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KEY=WORLDS - SCHMITT ABBEY

Brave New Worlds Staying Human in the Genetic Future This text takes the liberal humanist position against the advance of scientific ethics (or lack of them), in particular those of genetics. As the achievements of science threaten to engulf this century leaving us morally and philosophically floundering in their wake (what are we going to do about Dolly?), Appleyard engages with the issues in a debate which can only get hotter and more desperate. **Hacking Darwin Genetic Engineering and the Future of Humanity** Sourcebooks, Inc. "A gifted and thoughtful writer, Metzl brings us to the frontiers of biology and technology, and reveals a world full of promise and peril." — Siddhartha Mukherjee MD, New York Times bestselling author of *The Emperor of All Maladies* and *The Gene* Passionate, provocative, and highly illuminating, *Hacking Darwin* is the must read book about the future of our species for fans of *Homo Deus* and *The Gene*. After 3.8 billion years humankind is about to start evolving by new rules... From leading geopolitical expert and technology futurist Jamie Metzl comes a groundbreaking exploration of the many ways genetic-engineering is shaking the core foundations of our lives — sex, war, love, and death. At the dawn of the genetics revolution, our DNA is becoming as readable, writable, and hackable as our information technology. But as humanity starts retooling our own genetic code, the choices we make today will be the difference between realizing breathtaking advances in human well-being and descending into a dangerous and potentially deadly genetic arms race. Enter the laboratories where scientists are turning science fiction into reality. Look towards a future where our deepest beliefs, morals, religions, and politics are challenged like never before and the very essence of what it means to be human is at play. When we can engineer our future children, massively extend our lifespans, build life from scratch, and recreate the plant and animal world, should we? **The Next 500 Years Engineering Life to Reach New Worlds** MIT Press An argument that we have a moral duty to colonize other planets and solar systems, and a plan for doing so. Inevitably, life on Earth will come to an end, whether by climate disaster, or by cataclysmic war, or when the sun runs out of fuel in a few billion years. To avoid extinction, will we have to find a new home planet, perhaps even a new solar system, to inhabit? In this provocative and fascinating book, Christopher Mason argues that we have a moral duty to do just that. Because we are the only species aware that life on Earth has an expiration date, we have a responsibility to act as the shepherd of lifeforms--not only for our species but for all species on which we depend and for those still to come (by accidental or designed evolution). Mason argues that the same capacity for ingenuity that has enabled us to build rockets and land on other planets can be applied to redesigning biology so that we can sustainably inhabit those planets. And he lays out a 500-year plan for undertaking the massively ambitious project of reengineering human genetics for life in other worlds. **Forever for a Moment** A fast-paced Crichton-like techno-thriller that journeys through the near-future of genetic engineering of living humans. The discovery of CRISPR AND CAS9 has forever changed the world. Living humans are walking the planet today with modified DNA. In *Forever for a Moment*, Detective Casey Randall discovers the Omega Alpha Institute (OAI) and its powerful CEO, who is secretly genetically modifying living humans - for inconceivable profit. The Anti Genetics Engineering Society - a front for a church-sponsored crusade - anoints Casey as its prophet and leader. But it may be too late as the CEO sells his greatest discovery to the highest bidders - a genetic cure for aging. Unlikely partners align, and they pay in blood for information aimed to destroy OAI. But will there be enough time to stop the CEO from redefining the very definition of "human?" After all, who doesn't want to live forever? Preface While *Forever for a Moment* is fiction, almost everything contained herein is either possible or happening now. Humans are walking around today with artificially modified genes. I wrote this novel to explore what I consider a clear and imminent existential threat to the definition of "human." For the first time, we as a species can "self-program." Many science fiction stories focus on the fear of computers becoming self-aware by modifying their own code. This may never happen. However, in some sense, we are all walking, talking, and breathing computers, with our DNA being our programming code. And now, we can reach inside of our cells and change our very own code. I believe it is not a matter of if but when nefarious actors modify humans for profit. It will start with "curing" genetic diseases in children. After all, who doesn't want to cure children? It will then move onto adults and genetic disorders. But as we become accustomed to genetic modifications in living humans, the lines between illness and traits and preferences will become blurred, and transhumans will emerge. If we as a society don't take this threat seriously and implement draconian measures to curtail the genetic engineering of living humans, our children's children will be competing against a new species that I call *Homo independus*. I hope this novel provides you with a foundation to ponder the ramifications - both positive and negative - of transhumanism - and that you express any concerns you might have to those in power - before they too succumb to the addicting elixir of genetic engineering of the human genome. But know this, it may already be too late to put the genie back into the proverbial bottle. A.G. Ferguson - May 19th, 2021 Praise for *Forever for a Moment* "Forever for a Moment is an engrossing action thriller that takes off like a rocket and never slows. Combine that with a fascinating education about the threats of transhumanism and

you have a winner. Economics, power, greed, and selfishness could very well combine in such a way that the world - and the definition of human - may be changed forever. This novel is a must-read for anyone who cares about the future and how genetics may forever alter humanity." - Chris Elsenbach "Ferguson tells a frightful story that clearly captures the threat of genetic engineering. No matter what preconceived notions you might have, Forever for a Moment will create a foundation for you to consider the many ramifications of transhumanism. You owe it to yourself and future generations to become familiar with this existential threat to humanity - and to act upon it if you dare." - Brad Parker "Ferguson's novel hits the ground running. The story line is ominous, sensational, and believable. The characters are very human and relatable. Take a few hours of your life to see into the not-too-distant future in a highly entertaining way." - Kory MacGregor

A Terrible Beauty is Born Clones, Genes and the Future of Mankind CRC Press Genetics and its related technologies are revolutionizing the world. The media is regularly dominated by controversy over the latest genetically modified (GM) food, human gene therapy or cancer chip technology. Maverick scientists are in the process of cloning humans, and the human genome sequence is available on the Internet. Fifty years ago we did not know what a gene was; today the awesome power of genetics is being released on an unsuspecting public, and with it a whole series of ethical dilemmas undreamt of even ten years ago. The question now has become not "can we?" but "should we?" By demystifying genetic engineering and exploring the basic biology of the living world, A Terrible Beauty is Born explains how clones and cloning technology are in many ways extensions of processes that occur constantly in nature. Used wisely these processes have the potential to bring enormous benefits; abused, they carry with them potential dangers that we ignore at our peril.

Biology in the World of the Future Evolving Ourselves Redesigning the Future of Humanity--One Gene at a Time Penguin "We are the primary drivers of change. We will directly and indirectly determine what lives, what dies, where, and when. We are in a different phase of evolution; the future of life is now in our hands." Why are rates of conditions like autism, asthma, obesity, and allergies exploding at an unprecedented pace? Why are humans living longer, getting smarter, and having far fewer kids? How might your lifestyle affect your unborn children and grandchildren? How will gene-editing technologies like CRISPR steer the course of human evolution? If Darwin were alive today, how would he explain this new world? Could our progeny eventually become a different species—or several? In Evolving Ourselves, futurist Juan Enriquez and scientist Steve Gullans conduct a sweeping tour of how humans are changing the course of evolution—sometimes intentionally, sometimes not. For example:

- Globally, rates of obesity in humans nearly doubled between 1980 and 2014. What's more, there's evidence that other species, from pasture-fed horses to lab animals to house cats, are also getting fatter.
- As reported by U.S. government agencies, the rate of autism rose by 131 percent from 2001 to 2010, an increase that cannot be attributed simply to increases in diagnosis rates.
- Three hundred years ago, almost no one with a serious nut allergy lived long enough to reproduce. Today, despite an environment in which food allergies have increased by 50 percent in just over a decade, 17 million Americans who suffer from food allergies survive, thrive, and pass their genes and behaviors on to the next generation.
- In the pre-Twinkie era, early humans had quite healthy mouths. As we began cooking, bathing, and using antibiotics, the bacteria in our bodies changed dramatically and became far less diverse. Today the consequences are evident not only in our teeth but throughout our bodies and minds. Though these harbingers of change are deeply unsettling, the authors argue that we are also in an epoch of tremendous opportunity. New advances in biotechnology help us mitigate the cruel forces of natural selection, from saving prematurely born babies to gene therapies for sickle cell anemia and other conditions. As technology like CRISPR enables us to take control of our genes, we will be able to alter our own species and many others—a good thing, given that our eventual survival will require space travel and colonization, enabled by a fundamental redesign of our bodies. Future humans could become great caretakers of the planet, as well as a more diverse, more resilient, gentler, and more intelligent species—but only if we make the right choices now. Intelligent, provocative, and optimistic, Evolving Ourselves is the ultimate guide to the next phase of life on Earth.

Global Trends 2030 Alternative Worlds Createspace Independent Publishing Platform This publication covers global megatrends for the next 20 years and how they will affect the United States. This is the fifth installment in the National Intelligence Council's series aimed at providing a framework for thinking about possible futures and their implications. The report is intended to stimulate strategic thinking about the rapid and vast geopolitical changes characterizing the world today and possible global trajectories during the next 15-20 years by identifying critical trends and potential discontinuities. The authors distinguish between megatrends, those factors that will likely occur under any scenario, and game-changers, critical variables whose trajectories are far less certain. NIC 2012-001. Several innovations are included in Global Trends 2030, including: a review of the four previous Global Trends reports, input from academic and other experts around the world, coverage of disruptive technologies, and a chapter on the potential trajectories for the US role in the international system and the possible the impact on future international relations. Table of Contents: Introduction 1 Megatrends 6 Individual Empowerment 8 Poverty Reduction 8 An Expanding Global Middle Class 8 Education and the Gender Gap 10 Role of Communications Technologies 11 Improving Health 11 A MORE CONFLICTED IDEOLOGICAL LANDSCAPE 12 Diffusion of Power 15 THE RISE AND FALL OF COUNTRIES: NOT THE SAME OLD STORY 17 THE LIMITS OF HARD POWER IN THE WORLD OF 2030 18 Demographic Patterns 20 Widespread Aging 20 Shrinking Number of Youthful Countries 22 A New Age of Migration 23 The World as Urban 26 Growing Food, Water, and Energy Nexus 30 Food, Water, and Climate 30 A Brighter Energy Outlook 34 Game-Changers 38 The Crisis-Prone Global Economy 40 The Plight of the West 40 Crunch Time Too for the Emerging Powers 43 A Multipolar Global Economy: Inherently More Fragile? 46 The Governance Gap 48 Governance Starts at Home: Risks and Opportunities 48 INCREASED FOCUS ON EQUALITY AND OPENNESS 53 NEW GOVERNMENTAL FORMS 54 A New Regional Order? 55 Global Multilateral Cooperation 55 The Potential for Increased Conflict 59 INTRASTATE CONFLICT: CONTINUED DECLINE 59 Interstate Conflict: Chances Rising 61 Wider Scope of Regional Instability 70 The Middle East: At a Tipping Point 70 South Asia: Shocks on the Horizon 75 East Asia: Multiple Strategic Futures 76 Europe: Transforming Itself 78 Sub-Saharan Africa: Turning a Corner by 2030? 79 Latin America: More Prosperous but Inherently Fragile 81 The Impact of New Technologies 83 Information Technologies 83 AUTOMATION AND MANUFACTURING TECHNOLOGIES 87 Resource Technologies 90 Health Technologies 95 The Role of the United States 98 Steady US Role 98 Multiple Potential Scenarios for the United States' Global Role 101 Alternative Worlds 107 Stalled Engines 110 FUSION 116 Gini-out-of-the-Bottle 122 Nonstate World 128 Acknowledgements 134 GT2030 Blog References 137 Audience: Appropriate for anyone, from businesses to banks, government agencies to start-ups, the technology sector to the teaching sector, and more. This publication helps anticipate where the world will be: socially, politically, technologically, and culturally over the next few decades. Keywords: Global Trends 2030 Alternative Worlds, global trends 2030, Global Trends series, National Intelligence Council, global trajectories, global megatrends, geopolitics, geopolitical changes **Gene**

Future The Promise and Perils of the New Biology Springer Explores the scientific, ethical, and legal aspects of biotechnological advances, including DNA fingerprinting, genetically altered crops, and genetic diseases

Mapping and Sequencing the Human Genome National Academies Press There is growing enthusiasm in the scientific community about the prospect of mapping and sequencing the human genome, a monumental project that will have far-reaching consequences for medicine, biology, technology, and other fields. But how will such an effort be organized and funded? How will we develop the new technologies that are needed? What new legal, social, and ethical questions will be raised? Mapping and Sequencing the Human Genome is a blueprint for this proposed project. The authors offer a highly readable explanation of the technical aspects of genetic mapping and sequencing, and they recommend specific interim and long-range research goals, organizational strategies, and funding levels. They also outline some of the legal and social questions that might arise and urge their early consideration by policymakers.

One World The Health and Survival of the Human Species in the 21st Century Health Press Contributors such as Jimmy Carter, Jonathan Mann, Carl Sagan, Jonas Salk, Linus Pauling, and Robert Gallo examine health and disease on a global scale, from a perspective that encompasses the well-being of the whole of humanity. This enormous project offers a view of the planet's future through the eyes of dozens of the world's best and brightest minds.

The Future of the Brain Essays by the World's Leading Neuroscientists Princeton University Press The world's top experts take readers to the very frontiers of brain science Includes a chapter by 2014 Nobel laureates May-Britt Moser and Edvard Moser An unprecedented look at the quest to unravel the mysteries of the human brain, The Future of the Brain takes readers to the absolute frontiers of science. Original essays by leading researchers such as Christof Koch, George Church, Olaf Sporns, and May-Britt and Edvard Moser describe the spectacular technological advances that will enable us to map the more than eighty-five billion neurons in the brain, as well as the challenges that lie ahead in understanding the anticipated deluge of data and the prospects for building working simulations of the human brain. A must-read for anyone trying to understand ambitious new research programs such as the Obama administration's BRAIN Initiative and the European Union's Human Brain Project, The Future of the Brain sheds light on the breathtaking implications of brain science for medicine, psychiatry, and even human consciousness itself. Contributors include: Misha Ahrens, Ned Block, Matteo Carandini, George Church, John Donoghue, Chris Eliasmith, Simon Fisher, Mike Hawrylycz, Sean Hill, Christof Koch, Leah Krubitzer, Michel Maharbiz, Kevin Mitchell, Edvard Moser, May-Britt Moser, David Poeppel, Krishna Shenoy, Olaf Sporns, Anthony Zador.

Global Trends 2030 Alternative Worlds : a Publication of the National Intelligence Council U.S. Government Printing Office This report is intended to stimulate thinking about the rapid and vast geopolitical changes characterizing the world today and possible global trajectories over the next 15 years. As with the NIC's previous Global Trends reports, we do not seek to predict the future, which would be an impossible feat, but instead provide a framework for thinking about possible futures and their implications. In-depth research, detailed modeling and a variety of analytical tools drawn from public, private and academic sources were employed in the production of Global Trends 2030. NIC leadership engaged with experts in nearly 20 countries, from think tanks, banks, government offices and business groups, to solicit reviews of the report.

Brave Green World How Science Can Save Our Planet MIT Press How we can harness cutting-edge biology and manufacturing to fight waste and pollution. In Nature, there is little chemical waste; nearly every atom is a resource to be utilized by organisms, ensuring that all the available matter remains in a perpetual cycle. By contrast, human systems of energy production and manufacturing are linear; the end product is waste. In Brave Green World, Chris Forman and Claire Asher show what our linear systems can learn from the efficient circularity of ecosystems. They offer an unblinkered yet realistic and positive vision of a future in which we can combine biology and manufacturing to solve our central problems of waste and pollution.

Imagined Worlds Harvard University Press A thought-provoking, speculative look at the world's cultural future addresses the issue of whether or not human society will progress ethically as it progressed technologically. Reprint. UP.

Future Human Evolution Eugenics in the Twenty-first Century Future Human Evolution This book lays out the history of eugenics movement and the politics which continues to rage around it. "The human rights of the future generations" are discussed.

Who Gives a Gigabyte A Survival Guide for the Technologically Perplexed John Wiley & Sons Incorporated Answers the question, "how has technology shaped our lives?," covering genetics, medicine, cybernetics, telecommunications, nanotechnology, robotics, and environmental science

Where Do We Come From? The Molecular Evidence for Human Descent Springer Science & Business Media From the moment we first began to contemplate the world, three questions have occupied our minds: Where do we come from?, What are we?, and Where are we going? Artists, religious thinkers, philosophers, and most recently scientists have all searched for answers. Here, the authors describe how scientists decipher human origin from the record encrypted in the DNA and protein molecules. After explaining the nature of descent and the methods available for studying genealogical relationships, they summarize the information revealed by the molecular archives. In doing so, they draw conclusions about our identity, our place in the living world, and our future.

The Fourth Industrial Revolution Penguin UK The founder and executive chairman of the World Economic Forum on how the impending technological revolution will change our lives We are on the brink of the Fourth Industrial Revolution. And this one will be unlike any other in human history. Characterized by new technologies fusing the physical, digital and biological worlds, the Fourth Industrial Revolution will impact all disciplines, economies and industries - and it will do so at an unprecedented rate. World Economic Forum data predicts that by 2025 we will see: commercial use of nanomaterials 200 times stronger than steel and a million times thinner than human hair; the first transplant of a 3D-printed liver; 10% of all cars on US roads being driverless; and much more besides. In The Fourth Industrial Revolution, Schwab outlines the key technologies driving this revolution, discusses the major impacts on governments, businesses, civil society and individuals, and offers bold ideas for what can be done to shape a better future for all.

Living with the Genie Essays On Technology And The Quest For Human Mastery Island Press "A group of remarkably penetrating, frank, and expert scientists, techno-wizards, activists, and writers raise provocative questions about what is gained and what is lost in a world enthralled by technology in this wonderfully soulful forum on life in the 'Wired World.' " -BOOKLIST

Biotechnology, Cloning, Robotics, Nanotechnology... At a time when scientific and technological breakthroughs keep our eyes focused on the latest software upgrades or the newest cell-phone wizardry, a group of today's most innovative thinkers are looking beyond the horizon to explore both the promise and the peril of our technological future. Human ingenuity has granted us a world of unprecedented personal power -- enabling us to communicate instantaneously with anyone anywhere on the globe, to transport ourselves in both real and virtual worlds to distant places with ease, to fill our bellies with engineered commodities once available to only a privileged elite. Through our technologies, we have sought to free ourselves from the shackles of nature and become its master. Yet science and technology

continually transform our experience and society in ways that often seem to be beyond our control. Today, different areas of research and innovation are advancing synergistically, multiplying the rate and magnitude of technological and societal change, with consequences that no one can predict. *Living with the Genie* explores the origins, nature, and meaning of such change, and our capacity to govern it. As the power of technology continues to accelerate, who, this book asks, will be the master of whom? In *Living with the Genie*, leading writers and thinkers come together to confront this question from many perspectives, including: Richard Powers's whimsical investigation of the limits of artificial intelligence; Philip Kitcher's confrontation of the moral implications of science; Richard Rhodes's exploration of the role of technology in reducing violence; Shiv Visvanathan's analysis of technology's genocidal potential; Lori Andrews's insights into the quest for human genetic enhancement; Alan Lightman's reflections on how technology changes the experience of our humanness. These and ten other provocative essays open the door to a new dialogue on how, in the quest for human mastery, technology may be changing what it means to be human, in ways we scarcely comprehend.

Experiencing the New Genetics Family and Kinship on the Medical Frontier University of Pennsylvania Press *Experiencing the New Genetics* will lead scholars and general readers alike to question how far genetic inheritance affects our selves and our future.

The Future of Human Nature John Wiley & Sons Recent developments in biotechnology and genetic research are raising complex ethical questions concerning the legitimate scope and limits of genetic intervention. As we begin to contemplate the possibility of intervening in the human genome to prevent diseases, we cannot help but feel that the human species might soon be able to take its biological evolution in its own hands. 'Playing God' is the metaphor commonly used for this self-transformation of the species, which, it seems, might soon be within our grasp. In this important new book, Jürgen Habermas – the most influential philosopher and social thinker in Germany today – takes up the question of genetic engineering and its ethical implications and subjects it to careful philosophical scrutiny. His analysis is guided by the view that genetic manipulation is bound up with the identity and self-understanding of the species. We cannot rule out the possibility that knowledge of one's own hereditary factors may prove to be restrictive for the choice of an individual's way of life and may undermine the symmetrical relations between free and equal human beings. In the concluding chapter – which was delivered as a lecture on receiving the Peace Prize of the German Book Trade for 2001 – Habermas broadens the discussion to examine the tension between science and religion in the modern world, a tension which exploded, with such tragic violence, on September 11th.

The Language of Genes Solving the Mysteries of Our Genetic Past, Present, and Future Anchor Books A timely and revealing exploration of the world of human genetics by a famed geneticist explains the history of this scientific field while showing how genes help determine who we are and discussing the ramifications of new genetic discoveries. **Genetics of Fitness and Physical Performance** Human Kinetics *Genetics of Fitness and Physical Performance* is the first comprehensive reference on the role of the genes in influencing individual variation in fitness and performance. This essential compendium reviews the past 25 years of accumulated evidence on the genetic basis of health- and performance-related fitness phenotypes. Focusing on the interests of sport scientists, the authors provide insight into the significance of this research on nearly every aspect of the study of human physical activity. The book presents the biological basis of heredity and explains the concepts and methods of genetic epidemiology and molecular biology that are necessary to understand this specialized field. With the rapid advances in molecular biology and the paradigms of human genetics, exercise scientists face a dynamic and vibrant new field. This book offers readers new opportunities to better understand atherosclerosis, noninsulin dependent diabetes, obesity, and hypertension by searching for single gene effects and identifying susceptibility genes. The authors review the evidence on the role of the genes for human traits as it pertains to the exercise science field. And they explore the scientific, practical, and ethical issues that confront exercise scientists as progress is made in this field. *Genetics of Fitness and Physical Performance* is vital reading for scholars in the field of exercise and sport science to understand how recent discoveries in genetics might shape their future research.

The Skeptics' Guide to the Future What Yesterday's Science and Science Fiction Tell Us About the World of Tomorrow Grand Central Publishing From the bestselling authors and hosts of "The Skeptics' Guide to the Universe," a high-tech roadmap of the future in their beloved voice, cracking open the follies of futurists past and how technology will profoundly change our world, redefining what it means to be human. Our predictions of the future are a wild fantasy, inextricably linked to our present hopes and fears, biases and ignorance. Whether they be the outlandish leaps predicted in the 1920s, like multi-purpose utility belts with climate control capabilities and planes the size of luxury cruise ships, or the forecasts of the '60s, which didn't anticipate the sexual revolution or women's liberation, the path to the present is littered with failed predictions and incorrect estimations. The best we can do is try to absorb the lessons from futurism's checkered past, perhaps learning to do a little better. In *THE SKEPTICS' GUIDE TO THE FUTURE*, Steven Novella and his co-authors build upon the work of futurists of the past by examining what they got right, what they got wrong, and how they came to those conclusions. By exploring the pitfalls of each era, they give their own speculations about the distant future, transformed by unbelievable technology ranging from genetic manipulation to artificial intelligence and quantum computing. Applying their trademark skepticism, they carefully extrapolate upon each scientific development, leaving no stone unturned as they lay out a vision for the future.

In the Name of Eugenics Genetics and the Uses of Human Heredity Univ of California Press Daniel Kevles traces the study and practice of eugenics--the science of "improving" the human species by exploiting theories of heredity--from its inception in the late nineteenth century to its most recent manifestation within the field of genetic engineering. It is rich in narrative, anecdote, attention to human detail, and stories of competition among scientists who have dominated the field.

The Code Breaker Jennifer Doudna, Gene Editing, and the Future of the Human Race Simon and Schuster "A gripping account of how the pioneering scientist Jennifer Doudna, along with her colleagues and rivals, launched a revolution that will allow us to cure diseases, fend off viruses, and enhance our children"--

Uncertain Peril Genetic Engineering and the Future of Seeds Beacon Press Life on earth is facing unprecedented challenges from global warming, war, and mass extinctions. The plight of seeds is a less visible but no less fundamental threat to our survival. Seeds are at the heart of the planet's life-support systems. Their power to regenerate and adapt are essential to maintaining our food supply and our ability to cope with a changing climate. In *Uncertain Peril*, environmental journalist Claire Hope Cummings exposes the stories behind the rise of industrial agriculture and plant biotechnology, the fall of public interest science, and the folly of patenting seeds. She examines how farming communities are coping with declining water, soil, and fossil fuels, as well as with new commercial technologies. Will genetically engineered and "terminator" seeds lead to certain promise, as some have hoped, or are we embarking on a path of uncertain peril? Will the "doomsday vault" under construction in the Arctic, designed to store millions of seeds, save the genetic diversity of the world's agriculture? To answer these questions and

others, Cummings takes readers from the Fertile Crescent in Iraq to the island of Kaua'i in Hawai'i; from Oaxaca, Mexico, to the Mekong Delta in Vietnam. She examines the plight of farmers who have planted transgenic seeds and scientists who have been persecuted for revealing the dangers of modified genes. At each turn, Cummings looks deeply into the relationship between people and plants. She examines the possibilities for both scarcity and abundance and tells the stories of local communities that are producing food and fuel sustainably and providing for the future. The choices we make about how we feed ourselves now will determine whether or not seeds will continue as a generous source of sustenance and remain the common heritage of all humanity. It comes down to this: whoever controls the future of seeds controls the future of life on earth. Uncertain Peril is a powerful reminder that what's at stake right now is nothing less than the nature of the future. **Children of a Living Universe Discovering Our Legacy Will Change Our Future** Hampton Roads Publishing This book is an articulate, well-researched, intelligent compilation of new and ancient data that explores the implications of the extraterrestrial origins of the human race. The primary stories of our origins (religious versions/Darwinism) are called into question when held against scientific evidence and recorded histories of many cultures. Among Von Ward's startling conclusions are: The universe is self-manifesting, self-directing, and self-learning Everything that is (including the human race) is a manifestation of the universal consciousness Intelligent human life is much older than is popularly believed Human consciousness mirrors that of the universe's creators Science and technologies of a millennia ago were as advanced as they are today Our consciousness is not limited to the world of the five senses With insight and clarity, Von Ward envisions that discovery of our true legacy will inspire a global renaissance of inner knowing and unprecedented social progress. Beyond earthly evolution, he sees humanity assuming its place as a part of a universal community of conscious beings, and fulfilling our potential to serve as galactic leaders. This is a brilliant guide to this new and essential process in human spiritual evolution. **Technology and Religion Remaining Human Co-created World** Templeton Foundation Press Technology is changing all the time, but does it also have the ability to change us and the way we approach religion and spirituality? In *Technology and Religion: Remaining Human in a Co-created World*, Noreen Herzfeld examines this and other provocative questions as she provides an accessible and fascinating overview of the relationship between religion and the ever-broadening world of technology. In order to consider fully a topic as wide as technology, Herzfeld approaches the field from three different angles: technologies of the human body—such as genetic engineering, stem cells, cloning, pharmaceutical technologies, mechanical enhancement and cyborgs; technologies of the human mind—like human and artificial intelligence, virtual reality and cyberspace; and technologies of the external environment—such as nanotechnology, genetically modified crops and new agricultural technologies, and energy technology. She takes a similarly broad approach to the field of religion, focusing on how these issues interface with the three Abrahamic traditions of Christianity, Islam, and Judaism. Throughout, readers will find nuanced examinations of the moral and ethical issues surrounding new technologies from the perspectives of these faith traditions. The result is a multifaceted look at the ongoing dialogue between these two subjects that are not commonly associated with one another. This volume is the third title published in the new Templeton Science and Religion Series. **Future Evolution An Illuminated History of Life to Come** W. H. Freeman Everyone wonders what tomorrow holds, but what will the real future look like? Not decades or even hundreds of years from now, but thousands or millions of years into the future. Will our species change radically? Or will we become builders of the next dominant intelligence on Earth- the machine? These and other seemingly fantastic scenarios are the very possible realities explored in Peter Ward's *Future Evolution*, a penetrating look at what might come next in the history of the planet. Looking to the past for clues about the future, Ward describes how the main catalyst for evolutionary change has historically been mass extinction. While many scientist direly predict that humanity will eventually create such a situation, Ward argues that one is already well underway--the extinction of large mammals--and that a new Age of Humanity is coming that will radically revise the diversity of life on Earth. Finally, Ward examines the question of human extinction and reaches the startling conclusion that the likeliest scenario is not our imminent demise but long term survival--perhaps reaching as far as the death of the Sun! Full of Alexis Rockman's breathtaking color images of what animals, plants and other organisms might look like thousands and millions of years from now, *Future Evolution* takes readers on an incredible journey through time from the deep past into the far future. **Nano Comes to Life How Nanotechnology Is Transforming Medicine and the Future of Biology** Princeton University Press "Increasingly, scientists are gaining control over matter at the nanometer scale. Spearheaded by physical scientists operating at the interfaces of physics and biology (such as the author herself), advances in nanoscience and technology are transforming how we think about life and treat human health. This is due to a convergence of size. To do medicine, one must understand and be able to reach the nanoscale environment of healthy cells in tissues and organs, as well as other nano-sized building blocks that constitute a living organism, such as proteins and DNA. The ground-breaking advances being made at the frontiers of nanoscience and -technology, specifically in the areas of biology and medicine, are the subject of this short, popular-level book. Chapter 1 describes how nanotechnology and quantitative methods in biology are progressively being deployed to embrace life in all its multiscale, hierarchical intricacy and multiplicity. Chapters 2 through 4 review how bioinspired and biomimetic nanostructures and nanomachines are being created and integrated into strategies aimed at solving specific medical problems. In particular, Chapter 2 summarizes how scientists are seeking to build artificial nanostructures using both biological molecules and the organizational principles of biology. Chapter 3 gives an account of how nanotechnology is being used to develop drug-delivery strategies that specifically target cancer cells and tumors to improve the efficacy of current cancer chemotherapies. Chapter 4 reviews the science of one of the most potentially transformative scientific fields: tissue engineering. In a concluding chapter (Chapter 5), Contera reviews how nanotechnology, biology, and medicine will continue fusing with other sciences and technologies - incorporating more mathematical and computational modelling, as well as AI and robotics. Nanoscale devices will be used to learn biology; and biology will be used to inspire increasingly sophisticated "transmaterial" devices that mimic some of the characteristics of biology and incorporate new features that are not available in the biological world. The effects on human health and longevity will be profound. In a more personal epilogue, Contera describes the crossroads at which we find ourselves. Accessing our own biology evokes a mixture of possibility and dread. However, Contera maintains that we can create a positive transmaterial world for the benefit of humankind, and she describes ways in which scientists are proactively engaging with the public, politicians, industry, and entrepreneurs, as well as the media and the arts, to communicate the power and risks of new advances and to influence the ways in which new technologies will affect our future"-- **Reinventing The Future Conversations With The World's Leading Scientists** Addison Wesley Publishing Company The author of *The Eudaemonic Pie* now reveals the inspiration, motivations, and aspirations of the world's greatest

scientists. The scientists interviewed in this collection have changed the rules of the game--altered our perception of reality and the language used to describe it. **Human Genome Editing Science, Ethics, and Governance** National Academies Press Genome editing is a powerful new tool for making precise alterations to an organism's genetic material. Recent scientific advances have made genome editing more efficient, precise, and flexible than ever before. These advances have spurred an explosion of interest from around the globe in the possible ways in which genome editing can improve human health. The speed at which these technologies are being developed and applied has led many policymakers and stakeholders to express concern about whether appropriate systems are in place to govern these technologies and how and when the public should be engaged in these decisions. Human Genome Editing considers important questions about the human application of genome editing including: balancing potential benefits with unintended risks, governing the use of genome editing, incorporating societal values into clinical applications and policy decisions, and respecting the inevitable differences across nations and cultures that will shape how and whether to use these new technologies. This report proposes criteria for heritable germline editing, provides conclusions on the crucial need for public education and engagement, and presents 7 general principles for the governance of human genome editing. **Challenging Nature The Clash of Science and Spirituality at the New Frontiers of Life** Harper Collins Biotechnology is the oldest and most widespread of inventions, providing sustenance for humankind since the beginning of civilization. Until recently, however, its tools were crude and its implementation was opaque. Today new understanding in the life sciences brings both precision and transparency to the process. Modern inventions could alleviate human suffering, feed the world, and, at the same time, stem the tide of earth's ecological degradation. Yet ironically, biotechnology becomes evermore contentious. On the left, New Age secularists rail against genetically modified crops. On the right, religious Americans want embryo stem-cell research to be a felony. While they share seemingly little beyond mutual contempt, Silver argues that both political camps are driven -- consciously or subconsciously -- by a fundamental fear of violating a higher spiritual authority, imagined either as the creator God of the Bible, who rules from above, or a vague Mother Nature goddess here on earth. In *Challenging Nature*, Silver offers a provocative look at the collision of science, religion, pseudoscience, and politics. A hands-on scientist who has actually manipulated genes, he leaves the laboratory, traveling the globe in what he calls "one scientist's journey from a cloistered community, in which life is assumed to be combinations of complex molecules and information flow between them, to a world of humanity dominated by soul and spirits, and to the intense chaos of Mother Nature at large." The result is a fascinating book that could provide a wake-up call for the West, where the economic ramifications of pseudoscience may be enormous: a future in which Asia becomes dominant in biotechnological advances. **On the Future Prospects for Humanity** Princeton University Press A provocative and inspiring look at the future of humanity and science from world-renowned scientist and bestselling author Martin Rees Humanity has reached a critical moment. Our world is unsettled and rapidly changing, and we face existential risks over the next century. Various outcomes—good and bad—are possible. Yet our approach to the future is characterized by short-term thinking, polarizing debates, alarmist rhetoric, and pessimism. In this short, exhilarating book, renowned scientist and bestselling author Martin Rees argues that humanity's prospects depend on our taking a very different approach to planning for tomorrow. The future of humanity is bound to the future of science and hinges on how successfully we harness technological advances to address our challenges. If we are to use science to solve our problems while avoiding its dystopian risks, we must think rationally, globally, collectively, and optimistically about the long term. Advances in biotechnology, cyberotechnology, robotics, and artificial intelligence—if pursued and applied wisely—could empower us to boost the developing and developed world and overcome the threats humanity faces on Earth, from climate change to nuclear war. At the same time, further advances in space science will allow humans to explore the solar system and beyond with robots and AI. But there is no "Plan B" for Earth—no viable alternative within reach if we do not care for our home planet. Rich with fascinating insights into cutting-edge science and technology, this accessible book will captivate anyone who wants to understand the critical issues that will define the future of humanity on Earth and beyond. **As the Future Catches You How Genomics and Other Forces Are Changing Your Life, Work, Health, and Wealth** Currency You will never look at the world in the same way after reading *As the Future Catches You*. Juan Enriquez puts you face to face with a series of unprecedented political, ethical, economic, and financial issues, dramatically demonstrating the cascading impact of the genetic, digital, and knowledge revolutions on your life. Genetics will be the dominant language of this century. Those who can "speak it" will acquire direct and deliberate control over all forms of life. But most countries and individuals remain illiterate in what is rapidly becoming the greatest single driver of the global economy. Wealth will be more concentrated and those with knowledge to sell—both countries and individuals—will be the winners. Consider what will happen when: • Your genetic code can be digitally imprinted on an ID card and your insurance company and employer see that you are genetically disposed to, say, heart disease. • Pharmaceutical products are developed so that you can eat genetically modified broccoli to protect yourself from cancer. • Cloning will be as common as in vitro fertilization and scientists can influence the genetic design not only of other species but of your own children. • Creating wealth no longer requires many hands. Lone individuals are giving birth to entire new industries that rapidly become bigger than the economies of most countries on earth, but create very few jobs. *As the Future Catches You* resembles no other book. A typical page may contain just a few dozen words. But each seemingly discrete fact is like a chip in an intellectual mosaic that reveals its meaning and beauty only as you step back and see the big picture. Juan Enriquez is like the best teacher you ever had, one who helps you to see something in a new light and makes you say, "Now I get it!" Juan Enriquez's main point is that technology is not kind, it does not say "please," but slams into existing systems and destroys them while creating new ones. Countries and individuals can either surf new and powerful waves of change—or get crushed trying to stop them. The future is catching us all. Let it catch you with your eyes wide open. **Experimental Man What One Man's Body Reveals about His Future, Your Health, and Our Toxic World** Wiley Bestselling author David Ewing Duncan takes the ultimate high-tech medical exam, investigating the future impact of what's hidden deep inside all of us David Ewing Duncan takes "guinea pig" journalism to the cutting edge of science, building on award-winning articles he wrote for *Wired* and *National Geographic*, in which he was tested for hundreds of chemicals and genes associated with disease, emotions, and other traits. Expanding on these tests, he examines his genes, environment, brain, and body, exploring what they reveal about his and his family's future health, traits, and ancestry, as well as the profound impact of this new self-knowledge on what it means to be human. David Ewing Duncan (San Francisco, CA) is the Chief Correspondent of public radio's *Biotech Nation* and a frequent commentator on NPR's *Morning Edition*. He is a contributing editor to *Portfolio*, *Discover*, and *Wired* and a columnist for *Portfolio*. His books include the international bestseller *Calendar: Humanity's Epic Struggle to Determine a True and Accurate Year*

(978-0-380-79324-2). He is a former special producer and correspondent for ABC's Nightline, and appears regularly on CNN and programs such as Today and Good Morning America. **The Oxford Handbook of Environmental Ethics** Oxford University Press This handbook is currently in development, with individual articles publishing online in advance of print publication. At this time, we cannot add information about unpublished articles in this handbook, however the table of contents will continue to grow as additional articles pass through the review process and are added to the site. Please note that the online publication date for this handbook is the date that the first article in the title was published online. **The Double Helix A Personal Account of the Discovery of the Structure of DNA** Simon and Schuster The classic personal account of Watson and Crick's groundbreaking discovery of the structure of DNA, now with an introduction by Sylvia Nasar, author of A Beautiful Mind. By identifying the structure of DNA, the molecule of life, Francis Crick and James Watson revolutionized biochemistry and won themselves a Nobel Prize. At the time, Watson was only twenty-four, a young scientist hungry to make his mark. His uncompromisingly honest account of the heady days of their thrilling sprint against other world-class researchers to solve one of science's greatest mysteries gives a dazzlingly clear picture of a world of brilliant scientists with great gifts, very human ambitions, and bitter rivalries. With humility unspoiled by false modesty, Watson relates his and Crick's desperate efforts to beat Linus Pauling to the Holy Grail of life sciences, the identification of the basic building block of life. Never has a scientist been so truthful in capturing in words the flavor of his work.