even visited—by extraterrestrial beings, and *that* the U.S. Government, in collusion with other national powers of the Earth, is determined to keep this information from the general public.¹¹

So the filmmakers grossly misquoted Marchetti by removing the statement that it was his *theory* that we have been contacted by extraterrestrial beings, dishonestly quoting him as saying that extraterrestrial beings have definitely contacted us and that he knows that our government is covering it up.

Earlier in the film, the narrator states that Carl Sagan originally supported the idea that UFOs were real and said that it was clear Earth was not the only inhabited planet. The narrator then suggests:

After he was threatened by the intelligence community, and blackmailed, he then began to debunk the issue.

So, was Sagan originally a UFO believer, silenced and cowed by those running the Black Programs? Here's what Carl Sagan actually said about extraterrestrial intelligence:

It now seems quite clear that Earth is not the only inhabited planet. There is evidence that the bulk of the stars in the sky have planetary systems. Recent research concerning the origin of life on

Earth suggests that the physical and chemical processes leading to the origin of life occur rapidly in the early history of the majority of planets. The selective value of intelligence and technical civilization is obvious, and it seems likely that a large number of planets within our Milky Way galaxy—perhaps as many as a million—are inhabited by technical civilizations in advance of our own. Interstellar space flight is far beyond our present technical capabilities, but there seems to be no fundamental physical objections to preclude, from our own vantage point, the possibility of its development by other civilizations.¹²

Here Sagan is merely running a thought experiment extrapolating the possible number of extraterrestrial civilizations based on the number of potential planets in our galaxy, a very common theme in SETI literature. In any case, there is no evidence that Carl Sagan was threatened by the government or that he was ever anything other than a skeptic of reported contacts by UFOs.

Unacknowledged is divided into three acts. The first act, titled “Embarrassment of Riches,” asserts that the evidence of extraterrestrial contact is overwhelming. It isn’t. The second act, “Down the Rabbit Hole,” claims, but does not substantiate, a grand cover-up conspiracy. Act three, titled “The Lost Century,” begins with the assertion that Nicola Tesla had found an inexhaustible source of energy and that, upon his death, his files were confiscated by the powers that be. The energy source in question is called zero-point energy or quantum vacuum energy. In the film, Mark McCandlish, military aeronautic illustrator says of this force:

The amount of energy in a cubic meter of space-time is 10^{26} power. That’s ten with 26 zeros behind it. That’s enough energy in a coffee cup to boil all the oceans of Earth completely away into steam.

This would certainly be an impressive energy source—if we could use it. The problem is that we may never be able to. The film never really explains what zero-point energy is. A physics website

points out that, while it is abundant it is also diffuse:

Zero-point energy is the energy that remains when all other energy is removed from a system. This behaviour is demonstrated by, for example, liquid helium. As the temperature is lowered to absolute zero, helium remains a liquid, rather than freezing to a solid, owing to the irremovable zero-point energy of its atomic motions. (Increasing the pressure to 25 atmospheres will cause helium to freeze.)¹³

Can this energy actually be accessed? The website goes on to say:

As to whether zero-point energy may become a source of usable energy, this is considered extremely unlikely by most physicists, and none of the claimed devices are taken seriously by the mainstream science community. Nevertheless, SED interpretation of the Bohr orbit (above) does suggest a way whereby energy might be extracted. Based upon this a patent has been issued and experiments have been underway at the University of Colorado (U.S. Patent 7,379,286).¹⁴

That research into extracting zero-point energy is being performed at the University of Colorado belies the movie’s claim that the government is keeping this free energy source from us. The film also claims in passing that a car that can run on water, invented by Stanley Meyer, was also suppressed. Cars that can run on water are a recurring theme in pseudoscience. Writing in *Nature*, Philip Ball says of this car:

And then there is poor Stanley Meyer, inventor of the “water-powered car.” Meyer just wanted to give people cheap, clean energy. But the oil companies clearly couldn’t have that and so harassed and intimidated him (the internet says so, so it must be true). In 1996 he was found guilty of “gross and egregious fraud” by an Ohio court. He died in 1998 after eating at a restaurant; the coroner diagnosed an aneurysm, but the conspiracy web still suspects he was poisoned.

It’s not easy to establish how Meyer’s car was meant to work, except that it involved a fuel cell that was able to split water using less energy than was released by recombination of the elements.¹⁵

And so, with zero-point energy and cars that run on water the film descends into the realm of perpetual motion machines.

One question that is never even posed in the film, let alone answered, is why the space aliens, who Greer says are probably concerned by our warlike tendencies, haven’t used their immense energy resources and advanced technology to overwhelm the evil perpetrators of the Black Projects by, for example, simply commandeering the air waves and the internet to expose the cover-up and reveal the information to everyone on Earth. It would seem that despite their vaunted technology, they can’t do what Edward Snowden did. **S**

REFERENCES

1. <http://bit.ly/1mz5IBi>
2. Hayakawa, Norio. “Did Richard C. Doty ruin the life of Albuquerque businessman, Paul Bennewitz?” <http://bit.ly/2CCWirH>
3. Ibid
4. Schaeffer, Robert. 2011. “A Skeptic does the MUFON Symposium—Part 5 of 5.” *Bad UFOs: Skepticism, UFOs, and The Universe*. August 13. <http://bit.ly/2CICYVA>
5. <http://bit.ly/1Er4uoU>
6. Preston, Harrison. “3 Dumbest Dark Side of the Moon Conspiracy Theories.” <http://bit.ly/2EPoUVV>
7. <https://go.nasa.gov/2qkbZyW>
8. “UFO Updates: Edgar Mitchell On The UFO Cover-up” October 11, 1998. Archived from the original on January 28, 2007. <http://bit.ly/2CBmYZF>
9. Neimark J. 2005. “The Big Bird, the Big Lie, God and Science” *Skeptical Inquirer* November 29. <http://bit.ly/2CPHcwx>
10. Marchetti, Victor. 1979. “How the CIA Views the UFO Phenomenon” *Second Look* vol.1. No. 7, May. <http://bit.ly/2IS3B4U>
11. Sagan, Carl. 1963. “Unidentified Flying Objects.” *The Encyclopedia Americana*.
12. “Zero Point Energy” Calphysics Institute <http://bit.ly/1Pm6N18>
13. Ibid.
14. Ball, Philip. 2007. “Burning water and other myths” *Nature* (published online) 14 September. <http://go.nature.com/2IOAfEM>

Astor Alexander is a figurative illustrator and painter. He specializes in portraits and he's a big fan of the American illustrators of the 60s. His work can be seen at behance.net/astoralexander

Dr. David P. Barash is professor of psychology emeritus at the University of Washington; his most recent book is *Through a Glass Brightly: Using Science to See Our Species as it Really Is*, forthcoming from Oxford University Press. With his wife, Judith Eve Lipton, he is currently writing a book about nuclear deterrence.

Dr. Todd M Freeberg is a Professor in the Department of Psychology and the Department of Ecology and Evolutionary Biology at the University of Tennessee, Knoxville. He is a behavioral ecologist who studies social behavior and communication.

Stephen B. Gray is a long-time specialist in science and religion and their relationship. He has a BS from the University of Pennsylvania in engineering and graduate work at Harvard in physics. He is a former designer of computer hardware and software. He has published in engineering, mathematics, and science, and holds several patents. For the past several years he has been writing an encyclopedia called *Christianity in Ruins: Refuting the Faith*, available at Amazon.

Dr. L Kirk Hagen teaches courses in Western Culture, critical thinking, and French. His research interests include language acquisition skepticism, and computer-assisted instruction. He is a linguist with a Ph.D. from the University of Illinois Urbana-Champaign. Originally from New Mexico, he currently lives in Cypress, Texas. Dr. Hagen has been contributing to SKEPTIC since 2002. His contact information is at lkirkhagen.com

Dr. James K. Lambert is a documentarian and has taught film/mass media classes at several institutions, most recently as Program Chair at Minneapolis Media Institute. His feature film, *Conspiracy Theorists Lie* (2015) chronicles some of the people who have distorted the general public's understanding of President Kennedy's assassination.

Dr. Ralph Lewis is a Staff Psychiatrist at Sunnybrook Health Sciences Centre in Toronto, Canada, and an Assistant Professor at the University of Toronto. His upcoming book *Finding Purpose in a Godless World: Why We Care Even if the Universe Doesn't* with a foreword by Michael Shermer will be available July 2018.

Anna Maltese is an artist who spent most of her adult life as an animator for the Simpsons before she struck out on her own as a freelance illustrator and digital painter. When she's not drawing or painting, she can be found coaching archery in Pasadena or immersing herself in a book on history and science.

Dr. Kevin McCaffree is a sociologist of religion and morality. He teaches social psychology and research methods at Chapman University. His current research is on ideological differences among religious non-affiliates.

Dr. Charles S. Reichardt, Ph.D., is a professor of psychology at the University of Denver. He has published three edited volumes in the field of program evaluation, is a Fellow of the American Psychological Society, and is an elected member of the Society of Multivariate Experimental Psychology. He received the Perloff Prize from the American Evaluation Society and the Tanaka award from the Society of Multivariate Experimental Psychology.

Simone Rein is an illustrator

and textile designer based in Los Angeles. She is the editor of School of Visual Arts' student-run publication, *Visual Opinion*. In her free time she travels and overdresses.

Dr. Arturo Sangalli has a Ph.D. in Mathematics and has taught and done research at colleges and universities in Canada, Europe and the Middle East. As a freelance science journalist and writer, he is the author of *The Importance of Being Fuzzy and Pythagoras' Revenge* (Princeton University Press) and has contributed many pieces to the British weekly *New Scientist*.

REGULAR CONTRIBUTORS

Tim Callahan is religion editor of SKEPTIC. His books include *Secret Origins Of the Bible*, and *Bible Prophecy: Failure or Fulfillment?* both published by Millennium Press. He has also researched the environmental movement, and his article "Environmentalists Cause Malaria! (and other myths of the 'Wise Use' movement)" appeared in *The Humanist*.

Dr. Harriet Hall, MD, the SkepDoc, is a retired family physician and Air Force Colonel who writes about alternative medicine, pseudoscience, quackery, and critical thinking. She is a contributing editor to both SKEPTIC and *Skeptical Inquirer*, an advisor to the Quackwatch website, and an editor of *Sciencebasedmedicine.org*, where she writes an article every Tuesday. She is author of *Women Aren't Supposed to Fly: The Memoirs of a Female Flight Surgeon*. Her website is www.skepdoc.info.

Pat Linse is an award winning illustrator who specialized in film industry art before becoming one of the founders of the Skeptics Society, SKEPTIC, and the creator of JUNIOR SKEPTIC magazine. As SKEPTIC's art director she

has created many illustrations for both SKEPTIC and JUNIOR SKEPTIC. She is co-editor of the *Encyclopedia of Pseudoscience*.

Daniel Loxton was a professional shepherd for nine years before he became editor of JUNIOR SKEPTIC. He illustrates and authors most of the current JUNIOR SKEPTIC material. He wrote and illustrated the best selling award-winning *Evolution: How All Living Things Came to Be*, and the award winning children's three book *Tales of Prehistoric Life Series*.

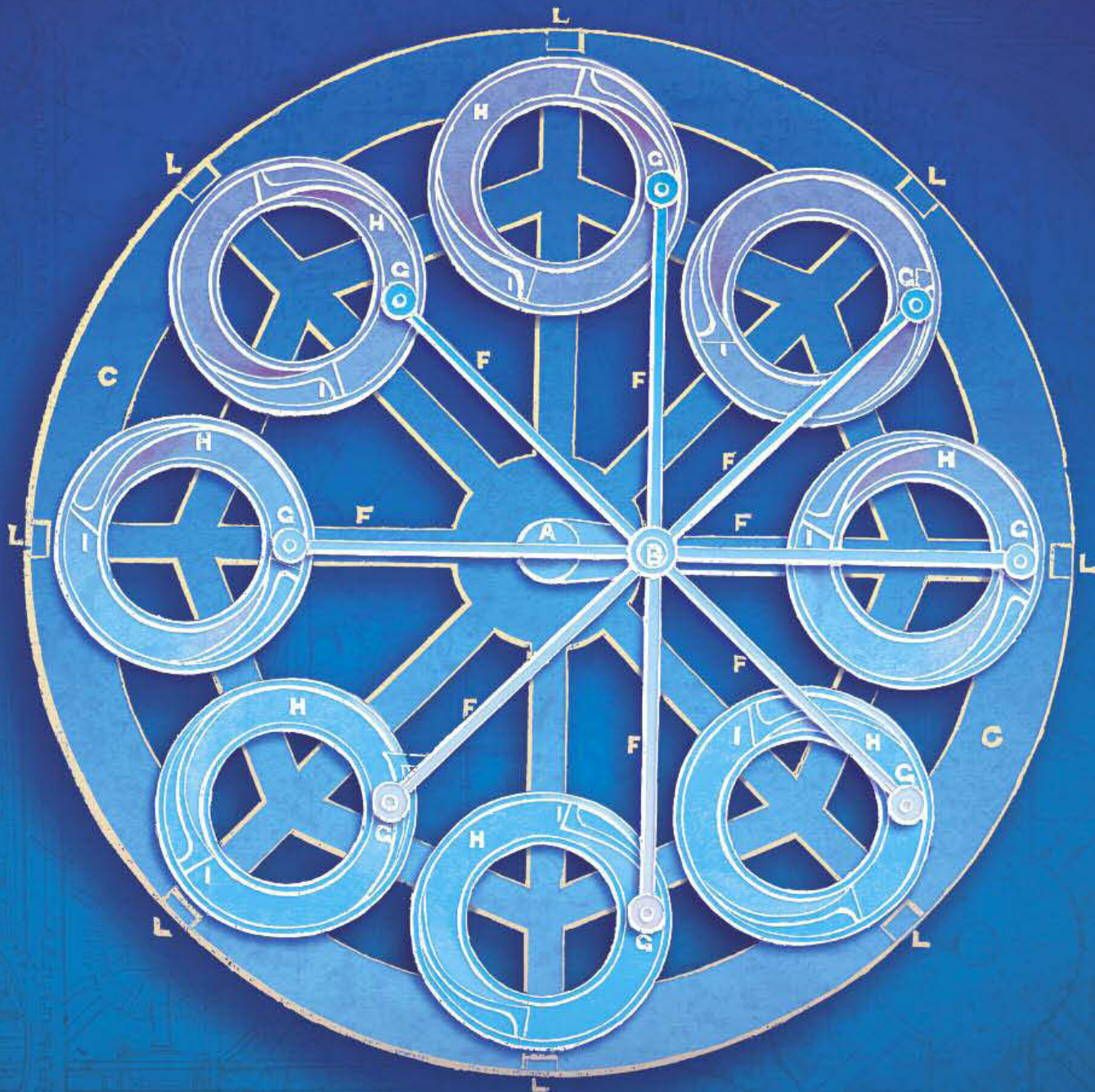
Dr. Michael Shermer is the Publisher of SKEPTIC magazine, a monthly columnist for *Scientific American*, a regular contributor to Time.com, and Presidential Fellow at Chapman University. His new book is *Heavens on Earth: The Scientific Search for the Afterlife, Immortality, and Utopia*. As a public intellectual he regularly contributes Opinion Editorials, book reviews, and essays to *The Wall Street Journal*, *The Los Angeles Times*, *Science*, *Nature*, and other publications. He appeared on such shows as *The Colbert Report*, *20/20*, *Dateline*, *Charlie Rose*, and *Larry King Live* (but, proudly, never *Jerry Springer!*). His two TED talks, seen by millions, were voted in the top 100 of the more than 1000 TED talks. He holds a Ph.D. from Claremont Graduate University in the history of science.

Dr. Carol Tavis is a social psychologist and coauthor, with Elliot Aronson, of *Mistakes were made (but not by ME)*.

CORRECTION

In SKEPTIC Vol. 23 No.1, on page 35, Ellen White was incorrectly identified as the founder of the Christian Science Church. She was actually the founder of what became known as the Seventh-day Adventist Church.

Junior
SKEPTIC ⁶⁷



THE PERPETUAL QUEST FOR PERPETUAL MOTION



HELLO!

Today I'd like you to imagine two impossible, magical machines:

The first machine *runs forever*. You may picture a complex tangle of gears and wheels, or something as simple as a spinning top, but imagine that it never runs down—once started it just keeps going without ever needing more energy. Now imagine a second machine. This one may require fuel or energy to run, but somehow, through some fantastic process, it *generates more energy than it consumes*. We aren't the first to imagine these two types of "perpetual motion" machines. Inventors have dreamed of such devices for centuries. How has their search unfolded?

Let's Find out!

CONTRIBUTORS:

Pat Linse is the creator of and Editor in Chief of JUNIOR SKEPTIC. She wrote many of the early issues.

Daniel Loxton is the Editor of JUNIOR SKEPTIC, and writes and illustrates most issues. Daniel is the author of *Evolution: How We and All Living Things Came to Be*.

THINGS RUN DOWN—DON'T THEY?

A perpetual motion machine would be totally different than any kind of machine we know. Machines need energy to keep them running. A car can keep going only until its gas tank runs dry. A remote control drone can only fly while its battery remains charged.

Even the simplest machines run out of energy. A "fidget spinner" toy is designed to spin for as long as possible, but even a really good one will slow to a halt within minutes. If a parent stops pushing a toddler on a swing, the poor kid will slowly come to a stop (and then dangle there, hollering for a push).

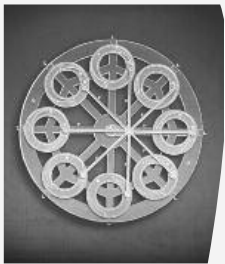
Some machines *can* run for a very long time—even until they wear out—because they continually get energy from natural sources. I don't need to change the batteries in the solar-powered lights on my patio; they're recharged every day by energy from the sun. The long

blades of a wind turbine are turned day and night by energy from the wind. A waterwheel is kept in motion by energy from flowing water.

A perpetual motion machine would be something else entirely. Imagine that you could flick a fidget spinner once and then watch it spin without slowing for the rest of your life!

Is such a thing possible? Many have hoped so. For hundreds of years, cunning and obsessed inventors have attempted to design machines that could run by

themselves forever. Countless clever contraptions have been built to try to make that dream a reality. Some have been simple; others have been complicated. But no matter the details, every perpetual motion machine ever built has had one thing in common: none of them has ever worked.



This Issue's Cover by Daniel Loxton is based upon a perpetual motion machine designed in 1790.

CENTURIES OF DREAMING

No one knows when the search for perpetual motion began, but the quest is very old. “From the beginning of the world,” guessed one writer five centuries ago, mathematicians and philosophers “with great expenses and labor, have attempted to find out a continual motion or moving” using “diverse instruments and wheels”—but none succeeded.

A hundred and fifty years later, another writer described the countless inventors who struggled and failed to create perpetual motion machines. Most such contraptions were wheels intended to turn on their own because of the way they were balanced:

The so-called machine to produce perpetual motion consists of a proper adjustment of weights. Such a machine is one that without external power would have a continual movement of its own, as long as its materials last.

It’s easy to imagine a wheel that remains continually heavier on one side. That was the exact problem, that writer reflected: such machines were *all too easily imagined* by people who lacked “proper mechanical knowledge.” This was why “so many inventors have been deceived”—they couldn’t see the flaws in their own ideas. The result was widespread obsession without success. The writer asked, “is there any subject after which so many thousands have longed, spent their money, industry, and time, as at this same perpetual motion?”

No inventor has succeeded in the quest for perpetual motion (though many tricksters have *faked* success, as we’ll learn later in our story). But it’s easy to understand why so many have tried. People invent tools and machines to help us do work. However, the power of our technologies is limited by the cost and availability of our energy sources. If perpetual motion were possible, it might set us free from those limits completely.

Machines and Work

Humans have used simple machines for many thousands of years. Levers, wheels, and ramps were among the tools that ancient builders used to construct the pyramids. These channeled the physical strength of people and animals more efficiently to accomplish more work.

Eventually people invented machinery that didn’t need musclepower. Rivers and wind were sources of energy for

anyone who could figure out ways to harness the power of nature. People in many ancient lands did just that.

The invention of waterwheels allowed people to do more work much more easily—grinding grain, lifting water, and pumping the bellows in furnaces for forging metal. Waterwheels helped the Romans to power mining projects, cut lumber, and produce food for their civilization.

But as powerful and useful as waterwheels were, they had serious limitations: they needed flowing water to work, and water only flows downhill. This meant that waterwheels could be built only beside rivers or downhill from a lake or other water source that could be channeled or piped to the wheel. If the water source dried up in summer or froze during winter, the wheel stopped working.

Windmills harnessed the power of the wind to grind grain, pump water, and many other tasks. Unlike waterwheels, they could be built far from water, and they produced work even in seasons when rivers froze or dried up. But like waterwheels, windmills have a flaw: they work only when the wind blows.

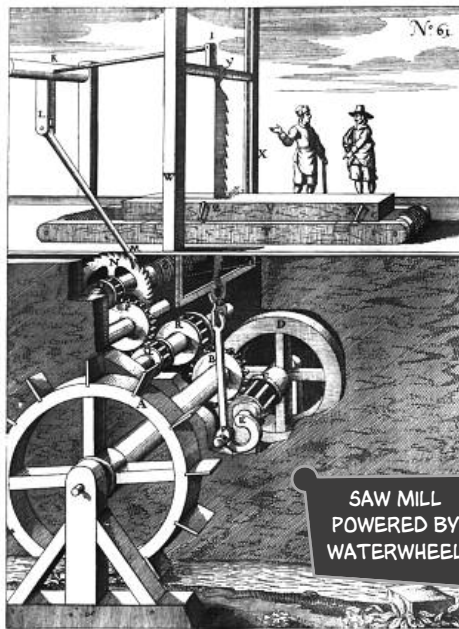
Invention Versus the Limits of Nature

At the heart of invention lies a very basic question: what if there was another, better way? Over centuries, our species has invented ways to get past many of our limits. We’ve built machines to carry us sailing across oceans and soaring into the sky. Today’s technologies allow us to see distant galaxies, microscopic organisms, and even the insides of our own living bodies.

Hundreds of years ago, inventors dreamed of something that sounds pretty simple compared to the technological marvels of our modern world. They watched waterwheels and windmills grind to a stop, and asked themselves: *what if we didn’t have to depend on wind or water or fuel?* Could people invent machines that didn’t need external sources of energy—machines that power themselves?

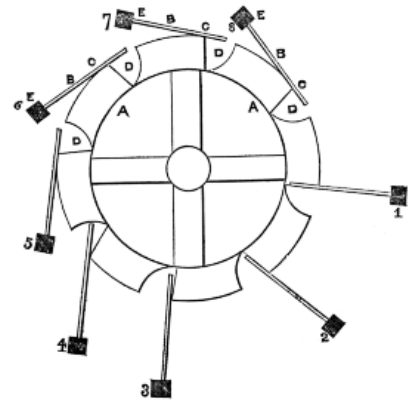
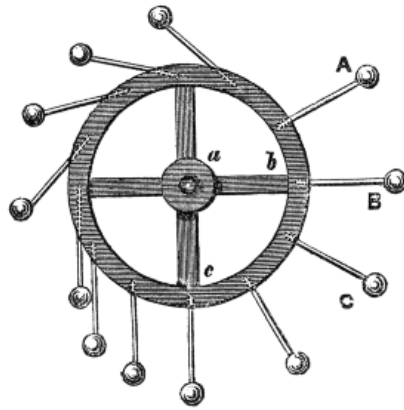
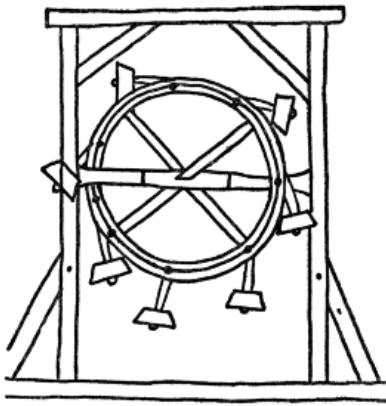
Those were smart questions at the time. No one knew the answer. No one would ever know unless they tried.

It was a noble dream. It was also doomed from the start. Some challenges cannot be overcome, no matter how cleverly we try. Perpetual motion inventors didn’t know it, but they were up against the very laws of nature. As it turned out, some laws can’t be broken.



SAW MILL
POWERED BY
WATERWHEEL

WONDERFUL WHEELS



The oldest and most common type of perpetual motion machine is called an “overbalanced wheel.” Countless inventors have attempted to design wheels that would continually turn because of some mechanism to make them constantly heavier on one side than the other. The machine on the upper left was sketched 800 years ago.

These designs all imagine some system of shifting weights such as swinging arms or rolling balls. When we see them on paper, overbalanced wheels *look* like they should work. But they don’t. Not ever. No matter how clever the design, and no matter how convincing the drawings appear, none of these wheels will turn themselves.

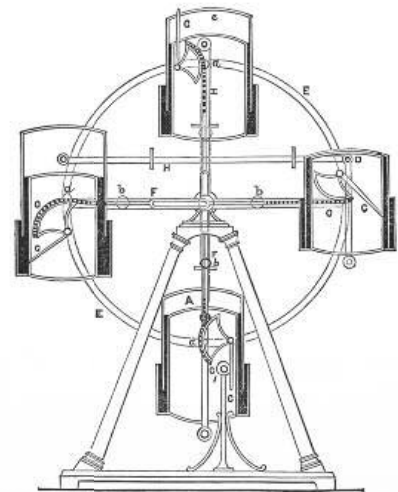
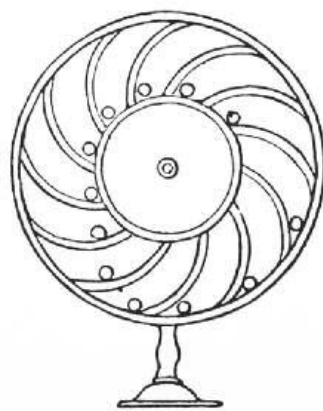
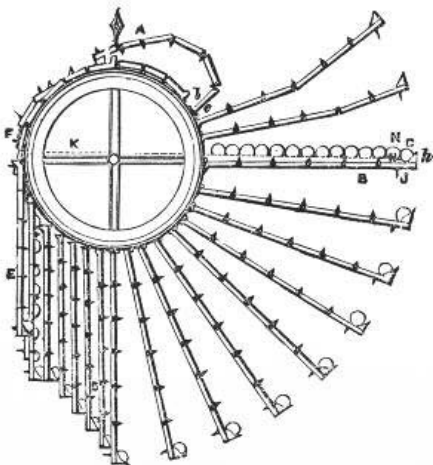
Inventors have been building and testing such machines for centuries. All of them always just sit there like rocks. They don’t turn unless something *makes* them turn.

The flaw in the idea has been understood for a long time. In order to turn themselves, one writer explained in 1828, such a wheel would have to be “at the same time both heavier and lighter than itself,” which is a “physical absurdity.” In reality, all such wheels swing to a position in which both sides are equally balanced, and then they come to rest.

These contraptions are often hard to turn even by hand. The problem is friction. If we want something to turn easily and spin for a long time, it’s best to keep things simple. Get a good heavy wheel that can store a lot of energy, give it a hefty spin, and reduce its contact with any source of friction. That is how toys like fidget spinners, gyroscopes, and tops spin for so long.

If an astronaut were to throw a frisbee out the airlock of the International Space Station, it would spin through space for millenia. There’s no air in space to cause friction. Things are different down here on Earth. As soon as you spin a top on your kitchen table, it immediately starts to lose energy. There’s air in the room, and the pointy tip of the spinning toy is in contact with the table. That causes friction. Bit by bit, the toy’s stored energy leaks away in the form of heat. The spin slows; the point of friction warms up.

Despite the hopes of perpetual motion inventors, swinging arms and rolling balls cannot make their wheels turn by themselves. In fact, the opposite is true: *more moving parts mean more friction*. Overbalanced wheels are in fact designed to slow themselves down!



MAGICAL MILLS

A self-turning wheel would be a stunning discovery. If it were possible to build a machine that would never run down, that would force us to rewrite our understanding of the laws of nature.

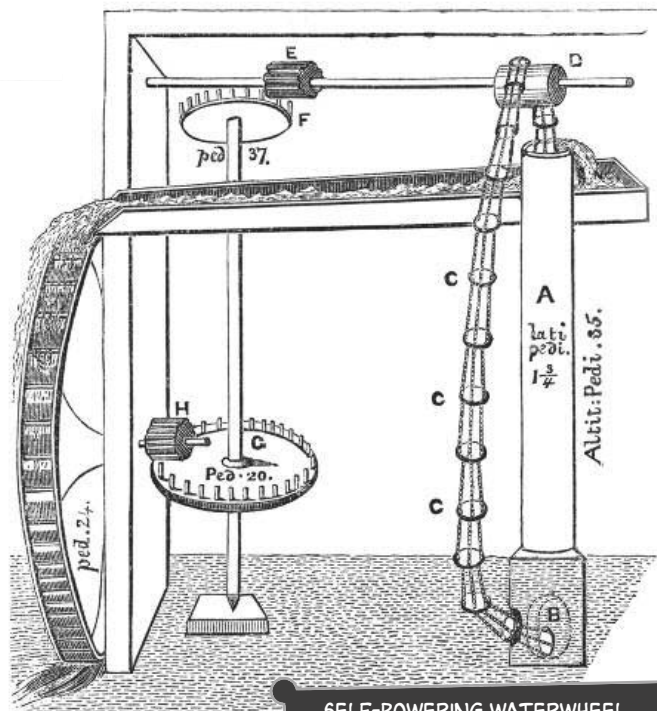
But the quest for perpetual motion has always been more than a search for knowledge. Most perpetual motion inventors have dreamed of something purely practical: free energy. They have hoped to discover a cheaper, more reliable way to do useful work without the limitations of water, wind, or fossil fuels.

In 1518, for example, an Italian philosopher named Antony Zimara proposed a self-powering windmill. The windmill would power a huge bellows, which would “blow perpetually” to make wind to turn the windmill.

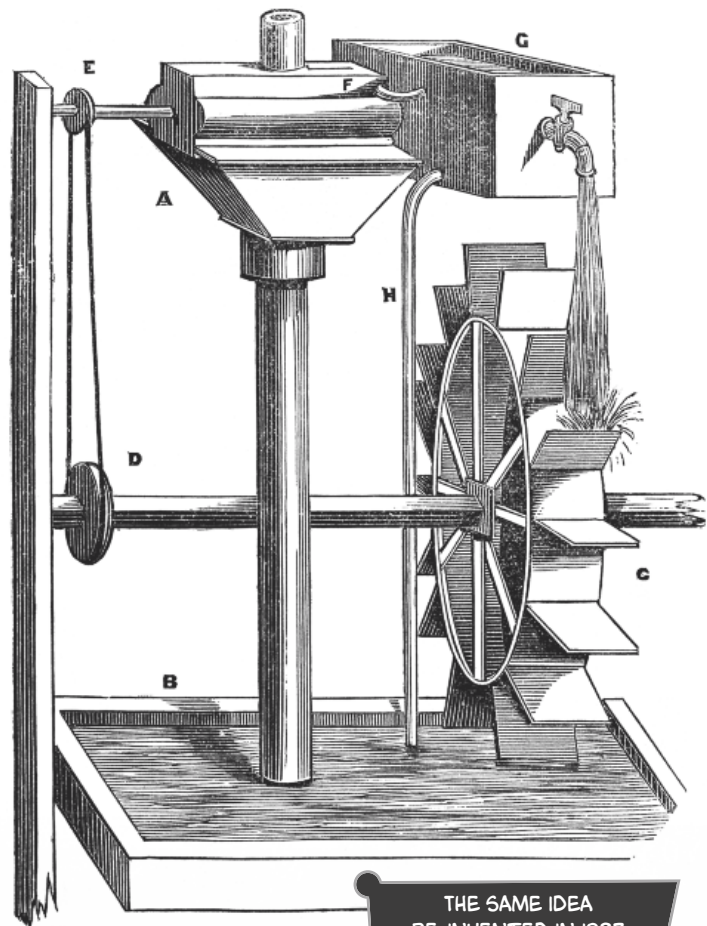
Around the same time, others proposed designs for self-powering waterwheels. These would use energy from falling water to do work, and also pump the water back up to a tank to keep the waterwheel turning. Optimistic inventors believed that this cycle could go on perpetually—the waterwheel powering the pump, and the pump powering the wheel. Over the next four centuries, many people came up with the same idea. All of them were mistaken.

We now know this couldn't work. It's impossible because of a series of scientific discoveries called the “Laws of Thermodynamics.” Scientists have learned that nature allows energy to behave only in certain ways. First, energy can't be created, only changed from one form to another. Even if a waterwheel *could* power itself, that would not create any extra energy to do work. Second, whenever energy is changed from one form to another, some of it is always lost in the form of heat. A self-powering waterwheel would have a lot of friction from all of its moving parts. This means that only *some* of the energy from the falling water could be used to pump *some* of the water back up to the tank—and less each time. The self-powering waterwheel would just keep losing energy. The water tank would soon run dry and the machine would grind to a halt.

The reality is that no machine can ever be 100 percent efficient. It *always takes more energy to run a machine than we can get back out of that machine* in the form of work.

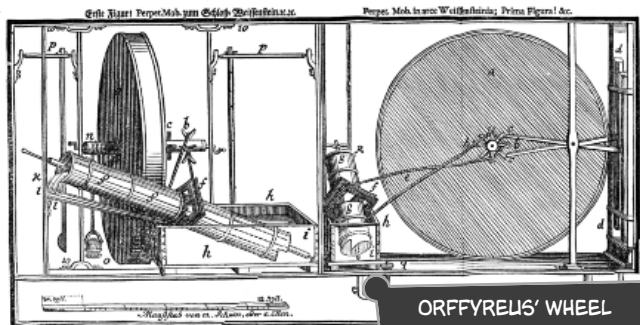


SELF-POWERING WATERWHEEL
DESIGN PUBLISHED IN 1618



THE SAME IDEA
RE-INVENTED IN 1823

PERPETUAL TRICKERY



Not everyone who claimed to have discovered perpetual motion was mistaken. Many supposed inventors were actually cunning scam artists. They used trickery to deceive people out of their money.

Fraudulent perpetual motion machines were built in Europe long before American swindlers built such deceptive devices. In Germany in the early 1700s, for example, several supposedly self-turning wheels were built by a man named Johann Bessler (or “Orffyreus,” as he called himself). The largest of his wheels was described in a letter to the English scientist Isaac Newton from a professor friend who had examined it:

It is a hollow wheel, or kind of drum, about 14 inches thick, and twelve feet in diameter; being very light, as it consists of several cross pieces of wood framed together; the whole of which is covered over with canvas, to prevent the inside from being seen.

Orffyreus convinced a German nobleman that this was a true perpetual motion machine. He was invited to move with his machine into the nobleman’s castle. The wheel was installed in its own room in the castle, where Orffyreus gave demonstrations. His marvelous wheel appeared not only to keep itself moving, but even to generate extra power that could do work such as lifting weights and pumping water. At one point the machine was set in motion, then “the door and windows... were locked and sealed, so that there was no possibility of fraud.” When the room was unsealed two months later, the wheel was found turning as though it had never stopped.

The professor who examined the wheel found no sign of secret mechanisms to keep it turning. So how did it work?

No one knows for sure. Orffyreus was a bad-tempered man who was often accused of madness. He was so enraged by the professor’s examination of the outside of his machine that he smashed it to smithereens.

Orffyreus kept the inside of his wheel hidden, but there are several reasons to think the machine was a fraud. To begin with, his secrecy was very suspicious. Also, his former

maid came forward to claim that she and others had kept the machine moving using a crank in a neighboring room. Finally, Orffyreus claimed his machine was a kind of over-balancing wheel. Those simply don’t work—ever. So we know that Orffyreus lied about his machine.

American Tricksters

Perpetual motion fraud was invented in Europe, but scams of this type have thrived throughout American history. In fact, perpetual motion scams continue to cheat Americans out of money even today.

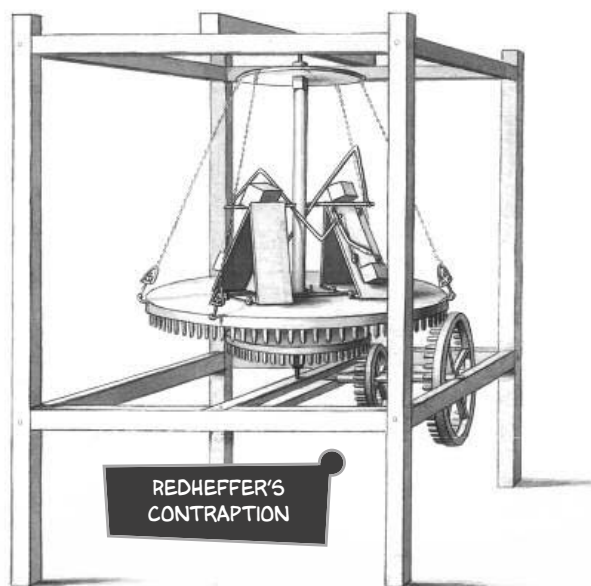
Perpetual motion claims fit in well with ideas that are popular in American culture. First, a lone inventor claims to have found the secret. The so-called experts said perpetual motion was impossible, but look! After years of innovation and plain old hard work, here is the machine! This invention will change the world as soon as the inventor can finish the final tweaks and get it to market. He’s sure to get rich—and so will anyone smart enough to invest now!

Such stories are very appealing in the country of the Wright Brothers and Thomas Edison. And sure enough, perpetual motion swindlers have never had trouble finding audiences and investors ready to part with their money.

The Redheffer Scheme

In 1812, for example, a man named Charles Redheffer began to offer demonstrations of an amazing device in Philadelphia. The machine seemed able to keep itself in motion and create energy to do work.

Redheffer made money by charging expensive admission fees. He kept people interested by publishing newspaper challenges calling on experts to examine his machine for themselves. Paying audiences crowded to see his machine.



Redheffer pocketed a fortune. The machine became so famous that even former President Thomas Jefferson marvelled that Redheffer “seems to be reaping a rich harvest from the public deception.”

Redheffer also asked the state government for money to continue his perpetual motion research. The government wisely decided to ask a group of experts to “make strict examination” of the machine first. One of those experts wrote to Jefferson to predict that Redheffer “most probably never will submit his machine to the examination” as this would lead to the “detection of the fraud he has so successfully practised.”

This prediction was correct. When the experts arrived, they were prevented from seeing the machine up close. They had to peer at it through a locked window. According to one story, it was the young son of one of the investigators who spotted evidence of fraud. From the way the gears were worn, it was clear that the machine was driven by “some concealed source of power.”

This was confirmed later in 1813 during a showing of the machine in New York. Redheffer was confronted by a member of his audience—the famous engineer Robert Fulton. Fulton could tell just from the sound of the machine that it was powered by a hidden hand crank. He declared that the machine was a fraud and Redheffer was “an impostor.” Ignoring Redheffer’s “anger and bluster,” Fulton convinced the audience to let him prove the machine was a fake. He broke open a part of the machine that was attached to the wall and found a concealed “catgut string” leading from the machine to another room. Fulton followed the string and discovered an old man with an “immense beard...turning a crank.”

Exposing Redheffer’s fraud didn’t stop him. He showed perpetual motion machines for at least six more years. He also continued to boldly challenge experts. In 1816, another group of investigators accepted his challenge. But after various excuses, Redheffer refused to set his machine in motion. The experts disgustedly concluded that he had wasted their time.

The Slippery Aldrich Brothers

Redheffer made money fooling audiences. It’s more common for perpetual motion frauds to cheat money from investors.

This was the scam that James Aldrich and his brother Thomas repeated for many years. Starting in 1888 or earlier, the Aldrich brothers showed off a contraption they said would run by itself until it wore out. Larger versions would produce abundant free energy and “revolutionize mechanical power.” All they needed was a partner willing to invest money now in exchange for huge profits later.

Using a variety of names, the Aldrich brothers

travelled the country with their machine for roughly two decades, cheating and stealing wherever they went. They sold the same half of their pretend business over and over to as many victims as they could fool. Then they would leave town with the money and do the same thing again somewhere else. At one point it seems they even burgled the life savings that one man kept hidden in his wooden leg!

The law caught up with the brothers several times despite their frequent moves and name changes. James was arrested as a fugitive in 1897, jailed for three months, and forced to repay some of his victims. But he continued the same scam as soon as he was released. Two years later he was arrested again and sentenced to a year in prison.

His machine was seized and sent to the offices of *Scientific American* magazine. The editors soon discovered how the supposed “perpetual motion” machine worked: an X-ray revealed that it had wind-up clockwork cunningly concealed inside its base! It was, the editors said, “a masterpiece of deception...calculated to deceive the unwary.”

Yet even then, prison and public exposure did not stop these career criminals. Two years later James was again on the run for pulling the same scam in Seattle. In 1905, both brothers were captured and tried yet again. This time, it was Thomas who was convicted for their perpetual swindling.



SCIENTIFIC AMERICAN'S DIAGRAM OF THE ALDRICH MACHINE, SHOWING HIDDEN CLOCKWORK

OTHER PEOPLE'S MONEY

The all time king of perpetual motion fraud was John Ernst Worrell Keely. He too made his living for decades by scamming investors and wealthy supporters—and he got away with it right up to the end of his days!

John Keely was a fast-talking, energetic character who came across to people as a rough-around-the-edges working man. Little is known about his early life. He may have trained as a carpenter. He worked various odd jobs and was a skilled musician.

In 1871 he began a new career as an inventor. He claimed that he had created a new kind of motor that would not only run “until worn out,” but also produce energy. He advertised this supposed breakthrough and began to lure investors. The Keely Motor Company was formed in 1874 to build, patent, and sell Keely’s miraculous motors. Investors poured millions of dollars into Keely’s projects—a staggering fortune that would pay for Keely’s workshop, tools, and living expenses.

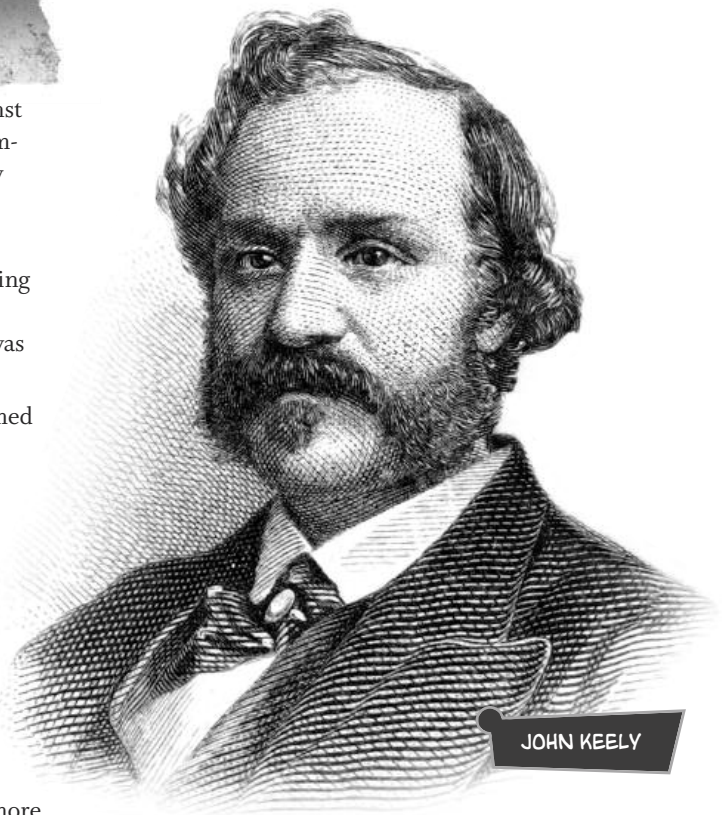
There was only one problem: Keely never completed his motor. As the years dragged by, he frequently demonstrated mysterious new machines that seemed to do amazing things in his workshop. These attracted yet more money from yet more people. However, these machines were never *quite* ready to be patented, sold, or even explained. His investors waited for a *quarter of a century* while Keely stalled and made excuses.

It was a spectacular swindle. As one newspaper jokingly noted, Keely had “one of the largest and best arranged collections of other people’s money to be found in the United States.” His investors got nothing while Keely swaggered around “well dressed, well fed” and “magnificently bedecked with studs of glittering diamonds” on the front of his shirt. Yet his fraud was only exposed after his death. How did he pull that off?

How to Be a Perpetual Motion Scammer

Keely had the quality every successful con artist needs: he *seemed* honest and sincere. Supporters were always deeply “impressed with his earnestness.”

But his claims and excuses were preposterous. “The deceptions of the whole scheme are so transparent,” marvelled the *New York Times*, “that it hardly seems credible that persons of sane minds can be found who are willing to invest.” But Keely had a powerful advantage: other people’s greed. If the things he said were true, his investors would surely get rich eventually.



JOHN KEELY

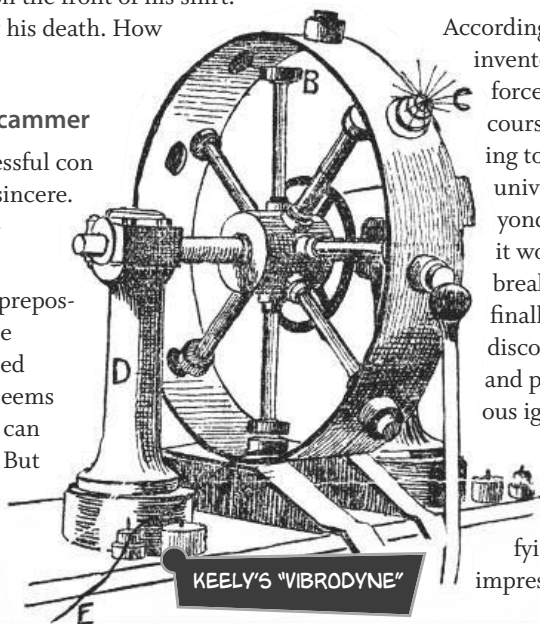
His supporters *wanted* to believe him. The true purpose of the “Keely motor deception,” said *Scientific American*, “appears to be the wriggling of money out of silly people.” Those people invested in Keely’s motor “just as they do in lottery tickets—expecting or hoping to win a prize.”

Dazzling Nonsense

Keely had another surprising advantage: *absolutely no one could understand what he was talking about.*

According to his claims, Keely was no mere inventor. His machines harnessed cosmic forces that he was the first to discover. Of course his research took time: he was working to solve the deepest mysteries of the universe! His research pushed so far beyond the understanding of scientists that it would take years even just to explain his breakthroughs to them. When scientists finally did become capable of grasping his discoveries, “physicists will stand aghast, and perhaps feel humiliated” by their previous ignorance.

He convinced his supporters and baffled his critics with an endless stream of made-up lingo and mystifying gibberish. He gave his machines impressively strange names like “Vibro-



KEELY'S "VIBRODYNE"

dyne,” “Sympathetic Negative Transmitter,” “Compound Disintegrator,” and even “Hydro-Pneumatic-Pulsating-Vacu-Engine.” His explanations of his theories of “sympathetic vibratory physics” were meaningless jumbles of phrases such as “spiro-vibrophonic,” “positive neutralization,” “sympathetic celestial,” and “enharmonic currents of the triune polar stream.” For example, a musical note demonstrated “the purity of the principle of sympathetic transmission, as negatized or disturbed by discordants; which, focalizing on the resonating sevenths of resonators” appeared to cause one of his globe-shaped engines to turn.

With this incredible new science, Keely claimed, his machines could propel trains across the country, power anti-gravity airships, and even heal diseases of the body and mind. They would need no more fuel than a few drops of water or even just the sound of a violin string or tuning fork.

To scientists and engineers, all this sounded as ridiculous “as if Keely had asserted that two and two make a billion,” admitted one supporter. Thomas Edison couldn’t be bothered to accept an invitation to Keely’s workshop. Electrical engineer Nikola Tesla considered Keely an “unscientific” fraud. “It is painful to read his theories,” Tesla said.

Blinded by Belief

Keely’s supporters didn’t care that scientists scoffed at his claims. They knew that Keely “contented himself to remain ignorant in physics, as taught by the schools,” but that only went to show that his ideas were far more advanced than ordinary science. His believers considered him “a giant in intellectual greatness.” Some thought his work was so important that they donated large amounts of money to help him.

Keely’s most devoted supporter was a kind-hearted, wealthy widow named Clara Bloomfield-Moore. She learned of Keely in 1881. At that time he was less able to get his hands on money because many of the investors in the Keely Motor Company had lost patience with him. “After convincing myself that Mr. Keely had made a great discovery,” Bloomfield-Moore decided to fund his work instead of donating money to build a library. She felt that supporting Keely’s work was the best way for her to do good for humanity. For 15 years, she poured her fortune into Keely’s work until she finally ran low on money herself. She also wrote an entire book lavishly praising and promoting Keely.

It was her belief that Keely would unite science and religion, give humanity unlimited energy, allow flying machines to soar through the air, and restore the sick to health. She gushed that Keely was “great enough in soul, wise enough in mind, and sublime enough in courage to overcome all difficulties, and to stand at last before the world as the greatest discoverer and inventor in the world.”

Bloomfield-Moore fiercely defended Keely against all accusations of fraud. However, there were countless warning signs that she and other believers simply refused to accept. His

machines were never finished. He was accused of fraud many times, and even briefly jailed. When skeptics pointed out that compressed air could secretly run many of his machines, Keely refused simple tests to prove otherwise. He was so suspiciously secretive that he even destroyed some of his machines to prevent them from being examined. “Mr. Keely is his own worst enemy,” admitted Bloomfield-Moore. “When suspected of fraud he acts as if he were a fraud.”

Furthermore, Keely could not even keep his own nonsense straight. During one demonstration, a reporter noted that Keely “insisted on using different names when speaking of the same parts at different times.”

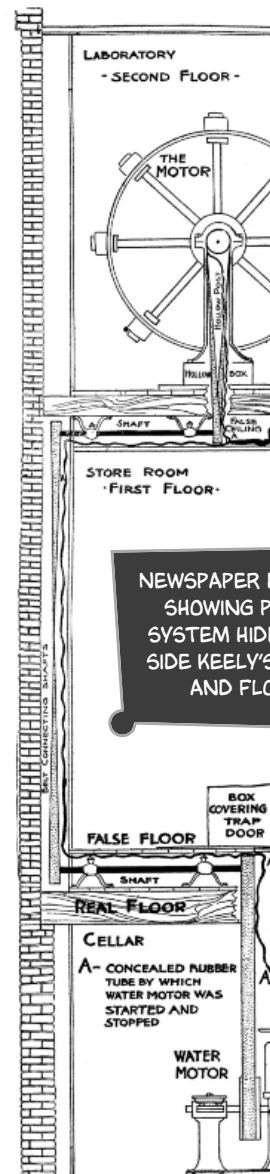
Revealed as a Scoundrel

Keely died in 1898 after decades of comfortable living at other people’s expense. He left behind no patents, no finished designs, and no reasonable explanation of how his machines supposedly worked.

After his death, friends and enemies scrambled to learn his secrets. What they discovered was shocking—at least for those who believed in him.

Many of his machines were sent to a supporter who hoped to get them working. He soon learned that all of the machines were fake. Each was powered by some hidden gimmick, such as powerful springs or compressed air. Bloomfield-Moore’s adult son rented Keely’s old workshop and set investigators to work pulling the place apart. They found false ceilings and concealed trap doors. Compressed air tubes ran through the walls. One device was secretly powered by belts and drive shafts hidden in the walls and floors. These were connected to a motor in the cellar.

Newspapers declared it “The Fraud of the Century!” Mrs. Keely’s lawyer stepped forward, with her permission, to agree that “the whole thing was essentially fraudulent.” Her lawyer told the papers that the evidence of her husband’s “fraud unmistakably speaks for itself.”



NEWSPAPER DIAGRAM SHOWING POWER SYSTEM HIDDEN INSIDE KEELY'S WALLS AND FLOOR

FREE ENERGY SCHEMES

So it has gone for centuries. Countless dreamers and schemers have made the same claims of machines that magically run forever or create energy. Those unrealistic dreams continue to delude inventors and investors to this day.

Patenting the Impossible

The scientific case against perpetual motion was settled well over a century ago. Such machines are impossible. Nature simply doesn't work that way. No one can create a machine that consumes no energy and never runs down. No machine can create more energy than it consumes.

However, scientific reality has done little to prevent a perpetual parade of preposterous claims. Because the claims always continue, scientists, skeptics, and legal authorities continue to have to deal with them.

Perpetual motion is especially irritating for patent offices. When someone invents something, they can apply to the government to have their invention recorded and recognized. This prevents other people from stealing the inventor's idea. But what are patent officers to do with inventions that do not and cannot possibly work?

In earlier centuries, hundreds of patents were granted for perpetual motion machines. Scientific knowledge was less advanced. There was still debate about the possibility of perpetual motion. But as science progressed, patent offices changed their approach. They began to reject applications for unworkable perpetual motion machines.

In 1911, the U.S. Patent Office went a step further. They made a firm announcement:

The views of the Patent Office are in accord with those of the scientists who have investigated this subject and are to the effect that such devices are physical impossibilities. The position of the Office can be rebutted only by the exhibition of a working model.

That is, they were so sick of perpetual motion machines that they decided not to even look at applications anymore. If an inventor thought they could build the impossible, they were welcome to try *before* bothering the Patent Office.

Energy from Nowhere

The dream of free energy has never faded away. Conferences, websites, magazines, and books promote the idea that special machines can get something for nothing. YouTube is crawling with hoax videos that appear to show working perpetual motion machines—usually now called “free energy devices” or “overunity” machines. (“Overunity” means “more than 100 percent efficient,” or “generating more energy than it takes to run.”)

Modern free energy claims are often connected to

“conspiracy theories” (unproven beliefs that a powerful group of people is secretly working together to deceive the world for a sinister purpose). If free energy devices really worked, wouldn't they already be running our cars and powering our homes? Not if a conspiracy was working to cover up the truth, say free energy believers. Many suppose that powerful oil companies conceal the existence of free energy so that they can sell more oil.

Money for Free

However, oil executives aren't the only people who want our money. Some perpetual motion claims are intended as harmless hoaxes. Other inventors sincerely fool themselves in one way or another. But many perpetual motion claims are ruthless scams intended to deceive people out of money. More than a century after Keely was exposed as a fraud, people still fall for new versions of the magical motor swindle.

Imagine that you were to see an astonishing demonstration of an invention that appeared to have the potential to change the world. How exciting! The inventor might attract an eager crowd to see the machine in person, or get themselves interviewed on TV, or post impressive videos online. Then they invite their audience to be part of something special. The inventor claims their free energy machine could power the world without oil and without pollution. Just think of the good you could do by donating money to support this amazing breakthrough! Or, even better, you could invest in this opportunity. You could make the world a better place *and* get rich doing it!

It sounds too good to be true, because it is. Unfortunately, new victims often get swept up in the excitement. Too few people know the sad history of perpetual motion claims. Modern victims don't realize how many people have lost their life savings on similar schemes in the past.

The Same Old Thing

Many free energy machines are essentially electrical versions of the centuries-old fantasy of self-powering waterwheels. A motor powers a generator, and the generator in turn powers the motor. It's claimed that loop can go on forever and somehow create extra energy—which is a scientific impossibility. These are very old claims sold in the same old ways that Keely's fraud made famous.

For example, one current company has posted YouTube videos showing a variety of magical machines supposedly doing the impossible. The company's website claims that their prototypes create an abundance of energy from nothing. The machines are *almost* ready to go into mass production. When they do, they will cheaply and easily solve the problem of climate change. For a mere \$120,000 U.S. dollars, savvy investors can purchase rights now to distribute the machines when they are ready. That's just Keely's scheme all over again. It's been repeated many times since his day.

A Texas-Sized Whopper

In 1977, for instance, Texas inventor Arnold Burke convinced a large company to invest \$150,000 into his “self-contained hydroelectric power system.” By “self-contained,” Burke meant that it generated electricity from water flowing down from a tank, and *also* pumped the water back up to fill the tank. He claimed this cycle would continue endlessly, generating power the whole time.

Eventually the company lost patience with Burke’s delays in completing his perpetual motion machine. No problem: he renamed his machine “Jeremiah 33:3” (after a Bible verse) and sold distribution rights to individual investors instead. He collected \$800,000 before Texas authorities charged Burke with fraud in 1979.

The court asked an engineer to pull Jeremiah apart and find out how it worked. Burke’s secret was quickly discovered: his bogus machine was powered from outside using a hidden electrical wire. After four years of court battles, Burke finally pled “no contest” to fraud. He was ordered to pay a fine—and to repay his investors.

Faith in Perpetual Motion

People tend to more easily trust folks who seem similar to themselves. When Burke named his machine after a Bible verse, he made it sound more trustworthy to investors with strong religious beliefs.

Another perpetual motion salesman named Dennis Lee did much the same thing. He used a lot of religious language in the demonstrations he gave for large crowds of believers. His speaking style was much like a TV preacher. He also went out of his way to present himself as a regular working man, just as Keely did. “I never took a course—I’m really not a very bright man—but I’m God’s man,” Lee told an audience in 1997. His events mixed together religion, conspiracy theories, salesmanship, and demonstrations of a wild variety of impossible devices. He urged investors to put their faith in his free energy inventions, and not to listen to experts. “We don’t trust scientists,” Lee said.

Lee boasted that he sold two thousand dealerships for his free energy devices. Some believers paid \$100,000 each for the right to distribute machines that were never ready. But Lee actually did market some other too-good-to-be-real inventions, including a “Sonic Bloomer”—a gadget that supposedly made plants grow by making a sound that humans

DENNIS LEE

can’t hear. It could grow “500 tomatoes from one plant” and “pumpkins as big as a grown man,” Lee’s website claimed.

Another was a device claimed to make cars go twice as far on one tank of gas. However, a 2009 investigation by reporters for NBC’s *Dateline* television program found that these automotive devices did nothing whatsoever. “It’s a scam,” explained the senior automotive editor for *Popular Mechanics* magazine after testing the device for NBC.

Lee ran into legal trouble in many different states as he peddled his schemes and contraptions. Courts in at least eight states ordered him to stop misleading investors and customers with false claims. He was convicted of fraud in California. He spent two years in prison. But he paid no more attention to the law than he did to “scientists, with their big words.” He told his believers that his troubles were all part of a conspiracy. Corrupt courts and news media were trying to stop his free energy inventions so that “polluters... can sell more oil.”

In the end, U.S. federal authorities decided to take action. After yet another court battle, Lee finally settled in 2011. He signed a court order permanently banning him from “selling, or distributing any product purported to generate energy, reduce energy consumption, or increase vehicle gas mileage” anywhere in the United States. He also agreed to turn over more than two million dollars.

And so It Goes, Seemingly Forever

There are still people who believe Lee’s free energy claims. There even are people who think Keely unlocked the secrets of the universe. It is very difficult for people who invested money and faith to accept that they were fooled, even when the evidence is clear. Nor does the story end with past victims. The ancient wish—something for nothing—is just too tempting. There’s always a new crop of scoundrels eager to prey upon people’s hope, greed, and faith. Perpetual motion claims will deceive the unwary for as long as there are lies to tell and money to be made.



FURTHER READING

FOR SKEPTICAL ARTICLES ON PERPETUAL MOTION, SEE *WORLDS OF THEIR OWN*, BY ROBERT SCHADEWALD (2008), AND “PERPETUUM MOBILE” BY ROBERT PARK, *INSIDE SKEPTIC* VOL. 8, NO. 1 (2000). TO DIG INTO THE DEEPER HISTORY OF PERPETUAL MOTION CLAIMS, SEE *PERPETUUM MOBILE: THE HISTORY OF AN OBSESSION*, BY ARTHUR ORD-HUME (1977, 1998) AND *PERPETUUM MOBILE: SEARCH FOR SELF-MOTIVE POWER DURING THE 17TH, 18TH, AND 19TH CENTURIES*, BY HENRY DIRCKS (1861). FOR A DETAILED LOOK AT THE LIFE AND INFLUENCE OF JOHN KEELY, SEE *FREE ENERGY PIONEER: JOHN WORRELL KEELY*, BY THEO PAIJMANS (2004). FOR A GREAT ONLINE RESOURCE, SEE WWW.LOCKHAVEN.EDU/~DSIMANEK/HOME.HTM

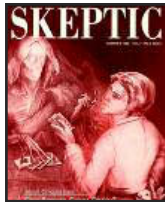
SKEPTIC MAGAZINE

back issues \$6.00 ea.

Sold out print issues are available digitally at www.skeptic.com/magazine/app/#BuySingleBackIssues



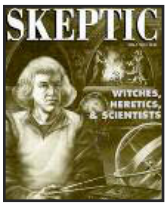
magv1n1-Tribute to Isaac Asimov (Premiere Issue) Isaac Asimov Tributes by Steve Allen, Martin Gardner & Harlan Ellison; Skeptics Society's Manifesto; Skeptics in Trenches by Randi; *The Most Precious Thing We Have—The Triumph of the Scientific Method* by Michael Shermer; Avoiding Legal Problems in Skepticism by Elie Shneour; Book Reviews.



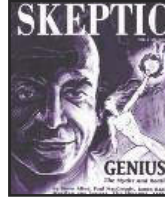
magv1n2-Cryonics: Can Science Cheat Death? Use & Abuse of Statistics in the "Real World" by Judith Grabiner; Cryonics: Reaching for Tomorrow by M. Darwin; Altered States & the Quest for Transcendence by M. Shermer; Q & A About Cryonics by Alcor Foundation; The Society for the Recovery of Persons Apparently Dead by S. Harris; Book & Article Reviews.



magv1n3-Revolution in Evolution? Darwin & Gould Skeptics Investigate Edgar Cayce; Mismeasure of History; Darwin, Gould & the Nature of Change by Michael Shermer; Twenty years of Punctuated Equilibrium by Donald Prothero; Punctuated Equilibrium in Fact & Theory by Stephen Jay Gould; Historic 1842 Sketch on Evolution by Charles Darwin; Darwinian Culture by James Rogers; Reviews.



magv1n4-Witches, Heretics, and Scientists and the Psychology of Resistance to New Ideas: Today's Heretic, Tomorrow's Saint by Clayton Drees; Spirits, Witches & Science by Richard Olson; Resistance to Heretical Science of Copernicus by M. Shermer; Ideological Immune System by J. Snelson; Edgar Cayce Foundation Responds to Skeptics & We Reply; Can Religion be Rational? by C. Brough; Reviews.



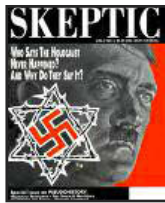
magv2n1-Genius: Myth & Reality: Genius by Steve Allen, James Randi, Paul MacCreedy, Elie Shneour; Marilyn Vos Savant; James Gleick (on Feynman); Amadeus Myth by M. Shermer; D. Alexander (on Gene Roddenberry); Review of Genius, by M. Rothman; "Science" of Noah's Ark by D. Porter; Who & What Mattered in History by M. Shermer; Mathemagics by A. Benjamin; Millennium Watch by T. Daniels; Reviews.



magv2n2-Science, Religion, & Cults: The Jesus Cults by Steve Allen; What Makes A Cult? by C. Kisser; Millennium Watch by T. Daniels; The Resurrection Myth by S. Harris; Was Christianity a Cult? by G. Larue; Realism & Religion by M. Rothman; The Unlikeliest Cult Of All by M. Shermer; Mathemagics by Auther Benjamin; Ark Hoax; 25 Creationist Questions & 25 Evolutionist Answers; Reviews.



magv2n3-Fad Psychology, False Memory, Facilitated Communication: False Memory Syndrome by Hochman; Diagnoses are not Diseases by Szasz; Facilitated Communication by Green; William Reich by Morroc & Carlinsky; Sex, Brains, & Hands by Halpern; How Thinking Goes Wrong by Shermer; Pseudoscience in Psychiatry by Tavris; Anti-Science by McDonough; Flood Myths by Larue; Ark Hoax by Lippard & Bloomberg.



magv2n4-Pseudohistory-Afrocentrism and Holocaust Revisionism: Free Speech & Neo-Nazis by Miele; Denying the Holocaust review by Siano; Holocaust Revisionism by Shermer; Creationism & Racism by McIver; Goodbye Columbus? by Fritze; Were Egyptians & Greeks Black? by Lefkowitz; Beyond Race by Appiah. Noah's Ark Hoax Update by Lippard; Randi on the Millennium; Reviews.



magv3n1-Pseudomedicine: Update False Memory Syndrome; Homeopathy by Jarvis; Alternative Healthcare by Raso; Therapeutic Touch by Rosa; Skeptics & Religion by Drees; Shallit on Leftist Science; Mattoon Mass Hysteria by Smith; Liquefying "Blood" by Randi; Star Trek's Meaning by Shermer; Is Raw Meat Conscious? by Leikind; Huston reviews books on Miracles, Conspiracies & Skinheads.



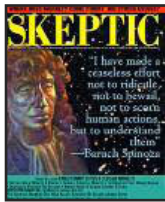
magv3n2-AIDS: AIDS Heresies by Harris; Astrology Brouhaha by Randi; Should the Bible be Taken Literally? by McCollister; Extraordinary Claims Require Extraordinary Evidence? by Schick, Jr.; Charles Murray Interview by Miele; Wallace & Darwin's Priority Dispute by Shermer; Culture Wars: Skeptics, Parapsychologists & New Agers by Siano; Debunking Hal Lindsay by Callahan; Did God Make Rice Cakes? by Leikind; Reviews.



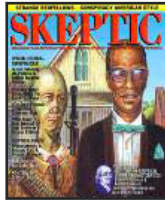
magv3n3V Race & IQ: Place In The Sun by Tavris. Bell-Shaped Curve's Skewed Logic by Halpern. Sternberg interview by Miele. Insult to Injury: Uses of *The Bell Curve* by Griffin. Defending *The Bell Curve*, by Sarich. Cycles & Curves by Shermer. Scientology v. the Internet by Lippard & Jacobson. King Tut's Curse by Randi. Moral Panics by Victor. "Recovered Memories" by Pendergrast. How to Eat a Light Bulb by Leikind; Reviews.



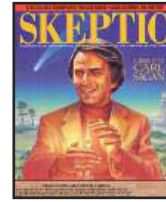
magv4n1-Evolutionary Psychology: Stephen Jay Gould Interview, Lionel Tiger, & Robin Fox. (Im)moral Animal by Miele; Sociology as Alchemy by Salter; Beyond Just-So-Stories by Holcomb; How Humans Got Spots by Schlinge; Gould's Dangerous Idea by Shermer; Darwin Dangerous? by Ruse; Randi debunks Quadro tracker; Creationist museum; Scientology responds; What Is the Ant, Sir? by Leikind; Reviews.



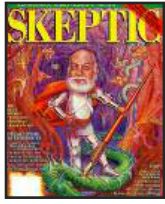
magv4n2-Evolutionary Ethics: Science of Morality by R. Bingham; F. Miele interviews Garrett Hardin; Morality & Genetic Engineering by J. Hartung; Evolution of Morality & Religion by W. Irons; Plants & Property by A. Oubre; Ethics Without Religion by Shermer; William Jennings Bryan's Argument Against Evolution; Superstition by Olson; Randi debunks saving fuel device; Cosmythology by V. Stenger. Adam's IQ by Leikind.



magv4n3-Conspiracy: Jerry Brown Interview by Miele; World's End by Callahan; Farrakhan & Paranoid Style by Brackman; Freud's Follies by MacDonald; Political Correctness Conspiracy by Siano; End of Science by Horgan; End of Science Illusions by Casti; Heretic-Personality by Shermer; Hollywood ET by McDonough; Mesmerism by Ben Franklin, Antoine Lavoisier; *Bell Curve* Book Cracks; Randi on Police Psychics; Tomorrow? by Leikind.



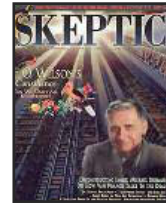
magv4n4-Is History A Science? Tribute to Carl Sagan: Can History Be Science?; F. Sulloway on *Born to Rebel*; Early Ghost-busters; Debunking Nostradamus; Critical Thinking About History; Norm Levitt Replies to Critics; R. Olson on Left & Right Science; What Happened to N-Rays?; Randi-How To Be Psychic: Im-moral Creationism. Reviews: Evolution & Literary Theory; Killing of History; Amazing Kreskin. Dumbth News.



magv5n1-Ecology: Economists v. Ecologists by F. Miele; Scientists' Warning to Humanity; Julian Simon Interview; Not-So-Wise Use Movement by P. Lindholdt; Population Risk Assessment by E. Shneour; Myth of the Beautiful People by M. Shermer; Ancient Astronauts by E. Wojcie-howski; Dumbth News by R. Cassingham; Modern Demonology by F. Crews. Randi's Swift: Dowling, Human Magnetism, Pegasus Awards, Futurists.



magv5n3-Anthropology: Interview: Donald Johanson; Human Origin Stories by Miele; God & Ghost Dance by Shermer; Mead & Anthro. by Freeman; Indians v. Archaeologists by Feder; Millennium by Stephen Jay Gould; Dumbth News by Cassingham; Di Conspiracies by Gerlich; X-Files Meets Disney by Mc-Donough; Houdini v. Margery by Polidoro; Fairies Frauds by Randi; Alternative Medicine by L. Jaroff; Reviews.



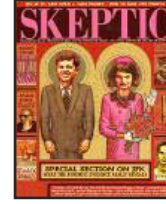
magv6n1-Science & Society: E.O. Wilson Interview by F. Miele; Review of Wilson book by B. Siano; Van Praagh-How He Talks To the Dead by M. Shermer, plus Commentary by G. Posner; Skeptical Of Objective Journalism by A. Kitty; GRE As Fringe Science by K. Oldfield; Drug Policy Debate Guide by E. Goode; Fraud In the Name of Religion? by M. Fried; New Age High Tech by J. Randi; Dumbth News; Evil Eye by G. Bohigian; Reviews.



magv6n2-Taking God Seriously: Deepak Chopra Danger by P. Molé; Ray Hyman Interview; Atheist v. Agnostic by Shermer; Karl Popper On God; TT Wars by L. Sarnes; Against God by M. Pigiucci; For God by B. Mazet; Answering Creationists by T. Edis; Intellectual Danger by J. Randi; Self-Help Coach by D. Lease; '97 Dumbth Awards by R. Cassingham • Jr. SKEPTIC: TT & Me by E. Rosa; Lucky 7 by E. Antisdale; Web reviews by C. Walker & S. Kinney.



magv6n3-Why Professors Believe Weird Things: Sex, Race, & the New Left by N. Levitt; Susan Blackmore Interview; Is God Dead? by M. Shermer; Meme Critique by J. Polichak; Alternative Religion Supporters by S. Kent & T. Krebs; Facilitated Communication by B. Gorman; Snake Oil Psychotherapy? by T. Dineen; Randi on True Believers, Waco. Jr. SKEPTIC; Bigfoot! by Harter; Crystals by A. Chesworth; Golfball Finder by Cohen.



magv6n4-JFK: Jack Horner Interview; JFK-Facts & Fictions by N. Gerlich; JFK-Case Still Open by A. & M. Snyder; Pope & Science by M. Shermer; Anastasia: Miraculous Survival Myth by T. Callahan; Dumbth News by R. Cassingham; Dowling Challenge by Randi; Ig Nobel Awards by S. Gibson • Jr. SKEPTIC; Aliens Among Us? by A. Chesworth; Abducted! by M. Shermer; Psychic Math! by A. Benjamin; UFO Photos



magv7n1-Influence: Carol Tavris Interview; Fraud & Science by *D. Kevles*; Biologist Views Belief by *K. Parejka*; Christian Science & Quantum Physics by *R. Miller*; Hypnosis Reconsidered by *B. Seidman*; Public Relations by *B. Stano*; Communication's Hidden Dynamics by *D. Brenders*; The Knowledge Filter by *M. Shermer*; Alternative Medicine by *H. Zief*; Randi Addresses Congress; Dumbth by *R. Cassingham*; Jr. SKEPTIC: Fortunetelling.



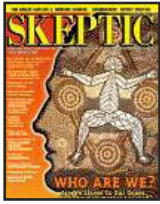
magv7n4-Pseudoscience: Interview of Phil Klass by *Posner*; Sagan Bios by *Shermer & Morrison*; Holistic Healing by *Mole*; Phantom Assaults by *Bartholomew & Goode*; Satan Panic by *Wade*; Penis Panics by *Bartholomew*; Eye Movement Therapy by *Rosen*; Sai Baba by *Gogineni*; Thought Field Therapy by *Swenson*; Lilienfeld & McNally; Photo ESP by *Kauffman & Brown*; Psi Missing by *Riniolo & Schmidt*. Jr. SKEPTIC: TV Psychics.



magv8n3-Chaos & Complexity: Jared Diamond Interview by *M. Shermer*; Quick Introduction to Chaos Theory by *F. Miele*; Chaos Skepticism by *M. Pigliucci*; Contingencies by *M. Shermer*; Latest Cosmology by *R. Ebert*; Complex Systems by *L. Lam*; Darwin Bumper Fish by *S. Gibson*; Randi on Cold Reading; Reverse Speech by *W. Langstoni & J. Anderson*; Cultural Relativism by *R. Bartholomew*; Stephen Jay Gould Festschrift.



magv10n1-Roswell Requiem: by *B. D. Giidenberg*; Psychic For A Day by *M. Shermer*; HAARP Conspiracy? by *D. Naiditch*; Fear by *D. G. Myers*; Blind Research by *R. Sheldrake*; Pet Psychics by *B. Farha*; Three Views Of Time Travel by *A. Bernardin*, *M. Shermer*, and *T. Dace*; Skeptical Maxims: by *J. Hrynshyn*, *J. Gribbin*, *P. Molé*; Homeopathy by *Randi*; Evolutionists Give Up by *B. Muller*; Jr. Skeptic: Alien Life by *D. Loxton*



magv11n2-Nature v. Nurture Human Nurture by *H. D. Schlinger*; A Consilient View of Human Behavior by *F. Miele*; Are Sports Streaks Random? by *A. Bernardin*; Alternative Health Journalism by *C. Bowerman*; A New Chronology of History by *J. Colavito*; Spiritualists Prove Religion With Science by *P. Firenze*; How to Investigate by *J. Randi*; Politicization Of Science by *D. O. Krieger*; Mexican UFOs by *J. C. Smith*; Cryonics by *G. Benford*; Jr. SKEPTIC: Sasquatch by *D. Loxton*



magv12n2-Artificial Intelligence Quest by *P. Kassan*; Design Illusion by *R. Dawkins*; Dover ID Trial by *B. Humburg & E. Brayton*; ID as Scientific as SETI? by *R. Camp*; Young Earth Creationists by *J. Rosenhouse*; Other ID Theories by *D. Brin*; Ted Serios's Camera Brain by *C. Campbell*; Omnitron by *Randi*; Coral Castle Enigma by *W. Stansfield*. Jr. SKEPTIC-Pyramid Power by *D. Loxton*. REVIEWS: 9/11; Privileged Planet Film; Republican War on Science



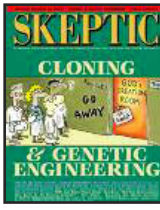
magv14n1-Global Warming: G W Skepticism by *P. Frank*; How We Know Warming Is Real by *T. Schneider*; Global Warming Solutions by *W. Calvin*; Hydrogen by *A. Friedemann*; Last Chance to Win \$1,000,000 by *J. Randi*; Detox Quackery by *H. Hall*; Houdini & Séance Fraud by *S. E. Rivkin*; Kong & Nessie by *D. Loxton*; Journalism's Flaws by *S. Salerno*; Supernatural Claims by *C. T. Palmer*, *K. Coe*, & *R. L. Wadley*. Reviews: Dragons by *Loxton*



magv14n4-Ponzi: Ponzi Scheme Psychology by *S. Greenspan*. FAITH HEALING: Medicine by *K. W. Krause*; Benny Hinn by *R. Shaffer*; Peter Popoff by *M. Carrier*. Self-Esteem Myths by *S. Salerno*; Gulf War Syndrome by *H. Hall*; Randi on Double Blind Studies; Evaluating Science Claims by *R. M. Barnes*, *A. L. Alberstadt*, & *L. E. Keilholtz*; Global Warming Consensus by *G. Whittenberger*. Reviews. Jr. SKEPTIC: *I. Rowland's* Psychic Cold Reading.



magv16n1-Happiness by *S. Salerno*; Zen Motorcycle Maintenance by *C. Edwards*; Genetic Tests by *H. Hall*; Gardner Tribute by *Randi & M. Shermer*; Changing Minds by *M. J. Kane*; Intellectuals v. Think Tanks by *M. Pigliucci*; Antony Flew's Conversion by *K. Grubbs*; Quantum Consciousness Myth by *M. Bief*; Mars Effect Statistics by *A. Y. Panchin*; Sports Dominance by *S. Sniderman*. Jr. Sk: Griffins - Loxton.



magv7n2-Cloning: Science, Ethics of Cloning by *F. Miele*; Cloning & Science's Moral Limits by *M. Shermer*; Richard Seed Interview; Evolution Information by *R. Dawkins*; Evil & Group Selection by *N. Thompson*; Theology & Evolutionary Psych by *K. Konkola & G. Sunshine*; Fake Quotes by *J. George*; Medical Discoveries? by *H. Zief*; Population Myths by *D. Henige*; Humor by *S. Asma & D. Lease*; Randi's Pigasus Awards; Jr. SKEPTIC: Urban Legends.



magv8n1-Race & Sports: Black Domination by *J. Entine*; Race Sports Myths by *J. Hoberman*; Race Differences by *V. Sarich*; Meaning of Dominance by *M. Shermer*; Ernst Mayr Interview by *F. Sulloway & M. Shermer*; Free Energy by *R. Park*; Nonzero Human Gaia by *D. Wilson*; Chiropractic by *S. Homola*; Attention Deficit Disorder by *J. Leo*; Geller Compass Trick by *Randi*; Mind/Body Problem by *W. Lee*; Women Skeptics? by *S. Gibson*; Jr. SKEPTIC: Darwin by *P. Linse*.



magv9n1-Anthropology Wars: Steven Pinker Interview; Intro to Anthro Wars by *F. Miele*; Science v. Spin Doctoring in Anthro Wars by *M. Shermer*; "Noble Savage"? by *P. Frank*; Margaret Mead Anthro Controversy by *P. Shankman*; Testing Mediums by *J. Randi*; Belief & New Transcendence by *D. Brin*; Velikovsky at 50 by *D. Morrison*; New Atlantis by *G. G. Fagan & C. Hale*, Jr. Skeptic: Did We Go To the Moon? by *P. Linse*



magv10n2-Stephen Wolfram's Science by *D. Naiditch*; Are We Getting Dumber? by *R. Ehlich*; Why Smart People Believe Weird Things by *M. Shermer*; Can the Media Help Science? by *H. N. Pollock*; The Media Harms Science by *S. Waxman*; Psychic Grief Counselors by *R. Freedman*; Randi; Mystery Balls by *R. Saberi*; B. Muller-Humor; John Edward Seminar by *B. J. Phelps*, *S. Pedersen*. E. Wogen; Test Sylvia Brown by *B. Farha*. Jr. SKEPTIC: Yeti by *Loxton*



magv11n3-Catastrophe by *R. A. Posner*; Collapse by *J. Diamond*; Double-Blind Protocol & Science by *S. Bratman*; Consumer Electronic Myths by *E. Winer*; Many Powerful Memories Untrustworthy? by *D. Greenberg*; Psychic Renier & Court TV by *G. Posner*; Shakespeare's Authorship by *D. Price*; Cholesterol by *M. E. Deutsch*; Forum: Nature-Nurture Debate; *Randi*; Film reviews: Question of God, Ramtha; Jr. SKEPTIC: Sasquatch Part Two by *D. Loxton*



magv13n3-Medical Controversies: Flawed Psychiatry by *J. Sorbara*; Reading Medical Research by *H. Hall*; Secondhand Smoke Debate: *S. Zion v. H. Hall*; Animal Research by *N. Shanks*, *R. Greek*, *N. Nobis*, & *J. Swingle-Greek*; Vaccine-Autism Myth by *M. Normand & J. Dallery*; Science Disputes/AIDS Origin by *B. Martin*; Randi on S. Harris; Cold Cures by *Hall*; Bonobo Politics by *F. de Waal*; Cosmology & ID by *Pilpel*; Jr. SK: Alien Astronauts



magv14n2-Is the Evolution of Intelligence Likely to Happen Again On Earth or On Other Planets?; Grief Studies a Myth? Criminal Profiling; Near Death Experiences; Phoenix Lights; Behind the Anti-science Film *Expelled*: 9/11 Conspiracy; Popular Medical Fallacies; Dyson & the Paranormal. REVIEWS: Snake Oil, Suckers; Perceptual Distortion; Arguments for God; Postmodern Misadventures; DNA Evolution; Spiritual Brain; Jr. Sk: Crystal Skulls.



magv15n1-Christian Origins Conspiracy Matt Ridley Interview; Atheism a Stealth Religion?; Hugh Ross v. Michael Shermer; Morristown UFO Hoax; Randi on Firewalking; Internet Matchmaking; Ape Language Controversy; Testing Orgone Energy; SkepDoc on Homeopathy, Placebo Effect; Flawed Justice System; Teach Critical Thinking. REVIEWS: Core theory; Science of Love; Metaphysical Mind; Film: Oppenheimer. JR SK: Scooby-Doo



magv16n2-Origin of Life by *P. F. Deisler*; Jr. New Atheists by *M. Dowd*; Accents by *C. Stollznow*; Religion & Violence by *B. G. Purzycki & K. Gibson*; Kurzweil's Flaws by *C. Edwards*; Science & Magic by *Randi*; Ayurvedic Medicine by *M. Carrier*; Incomprehensible Universe by *D. Zeigler*; Naturopathy by *H. Hall*; Literary Test by *M. Simkin*; Stradivarius Myth by *R.L. Barclay*; 9/11 Conspiracies by *S. Sommers*; Reviews. Jr. SKEPTIC: Investigation by *Loxton*.



magv7n3-Millennium: *T. Dufresne* Interviews Frederick Crews; Search for Immortality by *A. Herd*; Creation & The End by *T. McIver*; Celestine Prophecy by *P. Molé*; Millennial Meanings by *M. Shermer*; That's All Folks! by *D. Lease*; Randi Comments; Dumbth by *R. Cassingham*; Educashun by *S. Asma*; Myth & Science by *T. Callahan*; Political Extremism by *L. Hyman*. Jr. SKEPTIC Halloween; Autopsy Aliens. Haunt Houses by *B. Friedhoffer*



magv8n2-Skepticism & Religion: Frans de Waal Interview by *M. Shermer*; Agnosticism by *S. Dawson*; Skeptic's Faith? by *B. Wildish*; Scope's Trial Revisited by *T. Riniolo & L. Torrez*; Bible Belt by *G. Sloan*; Influence & Scientology by *D. Martin*; Bible/Nature by *H. Zerin*; Life's Meaning by *D. Naiditch*; Existence by *H. Vahidi & S. Friberg*; Personal Gods by *M. Pigliucci*; Prayer Heals? by *W. Matthews*, *T. Christ & J. Conti*; Randi; TV by *S. Gibson*. Jr. SKEPTIC: Pyramids.



magv9n3-A.I. & Theology of UFOs: Artificial Intelligence by *S. Harris*; Theology of UFOs by *B. Denzler*; Education Doesn't make Skeptics by *W. R. Walker*, *S. J. Hoekstra*, and *R. J. Vogt*; Accelerated Learning by *L. K. Hagan*; How Smart People Sabotage Thinking by *P. Molé*; Neo-Confederates by *C. M. Center*; Peers & influence by *B. Markovsky & S. R. Thye*; Freud, Darrow, & the Leopold/Loeb Trial by *T. C. Riniolo*. Plus Randi, Dumbth, Jr. SKEPTIC.



magv11n1-Medieval UFOs? by *D. Cuoghi*; African Witchcraft by *L. Igwe*; Xhosa Mass Suicide by *S. Kowitz*; Chinese Medicine's Origin by *D. Mainfort*; Puerto Rican Film Flam by *L. Montes-Valentin*; Dogon Mystery by *L. McDaid*; India's Conspiracy Theories by *D. A. Polak*; Gibson's Passion, Who Killed Jesus? & Da Vinci Code Facts by *Tim Callahan*; Berlitz by *L. K. Hagen*; Burden of Proof by *J. Randi*; Jr. SKEPTIC: Loch Ness by *D. Loxton*



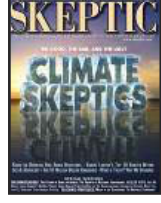
magv11n4-ID, Ernst Mayr: Dembski's Creationism by *M. Perakh*; Intelligent Design gets Peer-Reviewed by *R. Weitzel*; *Supernatural Test* by *S. Shuster*; Conspiratorial Thinking by *G. Case*; Are UFO Alien Faces an Inborn Template? by *F. V. Malmstrom*; Mind as Myth by *H. D. Schlinger*; Randi slams TV Promo of "Healer" John O'Geer; Race Debate; Also: Epicurus, God Code, Race, Ernst Mayr Tribute, Obesity, Gender, Resurrection, Jacques Derrida, Da Vinci Code. Jr. SKEPTIC: Madman of Magic



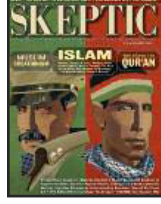
magv13n4-Quirkology: Odd Science of Everyday Life by *R. Wiseman*; Afterlife Debate: *D. Chopra v. M. Shermer*; Dawkins is Wrong About Religion by *D. S. Wilson*; Dawkins Replies; New ET Myths by *Tim Callahan*; Can Apes Learn Language? by *C. Wynne*; Franklin's Kite a Hoax? by *W. D. Stansfield*; Mozart Effect Myth by *W. Dowd*; Consciousness by *H. D. Schlinger*; Reviews: Levitt; Hall; Paranormal. Jr. Skeptic: Alien Astronauts II by *D. Loxton*



magv14n3-New Revisionism: if Hitler Had Won by *M. Shermer*; Skeptical of Evolved Altruism by *K. W. Krause*; Twins Experts Interviewed On Behavior Genetics and Evolutionary Psychology by *F. Miele*; New Look at Out-of-Body Experiences by *J. A. Cheyne*; Germ Theory Denial by *H. Hall*; Near Death Experiences by *S. Dieguez*; ID's Machine-like Flagella a Myth by *M. Perakh*; Wolfram Revisited by *G. Neske*; Reviews. Jr. SKEPTIC: Great American Skeptics.



magv15n4-Climate Skeptics by *D. Brin*; Dowsing Rod Bomb Detectors by *Randi*; Cell Phones & Cancer by *B. Leikind*; Fertility, Immune System by *H. Hall*; Longevity by *S. Salerno*; Biology Curriculum by *C. Lindgren*; Magic in Class by *P. Goodin*; Astrology & Sex by *C. S. Reichardt*; Million Dollar Challenge by *G. Thompson*; Atheist Stigma by *T. Arcaro*; Truths by *W. M. Gardner*; More Non-religious by *J. A. Cheyne*; Reviews. Jr. SKEPTIC: Top 10 Myths by *D. Loxton*.



magv16n3-Islam. R. S. Humphreys interview on Islam by *F. Miele*; Qur'an Origins by *T. Callahan*; Muslim Creationism by *M. Carrier*; Aspartame by *Hall*; Automatic Writing by *K. Stollznow*; UFO Artifact by *P. Linse & E. Harrison*; Understanding Evolution by *A. Shtulman*; D. Bem's Preconception by *N. Gauvrit*; Alien Contact OK? by *G. Michael*; Model Dependent Realism by *C. Edwards*; The Kraken! by *Loxton*. Reviews: G. Taubes, S. Harris, D.D'Souza.



magv16n4-Inventing UFOs by A. Simon; Alien Roswell by F. Borzellieri; Antioxidants by H. Hall; Sound Healing by K. Stollznow; \$1,000,000 Prize by Randi; Quakes/Tornados by D. Prothero; Effective Debate by D. Loxton; Creationist Self-Critique by R. M. Barnes & R.A.Church; Daryl Bem by N. Gauvrit; Sleep & Precognition by R. Wiseman; D'Souza by M. Dahler; William L. Craig by K. Grubbs; Fine-tuned Universe? by C. Sirola. Reviews. Fossil Fakes by D. Loxton.



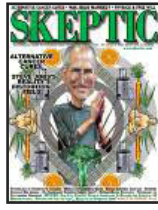
magv17n1-Scientology: 2 Views by J. Lippard; Scientology A Cult? by M. Shermer; Meaning of Life by D. Zeigler; 9/11 Demolition Science by Chris Mohr; Body Language by K. Stollznow; Scientific Medicine by H. Hall; Educational Reform by C. Edward; Science & Eternal Life? by C. Braun; Resurrection Hallucination by G. Wittenberger; Psychology A Science? by R. E. Silverman; Religion In Harry Potter by A. Armstrong; Reviews. Fossil Fakes 2 by D. Loxton.



magv17n2-Climate Change Q & A by D. R. Prothero; Foo Fighters by J.A. Lindell; No. 3 by S. Morris; Randi on Hitchens; Energy Medicine by H. Hall; Skeptic R. Rosen by K. Stollznow; Shroud of Turin by D. Loxton; Depression Treatments by B. E. Levine; Sensory Integration & Autism by C. A. Polenick & S. R. Flora; L. Krauss Interview by A. Z. Williams; Audio Hallucinations by J. E. Buckner V & R. A. Buckner; Sleep Paralysis by H. Love. REVIEWS. JR. SKEPTIC: The Mighty Moa! by D. Loxton.



magv17n3-Christian Civilization? by T. Callahan; Fetus Food Myth by T. Dupuy; Facilitated Communication by L. K. Hagen; Science/Democracy by B. Vroman; "Nothing" by C. Sirola; "Nothing" by M. Shermer; UFO Physics by M. K. Gainer; Planet Search by A. Narechania; Changing Minds by E. Prichard & S. Christman; Scientific Modeling by A. Woronow; Genesis Unique? by T. Callahan. Flake Equation by M. Shermer; REVIEWS. JR. SKEPTIC: Mokele-mbembe by D. Loxton



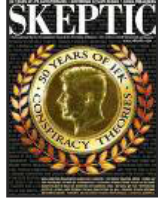
magv17n4-Cancer Cures? by H. Hall; Reality Distortion by M. Shermer; Free Will by V. J. Stenger; Neuroethics by M. Pigiucci; Fact Check by D. L. Halper; Was Jesus Married? by T. Callahan; Earth Grounding by H. Hall; Americans Discover Europe? by J. Colavito; Exorcist Bob Larson by K. Stollznow; Postmodern Nonsense by J. Davies; Howard Bloom Interview by F. Miele; Glossolalia by S. Semenyina et al.; Ancient Mythbuster by D. Loxton



magv18n1-Mass Murder: What Can We Do? by D. Hillshafer, by M. Shermer. Creationists' Dino Claim by P. Senter; Coral Castle by P. Hancock; Expanding Earth by D. R. Prothero; Poltergeist Rain Case by R. E. Bartholomew & J. Nickell; Sense of Being Stared At Test by J. M. Lohr, T.G. Adams, M. Schwarz, & R. E. Brady; Electromagnetic Sensitivity by H. Hall; Almanacs by K. Stollznow; Skeptic in Court I by Randi. REVIEWS. JR. SKEPTIC: Ghostbuster Girls! by D. Loxton



magv18n2-Gender Differences by H. Hall; Gender & the Paranormal by A. Saide; Science Reporting by H. Hall; Skeptics in Court II by Randi; Science/Handbook by K. Stollznow; Earth's Magnetic Field Reversal by D. Prothero; Skeptics in Films by R. Martoccia; Napoleon Chagnon Interview by F. Miele; Science & the Soul by S. Cave; Levels of Nothing by R. L. Kuhn; Witch Doctors by J. Chapman. JR SKEPTIC: Alien Invaders! by Loxton. Reviews.



magv18n3-50 Years of JFK Conspiracies by David Reitzes; Origin of Science in Paleolithic Times by L. Liebenberg; Science Denial Threats by D. Prothero; Great Radium Craze by R. Sutura; J. Randi, K. Stollznow and H. Hall on Scientology; Sylvia Browne by I. H. Smythe Sovereign Citizen Scam by J. Tsidulko, JR SKEPTIC: Mermaids by D. Loxton. REVIEWS: Media Panics; Earth's History: Amityville Horror; Room 237.



magv18n4-Ancient Aliens Evidence by C. White; Noacian Flood: Myth & Geology by T. Callahan & D. Prothero; Astrology v. Astronomy by Randi; Uncertainty in Medicine by H. Hall; Psychiatric Diagnosis by R. Lewis; Measuring Multiple Personalities by R. Stern & M. McDonald; Bigfoot Hunter by J. Blais; New Satanic Panic by M. Moran; Sean Carroll Interview by H. Trujillo; Medical Error Reduction by P. Levitt. JR SKEPTIC: Velikovsky by D. Loxton. REVIEWS.



magv19n1-Did Jesus Exist? by T. Callahan; Does Religion Make People Healthier? by H. Hall; Inside Faith Healing by D. White: Excerpt: Madalyn Murray O'Hair by M. Stephens; James Van Praagh's Afterlife by I. H. Smythe; Ghost Hunting at Sand Creek Massacre Site by Gregory F. Michno; Whistle-blowing Doesn't Work by F. V. Malmstrom and D. Mullin; Latest on IQ: James R. Flynn Interviewed by L. Traynor. JR SKEPTIC: Sagan by D. Loxton. REVIEWS.



magv19n2-Boston Bombing Conspiracies by G. Michael, Randi on M. Gardner; Faith Healing by H. Hall; Voynich Manuscript by K. Stollznow; Science of Memory by C. Tavis; Multiverse & God by R. Grigg; Soft Theism by M. Jako; Evolving a Soul by J. Harris; Mass Hysteria by R. E. Bartholomew; Probability and Miracles by Alex Boklin; Artificial Intelligence Optimism by B. Ferris; K. Sanders Cartoon. JR. SKEPTIC: Ghost Photos, Part I by D. Loxton. REVIEWS.



magv20n1-Terrorism. Terrorism Guide by R. E. Wackrow; Terrorism Myths by M. Shermer; Terrorism and Religion by K. Krause; Colloidal Silver by Harriet Hall, M.D.; Genius Myth by C. Tavis; Fake Rainmakers by Peter Olausson; Clever Hans by T. E. Heinzen, S. O. Lilienfeld, & S. A. Nolan; Testing for Demons by R. Ammirati, S. T. Hendrick, & S. O. Lilienfeld; Horror by S. T. Asma; Cow tipping by P. Linse; Quantum Quackery by J. Harris. JR. SKEPTIC: Hollow Earth II by D. Loxton. REVIEWS.



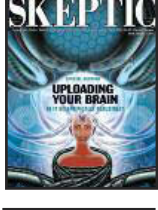
magv20n2-Drug Myths: Carl Hart Interview by F. Nogueira; Preventative Medicine by H. Hall; Raising Kid's IQs by C. Tavis; Parenting Myths by S. Hupp & J. Jewell; Calling E.T. by D. Brin; Do Emotions Effect Matter? by N. Gauvrit & S. Francfort; Placebos by J. Brissonnet, trans. by H. Hall; Diet & Heart Health by K. W. Krause; Supernatural? by Shermer; Putin's Dugin by R. Zubrin; Near-Death by C. Markum; Pseudo-Math by E. C. Prichard; JR. SKEPTIC: Hollow Earth II by Loxton.



magv20n3-Alfred Russel Wallace: Species by R. Conniff; Consilience by J. T. Costa; Human Cognition by L. Dugatkin; Spiritualism by R. Milner; Flat Earth by R. Milner & Shermer; Heretic Scientist by M. Shermer. Internet Civility by C. Tavis; Good Evidence; by H. Hall; Full Moon Test by J. D. Van Dyke; Non-Fine-Tuned Universe by J. Harris & E. Harris; Science/Theology by D. J. Navarick; Critical Thinking by J. E. & R.A. Buckner. JR. SKEPTIC: Bat-People Hoax by D. Loxton. REVIEWS.



magv20n4-Robert Trivers: Photo Amnesia by Tavis; Incidentalomas by H. Hall; Tanning Myths by A. Becirevic & D. D. Reed; Magic Perception by D. Russell; Moral Values: M. Hauser v. M. Shermer; Richard Paul Tribute by G. Hart; Destiny? by D. Zeigler; Radiation by J. A. Siegel & C. W. Pennington; Ben Carson's Beliefs by D. Prothero; Moving Tomb by G. J. van t Land; Education & Religion by N. M. Baker; God Debate: D. Navarick v. D. Matson; Reviews. Adamski UFOs by Loxton. REVIEWS.



magv21n2-Uploading the Mind: Plausible by K. Hayward; Implausible by P. Kassan; Mind-Body Problem by R. L. Kuhn. Flu Shots by Hall; Abuse Cycle? by Tavis; Extremists & Idealism by T. Dupuy; Islamism by P. Boghossian & J.A. Lindsay; Future Terrorism by P. Torres; Homo naledi by N. H. Lents; HIV Goat Milk Cure by Hall; Mass Hysteria by R. E. Bartholomew; St Paul by H. White; Pro Anti-Science by H. Siegal; ID Declines by D. Prothero; JR. SK: Man-Eating Plants by Loxton



magv21n3-Internet Porn = Sexual Dysfunction? "Yes" by P. Zimbaro, G. Wilson & N. Coulombe, "No" by M. Klein. Herbal Hazard by Hall; Sex Orientation by Tavis; Ancient Maya on Google by D.S. Anderson; Paleo Diet by A.R. Johnson; Does AA Work? by C. J. Bogart; End-Times by P. Torres; Neuropsychology of Bad Dreams by J. A. Cheyne; Poison Gas Attack by R. E. Bartholomew, et al.; EM Field Panic by J. Frantsve-Hawley; REVIEWS. JR. SK: Mammoths I by Loxton.



magv21n4-Cancer Care Industry by L. Kirk Hagen; Aging Claims by Hall; Train Memory by Tavis; Amityville by R. E. Bartholomew & J. Nickell; Alien Skull by D. Prothero, A. Bondarev, & Callahan; Nazca Lines by D. Iammarino; Galactic Defense System by G. Michael; Spirituality Defined by D. Speed; Clown Panics by R. Bartholomew; Living in a Computer Simulation? by Kassan; Luck & the Mean by G. Smith; Political Crit. Thinking by T. J. Redmond. JR. SK.



magv22n1-Bill Nye Saves the World. interview by M. Shermer; Functional Medicine by H. Hall; Prejudice by C. Tavis; ET v. Earth Germs by Callahan; Miracle Zamzam Water by M. Telias; Lone Wolf Terror by G. Michael; Torturing Data by Smith; Changing Minds by P. Boghossian; Shoddy Journalism by R. E. Bartholomew; Multiverse Trouble by P. Kassan; Football Playoff Science by M. J. Defant. JR. SKEPTIC: Kids Baloney Detection



magv22n2-Artificial Intelligence Danger AI Concerns by M. Graves; AI an Existential Threat? by Shermer; AI: Simulation/Synthesis? by P. Kassan; pH Med Myths by H. Hall; Racism Test by C. Tavis; Alt-Right by G. Michael; "Tractor" Quack Device by T. Hines; Area 51 by D. R. Prothero; Concept of Race by R. Khan & B. B. Boutwell; 3 Kinds of Atheism by B. Page & D.J. Navarick. REVIEWS: New Ideas; Men Age, Homo Deus; Science Deniers; Cons. JS: Chemtrails



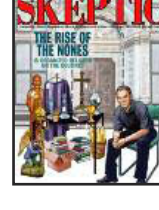
magv22n3-Hancock's Lost Civilization: Joe Rogan Debate by Shermer; Hancock's Geological Claims by M. Defant; Hancock's Historical Claims by Callahan. CONCEPTUAL PENIS HOAX: Why We Published It-Shermer; Hoax by Boghossian/Lindsay; On Hoaxes by Alan Sokal. Juicing by Hall; Our Angry Era by Tavis; CA Stem Cell Research by Barglow; Homo naledi by Lents; ET Aliens by Callahan; Taming Foxes by Trut/Dugatkin; Facts by D. Zeigler. JR SK Zombies-Loxton.



magv22n4-Science Wars. No Barriers to Inquiry by M. Shermer; Racist Shaming by S. Beckner; Science the Enemy by M.J. Defant; Wrong in Berkeley by R. Barglow; Alt-Left & Alt-Right by K. McCaffree; Diet Soda by Hall; Crow Intelligence by P. Lindenfors; Dr. Brian Hare Interview: Canine Minds by F. Nogueira; Biology & Crime by N. H. Lents & L. Kazemian; Taubes Sugar Claims by Hall; JFK Myths by M. J. Gagné; Dualism by P. Kassan. JS: Ghost Ships by Loxton.



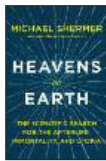
magv23n1-Evil. Atheists Find Meaning by R. Lewis; Atheism Defended by K. Levy; What is Evil? by G. Salis; Evaluating Evil by R. Stern; Moral Realism Debate by D. J. Navarick & M. Shermer; Alzheimers by Hall; Me, Too Movement by Tavis; Alien Skeleton by E. Weiss; Brazil Cancer Quackery by N. P. Taschner; Anna Freud by R. Barglow; Cuban Sonic Attack by R. E. Bartholomew; Education Upgrade by C. Edwards; F. Crews' Freud review by M. Schaefer. JS: Pet Psychics



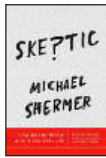
magv23n2-Rise of the Nones. Decline of Religion by Shermer; God Surveys by C. S. Reichardt; Fake Headlines by Hall; Please Touch by Tavis; Flat Earth by Loxton; Conspiracy Theory Harm by J. K. Lambert; Recovered Memory Tragedy by L. K. Hagen; Diversity's Value by T. M. Freeberg; Nuclear War by D. Barash; Our Place In the Cosmos by S. B. Gray; Multiverse by A. Sangalli; Ahtiesit Purpose by R. Lewis. REVIEWS: Victimhood Culture. JR SK: Perpetual Motion.

See <https://shop.skeptic.com/> for subscriptions, books, back issues, lectures, clothing and more...

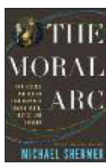
Michael Shermer



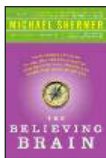
Heavens on Earth: the Scientific Search for the After-life, Immortality and Utopia by Michael Shermer. (b170HB \$30. hardback) What drives belief in life after death, plus scientific attempts to achieve immortality, extropians, transhumanists, cryonicists, and mind-uploaders. Utopias. Purpose and progress and what we can do in the here-and-now.



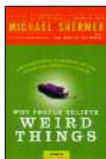
Skeptic by Michael Shermer. (b168HB \$28. hardback) A collection of 75 essays from Shermer's *Scientific American* columns. Features his trademark combination of deep scientific understanding, scientific concepts and theory, and an entertaining writing style.



The Moral Arc by Michael Shermer. (b162HB SALE! LIMITED NUMBER \$9.95 While they last. hardback) Are we living in the most moral period of our species' history? Extensive data suggest we are. Of the many factors over the centuries that have bent the arc in a more moral direction, science and reason are foremost.



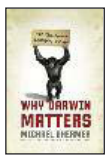
The Believing Brain... How the Brain Constructs Beliefs & Reinforces Them as Truths by Michael Shermer. (b149HB \$28. hardback) (b149PB \$15.95 paperback.) How beliefs are born, formed, nourished, reinforced, challenged, changed, and extinguished. From our superstitions to our politics, and economics. The neuroscience behind our beliefs, real-world examples of belief from all realms of life, and why science is the best tool ever devised to determine whether or not a belief matches reality.



Why People Believe Weird Things by Michael Shermer. (PB062 \$17. paperback) Witty & eloquent. A no-holds-barred assault on mass delusion, prejudice, & gullibility. UFOs, ESP, Near Death Experiences, Alien Abductions, Recovered Memories, Creationism, Holocaust Denial, Race, God, & Science v. pseudoscience. A classic & a best seller.



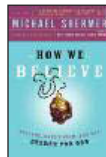
Borderlands Of Science by Michael Shermer. (PBB069 \$29.95. paperback. **Hardback on sale at \$10.00 each**) Where does valid science leave off and borderland science begin? Examines the theories, the people and the history involved in areas of controversy where sense is in danger of turning into nonsense.



Why Darwin Matters by Michael Shermer. (b111PB \$13. paperback) An insiders' guide to the evolution/creation debate—what evolution really is, how we know it happened, and how to test it. Why creationism and Intelligent Design theory are not science. Why 50% in U.S. reject evolution—spiritual, psychological and political reasons, such as moral relativism and social Darwinism.



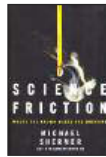
Soul of Science by Michael Shermer. (b109PBB \$5.) Shermer's popular lecture & inspirational essay as a pocket booklet. How can we find spiritual meaning in a scientific worldview? Religion may be the most common source of spirituality, but anything that generates a sense of awe may be a source of spirituality. Science does this in spades.



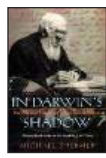
How We Believe (b063PB \$16.00 paperback) by Michael Shermer. An empirical study of 10,000 Americans—why do people believe in God?; science & religion controversies; proofs of God; did religion evolve?; deeper millennial destruction-redemption meanings; finding meaning in life; how people assume that others believe for different reasons than they do.



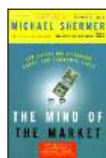
The Science Of Good and Evil: Why People Cheat, Gossip, Care, Share, & Follow the Golden Rule by Michael Shermer. (PB085—paperback \$17.) Broad in scope, deep in analysis, and controversial. Is it human nature to be selfish or selfless, fierce or loving, moral or immoral? Scientific evidence shows that morality is deeply embedded in our being and behavior. Explores how science can address some of our most difficult moral dilemmas.



Science Friction: Where the Known Meets the Unknown by Michael Shermer. (SALE: \$10. 100HB) Shermer becomes a psychic for a day, investigates quack cancer & alternative medicine, evolutionary psychology and the mutiny on the Bounty, chaos theory and history, intelligent design creationism, sports psychology, and more. Lively and fun reading.



In Darwin's Shadow: The Life & Science of Alfred Russel Wallace by Michael Shermer (HB081 \$55. hardback) A landmark biography of the co-discoverer of natural selection & the greatest naturalist of his age. Shermer applies modern psychological theories to understand why Wallace also crossed disciplines to become involved in spiritualism, seances, & life after death belief systems.



Mind of the Market by Michael Shermer. (b126PB \$15. paperback) Integrates behavioral economics, neuroeconomics, & evolutionary economics, expanding the application of science & skepticism to reveal that humans are just as irrational when it comes to money & markets as they are in other areas.



The Skeptic Encyclopedia of Pseudoscience by Michael Shermer, Ed. / Pat Linse, Con. Ed. TWO VOLUMES, \$129.00. (save over \$50.00 off the library price. Hardback. b082HB) Four parts: (1.) A-Z topic listings. (2.) Case Studies: In-depth analyzes. (3.) Pro & Con" debate section. (4.) Historical documents. Bibliography, Illustrated

DVDs

The Atheism Tapes av571DVD. \$29.95 (2 DVD set) A Documentary Extra with Jonathan Miller Neurologist, playwright, filmmaker & self-described atheist. Conversations with six of today's leading men of science and letters: Richard Dawkins, philosophers Daniel Dennett & Colin McGinn, playwright Arthur Miller, theologian Denys Turner, and Nobel laureate physicist Steven Weinberg. These distinguished thinkers discuss their personal intellectual journeys & offer illuminating analyses of belief & disbelief from a wide range of perspectives. Compelling viewing you won't want to miss.

THE ROOT OF ALL EVIL? The Original TV Documentary av568DVD. \$19.95. (2-DVD set) Two-part documentary ("The God Delusion" & "The Virus of Faith") plus Bonus Features: Commentary, Q&A; and a reading from *The God Delusion*, all by Richard Dawkins. Examines the power of religion, an interview with former Pastor Ted Haggard, novelist Ian McEwan, the former Bishop of Oxford, & others offer insights into the impact & consequences of faith in the 21st century.

Root of All Evil? The Uncut Interviews av569DVD. \$24.95 (3 DVD set) During the filming of *Root of All Evil?*, Richard Dawkins conducted many fascinating interviews. The footage was edited, and some entire interviews had to be omitted. Here are eight raw and uncut interviews, allowing the viewer a rare vantage point see these revealing exchanges. Interviews with: Jill Mytton; Ian McEwan; Bishop Richard Harries (Watch this interview free online at skeptical.com); Michael Bray; Hell House Pastor Keenan Roberts; Alister McGrath; Adrian Hawkes; & Rabbi Gluck.

The Great Debate-Does God Exist? av558DVD (DVD only-\$23.95) Dr. Doug Geivett, Professor of Philosophy at Talbot School of Theology at Biola University v. Dr. Michael Shermer, SKEPTIC magazine, Director, Skeptics Society. Dr. Geivett presents the best theological, philosophical, and scientific evidence for God's existence. Dr. Shermer counters these arguments, then presents the best scientific evidence that God and religion are human creations. Remarkably enlightening and entertaining! Lively Q & A.

Growing Up in the Universe av570DVD. (2-DVD set) (\$19.95) Richard Dawkins presents a series of lectures on life, the universe, and our place in it. With brilliance and clarity, Dawkins unravels an educational gem that will mesmerize young and old alike. Illuminating demonstrations, wildlife, virtual reality, and special guests (including Douglas Adams) all combine to make this collection a timeless classic. Originally presented as part of the Royal Institution Christmas Lectures for Children were founded by Michael Faraday in 1825.

Brain, Mind and Consciousness (av560DVD) FREE WITH ANY DVD ORDER! 3 DVDs. About 7 1/2 hours. Skeptics Society conference hosted by Michael Shermer and Roger Bingham. Christof Koch on neurobiology; Alison Gopnik on how brains learn; Richard McNally on false memory; Terrence Sejnowski on sleep & subconscious; Susan Blackmore on altered states; John Allman neurobiology of emotion; Paul Zak on behavioral economics; & Ursula Goodenough on morality.

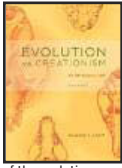
Break the Science Barrier av577DVD. \$15. A 1 hour film by Richard Dawkins. Communicates the power and the beauty of science including the discovery of the Big Bang, junk science in the courtroom, magic and deception, and how science is the best tool ever devised for understanding how the world works. Includes a delightful interview with Douglas Adams and magician Ian Rowland, who reveals how easy it is for any of us to be fooled by both magic & superstition.

Penn & Teller's Bullshit (first season) av553DVD (\$39.99) by Penn & Teller. A 13 episode boxed set of 3 DVDs from their TV show. The masters of in-your-face entertainment debunk everything from designer water to aliens to "alternative medicine." Outrageous! (second season) av557DVD by Penn & Teller (\$34.99) A 13 episode boxed set of 3 DVDs. Blows the lid off taboo topics like P.E.T.A., True Love, Safety Hysteria, Anti-Aging Treatments, Death...and more!

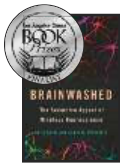
The Question of God (av556DVD \$34.98) 4 hours. An examination of the questions raised by theism and atheism seen through the lives of Sigmund Freud and C. S. Lewis, with roundtable discussion by Dr. Michael Shermer & eight other panelists.

The Original Cosmos Collector's Edition by Carl Sagan A beautiful boxed set of 7 DVDs. (av554DVD \$129.98) The original 13 hour series narrated in 1980 by Carl Sagan updated in 2000 with new science and images. The definitive tour of our universe. Inspiring! A classic!

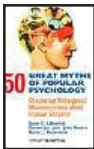
Other Fascinating Topics



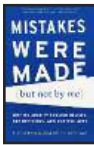
Evolution vs. Creationism: An Introduction by Eugenie C. Scott. The debate over teaching evolution continues in spite of the emptiness of the creationist positions. This accessible resource, now completely revised and updated, provides an essential introduction to the dispute's many facets—the scientific evidence for evolution, the legal and educational basis for its teaching, and the various religious points of view—as well as a concise history of the evolution-creationism controversy. Cat. No. b160PB (\$29.95 Paperback)



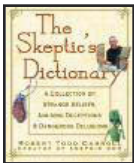
Brainwashed: The Seductive Appeal of Mindless Neuroscience by Sally Satel and Scott O. Lilienfeld. What can't neuroscience tell us about ourselves? Since fMRI was introduced in the early 1990s, brain scans have been used to help politicians understand and manipulate voters, determine guilt in court cases, and make sense of everything from musical aptitude to romantic love. But although brain scans and other neurotechnologies have provided groundbreaking insights into the workings of the human brain, the increasingly fashionable idea that they are the most important means of answering the enduring mysteries of psychology is misguided—and potentially dangerous. Cat. No. b159HB-(\$26.99 HB)



50 Great Myths of Popular Psychology by Scott O. Lilienfeld, Steven Jay Lynn, John Ruscio, and Barry L. Beyerstein. Do we use only 10% of our brains? Of course not, but this, and 49 other myths, have made their way into the brains of millions of people through pop culture. Three world-class psychologists deconstruct the myths, show how they got started, and explain why they're wrong. Includes critical thinking skills; a mythbusting kit; 200 additional psychological myths and an appendix of useful Websites; and last but not least, psychological findings that sound like myths but are actually true. Engaging and accessible. Cat. No. b158PB. (\$29.95 paperback)



Mistakes Were Made (but not by me): Why We Justify Foolish Beliefs, Bad Decisions, and Hurtful Acts by Carol Tavris and Elliot Aronson. Why do people dodge responsibility when things fall apart? Why the parade of public figures unable to own up when they screw up? Why the endless marital quarrels over who is right? Why can we see hypocrisy in others but not in ourselves? Are we all liars? Or do we really believe the stories we tell? Two of the world's greatest social psychologists answer these and other questions. Cat. No. b157PB (\$15. paperback)

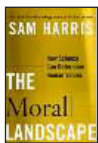


The Skeptic's Dictionary by Robert Carroll. (b086 PB \$19.95) Based on Carroll's website: skeptdic.com, the Dictionary is the definitive short-answer debunking of nearly everything skeptical. Nearly 400 definitions, arguments, and essays on topics ranging from acupuncture to zombies. A lively, commonsense trove of detailed information on all things supernatural, occult, paranormal, and pseudoscientific. It covers such categories as alternative medicine; cryptozoology; extraterrestrials and UFOs; frauds and hoaxes; junk science; logic and perception; New Age energy; and the psychic. Should be on every skeptic's book shelf. An invaluable reference.

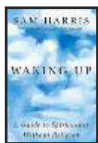


Secret Origins of the Bible by Tim Callahan. b079PB \$19.95 Many otherwise well informed readers will find much of the material in this book quite startling, although Bible scholars and comparative mythologists will be familiar with it. Contains material from many sources: literary analysis, archeology, history and comparative mythology to explain Bible stories that do not make sense when taken literally. Addresses: why is the bible so repetitive and contradictory?; what was ancient Egypt's influence on Christianity?; Is there evidence for the Exodus or Joshua's conquest of Canaan?; What Bible stories were derived from earlier tales?; What ancient myths influenced the Nativity, Passion, and Resurrection narratives?; did the Israelites worship other deities? A great reference book.

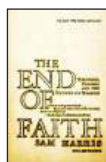
Sam Harris



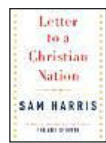
The Moral Landscape: How Science Can Determine Human Values by Sam Harris. (b141HB \$26.95 hardback) Views the experiences of conscious creatures as peaks and valleys on a "moral landscape." "Definite facts can be known about where we fall on this landscape, so science can go beyond merely describing morality—it should be able to tell us what we ought to do to live the best lives possible.



Waking Up by Sam Harris. Cat. No. b161HB-(\$20. Hardback) A guide to spirituality without religion. Meditation as a rational practice. Important truths from Jesus, the Buddha, Lao Tzu, Rumi, and other saints and sages. Waking Up is part memoir Only Harris—a neuroscientist, philosopher, and famous skeptic—could write it. **AUTOGRAPHED.**



The End Of Faith: Religion, Terror, and the Future of Reason by Sam Harris. (b139PB \$13.95 paperback). Harris' first book was an instant bestseller because of its cogent arguments & literary clarity, in which the author argues that because of weapons of mass destruction the world can no longer tolerate violent religions, & that in fact even moderate religious believers only encourage extremists by enabling their supernatural beliefs.

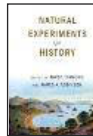


Letter to a Christian Nation by Sam Harris. (b140HB \$12. hardback) In this tightly reasoned commentary on the state of religion in America, Sam Harris pulls no punches in his arguments to members of the Christian Right on all matters moral and political, noting Old Testament law (death for adultery, homosexuality, disobedience to parents etc.) and contrasts this with, for example, the complete non-violence of Jainism. Harris argues that the reliance on dogma can create a false morality, which is divorced from the reality of human suffering and the efforts to alleviate it. Quite a bargain for only \$12.

Jared Diamond



The Third Chimpanzee: The Evolution and Future of the Human Animal by Jared Diamond (b049PB \$15. paperback) The evolution of human sexuality and science of adultery. How we pick our mates and sex partners. Why do we grow old and die? The animal origins of art. Why do we smoke, drink, and use dangerous drugs? The golden age that never was.



Natural Experiments in History (b138HB \$29.95 hardback) Edited by Jared Diamond and James Robinson. You can't run a controlled scientific experiment to discover the economic consequences of military conquest or slavery. But you can use comparative statistics from closely related societies to discover surprising reasons for far-reaching historical outcomes. Why is Haiti, which shares an island with the Dominican Republic, so much poorer? Why did deforestation occur on some Pacific islands and not others? Why did places conquered by Napoleon become wealthier than those that were not? Also: world banking systems, India, the New World.

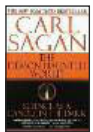


Collapse: How Societies Choose to Fail or Succeed by Jared Diamond. (88PB \$18. paperback) What caused some of the great civilizations of the past to collapse into ruin, and what can we learn from their fates? Diamond traces the fundamental patterns of social catastrophe.



Guns, Germs and Steel by Jared Diamond (b054PB \$15.95 paperback) Why did Eurasians conquer Native Americans, Australians, & Africans, instead of the reverse? Diamond dismisses racially-based theories of human history by revealing the environmental factors responsible for history's broadest patterns. A work rich in dramatic revelations that challenges conventional wisdom.

Carl Sagan



The Demon-Haunted World (b045PB \$15.95 paperback) by Carl Sagan. The great astronomer and science writer challenges New Agers & explains social phenomena like UFOs, alien abductions, recovered memories, satanic cults, witch crazes, hallucinations. How to detect baloney. A classic!

The Varieties of Scientific Experience: A Personal View of the Search for God

by Carl Sagan, Ed. by Ann Druyan. (B114PB \$17. paperback) Sagan's prestigious Gifford Lectures on Natural Theology. Considers: psychology of belief; possible chemical nature of transcendence; creationism & intelligent design; life on other planets; science as "informed worship." Humorous, wise, and at times stunningly prophetic. Sagan at his best.

\$5. Booklets



THE BALONEY DETECTION KIT

This 16-page booklet is designed to hone critical thinking skills. What questions to ask, what traps to avoid. Specific examples of how the scientific method is used to test pseudoscience and paranormal claims. Includes a how-to guide in developing a class in critical thinking. Includes: Sagan's Ten Tools for Baloney Detection; Shermer's Ten Questions For Baloney Detection; How Thinking Goes Wrong; The 25 Fallacies of Thought; Eight Sample Syllabi: How to Teach a Course in Science & Pseudoscience; Most Recommended Skeptical Books; Skeptical Manifesto. Baloney Detection Kit. Cat. No. PB075 16 pages, 8 1/2 x 11 booklet.



HOW TO DEBATE A CREATIONIST

PART I: BACKGROUND: Science on Evolution; Science & Religion; Debating a Creationist: Duane T. Gish; Creation myths. PART II: OLD & NEW CREATIONISM: 25 Creationist Arguments & 25 Evolutionist Answers. Philosophically based arguments: 1-12; Scientifically based arguments: 13-25 PART III: THE NEW NEW CREATIONISM: Creationist strategies to get into schools; Why creationism is not science. U.S. Supreme Court ends new creationism. • The Rise of Intelligent Design Theory: Ten I.D. arguments including: The Nature of the Designer; Methodological Supernaturalism; Irreducible Complexity; Inference to Design; Fine Tuned Universe; Conservation of Information. How to Debate A Creationist Cat. No. PB007. 28 pages, 8 1/2 x 11 booklet.



A Skeptic's Guide to Global Climate Change

by Don Prothro (148PB \$5. paperback) See skeptic.com for multiple copy discounts! The Scientific Background & Evidence for Climate Change; M. Shermer on why he changed his mind; Skepticism v. Denialism; Answers to 25 Climate Denier Arguments; Are We the Cause?; Forces Behind Science Denialism; A Skeptical Scientist Looks at Climate Data; Consequences. 28 pages 8 1/2 x 11 inches.

DISCOUNTS ON ORDERS OF ANY 5 OR MORE: 626/794-3119

Don Prothro

Reality Check by Don Prothro (b151HB \$35. hardback)

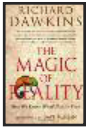
Describes how major scientific ideas that are accepted by the entire scientific community (evolution, anthropogenic global warming, vaccination, the HIV cause of AIDS, and others) have been attacked with totally unscientific arguments and methods, and argues that science denial has resulted in widespread scientific ignorance, increased risk of global catastrophes, and deaths from disease.

Catastrophes! Earthquakes, Tsunamis, Tornadoes, and Other Earth-Shattering Disasters (b147HB \$30. hardback) A fascinating read. Describes historic catastrophic events and the forces that cause them in gripping detail. These tales of geologic history and human fortune & folly will stay with you long after you put the book down & leave you with respect for the mighty power of the earth.

Greenhouse of the Dinosaurs: Evolution, Extinction, and the Future of Our Planet (b137HB \$29.95 hardback) Dr. Donald Prothro discusses the latest findings and controversies in geology and paleontology, using a personal narrative style and examples from his own career. A must read for anyone interested in these professions. A section of the book covers the possible reasons for past radical climate changes and extinctions—from jungles in the Arctic to the frozen snowball earth—and what this could mean for us and our current changing climate.

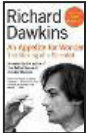
Evolution: What the Fossils Say and Why It Matters by Donald Prothro. (b127HB \$30. hardback) Rave reviews! "Best damn evolution book, period!" "A great introduction to the field or get up to speed on the latest discoveries in the incredibly rich fossil record, with an emphasis on transitional forms. Includes a no holds barred critique of the claims of creationism and Intelligent Design. Over 200 illustrations.

Richard Dawkins



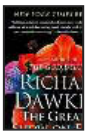
The Magic of Reality: How We Know What's Really True by Richard Dawkins

For years people have wanted the renowned evolutionary biologist to write a book for kids on evolution. He has done that—and much more—with this highly engaging and well-illustrated work that will also enlighten adults who read it. Filled with clever thought experiments and jaw-dropping facts, *The Magic of Reality* explains a stunningly wide range of natural phenomena. This is a page-turning detective story that not only mines all the sciences for its clues but primes the reader to think like a scientist as well. **Cat. No. b166PB (\$16. paperback)**



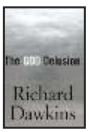
An Appetite for Wonder: The Making of a Scientist

by Richard Dawkins. Cat. No. b167PB. (\$15.99 paperback) A memoir covering material from Dawkins' childhood in colonial East Africa through the publication of his world-changing bestselling book *The Selfish Gene*. Told with frankness and eloquence, warmth and humor. An entertaining and enlightening read.

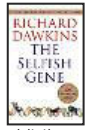


The Greatest Show on Earth

by Richard Dawkins. (b143PB \$16.99 paperback) A fierce counterattack against Intelligent Design. Rich layers of scientific evidence: living examples of natural selection; fossils; natural clocks; developing embryos; plate tectonics; molecular genetics—all make an airtight case for evolution by non-random selection. A master vision of life's splendor.



The God Delusion by Richard Dawkins. (B113PB \$15.95 paperback) Dawkins' most important book to date, his definitive statement on the God question, the origins of morality & religion, the best arguments for and against God's existence, the dangers of religious extremism, and why science offers the best hope for humanity.



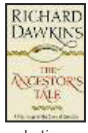
The Selfish Gene

by Richard Dawkins. (b123PB \$15.95 paperback) Changed the nature of the study of social biology. This brilliant reformulation of the theory of natural selection explains how the selfish gene revolves around savage competition and exploitation—yet acts of apparent altruism do exist in nature.



The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe Without Design

by Richard Dawkins. (b087PB \$15.95 paperback) Perhaps the most influential work on evolution written in this century. Natural selection—the unconscious, automatic, blind, yet essentially nonrandom process—has no purpose in mind. If it can be said to play the role of watchmaker in nature, it is the blind watchmaker. Engaging and accessible.



The Ancestor's Tale

by Richard Dawkins. (b092PB \$16.95 paperback) A masterwork: an exhilarating reverse tour through evolution, from present-day humans back to the microbial beginnings of life. Entertaining, insightful stories. Sheds light on topics such as speciation, sexual selection, and extinction. An essential education in evolutionary theory and a riveting read.



A Devil's Chaplin

by Richard Dawkins. (b122PB \$14. paperback) Diverse topics examined through the lens of natural selection: education, ape rights, jury trials, the vindication of Darwinism; memes; religion, academic obscurantism; Stephen Jay Gould; Douglas Adams; pseudoscience; & his awe at the marvelous complexity of the universe. Written with clarity & passion.



Climbing Mount Improbable

by Richard Dawkins. (b121PB \$16.95. paperback) The Mount Improbable metaphor symbolizes the improbability that seemingly perfectly designed living things evolved. In a breathtaking journey through the mountain's passes and up its many peaks, Dawkins demonstrates how the improbable path to perfection merely takes

A Classic!

Award Winner!

NEW YORK TIMES BESTSELLER

MULTI-AWARD WINNING CHILDREN'S BOOKS

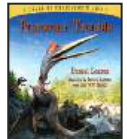
Daniel Loxton



Evolution: How We and All Living Things Came to Be by Daniel Loxton. (b136HB \$18.95) Ages 8–13. Winner of multiple awards. Easy to understand, spectacularly illustrated introduction to the theory of evolution. How the evidence for evolution was discovered, the basic mechanics of how it works. Answers to common questions and misunderstandings about evolution. Written with warmth and enthusiasm. Outstanding science content.



Ankylosaur Attack (Tales of Prehistoric Life) by Daniel Loxton. (b145HB \$16.95) Ages 4 and up. A mind-blowing feast for the eye that uses photorealistic images along with an exciting, natural history-inspired story. Pre-school children will enjoy a story that features a young hero. A young ankylosaur (a plant-eating, heavy-plated dinosaur) saves the day when a T. rex attacks. A surefire hit with young dinosaur lovers.



Pterosaur Trouble (Tales of Prehistoric Life) by Daniel Loxton. (b149HB \$16.95) Ages 4 and up. A dramatic paleofiction tale inspired by real fossil discoveries. The mighty pterosaur Quetzalcoatlus—perhaps the largest flying animal ever to exist—finds himself on the menu for a pack of small feathered Velociraptor-like dinosaurs. This photorealistic adventure will delight and astonish.



Plesiosaur Peril (Tales of Prehistoric Life) by Daniel Loxton. (b153HB \$16.95) Ages 4 and up. A group of plesiosaurs, ocean-dwelling cousins of the dinosaurs, keeps safe by swimming in a family pod. But when one baby plesiosaur swims too far from its mother it attracts the attention of something large and very hungry and the struggle for survival is on.



Do You Believe in Magic? Vitamins, Supplements, and All Things Natural by Paul A. Offit, M.D.

Medical expert Offit offers a scathing exposé of the alternative medicine industry, revealing how even though some popular therapies are remarkably helpful due to the placebo response, many of them are ineffective, expensive, and even deadly. He concludes: "There's no such thing as alternative medicine. There's only medicine that works and medicine that doesn't."

Cat. No. b156PB (\$15.99 paperback)

CHILDREN'S BOOKS

Secrets of Mental Math: The Mathematician's Guide to Lightning Calculation and Amazing Math Tricks

(12 to adult.) (b112PB \$12.95) By Arthur Benjamin & Michael Shermer. Renowned "mathemagician" Benjamin shares his secrets for lightning-quick calculations & amazing number tricks. Learn to do math in your head faster than you ever thought possible & make math fun.



The Magic Detectives

Written and illustrated by Joe Nickell (b070PB \$15. 115 pages. Paperback. 9 to 14 yrs) 30 mysteries—encourages readers to think for themselves before the solution is offered. Historical ghost incidents, Lock Ness, UFO aliens, Mummy's Curse, Holy Shroud, and more.



Maybe Yes, Maybe No

by Dan Barker (b071PB \$16.00, 128 pages. paperback. 7-10 years) Adventures of Andrea, a skeptic. Cartoon strip style. How to check out extraordinary claims. Simple straightforward text. How to listen and ask questions; how to seek a simple explanation; what tools and rules a scientist uses to check things out.



Sasquatches From Outer Space

by Tim Yule. (Ages 10-15) (b072PB \$15.) Chatty cheerful style. Covers Astrology, bigfoot, ESP, the Bermuda triangle, crop circles, Loch Ness Monster, Vampires, and UFOs and aliens. Glossary, bibliography. "Try This" sections encourage critical thinking skills.



Test Your Science IQ

by Charles Cazeau (b073PB \$20.00, 368 pages. paperback. 12 to adult) Hundreds of addictive questions & answers covering both science & pseudoscience. Clear, well written, yet sophisticated enough for adults. Very strong on why science is important. A book you will enjoy experiencing with your child. Fascinating and fun.



Wonder Workers! How They Perform the Impossible

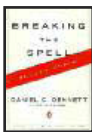
Written and illustrated by Joe Nickell (b099PB \$17.00, 94 pages. paperback. 9 to early teens) Detective Nickell investigates and reveals the secrets of the Fireproof Man, the bullet trick, levitation, the Human Magnet, a psychic, the Man Who Walked Through Walls, X-ray Vision, mind reading, Edgar Cayce & Peter Hurkos. With suggestions on how to use the stories to encourage critical thinking.

Daniel C. Dennett



Darwin's Dangerous Idea: Evolution and the Meanings of Life

by Daniel C. Dennett. Both groundbreaking and accessible. Focuses unerring logic on the theory of natural selection, showing how Darwin's great idea transforms and illuminates our traditional view of humanity's place in the universe. Dennett vividly describes the theory itself and then extends Darwin's vision with impeccable arguments to their often surprising conclusions, challenging the views of some of the most famous scientists of our day, including Stephen Jay Gould. **Cat. No. b155PB. (\$18. paperback)**



Breaking the Spell: Religion as a Natural Phenomenon

by Daniel C. Dennett. In this definitive work on religion by one of the "Four Horsemen" and world-famous philosopher Daniel Dennett asks "Is religion a product of blind evolutionary instinct or rational choice?" "Is it truly the best way to live a moral life?" Ranging through biology, history, and psychology, Dennett charts religion's evolution from "wild" folk belief to "domesticated" dogma. **Cat. No. b154PB. (\$18. paperback)**

1995 National Book Award Finalist

NEW YORK TIMES BESTSELLER

Award Winners!



UFOs, Chemtrails, and Aliens: What Science Says

(b171HB \$28.00) Donald R. Prothero and Tim Callahan Explores why demonstrably false beliefs—UFOs. Aliens. Strange crop circles— thrive despite decades of education and scientific debunking. Employs the ground rules of science and the standards of scientific evidence and discusses a wide range of topics including the reliability of eyewitness testimony, psychological research into why people want to believe in aliens and UFOs, and the role conspiratorial thinking plays in UFO culture. Callahan and Prothero examine a variety of UFO sightings and describe the standards of evidence used to determine whether UFOs are actual alien spacecraft. Finally, they consider our views of aliens and the strong cultural signals that provide the shapes and behaviors of these beings. While their approach is firmly based in science, the authors also share their personal experiences of Area 51, Roswell, and other legendary sites, creating a narrative that is sure to engross both skeptics and believers.



Abominable Science!: Origins of the Yeti, Nessie, and Other Famous Cryptids by Daniel Loxton and Donald Prothero. (b150HB \$29.95 hardback) An entertaining, educational, and definitive text on cryptids, presenting the arguments both for and against their existence. Takes on Bigfoot; the Yeti, or Abominable Snowman, and its cross-cultural incarnations; the Loch Ness monster; the evolution of the Great Sea Serpent; and Mokele Mbembe, the Congo dinosaur. Analyses the psychology behind the persistent belief in paranormal phenomena, and discusses the cryptozoology subculture.

CLOSEOUT SALE!! LECTURE DVDs—SAVE 70 to 90%

Limited Quantities • Order now for best selection • While they last

The more you buy the more you save. For U.S. destinations we will also offer a generous shipping discount. Visit www.skeptic.com or call our office for quantity and shipping discounts. (626) 794-3119
See page 1 and the inside front cover for a full list of available lectures.

FREE WITH EVERY DVD ORDER BRAIN, MIND, CONSCIOUSNESS CONFERENCE—3 DVD SET

The Brain, Mind & Consciousness conference, on what Nobel Laureate Francis Crick called “the greatest unsolved problem in biology.” This 3-DVD set includes 30–50 minute talks by **Michael Shermer, Roger Bingham, Christof Koch, Alison Gopnik, Terry Sejnowski, Richard McNally, Susan Blackmore, John Allman, Paul Zak, Hank Schlinger** and **Ursula Goodenough**.

Research on the brain, mind, and consciousness was given a significant boost in 1994 when Dr. Francis Crick wrote in his book *The Astonishing Hypothesis* “you, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules.”

Explaining each of the functional parts of the brain is the easy problem, such as the differences between discrimination of stimuli, or the control of behavior. By contrast, the hard problem is explaining how billions of neurons swapping chemicals give rise to such subjective experiences as consciousness, self-awareness, and awareness.

Dualists hold that qualia are separate from physical objects in the world and that mind is more than brain. Materialists contend that qualia are ultimately explicable through the activities of neurons and that mind and brain are one. Our speakers, some of the top neuroscientists in the world, will address these and other problems, such as the evolution of the brain, and how and why it got to be so large. Skeptics will get a chance to interact with these world-class scientists on the breaks, during meals, and in a formal discussion period. We will also consider the implications of this new brain research to better understand apparent paranormal phenomena, as well as how and why people believe weird things.

Lectures include: *The Quest for Consciousness: A Neurobiological Approach* with Dr. Christof Koch, *Children as Scientists: How the Brain Learns to Think* with Dr. Alison Gopnik, *In Search of Memory—True, False, Repressed, Recovered* with Dr. Richard McNally, *Sleep, Dreams, and the Subconscious* with Dr. Terry Sejnowski, *Exploring Altered States of Consciousness* with Dr. Susan Blackmore, *The Search for the Neurological Basis of the Social Emotions* with Dr. John Allman, *From Whence Trust Comes: Oxytocin and Behavioral Economics* with Dr. Paul Zak, *Consciousness is Nothing But a Word* with Dr. Hank Schlinger, and *From Biology to Consciousness to Morality* with Dr. Ursula Goodenough.

THE GREAT LEAP FORWARD: The Evolution of Human Creativity & Language **Dr. JARED DIAMOND**

Although humans may be classified as the “third chimpanzee” by virtue of the fact that we share 98% of our genes with the other two species, how is it that we developed a complex verbal language, writing, art, science, religion—culture and civilization—while our cousins did not? Further, why is it that Cro-Magnons succeeded where Neanderthals did not, when both were flourishing simultaneously? Dr. Diamond challenges skeptics with his controversial theory that it was the evolution of human creativity and language 30,000 to 40,000 years ago that gave Cro-Magnons the advantage they needed to become fully modern humans. But Neanderthals are even more similar to modern humans than chimpanzees—why didn't they develop creativity and language? Neanderthals had tools—why didn't they survive as a separate modern species of the genus Homo? These questions and more will be addressed by Dr. Diamond, one of the most stimulating scientists, authors, and speakers of our age. Dr. Jared Diamond is Professor of Physiology at the UCLA Medical School. He has published no less than 508 papers and 7 books in such diverse areas as physiology, biophysics, evolution, ecology, and anthropology, including over 40 columns for Discover magazine and 30 for Natural History. He has led 14 expeditions to the South

Pacific, focusing on the flora, fauna, and native people of New Guinea. Dr. Diamond is not only one of the most respected scientists in the world today, he is also considered to be one of the finest science writers, a combination achieved by only a handful in the history of science. He authored the best selling *The Third Chimpanzee*—winner of the L.A. Times Science Book Prize.

FUZZY LOGIC: Science Without Math? **Dr. BART KOSKO**

Most math models in science are linear models even though no one has found a truly linear process in nature. Nonlinear math models have more power and accuracy, and neural and fuzzy systems are tools that let us model nonlinear systems without having to guess at their exact mathematical form. In other words, we can do science without math through function approximation. Don't miss this lecture by the pioneer of fuzzy logic, who will speculate about how this new science will be applied in the 21st century to such diverse problems as moving traffic on a freeway, airport traffic control, computers and artificial intelligence,

Dr. Bart Kosko is Director of the Signal and Image Processing Institute and an Associate Professor in the Department of Electrical Engineering at the University of Southern California. He is the author of the best-selling popular science book *Fuzzy Thinking* and the three Prentice Hall textbooks *Neural Networks and Fuzzy Systems*, *Neural Networks for Signal Processing*, and *Fuzzy Engineering*. He is an elected member of the governing board of the International Neural Network Society (INNS), editor of the Springer-Verlag book series *Lectures in Neural Computing*, and has published nearly a hundred technical papers and has licensed a patent on fuzzy spread-spectrum (wireless) communication. His new nonfiction book *Heaven in a Chip* will be published by Bantam/Broadway this spring, and his cyberthriller novel *Nanotime* will be published this summer by Avon Books, **AV051DVD**

ENVIRONMENTAL WARS CONFERENCE 2006—Tape 2 DEBATE: **CHRIS MOONEY v. RONALD BAILEY** “Distorting Science: Who is Worse—the Left or Right?”

Chris Mooney is Washington correspondent for *Seed* magazine and a senior correspondent for the *American Prospect*. He focuses on issues at the intersection of science and politics, and is author of the bestselling *The Republican War on Science*, dubbed “a landmark in contemporary political reporting” by Salon.com and a “well-researched, closely argued and amply referenced indictment of the right wing's assault on science and scientists” by *Scientific American*. Chris has written for *Wired*, *Seed*, *Mother Jones*, *New Scientist*, *Legal Affairs*, *Reason*, *The New Republic*, *The American Scholar*, *The Washington Post*, *Columbia Journalism Review*, *The Washington Monthly*, *The Los Angeles Times*, and *The Boston Globe*. His blog, “The Intersection,” won *Scientific American's* 2005 Science and Technology web award. Mooney was recently named one of *Wired's* ten “sexiest geeks.”

Ronald Bailey is the science correspondent for *Reason* magazine. He is the author of *Liberation Biology: The Moral and Scientific Case for the Biotech Revolution*, and his work appears in *The Best American Science and Nature Writing 2004*. He edited *Earth Report 2000: Revisiting The True State of The Planet*, and is the author of *ECOSCAM: The False Prophets of Ecological Apocalypse, Global Warming and other Eco Myths*, and his latest book, *Liberation Biology: The Scientific and Moral Case for the Biotech Revolution*. He has produced several series and documentaries for PBS television and ABC News. He is a member of the Society of Environmental Journalists. **av162DVD**

Dr. SEAN CARROL

THE PARTICLE AT THE END OF THE UNIVERSE: HOW THE HUNT FOR THE HIGGS BOSON LEADS US TO THE EDGE OF A NEW WORLD

Scientists have just announced an historic discovery on a par with the splitting of the atom: the Higgs boson, the key to understanding why mass exists. In *The Particle at the End of the Universe*, Caltech physicist and acclaimed writer Sean Carroll takes you behind the scenes of the Large Hadron Collider at CERN to meet the scientists and explain this landmark event. What is so special about the Higgs boson? We didn't really know for sure if anything at the subatomic level had any mass at all until we found it. The fact is, while we have now essentially solved the mass puzzle, there are things we didn't predict and possibilities we haven't yet dreamed. A doorway is opening into the mind-boggling, somewhat frightening world of dark matter. We only discovered the electron just over a hundred years ago and considering where that took us—from nuclear energy to quantum computing—the inventions that will result from the Higgs discovery will be world-changing. **av261DVD**

ENVIRONMENTAL WARS CONFERENCE 2006—Tape 3

Dr. Donald R. Prothero: “Catastrophes that Shape the Planet.” Dr. Prothero is Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology in Pasadena. He is currently the author, co-author, editor, or co-editor of 21 books and almost 200 scientific papers, including five leading geology textbooks and three trade books. He is on the editorial board of *Scientific* magazine, and in the past has served as an associate or technical editor for *Geology*, *Paleobiology* and *Journal of Paleontology*. He is a Fellow of the Geological Society of America, the Paleontological Society, and the Linnean Society of London, and has also received fellowships from the Guggenheim Foundation and the National Science Foundation. He has also been featured on several television documentaries, including episodes of *Paleoworld* and *Walking with Prehistoric Beasts*.

Dr. Brian Fagan: “Climate Change and Ancient Societies.” Dr. Fagan is Emeritus Professor of Anthropology at the University of California, Santa Barbara and one of the world’s leading archaeological writers. An authority on world prehistory, he spent his early career working in museums in tropical Africa before specializing in communicating archaeology to general audiences. His many books include *The Rape of the Nile*, *The Great Journey*, *The Little Ice Age*, *The Long Summer*, and most recently, *Fish on Friday: Feasting, Fasting, and the Discovery of North America*. His other interests include bicycling, cruising under sail, good food, and cats.

Dr. Gregory Benford: “Stabilizing the Future Greenhouse Earth” Dr. Gregory Benford has published over 30 books. His fiction has won many awards, including the Nebula Award for his novel *Timescape*. A winner of the United Nations Medal for Literature, he is a professor of physics at the University of California, Irvine. He is a Woodrow Wilson Fellow, was Visiting Fellow at Cambridge University, and in 1995 received the Lord Prize for contributions to science. A fellow of the American Physical Society and a member of the World Academy of Arts and Sciences, he continues his research in both astrophysics and plasma physics. **av163DVD**

JONATHAN KIRSCH

A HISTORY OF THE END OF THE WORLD: HOW THE MOST CONTROVERSIAL BOOK IN THE BIBLE CHANGED THE COURSE OF WESTERN CIVILIZATION

The question of how and when the world will end has captivated thinkers for centuries. Wars, natural disasters, social upheaval and personal suffering often send believers back to the writings of their prophets and seers, whose gift is to bring satisfying answers to such questions. The book most studied in the Western tradition is Revelation, the last entry in the Christian canon.

Kirsch, a book columnist for the *Los Angeles Times* and the author of numerous bestsellers about the Bible, takes the reader on a delightful 2,000-year journey and shows how churches, philosophers, clergy and armchair interpreters have promoted their political, social and religious agendas based on their belief that the end was imminent. Some of this history can be quite sobering, as the powerful have waged wars and built societies based on their varying perceptions of Revelation’s message. However, consistent with Kirsch’s earlier literary efforts, in particular *The Harlot by the Side of the Road*, the author exercises great care while treating his material with both sobriety and a healthy sense of the ironic. Jonathan Kirsch is the author of *God Against the Gods*, *The Woman Who Laughed at God*, *King David*, and *Moses*. **av171DVD**

CATASTROPHES! EARTHQUAKES, TSUNAMIS, TORNADOES, AND OTHER EARTH-SHATTERING DISASTERS

Dr. DONALD PROTHERO

Devastating natural disasters have profoundly shaped human history, leaving us with a respect for the mighty power of the earth—and a humbling view of our future. Paleontologist and geologist Donald R. Prothero tells the harrowing human stories behind these catastrophic events: • The New Madrid, Missouri, earthquakes of 1811-1812 that caused church bells to ring in Boston • The 2004 Indian Ocean tsunami that killed more than 230,000 people • The massive volcanic eruptions of Krakatau, Mount Tambora, Mount Vesuvius, Mount St. Helens, and Nevado del Ruiz. His clear explanations of the forces that caused these disasters accompany gut-wrenching accounts of terrifying human experiences and a staggering loss of life. Floods that wash out whole regions, earthquakes that level a single country, hurricanes that destroy everything in their path—all remind us of how little control we have over the natural world. **av232DVD**

SCIENCE SYMPOSIUM

Dr. MICHAEL SHERMER

THE BELIEVING BRAIN FROM GHOSTS AND GODS TO POLITICS AND CONSPIRACIES— HOW WE CONSTRUCT BELIEFS AND REINFORCE THEM AS TRUTHS.

Synthesizing thirty years of research, Shermer upends traditional thinking about how humans form beliefs about the world. Simply put, beliefs come first, and explanations for beliefs follow. The brain, Shermer argues, is a belief engine, using data that flow in through the senses, it naturally looks for and finds patterns—and then infuses those patterns with meaning, forming beliefs. Once formed, our brains subconsciously seek out confirmatory evidence in support of those beliefs, accelerating the process of reinforcing them. Shermer provides countless real-world examples of how this process operates, from politics, economics, and re-

ligion to conspiracy theories, the supernatural, and the paranormal. And ultimately, he demonstrates why science is the best tool ever devised to determine whether or not our beliefs match reality. **av233DVD**

SCIENCE SYMPOSIUM

Dr. MICHAEL SHERMER: ON SCIENCE RELIGION, AND MORALITY

Shermer tackles two of the deepest and most challenging problems of our age: (1) The origins of morality and (2) the foundations of ethics. Is it in our nature to be moral, immoral, or amoral? If we evolved by natural forces then what was the natural purpose of morality? If we live in a determined universe, then how can we make free moral choices? If there is no outside source to validate moral principles, does anything go? Can we be good without God? He peels back the inner layers covering our core being to reveal a complexity of human motives—selfish and selfless, cooperative and competitive, virtue and vice, good and evil, moral and immoral—and how these motives came into being as a product of both our evolutionary heritage and cultural history, and how we can construct an ethical system that generates a morality that is neither dogmatically absolute nor irrationally relative, a rational morality for an age of science. **av234DVD**

ENVIRONMENTAL WARS CONFERENCE 2006—Tape 4

ADLER, ARNOLD, MACCREADY

Jonathan H. Adler: “Fables of Federal Environmental Regulation.” Jonathan Adler is Associate Professor and Associate Director of the Center for Business Law and Regulation at Case Western Reserve University where he teaches courses in Environmental Law, International Environmental Law, and Constitutional Law. Prior to entering law school, he worked as the Director of Environmental Studies for the Competitive Enterprise Institute in Washington, D.C. Mr. Adler’s writing focuses primarily on environmental and regulatory policy issues. He is the author or editor of *Ecology, Liberty, and Property: A Free Market Environmental Reader*, *The Costs of Kyoto: Climate Change Policy and its Implications*, and *Environmentalism at the Crossroads: Green Activism in America*. He has written articles for such journals as *Environmental Law and Supreme Court Economic Review* as well as *The Wall Street Journal* and *The Washington Post*. He is also a contributing editor to *National Review Online*.

Dr. Paul MacCready: “Doing More with Less for a World that Works.” Paul MacCready is an aeronautics engineer who was voted Engineer of the Century by the American Society of Mechanical Engineers, and was listed as one of the top 100 most influential people of the century by Time for his pioneering work in human-powered flight, solar-powered flight, solar-powered automobiles, electric cars, thinking skills, environmental topics, low energy vehicles, etc. His human-powered plane won the Kremer Prize for crossing the English Channel. His company, AeroVironment, developed a solar-powered plane that flew from Paris to England, the lightweight, giant 247-foot solar-powered Helios that reached an altitude of 96,863 feet, and the Sunraycer, that won the first solar car race across Australia. His work on high flying aircraft, tiny drones, battery-hybrid cars, and very efficient electrical devices continues, and he campaigns for the need for people to get by on the earth’s interest, not the earth’s capital.

GREGORY ARNOLD: “Can Markets Save the Planet?”: Market-based Solutions to Environmental Problems. With the possibility of climate change and the reality of other environmental externalities apparent, a number of economic approaches to solving such problems have emerged. One approach, the application of government-designed, capital markets approaches like cap and trade systems, have gained favor. These markets, which allow for the trading of pollution permits and offsets, have shown great promise in efficiently lowering pollution. At present, such systems are in place covering greenhouse gases worldwide (except in the US) and pollutants causing acid rain and smog in the U.S. and elsewhere. Many experts predict that the US will have a national trading system within the foreseeable future following the EU Emission Trading Scheme. Gregory Arnold is Managing Partner of CE2 Capital Partners LLC, an investment firm specializing in investment and trading in environmental markets including those for emission credits, renewable energy credits, and greenhouse gas credits. He has a MBA from the Harvard Business School and a BA from the University of California at San Diego. He is on the Board of the UC San Diego Dean’s Council in Physical Sciences and a member of the Pacific Council on International Policy. **av164DVD**

Dr. DANIEL DENNETT: BREAKING THE SPELL

Religion As A Natural Phenomenon

One of the greatest thinkers of our age tackles one of the most important questions of our time: why people believe in God and how religion shapes our lives and our future. In this lecture, based on his new book of the same title, Dr. Dennett shows that for the vast majority of people there is nothing more important than religion. It is an integral part of their marriage, child rearing, and community. Dennett takes a hard look at this phenomenon and asks: “Where does our devotion to God come from and what purpose does it serve? Is religion a blind evolutionary compulsion or a rational choice?” In a spirited investigation that ranges widely through history, philosophy, and psychology, Dennett explores how organized religion evolved from folk beliefs and why it is such a potent force today. Deftly and lucidly, he contends that the “belief in belief” has fogged any attempt to rationally consider the existence of God and the relationship between divinity and human need.

Dr. Dennett is a professor and director of the Center for Cognitive Studies at Tufts University, and the author of the highly acclaimed *Darwin’s Dangerous Idea*, *Consciousness Explained*, and *Freedom Evolves*. **AV157DVD**



Skeptic Pin

Tie-tack style metal pin shown here against a black background has cut-out lettering in burnished gold color. About 25mm x 6mm (1" x.25"). \$10. Cat. No. pin100



Small Skeptic Sticker

Classy vinyl self adhesive sticker in black & grey. 5" wide x 2.75" high. 1 for \$2. 3 for \$4. Cat. No. sticker100



Skeptic Bumper Sticker

Weather resistant quality vinyl (11.5" x 3") Black and lime green. Price: 1 for \$4., 3 for \$8. Cat. No. sticker120.

YES! I would like a MEMBERSHIP/SUBSCRIPTION to Skeptic Society and Skeptic magazine. Send checks or write to: Skeptics Society, P.O. Box 338, Altadena, CA 91001. For information phone 626/794-3119. Subscribe online: skeptical.com or e-mail us at skepticsociety@skeptical.com or FAX the form to us at 626/794-1301.

SUBSCRIPTIONS

NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
COUNTRY _____
PHONE/E-MAIL _____

- Check here if this is a new address
 Check here if this is a renewal

What issue would you like to start your subscription with?
 The current issue on our webpage at skeptical.com
 The next issue to be printed

- US Skeptic Membership & Subscription
 \$30./1 yr. \$50./2 yrs. \$70./3 yrs.
- CANADA/MEXICO Membership & Subscription
 \$40./1 yr. \$70./2 yrs. \$100./3 yrs.
- ALL Other Foreign Membership & Subscription
 \$50./1 yr \$90./2 yrs. \$130./3 yrs.

(VISA, Mastercard or Moneyorder only on Foreign orders. No Eurocheques or foreign checks please!)



GIFT SUBSCRIPTIONS

NAME OF GIFT RECIPIENT _____
ADDRESS OF GIFT RECIPIENT _____
CITY _____ STATE _____ ZIP _____
COUNTRY _____

What issue would you like to start the gift subscription with?
 The current issue on our webpage at skeptical.com
 The next issue to be printed

- US Skeptic Membership & Subscription
 \$30./1 yr. \$50./2 yrs. \$70./3 yrs.
- CANADA/MEXICO Membership & Subscription
 \$40./1 yr. \$70./2 yrs. \$100./3 yrs.
- ALL Other Foreign Membership & Subscription
 \$50./1 yr \$90./2 yrs. \$130./3 yrs.

(VISA, Mastercard, American Express or Moneyorder only on Foreign orders. No Eurocheques or foreign checks please!)

Charge my: MC VISA AM EX DISC EX DATE _____

Account No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Signature _____

Total for Membership/Subscriptions..... _____
Total gift Membership/Subscriptions..... _____

(\$10.00 charge on returned checks)
Payment with order required

Check # _____ **TOTAL ENCLOSED** _____

Moving? Notify us immediately! POST OFFICE WILL NOT FORWARD MAGAZINES (media mail) and we cannot offer free replacements.

Skeptics Society, P.O. Box 338, Altadena, CA 91001.
 Phone 626/794-3119. FAX: 626/794-1301. E-mail:
 skepticsociety@skeptic.com. (Please allow 3-4 weeks delivery)

SHIP TO: (Only if different from "Ordered by.")

ORDERED BY:

NAME _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP _____
 COUNTRY _____ PHONE _____

NAME _____
 ADDRESS _____ CITY _____
 STATE _____ ZIP _____ COUNTRY _____

Gift card message _____
 From: _____

Catalog No.	Description	Unit Price	Qty.	Total

Charge my:
 MC VISA AM EX DISC



EX DATE _____

Account No. []

Signature as name appears on credit card

SHIPPING AND HANDLING
In the U.S.—Add \$4.50 shipping for the first item ordered (book, tape, back issue, or T-shirt) and \$1.00 for each additional item ordered.
All countries other than the U.S.—Airmail only: We require credit card payment on orders so that we can accurately calculate the exact postage and handling for your country.
 Prices subject to change without notice.

TOTAL for items above	
add 9.25% tax for California residents	
SHIPPING & HANDLING in the U.S.	
GRAND TOTAL	



BUY SKEPTIC MAGAZINE (PRINT)
www.skeptic.com/magazine/print

BUY SKEPTIC MAGAZINE (DIGITAL)
www.skeptic.com/magazine/app

SIGN UP FOR eSKEPTIC
www.skeptic.com/eskeptic/signup

SHOP ONLINE
www.skeptic.com/shop

DONATE TO THE SKEPTICS SOCIETY
www.skeptic.com/donate

LIKE US ON FACEBOOK
facebook.com/skeptic.magazine

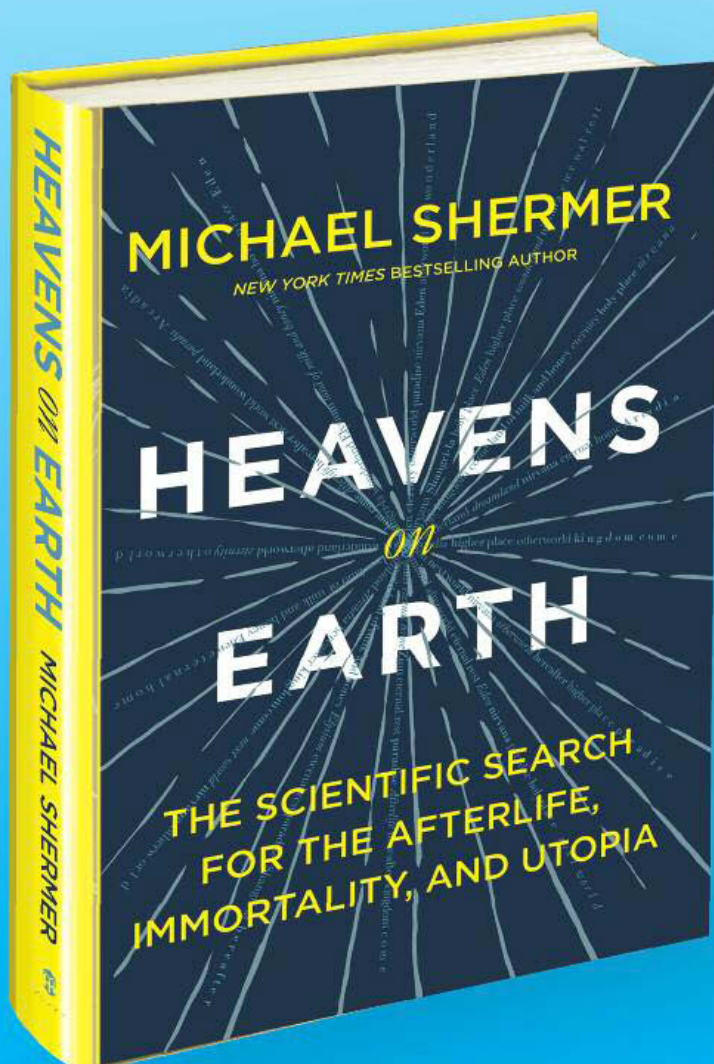
FOLLOW MICHAEL SHERMER
twitter.com/michaelshermer

“...absolutely brilliant, filled with profundity, startling facts, and mind-expanding ideas. One of the most fascinating books I’ve read in a long time.”

—Amy Chua, Yale Law professor and author of *Battle Hymn of the Tiger Mother* and *The Triple Package: How Three Unlikely Traits Explain the Rise and Fall of Cultural Groups in America*

“This book’s theme is the one of greatest practical importance to all of us: does some heaven or afterlife await us after we die? Most Americans, and even many atheists, believe that the answer is “yes.” If there is no heaven, how can we find purpose in life? Shermer explores these big questions with the delightful, powerful style that made his previous books so successful—but this is his best book.”

—Jared Diamond, Professor of Geography at UCLA, is the Pulitzer-Prize-winning author of *Guns, Germs, and Steel* and other books.



“...sound and inspired mindfulness [in an] importantly useful volume. Truly a delicious read. Ten Goldblums out of a possible ten Goldblums!”

—Jeff Goldblum

“Michael Shermer is a beacon of reason in an ocean of irrationality.”

—Neil deGrasse Tyson, Director of the Hayden Planetarium, host of *Cosmos* and *StarTalk*, author of *Astrophysics for People in a Hurry*

Get an Autographed 1st Edition from Shop Skeptic at skeptical.com/heavens or call 626/794-3119.