

How to Think About
Weird Things

Critical Thinking for a New Age

THIRD EDITION



Lewis Vaughn

Foreword by Martin Gardner

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Foreword by Martin Gardner



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Foreword

Every year, in English-speaking countries alone, more than a hundred books that promote the wildest forms of bogus science and the paranormal are published. The percentage of Americans today who take astrology seriously is larger than the percentage of people who did so in the early Middle Ages, when leading church theologians—Saint Augustine, for example—gave excellent reasons for considering astrology nonsense. We pride ourselves on our advanced scientific technology, yet public education in science has sunk so low that a fourth of Americans and 55 percent of teenagers, not to mention a recent president of the nation and his first lady, believe in astrology!

Now and then a courageous publisher, more concerned with enlightening the public than with profits, will issue a book that honestly assesses pseudoscience and the paranormal. Works of this sort now in print can be counted on your fingers. It is always an occasion for rejoicing when such a book appears, and there are several ways in which *How to Think about Weird Things* is superior to most books designed to teach readers how to tell good science from bad.

First of all, this book covers an enormous range of bogus sciences and extraordinary claims that currently enjoy large followings in America. Second, unlike most similar books, the authors heavily stress principles that help you critically evaluate outlandish claims—and tell you *why* these principles are so important. Third, the book's discussions are readable, precise, and straightforward.

I am particularly pleased by the book's clearheaded assessment of scientific realism at a time when it has become fashionable in New Age circles to think of the laws of science as not "out there," but somehow a projection of our minds and cultures. Yes, quantum mechanics has its subjective tinge. There is a sense in which an electron's properties are not definite until it is measured, but this technical aspect of quantum theory has no relevance on the macroscopic level of everyday life. In no way does the mathematical formalism of quantum mechanics imply, as some physicists smitten by Eastern religions claim, that the moon is not there unless someone looks at it. As Einstein liked to ask, Will a mouse's observation make the moon real?

The authors give clear, accurate explanations of puzzling physical theories. Quantum theory indeed swarms with mind-boggling experiments that are only dimly understood. None of them justify thinking that $E = mc^2$ is a cultural artifact, or that E might equal mc^3 in Afghanistan or on a distant planet. Extraterrestrials would of course

express Einstein's formula with different symbols, but the law itself is as mind-independent as Mars.

As the authors say simply: "There is a way that the world is." It is the task of science to learn as much as it can about how this universe, not made by us, behaves. The awesome achievements of technology are irrefutable evidence that science keeps getting closer and closer to objective truth.

As the authors tell us, there are two distinct kinds of knowledge: logical and mathematical truth (statements that are certain within a given formal system), and scientific truth, never absolutely certain, but which can be accepted with a degree of probability that in many instances is practically indistinguishable from certainty. It takes a bizarre kind of mind to imagine that two plus two could be anything but four, or that, as the authors put it, cows can jump over the moon or rabbits lay multicolored eggs.

The authors are to be especially cheered for their coverage of unsubstantiated alternative treatments, some of them weird beyond imagining. Preposterous medical claims can cause untold harm to gullible persons who rely on them to the exclusion of treatment by mainstream physicians.

The authors are also to be commended for finding colorful and apt quotations from other writers. Bertrand Russell, for instance, gave three simple rules for curbing one's tendency to accept what he called "intellectual rubbish":

1. When the experts are agreed, the opposite opinion cannot be held to be certain.
2. When they are not agreed, no opinion can be regarded as certain by a nonexpert.
3. When they all hold that no sufficient grounds for a positive opinion exist, the ordinary person would do well to suspend judgment.

"These propositions seem mild," Russell added, "yet, if accepted, they would absolutely revolutionize human life."

I am under no illusions about how effective this book will be in persuading readers to adopt Russell's three maxims. I *can* say that to the extent it does, it will have performed a service that our technologically advanced but scientifically retarded nation desperately needs.

—*Martin Gardner*

Preface

Few claims seem to arouse more interest, evoke more emotion, and create more confusion than those dealing with the paranormal, the supernatural, or the mysterious—what in this book we call “weird things.” Although many such claims are unbelievable, many people believe them, and their belief often has a profound effect on their lives. Billions of dollars are spent each year on people and products claiming supernatural powers. Channelers claim to communicate with aliens from outer space, psychics and astrologers claim to foretell the future, and healers claim to cure everything from AIDS to warts. Who are we to believe? How do we decide which claims are credible? What distinguishes rational from irrational claims? This book is designed to help you answer such questions.

Why do you believe in any given claim? Do you believe for any of the following reasons?

- You had an extraordinary personal experience.
- You embrace the idea that anything is possible—including weird things.
- You have an especially strong feeling that the claim is true or false.
- You have made a leap of faith that compels you to accept the claim.
- You believe in inner, mystical ways of knowing that support the claim.
- You know that no one has ever disproved the claim.
- You have empirical evidence that the claim is true.
- You believe that any claim is true for you if you believe it to be true.

This list of reasons for belief could go on and on. But which reasons are *good* reasons? Clearly, some are better than others; some can help us decide which claims are most likely to be true, and some can't. If we care whether any claim is actually true, whether our beliefs are well-founded (and not merely comfortable or convenient), we must be able to distinguish good reasons from bad. We must understand how and when our beliefs are justified, how and when we can say that we *know* that something is true or believable.

The central premise of this book is that such an understanding is possible, useful, and empowering. Being able to distinguish good reasons from bad will not only improve your decision-making ability, it

will give you a powerful weapon against all forms of hucksterism. This volume shows you step by step how to sort out reasons, how to evaluate evidence, and how to tell when a claim (no matter how strange) is likely to be true. It's a course in critical thinking as applied to claims and phenomena that many people think are immune to critical thinking.

The emphasis, then, is neither on debunking nor on advocating specific claims, but on explaining principles of critical thinking that enable you to evaluate any claim for yourself. To illustrate how to apply these principles, we supply analyses of many extraordinary claims, including conclusions regarding their likely truth or falsity. But the focus is on carefully wielding the principles, not on whether a given claim goes unscathed or is cut down.

Often in the realm of the weird, such principles themselves are precisely what's at issue. Arguments about weird things are frequently about *how people know* and *if people know*—the main concerns of the branch of philosophy called *epistemology*. Thinking about weird things, then, brings us face to face with some of the most fundamental issues in human thought. So we concentrate on clearly explaining these issues, showing why the principles themselves in this book are valid, and demonstrating why many alternatives to them are unfounded. We explore alleged sources of knowledge like faith, intuition, mysticism, perception, introspection, memory, reason, and science. We ask: Do any of these factors give us knowledge? Why or why not?

Since we show how these principles can be used in specific cases, this book is essentially a work of *applied epistemology*. Whether you're a believer or nonbeliever in weird things, and whether or not you're aware of it, you have an epistemology, a theory of knowledge. If you ever hope to discern whether a weird claim (or any other kind of claim) is true, your epistemology had better be a good one.

The principles discussed in this book can help you evaluate any claim—not just those dealing with weird phenomena. We believe that if you can successfully use these principles to assess the most bizarre, most unexpected claims, you're well prepared to tackle anything run-of-the-mill.

NEW EDITION, NEW MATERIAL

For this third edition, we have revised several sections, updated several others, and added new discussions of topics that now draw a great deal of popular interest. These changes include:

- A section on logic explaining the nature and function of both deductive and inductive reasoning.

- A section on communicating with the dead and cold reading.
- A revised chapter on cognitive relativism covering subjectivism, social constructivism, and conceptual relativism.
- Updated treatment of evolution and creationism with expanded coverage of intelligent design theory.
- Many additional exercises, discussion questions, and field problems.

IMPORTANT CONTINUING FEATURES

This volume also includes the following:

- Explanations of thirty-three principles of knowledge, reasoning, and evidence that you can use to enhance your problem-solving skills and sharpen your judgment.
- Discussions of over sixty paranormal, supernatural, or mysterious phenomena, including astrology, ghosts, fairies, ESP, psychokinesis, UFO abductions, channeling, dowsing, near-death experiences, prophetic dreams, demon possession, time travel, parapsychology, and creationism.
- Details of a step-by-step procedure for evaluating any extraordinary claim. We call it the SEARCH formula and give several examples showing how it can be applied to some popular weird claims.
- Numerous boxes offering details on various offbeat beliefs, assessments by both true believers and skeptics of extraordinary claims, and reports of relevant scientific research. We think this material can stimulate discussion or serve as examples that can be assessed using the principles of critical thinking.
- A comprehensive treatment of different views about the nature of truth, including several forms of relativism and subjectivism.
- A detailed discussion of the characteristics, methodology, and limitations of science, illustrated with analyses of the claims of parapsychology and creationism. This discussion includes a complete treatment of science's criteria of adequacy and how those criteria should be used to evaluate extraordinary claims.
- An in-depth treatment of various kinds of evidence appealed to in health issues, including personal experience, testimonials, case studies, test-tube and animal studies, human nonintervention studies, and clinical trials. It covers several principles that will help you assess any health claim, including popular ones in alternative medicine and holistic health.

- An appendix that describes various informal logical fallacies that are introduced and explained in the text.

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ONE

Introduction: Close Encounters with the Strange

THIS BOOK IS FOR you who have stared into the night sky or the dark recesses of a room, hairs raised on the back of your neck, eyes wide, faced with an experience you couldn't explain but about which you have never stopped wondering, "Was it real?" It's for you who have read and heard about UFOs, psychic phenomena, time travel, out-of-body experiences, ghosts, monsters, astrology, reincarnation, mysticism, acupuncture, iridology, incredible experiments in quantum physics, and a thousand other extraordinary things, and asked, "Is it true?" Most of all, it's for you who believe, as Einstein did, that the most beautiful experience we can have is the mysterious — and who yet, like him, have the courage to ask tough questions until the mystery yields answers.

Wonder is the feeling of a philosopher, and philosophy begins in wonder.

—PLATO

But this is not primarily a book of such answers, though several will be offered. This book is about *how to find the answers for yourself*—how to test the truth or reality of some of the most influential, mysterious, provocative, bewildering puzzles we can ever experience. It's about how to think clearly and critically about what we authors have dubbed *weird things*—all the unusual, awesome, wonderful, bizarre, and antic happenings, real or alleged, that bubble up out of science, pseudoscience, the occult, the paranormal, the mystic, and the miraculous.

THE IMPORTANCE OF WHY

*Skeptical habits of
thought are essential
for nothing less than
our survival—
because baloney,
bamboozles, bunk,
careless thinking,
flimflam and wishes
disguised as facts are
not restricted to
parlor magic and
ambiguous advice on
matters of the heart.*
—CARL SAGAN

Pick up almost any book or magazine on such subjects. It will tell you that some extraordinary phenomenon is real or illusory, that some strange claim is true or false, probable or improbable. Plenty of people around you will gladly offer you their beliefs (often unshakable) about the most amazing things. In this blizzard of assertions, you hear a lot of *whats*, but seldom any good *whys*. That is, you hear the beliefs, but seldom any solid reasons behind them—nothing substantial enough to justify your sharing the beliefs; nothing reliable enough to indicate that these assertions are likely to be *true*. You may hear naiveté, passionate advocacy, fierce denunciation, one-sided sifting of evidence, defense of the party line, leaps of faith, jumps to false conclusions, plunges into wishful thinking, and courageous stands on the shaky ground of subjective certainty. But the good reasons are missing. Even if you do hear good reasons, you may end up forming a firm opinion on one extraordinary claim, but fail to learn any principle that would help you with a similar case. Or you hear good reasons, but no one bothers to explain why they're so good, why they're most likely to lead to the truth. Or no one may dare to answer the ultimate why—why good reasons are necessary to begin with.

Without good whys, humans have no hope of understanding all that we fondly call *weird*—or anything else, for that matter. Without good whys, our beliefs are simply arbitrary, with no more claim to knowledge than the random choice of a playing card. Without good whys to guide us, our beliefs lose their value in a world where beliefs are already a dime a dozen.

We especially need good whys when faced with weirdness. For statements about weird things are almost always cloaked in swirling mists of confusion, misconception, misperception, and our own yearning to disbelieve or believe. Our task of judging the reality of these weird things isn't made any easier by one fact that humbles and inspires every scientist: Sometimes the weirdest phenomena are ab-