

General Introduction

Philosophy of science is a paradigm of contemporary intellectual rigor. It offers a challenge of clarification, a promise of systematic understanding, and an invitation to innovative conceptual exploration. Such is its appeal.

The occult traditions are steeped in antiquity. They reach us with an atmosphere of mystery, a whisper of wisdom, and a hint of the beckoning unknown. Such is their appeal.

This is an attempt to bring the two together.

The collection that follows can be viewed in either of two ways: as an introduction to philosophy of science through an examination of the occult, or as a serious examination of the occult rigorous enough to raise central issues in philosophy of science. That the collection *can* be viewed in either of these ways is, I think, an indication of its two virtues. Its concern with issues in philosophy of science marks it as a more serious investigation of the occult than most. And its use of the occult as an introduction to philosophy of science makes it a more intriguing and more accessible introduction than most.

The editorial integration of these two is of course entirely intentional. But let me render asunder for the moment what has been so carefully brought together and address each of these aims as if were my only aim.

I

Much that is best in current philosophy—and in philosophy for the past fifty years—falls within the loose but useful category of philosophy of science. With the benefits of increasingly sophisticated and rigorous work, however, have come unfortunate pedagogical costs. Philosophy of science is rarely seen, by students or by others as yet uninitiated into its mysteries, for the exciting ongoing exploration it truly is. As usually presented, the standard conundrums of confirmation and enigmas of explanation too often

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fail to jar intellectual inertia or disturb dogmatic slumbers as they should. The collection that follows is designed to change this: to make the lively excitement and intellectual fascination of philosophy of science immediate and obvious.

I think—and I think the collection demonstrates—that standard issues within the philosophy of science arise quite naturally in the context of an examination of intriguing claims concerning astrology, parapsychology, quantum mysticism, and other aspect of “the occult.” An examination of these areas thus offers an appealing and accessible forum in which to discuss theoretical issues which are also of importance for astronomy, psychology, quantum mechanics, and other aspects of science.

Topics standard to philosophy of science that arise in the following pages include issues of confirmation and selection for testing, possibility and *a priori* probabilities, causality and time, explanation and the nature of scientific laws, the status of theoretical entities, the problem of demarcation, theory and observation, and science and values. That these issues are raised here in the context of a discussion of the occult in no way weakens the importance of dealing with them carefully and rigorously as quite general issues. But this context does serve, more effectively than most, I think, to make the initial introduction of these issues immediately understandable and dramatically compelling, and thus serves to motivate the careful work they require.

The collection may serve as all that is needed within philosophy of science for a major section of an introductory philosophy or humanities course. It is quite clearly suited as a core text for courses in science and pseudoscience, which have generally proven successful,¹ and as a major text in informal logic or critical reasoning courses. Within traditional philosophy of science courses it can serve as a useful auxiliary text, with some of the major issues raised here further pursued using more standard materials.

II

The collection need not be conceived, however, solely or primarily as a pedagogical tool for philosophy of science. It is also a straightforward examination of various aspects or areas of the occult.

Those areas addressed here as “the occult,” for lack of a term more suitably inclusive and yet unprejudicial, are rarely met with equanimity.² Topics such as astrology, parapsychology, and quantum mysticism are likely to be as threatening to the calm order of polite conversation as politics and religion were once reputed to be. Some of us have blood that boils at the insufferable dogmatism of those who deny such areas of investigation their genuine integrity and their proper due. Others of us have blood that boils at the mere thought of the empty-headed gullibility of those impressed by such twaddle.

The theme of the collection, in most general terms, is this clash of viewpoints between impassioned defenders and icy critics. But the attempt is not to review, in tranquility and with judicial sobriety, an intellectual battle fought elsewhere. Nor is the attempt to structure debate so as to show either the defender of the occult, or the icy skeptic, triumphant. Instead, the battle itself is allowed to rage in these pages, with equally informed and sophisticated efforts on each side of the conflict and without an editorially imposed verdict. In this regard what follows is a collection of some of the most exciting arguments offered by defenders and skeptics in conflict. There are of course various shades and various forms of both defense and critique. But with that qualification duly noted, it seems safe to number Karl Popper, Thomas S. Kuhn, Clark Glymour, Antony Flew, Marshall Spector, Robert P. Crease and Charles C. Mann among the skeptics represented, with Paul Feyerabend, Michel Gauquelin, Bob Brier, Fritjof Capra, Gary Zukav, and J. B. Rhine among their opponents.

In the most general terms, then, this collection is a clash between sophisticated defenders and critics concerning topics grouped here as "the occult." But as a glimpse at the table of contents will indicate, things quickly become more complex. In anything *but* the most general terms, what is at issue is not a simple stand-off but an intricate web of challenge and response, evidence offered and disputed, argument and counter-argument. This is, of course, what is to be expected of any rigorous and systematic debate concerning these topics. Astrology, parapsychology, and quantum mysticism raise significantly different issues and call for quite different handling, whether in critique or defense. Within each topic, moreover, there are alternative lines of defense and critique and counter-critique, different types of appeal to different types of evidence, and various ways of applying various general principles at issue. To the impatient, anxious for a glib vindication or refutation, the labyrinthian twists of this complex argumentation may prove annoying. But it is precisely the intricacy and subtlety of such argument that marks a genuinely *serious* consideration of these topics, and it is a serious consideration that is intended here. It is also within the labyrinths of such careful argument that the major issues in philosophy of science, alluded to above, so clearly arise.

Let me add here a warning both to those who think of themselves as true believers and to those who think of themselves as icy skeptics with regard to the occult: one ought not expect to emerge from the philosophical discussion of the following pages, or from any serious philosophical discussion, entirely unscathed. Icy skeptics may find evidence of which they were unaware, and encounter new and unsettlingly plausible arguments against their initial stance. True believers may find that certain bodies of evidence, when actually examined, are less compelling than they are popularly reputed to be, and may discover new and strikingly sophisticated arguments on the

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other side. It is fine to enter the discussion as either a believer or a skeptic, as long as one is willing to take serious debate seriously, and as long as one recognizes that that offers no guarantee that one will end up with precisely the same convictions one began with.

It should also be noted that the major philosophical problems raised in this book are problems posed for both the skeptic and the believer. These are quite general and pervasive quandaries, and no particular position with regard to the occult will allow one to wave them aside.

Here the problem of demarcation, a major theme of the collection, may serve as a convenient example. Consider first the position of the skeptic. He who rejects certain topics as mere "pseudoscience" must draw a line between proper science and that which he rejects, and the problem of demarcation is the problem of precisely where, and on what justifiable basis, such a line is to be drawn. Nor can the skeptic rest content with a line of demarcation placed conveniently at the edge of undebatable contemporary scientific knowledge. Science always calls for *further* investigation, and thus one must have some grounds for distinguishing some proposed lines of investigation as properly scientific, even before they are actually pursued, from endeavors unworthy of pursuit because "pseudoscientific." For the skeptic the problem of demarcation is to draw a justifiable distinction in terms general enough that it may govern decisions regarding future work as well as judgments regarding current efforts.

But consider also the case of the true believer. No matter how sympathetic one is to the various topics that might be included as "the occult," one simply cannot, within the bounds of consistency, believe it all. The various aspects of the occult do not form a harmonious whole, and one is subjected to conflicting theories and rival explanations and contradictory claims and competing modes of investigation within occult lore, just as elsewhere. Thus even the truest of believers must distinguish good work from bad, and worthy from hopeless approaches or forms of investigation. The believer, too, is forced to draw a line, then, and to justify its placement, though his line may lie farther from recognized science and deeper within the occult. The general problem of where to draw a line, then, and why to draw it there—the general problem of demarcation—is the same for skeptic and believer. Much the same holds for general issues of causality, confirmation, probability, explanation, theory and observation, and science and values which form the major conceptual currents of the volume.

III

The two aims of the collection—as an introduction to philosophy of science through an examination of the occult, and as an exciting debate concerning the occult serious enough to broach general issues in philosophy of science—are not, I would suggest, in competition. To a large extent, the satisfactory pursuit of either aim quite naturally furthers the other aim as

well. The more serious and sophisticated that debate becomes concerning astrology, parapsychology, and the like, the more clearly philosophical it becomes as well. And the more such a discussion relies on traditional work within philosophy of science, the more sophisticated it is bound to be.

Here let me offer some more complete comments regarding the structure of the volume.

Each of the major sections of the collection opens with a brief introductory overview, designed to raise the particular issues of that section, to stress points of continuity with other sections, and to emphasize crucial patterns of argument that develop in the course of that section. The last of these is perhaps the most important. Within each section pieces have been chosen and placed so as to offer a continuous thread of developing argument, critique, and response through the section. Most pieces within a section offer implicit, and sometimes explicit, replies to the pieces that precede them, or offer a further development of earlier arguments. The first selections within each section are generally the simplest and most immediately accessible and are followed by pieces of increasing sophistication as the argument develops. So although pieces may be selected from the whole for individual attention, there is also a continuity within each section that recommends that the pieces it includes be read in the order in which they appear. It is this thread of continuity that I try to make more explicit in introductory outlines.

In some ways the section that is theoretically most fundamental for the collection as a whole is not the first section but the second, which offers a thorough discussion of the issue of demarcation in general. The most common rejection of astrology, parapsychology, and the like is to brand them with the epithet "pseudoscience." But what is it that lies behind that epithet; what does it mean to call something either "scientific" or "pseudoscientific," and what is it in general that will justify the praise of an endeavor as "scientific" or justify its vilification as "pseudoscientific"? This is Popper's "problem of demarcation," which forms a major theme within the collection as a whole.

In this second section Karl Popper, Thomas S. Kuhn, and Imre Lakatos are all represented, with comments both critical and elucidative by Daniel Rothbart and Robert Feleppa. Clark Glymour and Douglas Stalker offer a humorous lampoon of "pseudoscience" to open the section, Roger Cooter offers the view of a historian critical of the whole philosophical attempt at demarcation, and Robert F. Baum closes with some reflections on the debate and its wider cultural significance.

The first section of the collection is devoted to astrology. Its appearance before the more general theoretical discussion of demarcation is as I would recommend that it be read and as I would use it in my own teaching. The intricacies of complex argument concerning demarcation can seem twisted

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indeed, especially to the philosophically uninitiated, without a particular problem and a specific case to keep in mind in pursuing them. Astrology is offered first as such a specific case, with its legitimacy or illegitimacy a problem the more complete examination of which calls for further work in the later section.

The section on astrology opens with a critical broadside, excoriating astrology in no uncertain terms and signed by 186 scientific notables. That attack is immediately answered, however, by Paul Feyerabend in the role of critics' critic. This section also contains an impressive report of statistical work by Michel Gauquelin, work that has quite widely been applauded as vindicating astrology. Edward W. James gives a disparaging glance at the popular literature of astrology, alluding to the work of Popper and Kuhn that appears later in the collection, and I. W. Kelly, G. A. Dean, and D. H. Saklofske offer a comprehensive review of various types of astrology in an attempt to gauge their strengths and weaknesses.

This first section does not impose, and is not meant to impose, any clear resolution concerning the legitimacy of astrology. Thus it is no weakness if some readers find the work of Gauquelin and Kelly, Dean, and Saklofske's survey of more recent developments regarding that work so impressive as to establish at least a core of legitimacy for astrology, whereas other readers find compelling the critical comments in the opening piece, in James, or in other aspects of Kelly, Dean, and Saklofske's review. The section is intended rather to evoke, in the context of lively debate concerning astrology, some broader philosophical issues that call for further pursuit. The general issue of demarcation is primary among these, and thus leads directly into the succeeding section. But Gauquelin's work also offers an opportunity for further thought regarding causality and correlation, and Feyerabend and James introduce a number of informal fallacies worthy of attention. The difficulties of deciding what does or would serve as evidence for astrology may offer quite general lessons regarding hypothesis formulation and testing.

Using the initial consideration of astrology and the further development of important conceptual tools in the general discussion of demarcation as a background, the third section—on parapsychology—renews some earlier questions and poses important new ones. Here, to begin with, is another specific case against which to judge proposals for demarcation outlined in the previous section. Is *parapsychology* to be classified as mere pseudoscience, and if so why? The readings in this section indicate major ways in which the case of parapsychology *differs* from that of astrology, and thus emphasize the many different considerations that may be at issue in any serious attempt to draw a justifiable line between science and its pretenders. But parapsychology also raises important philosophical issues not previously addressed in the collection. What does it mean to wave some-

thing aside as “mere coincidence,” and on what basis do we distinguish phenomena that call for an explanation in their own right from phenomena that do not? What is the proper role in science of intuitive “basic limiting principles” such as our conviction that mental phenomena must in some way involve brains, or that all knowledge must ultimately be acquired by some sensory means? Is it possible for an effect to precede its cause?

The parapsychology section opens with a review of major parapsychological research, and a discussion of promising developments in the field, by Ruth Reinsel. This offers a helpful summary of documented work—rather than the merely anecdotal cases and merely rumored tests that abound as popular lore—against which to gauge the more general and philosophical treatments that follow. The last piece of the section is by J. B. Rhine, by far the most respected figure in the development of the field, and offers a direct response to accusations of fraud as well as addressing the discovery of experimental falsifications by Walter J. Levy, Jr. Noteworthy among the critics in this section is Antony Flew. His contribution touches on Hume’s comments regarding miracles and could easily serve as an introduction to questions concerning lawlikeness and the status of scientific laws. Other issues broached in the critical pieces by Flew, Galen K. Pletcher, and Jane Duran include repeatability, units of explanation, the scientific status of *a priori* principles, theoretical entities, and causality and correlation. Duran’s piece is also noteworthy for raising central questions in the analysis of knowledge and the issue of identity theory in philosophy of mind.

An issue dealt with quite thoroughly in the parapsychology section is that of “backward causation.” Can an effect precede its cause? The claim that this is not possible, and thus that precognition is not possible, is first introduced by Galen Pletcher and is more fully developed as a strong critical point in the pieces by Flew and Duran. Their skeptical conclusions are quite forcefully challenged, however, by Bob Brier and Maithili Schmidt-Raghavan. Brier and Schmidt-Raghavan suggest that this standard attack rests on a confusion, and attempt to vindicate parapsychology (and their own parapsychological experiment) by arguing that backward causation is indeed possible. Here Brier and Schmidt-Raghavan rely in part on the work of John Stuart Mill.

The fourth section of the collection is importantly different from its predecessors. Here the issue is, of course, not whether quantum mechanics—the central topic of the section—should be considered “science” or “pseudo-science”; quantum mechanics’ claim to full scientific status is undisputed. The question at issue here is, rather, whether a theory as firmly entrenched scientifically as quantum mechanics may not, nonetheless, have *implications* which might be considered “occult”: implications that parallel Eastern mysticism, and in particular implications that consciousness plays a *creative* role in the fundamental mechanisms of the universe—in Gary Zukav’s

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words, that “we create certain properties because we choose to measure those properties.”

The claim that quantum mechanics *does* parallel Eastern mysticism, and *does* have these major implications for the role of consciousness, is clearly made by Fritjof Capra in an excerpt from *The Tao of Physics* and by Gary Zukav in an excerpt from *The Dancing Wu Li Masters*. The claim of parallelism is directly attacked by Robert P. Crease and Charles C. Mann, however, and Marshall Spector offers a careful examination of what is *physically* new about quantum mechanics in the course of emphatically criticizing the claim that consciousness here plays any special role. Controversy regarding quantum mechanics is far from new, of course: the section opens with an exchange between Albert Einstein and Neils Bohr as to whether the theory should be considered “complete”. In one of the most intriguing pieces of the section, N. David Mermin leads the reader through the construction of a device which clearly illustrates the very real perplexities of the phenomena at issue. “It’s not the Copenhagen interpretation of quantum mechanics that is strange,” Mermin says, “but the world itself.”

The final section of the collection is an attempt to consider approaches to the occult we may have neglected in the rest of the volume. In general, our concern throughout has been with aspects of the occult as claimants to scientific status or as purported implications of fundamental scientific theory. The final section addresses the possibility that this mode of procedure and the tone of our examination in general may have unfairly distorted or disparaged fully legitimate but very different human endeavors properly included within the occult. Is a mistake being made in judging some things against a scientific standard or with the model of science in mind?

William James’s classic remarks on mysticism and nitrous oxide are used to open the section, and James proposes an affirmative answer to this question. There are perhaps, James suggests, different orders of experience beyond the reach of science, and these may provide the “truest of insights into the meaning of this life.” Such a position is further argued by Edward Conze, who quite explicitly accuses Western “science-bound philosophers” of perversely refusing to accept other traditions as on an equal footing with science as we know it. Such a position will be familiar to readers of Carlos Castañeda and Alan Watts, among others, but Conze’s work offers a more straightforward and in many ways more compelling argument. What James and Conze raise is the specter of epistemological relativism, and one of the things I attempt to do in the final piece is to offer a partial reply. I attempt to do so, however, by addressing the question of whether science is value-laden, and what this might mean in considering science as but one among rival alternatives. That my piece comes last is, of course, by no means to suggest that mine is to be taken as anything like the final word on the matter.

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The final section is designed to broach issues regarding science and values that do not emerge so clearly elsewhere in the collection, but is also intended to offer a context in which issues of epistemological relativism, so often introduced by the students themselves, can be clearly and profitably discussed. Thus it may prove pedagogically useful to skip to the final section when the issue arises.

IV

Some of the pieces included here are reprinted from other sources. I am grateful to Paul Kurtz and the editors of *The Humanist* for permission to reprint "Objections to Astrology"; to Paul Feyerabend for "The Strange Case of Astrology" and to Michel Gauquelin for "Spheres of Influence"; to Sir Karl Popper for permission to reprint from "Science: Conjectures and Refutations"; to Thomas S. Kuhn and Cambridge University Press for permission to reprint from "Logic of Discovery or Psychology of Research?"; to Alan Musgrave and Cambridge University Press for permission to reprint an excerpt from Imre Lakatos's "Falsification and the Methodology of Scientific Research Programmes"; to Roger Cooter, Wilfrid Laurier University Press, and the editors of *Science, Pseudoscience, and Society* for permissions regarding "The Conservatism of 'Pseudoscience'"; to the editors of *The Intercollegiate Review* for permission to reprint from Robert F. Baum's "Popper, Kuhn, Lakatos: A Crisis of Modern Intellect"; to Antony Flew, the *Pacific Philosophical Quarterly*, Wilfrid Laurier University Press, and the editors of *Science, Pseudoscience, and Society* for permission to reprint "Parapsychology: Science or Pseudoscience?"; to Louisa E. Rhine and the editors of the *Journal of Parapsychology* for permission to reprint from "Second Report on a Case of Experimenter Fraud"; to Fritjof Capra and Shambhala Publications for permission to reprint an excerpt from *The Tao of Physics*; to William Morrow and Co. for permission to reprint an excerpt from Gary Zukav's *The Dancing Wu Li Masters*; to N. David Mermin and the *Journal of Philosophy* for permission to reprint "Quantum Mysteries for Anyone"; and to Professor Ninian Smart, Muriel Conze, and George Allen and Unwin Ltd. for permission to reprint from "Tacit Assumptions." The opening quotations from Colin Wilson, *The Occult: A History* (New York: Random House, 1971), p. 39, and Carl Sagan, *Broca's Brain* (New York: Random House, 1979), pp. 3 and 18, are with permission. I am also indebted to the contributors for tolerating so many requests for laborious revision in the name of coherency and effectiveness within the collection.

The illustrations at section introductions are from rough sketches by my father, Elgas Grim.

Notes

1. See Michael Martin, "The Use of Pseudo-Science in Science Education," *Science Education* 55 (1971), 53-56, and Paul Thagard and Daniel M. Hausman, "Sun

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Signs vs. Science: Using Astrology to Teach Philosophy of Science," *Metaphilosophy* 11 (1980), 101-104.

2. It is intriguing that a suitably broad but unprejudicial term is so difficult to find. "Pseudoscience," of course, condemns as it classifies, and "the paranormal" seems more properly confined to parapsychology. Recourse to metaphor does little better. "The frontiers of science" seems too laudatory, as do "the edges of science" or the "borders of science," though less so. "The fringes of science," on the other hand, has precisely the opposite drawback. "Borderlands of science" is perhaps better, though its ambiguity extends not merely to normative overtones but leaves one wondering precisely what topics are at issue. Here I use "the occult" merely for lack of a better term and as the best approximation I could find to a term with an appropriately broad application but without prejudicial overtones.