



REAL SCIENTISTS

DON'T WEAR TIES
WHEN SCIENCE MEETS CULTURE

Sidney Perkowitz





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Real Scientists Don't Wear Ties: When Science Meets Culture

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To my beloved wife Sandy, Mike and Erica,
and Nora—I'm grateful that you're here.

Contents

<i>Preface: Scientist, Writer, or Both?</i>	xi
<i>Acknowledgment</i>	xv
<i>List of Illustrations</i>	xvii
1. Science	1
Introduction	1
<i>The mysteries of light</i>	
Illuminating Light	4
True Colors	18
Light Dawns	31
<i>Quantum mechanics, relativity, strings, and time</i>	
Nobody Knows the Quantum	38
Strange Devices	41
These Georgia Tech Physicists Helped Prove Einstein Right	52
Quantum Gravity	55
The Seductive Melody of the Strings	64
Time Examined and Time Experienced	67
<i>Solids, liquids, gases, and more</i>	
The Six Elements: Visions of a Complex Universe	73
Stealth Science	80
Froth with Meaning	89
Everything Worth Knowing About...Ice	98
2. Technology	103
Introduction	103
<i>Lasers and space travel</i>	
From Ray-gun to Blu-ray	106
How Close Are We to Actually Becoming Martians?	114
Ad Astra! To the Stars!	117
<i>Technology in the clinic</i>	
Brain Injuries in Soccer	124
When Vision Betrays	131

<i>Robots and artificial intelligence</i>	
John Markoff's Love for "Machines"	136
Removing Humans from the AI Loop: Should We Panic?	139
Do We Have Moral Obligations to Robots?	145
<i>Technology, society, and human behavior</i>	
The Internet before the Internet: Paul Otlet's Mundaneum	150
The Internet of Things: Totally New and a Hundred Years Old	155
Crimes of the Future	161
How to Understand the Resurgence of Eugenics	170
The Case Against an Autonomous Military	175
Frankenstein Turns 200 and Becomes Required Reading for Scientists	178
Can a Physics of Panic Explain the Motions of the Crowd?	185
<i>Future technologies</i>	
Fantasy into Science: Invisibility	189
Fantasy into Science: Teleportation	192
Fantasy into Science: Tractor Beams	195
3. Culture	199
Introduction	199
<i>Science and scientists meet culture</i>	
In Salmon Do Did Mobile Bond. . .	202
Laughing by Numbers	206
Real Physicists Don't Wear Ties	209
Spelling It Right in Karachi	216
Brother, Can You Spare a Cyclotron	219
<i>Cooking with science</i>	
Food for (Future) Thought or <i>Star Trek: The Menu</i>	226
The Future of Meat	229
<i>Science and art</i>	
Art Upsets, Science Reassures	235
Hubs, Struts, and Aesthetics	247
Inspirational Realism: Chesley Bonestell and Astronomical Art	251
Art, Physics, and Revolution	254

Mr. Turner, Artist, Meets Mrs. Somerville, Scientist	260
<i>Science, literature, and the media</i>	
Connecting with E. M. Forster	262
Science Fiction Covers the Universe and Also Our Own Little Globe	269
How Realistic Are Movies Set in Space?	271
Hollywood Science: Good for Hollywood, Bad for Science?	278
Turing and Hawking, Typical Nerds?	295
Boldly Going for 50 Years	302
Abstract Theory Has Real Consequences, in the Past and Today	306
<i>Books about science for general readers by Sidney Perkowitz</i>	310
<i>Republishing credits</i>	311
<i>Index</i>	317

Preface: Scientist, Writer, or Both?

I've wanted to be a scientist ever since I can remember, and when I became a successful research physicist, I was living my dream. But my early heroes also included writers—novelists such as F. Scott Fitzgerald, Sinclair Lewis, and J. D. Salinger, and science-fiction and fantasy writers such as Robert Heinlein, Ursula Le Guin, and J. R. R. Tolkien. Somehow the writing life appealed to me as much as science did. Of course, as a scientist, I had the opportunity and even the necessity to write journal articles that presented my research, producing over a hundred research pieces and several research-oriented books.

That was good training to express science directly and concisely, but though my research felt creative, presenting it in the rigid format of a scientific paper did not. And so when in the same year I reached two landmarks, my 50th birthday and the publication of my 100th research paper, I decided it was time for a different kind of writing. Though inspired by novels and imaginative fiction, I knew my strength would be to use my science background to inform and engage people who aren't scientists—to write popular science. That would also need plenty of imagination to find understandable examples and metaphors for abstract scientific ideas and to navigate the boundary between science and science fiction, which can illuminate science and where it is taking us.

My transition was helped by friends and colleagues at Emory University where I was Charles Howard Candler Professor of Physics, within Emory's commitment to good writing and interdisciplinary education. I got valuable support too from John Wilkes, founder and at the time director of the highly regarded science writing program at University of California, Santa Cruz, and from Peter Brown, then the editor of the regretfully long-gone magazine *The Sciences*.

My first science article for general readers appeared in the *Miami Herald* in 1989. From then until I retired from Emory as an emeritus professor in 2011, I carried on a two-track lifestyle: academic research and teaching, and writing pop science. Now I focus only on writing.

I hugely enjoyed lab research and now equally enjoy writing, which puts me into the blissful state psychologists call “flow.” The hours fly by and I write more than I would have believed possible. When I selected items to put into this collection, besides ten books published or in progress, I could choose from over 160 pop science articles, short blog pieces to long-form essays. I’ve selected fifty that represent what I think is my best writing and that cover a variety of topics and a time span from early pieces until 2018.

My choices are organized into three categories that reflect current research, my own interests, and those, I hope, of non-scientists.

The first category, “Science,” is about pure fundamental science, which aims to understand nature from the submicroscopic to the cosmic level. This desire motivated the ancient Greek natural philosophers and still drives researchers. In “Science” you’ll find selections dealing with the big questions and theories of physics—relativity, quantum mechanics, and the nature of light. The second big area I cover is the study of the matter that makes up the world around us.

That last area is closely related to my own research. Many pop science books are written by theoretical physicists, who do not work in labs but use their own minds, math and experimental data gathered by others to conceive theories, the best known example being Einstein and relativity. I however was an experimentalist, working in my lab to study the properties of solids such as semiconductors and superconductors with lasers and other tools. That gives me a different view of science and links right to my second category, “Technology.”

“Technology” covers the applications of pure science. Many appear in our daily lives and depend on the physical properties of materials such as the semiconductors in computer chips. Other uses involve biomedicine and social science. The pieces in this category range from current technology such as the laser and clinical medicine to science-fictional but maybe not impossible future technology like invisibility. They also present the growing human impact of new technology such as artificial intelligence (AI).

The last category, “Culture,” stems from my belief that science can be found in every human activity and is an integral part of human culture. “Culture” covers science and science fiction in visual art, literature, film, and television; science in everyday life; and the

culture of science itself in pieces that reveal how scientists think and behave (one of these, “Real Physicists Don’t Wear Ties,” about how scientists choose to dress, lent its title to this book. When I wrote it in 1991, there were far fewer women in science than today, so the traditional male accessory of the necktie has become even rarer among scientists).

I enjoyed selecting the variety of work I present here. I hope that readers of all backgrounds will find the pieces compelling as they have been written, with the science presented both correctly and understandably (and even with humor).

That’s important because of an idea bigger than my own personal collection. In today’s world where scientific fact often seems to receive less than its due, scientists owe it to themselves to convey science to the public for its benefit and for the benefit of science itself. If my experience as a scientist/writer inspires other scientists to express their own understanding of science, that would be a wonderful bonus.

Sidney Perkowitz

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I am happy to acknowledge the efforts of Jenny Rompas and Stanford Chong of Jenny Stanford Publishing, who approached me about the possibility of a book. They liked my idea of an anthology of my writings and have proven a pleasure to work with along with their editorial team.

List of Illustrations

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- 3.1 Scene from *Destination Moon* (1950).
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