

When Science Is Nonscientific

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It is understandable why scientists are strongly tempted to wax philosophical from time to time. Those who are not merely technicians are bound to have their theoretical moments, during which they wonder about their own specialized corner of the natural world, as well as the other areas that border it. Furthermore, no science is wholly empirical. Every branch of science rests on certain philosophical presuppositions about what nature is like and what observation is, as well as methodological assumptions about which investigative and explanatory procedures are appropriate to the domain in question. Therefore, whether they realize it or not, scientists adopt numerous philosophical positions, even as they go about their daily professional activities.

But therein lies a problem. In the time of Aristotle, and for many centuries thereafter, the philosophical foundations of science were out in the open. Only relatively recently have the various branches of what used to be called natural philosophy become sufficiently detailed and systematic to survive on their own. And that autonomy has made it all too easy for scientists to forget that their fields are extensions of a more thoroughly abstract and speculative discipline. Hence, few scientists appreciate the complexities of their philosophical roots, or even realize that one may properly evaluate a science with respect to the adequacy of its conceptual foundations. As a result, many dare to publish their "scientific" views on the nature of reality, despite gaping lacunae in their philosophical education generally, and almost certainly without

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benefit of a detailed examination of their own abstract presuppositions.

But there is an even more peculiar side to the matter. Scientists often seem to feel that the only qualification necessary for publishing one's philosophical views, perhaps apart from the appropriate scientific training, is the ability to use a natural language. If so, one can only wonder what the point is of securing a graduate education in philosophy. Obviously, if I were to publish a paper on, say, laser physics or microbiology without training in the field, not only would it probably be embarrassingly bad, but physicists and biologists would be entitled to regard me as presumptuous and rather contemptuous of their disciplines. Nevertheless, scientists frequently display a similar lack of humility and circumspection when it comes to tackling some of the deepest and most complex philosophical issues. For example, they publish their views about the nature of mind as if there were no technicalities and subtleties to the issues for which advanced training is appropriate. And what makes such hubris a serious matter is the fact that certain of these scientists, recent examples being David Bohm, John Eccles, and Karl Pribram, then earn reputations as pundits. Now I don't mean to suggest that scientists have no right to develop philosophical views. People from all walks of life have such a right, and one would hope that scientists are especially serious and inquisitive. What concerns me is the scientific community's failure to appreciate certain limits to its *expertise*. This brings me to Janusz Slawinski's paper.

Although I sympathize with Slawinski's desire to employ the techniques of science, when possible, to address the topic of survival, I wish I could be more enthusiastic about his theoretical proposals. Unfortunately, however, they seem to illustrate exactly what I described above. It's not just that Slawinski attempts to discuss some of the deepest conceptual issues in philosophy without a thorough grounding in the field—though that surely doesn't help matters. It is also that he seems unaware of the extent to which all scientific theorizing, and certainly, theorizing about *survival*, is philosophical at its foundations. Hence, he seems not to appreciate how philosophical his speculations are, and the extent to which his views rest on questionable, and sometimes egregiously defective, abstract presuppositions.

Slawinski's approach suffers from two outstanding flaws, whose characteristic features have been discussed fully in an extensive critical literature. The first is his confusion over the term "information," and the second is the vague and simplistic mechanistic reductionism endorsed throughout the paper. Moreover, since these flaws are rather

fashionable, especially outside of philosophy, a good portion of that literature has been tailored at least in part for nonphilosophers. In fact, I suggest that some of these works should be required reading for scientists who think their views about the nature of mind are worth publishing. So I shall simply point to the errors here, and indicate where interested readers can pursue the issues in greater depth. Besides, the second error in particular cannot be addressed quickly, since it concerns some of the most basic problems in the philosophy of mind.

To begin with, Slawinski commits a fatal equivocation on the term "information." He evidently fails to appreciate the difference between the purely formal concept of information derived from information theory, and the nonformal, semantic or contextual notion of information, to which the formal techniques of information theory have little or no application. It is this confusion, in fact, that underlies his basic, but incorrect, assumption that the concept of "electromagnetic consciousness" makes sense. Claude Shannon (1962, p. 3) and Warren Weaver (1962, p. 99) were quite clear about the limits of the technical use of "information." Nevertheless, scientists frequently ignore their warnings, and Slawinski's handling of the term is precisely what they warned against.

Slawinski's equivocation on "information" cannot be dismissed as an insignificant technical infelicity; it undermines his entire program. One of his central theoretical moves is to argue from claims about electromagnetism as it pertains to rudimentary and purely physical processes, and where "information" is used in its formal, nonsemantic or noncontextualist sense, to claims about electromagnetism as it allegedly pertains to the analysis of states of consciousness and the nonformal sense of "information." But that move is conspicuously fallacious.

To help explain why information in the second sense cannot be analyzed in terms of information in the first sense, consider the following analogy, inspired by a similar analogy in Howard Bursen's book on memory (1978). Suppose I define a technical and quantitative sense of the term "curiosity" as "the capacity of an object to be attracted to a magnet." Using that definition, we can make quantitative comparisons of different objects' degrees of curiosity, for example, iron filings as compared to rubber or cotton; and we can analyze curiosity in terms of the lower-level atomic structures that give rise to it. But it would be ludicrous to suppose that this sense of "curiosity" can be extended to cover the varieties of human curiosity, which concern a broad range of nonquantifiable, nonmechanistic phenomena. For example, we can quantify human curiosity only very imprecisely, as when we compare a

person's curiosity about his family tree to his curiosity concerning his lover's possible infidelity, or when we try to say just *how* curious we are to see a new movie. Moreover, "magnetic" curiosity is definable in terms of a set of necessary and sufficient conditions, while human curiosity is not. The reasons for that are quite complicated, and concern Slawinski's second general error, noted below. In any case, although the equivocation on "information" is perhaps slightly more seductive than the analogous equivocation on "curiosity," it is no more defensible (Braude, 1979a; Bursen, 1978; Dreyfus, 1979).

Slawinski recognizes that his proposals rest entirely on the plausibility of supposing that consciousness has an electromagnetic nature. That is the central assumption of his paper; even his criticisms of the competing two interpretations of the death-flash turn on it. But Slawinski's underlying mechanistic reductionism is both naive and defeatingly vague. He seems unaware, for example, that the assumption is controversial *at best*; he certainly makes no attempt to defend it. And his lack of clarity concerning the relation between the brain or electromagnetic processes generally and mind is evident throughout the paper. For instance, Slawinski begins by noting that all living matter *creates*, or is associated with, electromagnetic fields. But that is not to say, nor does it entail, that life including consciousness, *is*, or consists of, electromagnetic fields. Nevertheless, Slawinski either conflates these two claims, or else fails to see that there is no easy transition from the former to the latter.

It is that sort of confusion that leads Slawinski to commit the occasional stark nonsequitur. For example, he claims that "the brain can be regarded as consisting of electromagnetic activity both in the internal network of neurons and in the external aura." Then he makes the totally unwarranted inference, "Therefore, the 'mind' may also be extended in space as far as its aura and may reinforce its action by means of, for example, an 'intentionality field.'" Several points should be made about this passage. First the facile transition from claims about the brain to claims about the mind is a symptom of Slawinski's deeper mechanistic confusions, about which I'll have to say below. Second the vagueness of Slawinski's thinking is highlighted by his use of quotes around "mind" and intentionality field. I submit that Slawinski himself does not know exactly what he means by these terms, and is simply playing fast and loose with language. It is a form of conceptual carelessness I suspect he does not even recognize as such, since he does not appreciate the difficulty of the issues he implicitly addresses. Indeed, the remainder of the paper demonstrates that, for all his competence as a scientist, he is not at all at home with the philosophical concepts he attempts to use.

For example, Slawinski is apparently unaware that his central assumption is ambiguous among different reductionist theses, all false in my view, but some more wildly implausible than others. Revealingly, he does not specify whether it is *types* or *tokens* (specific instances) of conscious phenomena that are electromagnetic in nature. In fact, he seems not to realize that the distinction is important, much less that the first alternative the one embraced by most scientists, was long ago abandoned by philosophically sophisticated theoreticians, even those who cling tenaciously to physicalist analyses of the mental (Braude, 1979b).

In any case, it is clear that if consciousness does *not* have an electromagnetic nature, then Slawinski's proposals are groundless. As many have argued, mechanistic analyses of consciousness presuppose one or more deeply unacceptable theses, for example, the Platonic or essentialist view that mental or psychological kinds can be specified by some set of necessary and sufficient conditions, and the view that a physiological or physical (for example, brain or electromagnetic) state can be functionally unambiguous. These profoundly defective positions underpin Slawinski's attempt to model consciousness, or the "essence and contents of life," after a superposition of carrying and attained fields. They are presupposed by his suggestion that "emotion, motivations, and memories [may] all [be] objectively coded in the structure of the [electromagnetic] field." Apparently, Slawinski has no idea how problematic such assertions are. But I cannot do justice in a few paragraphs to the complex web of issues he ignores. Slawinski's proposals are merely new versions of traditional mistakes, the particulars of which have been discussed by many critics (Braude, 1979b, 1981, 1983, 1986; Goldberg, 1982; Heil, 1978, 1981, 1983).

Not surprisingly, Slawinski's fundamental errors are the same as those undermining Karl Pribram's holographic analysis of the mental (Braude, 1981), an approach that Slawinski tacitly endorses. Pribram, too, seems never to have realized that he has simply produced superficially more complex versions of ancient and elementary errors. Pribram's holographic analysis of memory, for example, commits the very same mistakes found in Plato's crude suggestion that memories are analogous to impressions in wax. The only difference is that Pribram's view *looks* more advanced (Braude, 1979b; Bursen, 1978; Heil, 1978). Both Pribram and Slawinski, in fact, offer their philosophical views in technically imposing packages, by couching their proposals in the language of the physicist and electrical engineer which a technique that, unfortunately, many find intimidating and inappropriately impressive. In both cases, however, the technique serves primarily to

hide deep, and elementary, confusions. Consequently, unwary readers are likely to think that the philosophical side of their theorizing is genuinely sophisticated.

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