The New Philosophy of Science and the 'Paranormal'

The task of demarcating between the real sciences and pseudoscience has had a long and complex history. That history should induce a certain modesty.

Stephen Toulmin

OVER THE PAST thirty years, there has been a major shift of focus on the part of many philosophers of science. This has been associated with a new recognition of the depth and importance of historical change as a factor in shaping our scientific beliefs, ideas, and presuppositions, and in determining the contexts of scientific discovery and even the methods of scientific research. The most widely read book in this new vein has, of course, been Thomas Kuhn's *The Structure of Scientific Revolutions*. But this work is only the tip of an iceberg, and it is perhaps too vague, superficial, and lacking in detail to help us in any examination of the claims of the paranormal. It is too easy, for instance, for parapsychologists and others to claim the Kuhnian protection of working according to "a different paradigm." So, here, let me indicate in my own terms—without any resort to the jargon of paradigms—what implications the current shift in philosophy of science has for the work of the Committee for the Scientific Investigation of Claims of the Paranormal.

Our immediate predecessors (as is well known) hoped that the work of defining a proper "method" for the sciences would yield a *unique* method, applicable to the subject matter of any science and notably to a given science at any stage in its historical development. Thus they sought to move beyond the position of (say) Aristotle, who claimed that each different kind of problem and subject matter needed to be analyzed,

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discussed, and explained in correspondingly different terms. In turn, they hoped that they could find the basis for a sharp, clear, and above all *permanent* criterion—the so-called demarcation criterion—for telling sciences whose students have some genuine claim to be proceeding rationally and methodically from "pseudosciences," which might pretend to deserve scientific status but fail to meet the required tests.

The newer approach to philosophy of science moves away from the more extreme claims of (say) the Viennese philosophers of the 1920s and 1930s. It begins from the observation that any *universal and timeless* account of scientific method—and, with it, any universal and timeless demarcation criterion for telling "real" sciences from pseudosciences—is also, unavoidably, an *abstract* account. We may respectfully tip our hats to the idea that true scientists should pay attention to, for instance, the quality and quantity of the "evidence" available to them, the strength of the "support" it lends to any given "hypothesis," the "observations" that might conceivably "falsify" that hypothesis, and the scope of the "predictions" and "explanations" to which it leads. But all of this is so much apple pie. The universality of the demands in question is purchased at the price of losing touch with the real work of the sciences.

For example, the standards that determine what counts as a scientific "prediction" vary between one science and another, and even from one phase to another in the development of any particular science. So, before we can apply these formal, abstract demands to actual scientific situations, we must pay attention *also* to certain specific, concrete features that are distinctive of any given science at this or that stage in its history; and it turns out that most of these features are highly variable, both among different sciences and among historical epochs. Correspondingly, all the general terms that the Viennese philosophers looked to as providing the universal and timeless indices of a science's rational status—*verify, falsify, predict,* and the like—turn out to be *multivocal:* They have a determinable sense only when understood in the particular ways appropriate to the problems of the science in question at the time in question.

So far, this is only prologue. If we take the new approach to philosophy of science seriously, we shall have to call up for reconsideration a dozen assumptions over which—as it seems now, in retrospect—our Viennese forerunners were too complacent. Two of the items requiring review, as a result, will be: (1) the very idea of a permanent "demarcation criterion" for telling real sciences from pseudosciences, and (2) the ways in which we draw the boundaries between the "normal," the "abnormal" (or "anomalous"), and finally the "paranormal" (or putatively mysterious). If the new approach is at all sound, we may expect to find that these distinctions have themselves to be drawn in historical and contextual terms. So, this article will discuss two topics: namely, the implications of this new approach, on the one hand, for defining any program and method for

inquiring into the claims of the paranormal and, on the other hand, for specifying the content of such a program.

Shifts in Demarcation Criteria

As to the first of these two questions, we should begin by reconsidering the meaning of the very term *normal* and its two parallel antonyms, *abnormal* and *paranormal*. Beforehand, we might be inclined to assume that the idea of *normality* must be a permanent item in the inventory of human thought; or that it is at the very least a necessary presupposition of modern science. Surely human beings (particularly, scientific investigators) have always had such a notion?

The slightest historical investigation reveals that this is not the case. The idea of the "normal," in its modern sense, is curiously recent, certainly far more recent than the rise of modern science. Other earlier notions (to be sure) are clearly cognate or ancestral to our own modern idea of normality. But the first use of the term *normal* in this sense recorded in the *Oxford English Dictionary* dates from the year 1840; as such, it coincides with the start of the professionalization of scientific work. Notice that 1840 was also the year when, in the course of his presidential address to the new British Association for the Advancement of Science, William Whewell introduced his freshly coined word to replace all those vague words and phrases hitherto used when referring to scientific students of natural phenomena—namely, "natural philosophers," "savants," "virtuosi," and the like—the brand new word, *scientist*, which Whewell invented on the model of the much older and better established word *artist*. (Sociologists will certainly see it as no accident that the rise of a professional class of "scientists" also coincided with fresh attempts to mark off the "normal" course of natural events from other, more surprising or mysterious phenomena.)

As to the contrary term, "abnormal," this turns out to be even more recent and ill defined. Indeed, this is one of the rare words for which the *O.E.D.* reserves a critical commentary. About "abnormal" it says, in what connoisseurs will recognize as fighting words, "Few words have shown such a series of pseudoetymological perversions"; and the earliest uses of the word in a recognizably modern sense date from around the 1860s and 1870s. (Not surprisingly, the word "paranormal" does not appear at all, either in the *O.E.D.* or in its supplements!)

During the two preceding centuries, scientists had spoken of exceptional or mysterious happenings and phenomena in different terms. For eighteenth-century natural philosophers, the operative contrast was that between the "natural" and the "unnatural," with the "supernatural" standing on one side (so to say) for emergency use only. For their seventeenth-century forerunners, the basic distinction was that between the "natural,"

on the one hand, and the "divine" or "miraculous," on the other. In framing his account of Nature, for instance, Isaac Newton took it for granted that the observed phenomena embrace both passive, natural processes and also the active interventions of Divine Agency; conversely, when Leibniz and the Cartesians criticized Newton's hypothesis of universal gravitation, they objected to it as being "either miraculous or imaginary."

Why was there this shift, around 1840, away from the ideas of Nature and the "natural" and toward those of the "normal," or "what is normally expected"? Aside from the beginnings of professionalization, at least two other factors need attention. For a start, from the 1830s, the Romantics had acquired something of a monopoly over "Nature," and as a result it was felt to have lost some of the precision it needed to be of use in science. In addition, this change was probably associated with the rise of the new "positivism" of Auguste Comte, which in turn acquired a special status among theoretical physicists and chemists, most of all in France.

In order to find out what is *natural,* all that one need do was to *look and see.* The "natural" is simply what we find to be natural as a matter of experience: before passing judgment about what is "possible" or "impossible," we must await the outcome of experience. (Pigs *don't* fly. Stick around them, and you will never see an airborne porker!) By contrast, we can decide what is "normal" beforehand only if we have built up a theoretical picture of relevant aspects of the natural world that is clear, definitive, and reliable enough to distinguish those things that "are normally to be expected" from those that can be believed in only by credulous and gullible people. The "normal" is thus what is theoretically intelligible: We have theoretical reasons for distinguishing the "conceivable" from the "inconceivable." (Pigs *can't* fly. You needn't waste time sticking around them, as the very idea of a porker taking off unaided is contrary to the laws of physics!)

Once we see how deeply the idea of the "normal," together with the contrary ideas of the "abnormal" and the "paranormal," is implicated with the current state of *theory,* we can recognize a serious problem. The content of scientific theories changes, sometimes drastically; so we may be tempted to rule out, as "inconceivable" and "paranormal," things that a later stage of science acknowledges as quite possible, or even actual. Thus we may unwittingly cross the line between skepticism and dogmatism, and so rule out of court phenomena and hypotheses that historical imagination should warn us not to dismiss. The task of drawing a line between what is and is not "theoretically conceivable," and so what is or is not "normal" (as contrasted with "paranormal" or "scientifically inconceivable"), has a long and complex history of its own; and if we only reflect on the course of that history, it will induce a certain modesty even about our skeptical doubts.

Sir Isaac Newton

Charles Darwin

History's Sobering Lessons

When we turn to the second of the topics we set ourselves to consider here, this point is only reinforced. When it comes to compiling a list of supposedly "paranormal" phenomena, which are rightly suspect today, we cannot afford to overlook those natural phenomena that we accept as quite natural, normal, and genuine today but which were dismissed in earlier times merely because, as yet, they had won no place in the accepted theories about the natural world. A short list of these is sobering.

The seventeenth-century mechanical materialists (for a start) could accept as "natural" constituents of the physical world only those material particles or corpuscles that were strictly passive. These were not themselves sources of motion, but they could be set in motion, either when they collided with similarly material particles or else (exceptionally) when they were acted on by "nonmaterial" agents. Interactions of the latter kind were not in themselves suspect. Although they were ruled out from the purely material (or physical) wing of Descartes's ontology, they had to be accepted as the means by which "mental action" alone could bring about physical effects. So, for instance, we find Giovanni Borelli's treatise *On Animal Motion* insisting that all of a living creature's muscles and bones are merely mechanical and that the ultimate source of its motion must be an immaterial but "vital" agency operating through the vehicle of its brain.

Newton, for his part, had no worries about admitting both passive

physical phenomena and active divine intervention into his overall picture of the world: Indeed, all the phenomena that were later attributed to "fields" Newton regarded as vehicles for divine intervention, and so attracted Leibniz's mockery of his reliance on "miracles." (In Leibniz's eyes, miracles could be tolerated in the realm of Grace, but they were not to be admitted into the realm of Nature.) As for the notion of a "thinking machine," that would have struck all the leading natural philosophers of the seventeenth-century as a *contradiction in terms.*

Over the 350 years between 1620 and 1970, in point of fact the meanings of the terms *matter* and *machine* have shifted quite drastically, and with them that of the correlative notion of an "immaterial entity" also. In the seventeenth century, "matter" was so defined that *thought* was, by definition, an immaterial thing; but so too were gravitational fields, electric currents, and even (on some accounts) gases. Only their successors in the eighteenth century, e.g., Julien de la Mettrie and Joseph Priestley, had the perception to see, and the courage to declare, that the seventeenth-century definition of "matter" had been arbitrary in the first place and that the resulting dualism was therefore unnecessary. For the time being, however, a seventeenth-century physical theorist would have been quite in order if he had looked at an electronic computer and said, "That's not what I mean by a machine at all!"

In the late eighteenth century, the topic of hypnotism aroused much of the suspicion and hostility that was to surround the topic of unconscious motivation a century later. In fact, Lavoisier undertook on behalf of the French Academie des Sciences an inquiry into the status of "animal magnetism," as hypnotism was then called. During the nineteenth century, likewise, the wave theory of light, cross-generic hybridization, and the molecular basis of genetics and morphogenesis were called into question; but the most suspect topic of all was, of course, Darwin's theory of evolution by variation and natural selection. Indeed, right up to the time of Darwin's death, there were those who believed that his theory was "inconsistent with physics"; and he himself was conscious enough of the force of their objections that he could meet them only with the hope that one day they would prove needless and "go away."

The basis of these objections was Darwin's estimate of the age of the earth and the length of time needed for the action of natural selection to produce the living creatures we know at the present time. On the best calculations of the time required for a spherical object the size of the earth to cool to a habitable temperature, according to Newton's Law of Cooling, it would be habitable for no more than 25 million years before becoming too cold to continue supporting life: At least, this was evidently the case if all the sources of the earth's heat were its initial high temperature and the solar radiation falling onto its surface. (In any case, as was pointed out by Lord Kelvin, the sun, too, must be cooling down in the same way and

Joseph J. Thomson

Max Planck

"could not" have remained at the required temperature for as long as Darwin needed.) So it was easy enough for Darwin's contemporaries to dismiss his views on the best available scientific grounds; and it took a man with the caution of Charles Lyell to see that the results of all these calculations held good only on the assumption that nineteenth-century physics already knew all the actual sources of the earth's heat. As it turned out, of course, it did not. And, since 1900, the extreme antiquity of the sun and the earth has been securely underpinned only with the discovery of two radioactive processes: nuclear fusion to maintain the sun's heat, and the inner sources of radioactivity within the earth to generate mountain building and provide the warmth needed to support life.

Yet even greater surprises were in store for orthodox physicists before the turn of the century. Max Planck's theory of quantization, introduced in 1899 in hope of saving James Maxwell's theory of electromagnetism from the "scandal" of the black body radiation spectrum, was greeted by many physicists as a major betrayal of established ideas. Worse still, J. J. Thomson's first paper in the *Proceedings* of the Cambridge Philosophical Society, reporting the discovery of minute negatively charged particles ("electrons") having a mass less than one-thousandth of the mass of a single hydrogen atom, was at first suspected of having been published as a hoax! After all, nineteenth-century atomism left no place for material units lighter than a single hydrogen atom; so (it was assumed) one *knew* that no such smaller particles could conceivably exist. It would be hard to illustrate more elegantly the alliance between skepticism and dogmatism.

The Blurred Periphery

To say this is not to argue for any fashionable "relativism to the current paradigm": Appeals to "paradigm switches" can, in any case, too easily be used to snow the gullible. Still less is it to call into question the general program of investigating, in a critical and skeptical spirit, the claims made on behalf of the "paranormal" today. It is to argue only that we need to be discriminating, even in the reach of our own skepticism. As we can now see in retrospect, some of our predecessors, e.g., the founders of the Society for Psychical Research in the nineteenth century, worked with ideas that were naive and dogmatic in just the sorts of ways we most need to avoid. We are right to recoil from the chance of being gulled; but, in doing, so, we must take care not to recoil so far that we put ourselves in the same camp as (say) the critics of J. J. Thomson. We can hope to find out what the proper scope of our doubts should be only in the same way that we discover other scientific truths, that is, *as we go along.*

At any stage in the development of science, there is a point beyond which we cannot know for certain *exactly* what it is that we do and do not understand and *exactly* where a line should be drawn between phenomena that are as yet mysterious and happenings that are frankly incredible. This is not to say that the changes we must look for, in this respect, will be so drastic as to wipe out all our current boundaries and distinctions. Some common core of understanding may be expected to survive all the future changes in scientific theory, just as Newton's ideas survive in our own quite different intellectual context. Still, at the edges, the periphery will always remain blurred; and, in the future as in the past, as our scientific understanding is still further refined, that blurred boundary will sometimes come into sharper focus in quite unexpected ways.

For the moment, the world of the paranormal embraces enough plainly unscrupulous quackery and exploitation to keep us fully occupied. Whether we concentrate on finding alternative ways of accounting for the supposedly *non*-normal features of all these things, or whether we focus rather on the sociological factors and political motives involved in such situations, there is lots to keep us busy. That being so, we shall do well if we try to avoid wasting our fire on marginal and questionable targets. •