

ON TAKING CAUSAL CRITERIA TO BE ONTOLOGICALLY SIGNIFICANT¹

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Psychologists are paying increasing attention to ontological questions which fall outside the scope of the explanatory issues that constitute psychology's proper subject matter. This is quite natural and is a sign of the discipline's increasing maturity. Nor should philosophers who make ontological questions their primary concern resent psychologists' interest as an illegitimate incursion; there is more than enough overlap of the two fields' central concerns to warrant cooperation. Philosophers dealing with issues such as that of responsibility are well-advised to be thoroughly acquainted with the growing evidence² that much reprehensible behavior is traceable to neural abnormalities which operate quite unbeknownst to the subject. At the same time, psychologists who seek to develop theories of cognition (including perception) should become cognizant of the arguments of philosophers that show that there are non-causal, non-behavioral, non-linguistic features of cognitive acts which cannot be redescribed in physical terms — that is, the intentional features of cognition.³ The most important point, however, is that careful analysis shows that the explanatory issues to which the psychologist addresses himself can be dealt with independently of those ontological questions. Such an analysis is attempted here.

Psychologists increasingly tend to adopt materialist views of mental events and processes as the evidence grows for a close causal dependence of mind on body. In this paper I will defend the view that in current discussions over the nature of mind in its relation to body there is a persistent confusion of causal questions with ontological ones. The confusion usually occurs in the form of taking evidence for or against a close dependence of mind on body to be evidence for some particular

¹I wish to thank Marjorie Clay for her extremely helpful comments and suggestions which resulted in major revisions of an earlier draft of this paper. She should not, however, be held responsible for the faults that remain.

²Cf. Vernon H. Mark and Frank R. Erwin, *Violence and the Brain*, Harper and Row, New York, 1970.

³Cf. Wilfrid Sellars and Roderick Chisholm, "Intentionality and the Mental," in H. Feigl *et al.*, eds., *Minnesota Studies in the Philosophy of Science*, vol. II, University of Minnesota Press, Minneapolis, 1958.

thesis as to the ontological nature of mind (e.g., reductive materialism or dualism). A particular instance of this form of the confusion is found in work done by Jerome Shaffer.⁴ I show that the criteria whose satisfaction he claims will establish materialism are in fact such that both their satisfaction and failure of satisfaction is compatible with at least three ontological positions: dualism, double-aspect materialism, and reductive materialism. I conclude that there is no reason to think that causal questions bear any significant relation to ontological disputes, and I indicate briefly the grounds on which I think such ontological disputes must be settled.

* * *

If we separate the causal issues from the ontological ones, the following characterizations serve as formulations of several positions held in current discussion of the mind/body problem and are adequate to display their minimal differentia. Stating such characterizations will be of help in showing how the ontological disputes are distinct from causal ones and will thus enable us to demonstrate that particular sorts of evidence that certain causal relations hold are compatible with most, if not all, of these positions, and are thus not evidence for any one of them. [In giving the characterizations, I am supposing that the identification of a certain individual (a term I use here in a broad enough sense to encompass particulars, substances, events, states, or processes) as mental or physical is to be expressed in terms of the properties and relations ('characters' for short) which it instantiates. This, of course, requires that characters be classifiable as mental or physical, and I provide a mechanism for the expression of such classifications of characters in terms of second-order predicates; however, I do not propose to solve here any questions relating to the thesis of elementarism (the view that there are no higher-order characters)⁵ as they arise concerning the ontological status of the referents of these second-order predicates (i.e., whether properties of first-order characters, or merely sets of them delimited by the patterns of inclusion and exclusion in which instances of those first-level characters fall, are the referents of second-order predicates).]

First, let the following terms be interpreted as indicated:

' φf ' = 'f is a physical character'

' ψf ' = 'f is a mental character'

' fx, t ' = 'x has f at time t' (where 'fx' occurs, the temporal parameter is simply ignored)

where no relations of inclusion, exclusion, or compatibility are presupposed in the terms. Then, we may express the four ontological views as follows, first in English, then in symbolic notion (which may be ignored if the English is read carefully):

(1) *Eliminative materialism*: All characters are physical; there are no mental characters; there are some individuals which exemplify physical characters.

$(f) (\varphi f) \ \& \ \sim (\exists f) (\psi f) \ \& \ (\exists x) (\exists f) (\varphi f \ \& \ fx).$

⁴Jerome Shaffer, "Could Mental States Be Brain Processes?", *The Journal of Philosophy*, 58 (1961), pp. 813-822 (hereafter referred to as "the 1961 article"); "Mental Events and the Brain," *The Journal of Philosophy*, 50 (1963), pp. 160-166 (hereafter, "the 1963 article"); "Recent Work on the Mind-Body Problem," *American Philosophical Quarterly*, 2 (1965), pp. 81-104.

⁵For a discussion of the thesis of elementarism and its ramifications, see Gustav Bergmann, "Elementarism," in *Meaning and Existence*, Madison: University of Wisconsin Press, 1959 (pp. 115-123).

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(2) *Reductive materialism*: All characters are physical; there are some mental characters; there are some individuals which exemplify mental characters, and some individuals which exemplify physical ones.

$$(\forall f) (\varphi f) \ \& \ (\exists f) \ \psi f \ \& \ (\exists x) (\exists f) (\psi f \ \& \ fx) \ \& \\ (\exists y) (\exists g) (\varphi g \ \& \ gy).$$

One corollary of reductive materialism is that

(2A) Every mental character is identical with some physical character.

$$(\forall f) (\psi f \supset (\exists g) ((\varphi g \ \& \ (f=g)))).$$

Another corollary of reductive materialism is that

(2B) Any individual which has one or more mental characters is identical with an individual all of whose characters are physical.

$$(x) (f) ((\psi f \ \& \ fx) \supset (\exists y) (g) ((gy \supset \varphi g) \ \& \ (y=x))).$$

(3) *Double-aspect materialism*: Some characters are physical; some characters are mental and are not identical with any physical characters; there are individuals, all of which have physical characters and some of which have mental characters that are not identical with any physical characters.

$$(\exists f) \ \varphi f \ \& \ (\exists g) (\psi g \ \& \\ (f) (\varphi f \supset \sim (f=g))) \ \& \\ (x) (\exists f) (\varphi f \ \& \ fx) \ \& \\ (\exists y) (\exists g) (\psi g \ \& \ gy \ \& \ (f) (\varphi f \supset \sim (f=g))).$$

[Double-aspect idealism would differ from the above in holding that all individuals have mental characters and some individuals have physical ones not identical with any mental ones. Neutral monism, on the other hand, either holds that all individuals have both physical and mental characters, some of each of which are not identical with any of the others, or it holds that there are some characters which are neither physical nor mental but which are exemplified by every individual. I do not intend discussing either view in this paper beyond indicating how they differ from double-aspect materialism.]

(4) *Dualism*: Some characters are physical; some characters are mental and are not identical with any physical characters; there are at least two individuals one of which has all physical characters and one of which has all mental characters; some of the latter are not identical with the former, and vice versa.

$$(\exists f) \ \varphi f \ \& \ (\exists g) (\psi g \ \& \ (f) (\varphi f \supset \sim (f=g))) \ \& \\ (\exists x) (\exists y) (\exists f) (\exists g) (fx \ \& \ \varphi f \ \& \ (g) (gx \supset \varphi g) \ \& \\ (gy \ \& \ \psi g \ \& \ (f) (fy \supset \psi f) \ \& \ \sim (f=g))).$$

Psychophysical correlation, the correspondence of every mental individual with a particular brain state, is usually regarded as the primary evidence for the causal dependence of mind on body. It will be useful to express the doctrine in a similar notation:

(5) *Psychophysical Correlation*: For every mental character there exists a physical character such that, for any time, some individual has that mental character at that time if and only if some individual has that physical character at that same time.

$$(f) (\psi f \supset (\exists g) (\exists x) (\exists y) (t) (\varphi g \ \& \ (fx,t \equiv gy,t)))$$

This is an extremely broad version of the doctrine of psychophysical correlation, as can be seen in the fact that it is logically compatible with all four ontological positions, while its denial is incompatible with only one of them.

With eliminative materialism, the doctrine is vacuously true, since on that view the antecedent of the main conditional is false for every individual. In conjunction with reductive materialism, it expresses a correlation of mental and physical characters which are such that the former, even though their occurrences are detected in different ways, are identical with the latter. In combination with double-aspect materialism, it asserts that there are one-to-one, temporally coextensive correlations between instantiations of all mental and certain physical characters, all of which instantiations are physical individuals (*i.e.*, individuals all of which instantiate physical characters). Finally, the doctrine is expressed in the dualistic context in terms of a correlation of all individuals which instantiate each mental character with individuals which instantiate certain physical characters. Hence, that the doctrine of psychophysical correlation were true would provide in itself no ground for deciding amongst the four ontological views.

On the other hand, the falsity of the doctrine of psychophysical correlation is not compatible with all four ontological positions. The contradictory of the doctrine is the following:

(6) It is not the case that, for every mental character there exists a physical character such that, for any time, some individual has that mental character at that time if and only if some individual has that physical character at that same time.

$$\sim(f) (\psi f \supset (\exists g) (\exists x) (\exists y) (t) (\varphi g \ \& \ (gx,t \equiv fy,t))).$$

But that is equivalent to

(6A) There exists a mental character and it is not the case that there exists a physical character such that, for any time, some individual has that mental character at that time if and only if some individual has that physical character at that same time.

$$(\exists f) (\psi f \ \& \ \sim ((\exists g) (\exists x) (\exists y) (t) (\varphi g \ \& \ (gx,t \equiv fy,t)))).$$

Such would be the case, of course, if there were only mental characters and no physical ones. For our purposes, however, the interesting case would be the one in which the quantified biconditional failed — that is, the case in which some mental character was instanced for which there was no physical character instances of which always occurred contemporaneously. In such a case eliminative materialism would be false, for the falsity of the doctrine of psychophysical correlation presupposes the existence of mental characters, which is explicitly denied in (1).

It is important to note, however, that it is the presupposition required by the falsity of (5), not the falsity of (5) itself, that is essential in entailing the falsity of (1). The latter would be false as well if (5) were true non-vacuously, for precisely the same reason. Hence, it is not the falsity of (5) *per se* which is incompatible with (1), but rather a presupposition, or necessary condition of the falsity of (5)

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which is incompatible with (1). I conclude that, while it is true that (6), the denial of (5), is incompatible with (1), that fact does not bestow any particular ontological relevance upon the doctrine of psychophysical correlation, but only upon a presupposition of that doctrine's falsity and of its non-vacuous truth — namely, that there are mental characters. But, of course, that *this* has ontological significance is no surprise.

Reductive materialism would not be falsified by (6), for while there might be a simple mental character not regularly correlated with a single, simply physical character, it might be correlated with several physical characters and, according to reductive materialism, thus identical with each one of them (or with a disjunction of them — itself a complex physical character). Some regular correlation would have to hold, of course; but a sufficiently dogged reductive materialist might accept a wildly imbalanced one-many correlation as compatible with his materialistic programme.⁶ Double-aspect materialism, again, is in principle compatible with the denial of psychophysical correlation. One may hold that every individual which instantiates mental characters also instantiates physical ones, without thereby committing himself to any regular correlation of particular physical and mental characters. Dualism, of course, can tolerate the failure of the doctrine of psychophysical correlation due to the falsity of the quantified biconditional component.

In all of these latter cases we should note that it becomes increasingly difficult to see how the causal thesis of determinism, which is commonly (although not universally) held by contemporary advocates of all four positions, can be plausibly maintained; the reason is that the thesis of determinism in the psychophysical context is usually expressed so that the doctrine of psychophysical correlation is a part of that thesis.⁷ Nonetheless, it is sufficient for my present purposes to point out (a) that the doctrine of psychophysical correlation is logically compatible with all four ontological positions, (b) that the denial of that doctrine is logically compatible with three of the four positions, and (c) that the incompatibility of its denial with the fourth ontological view is only due to the conflict of an ontological presupposition of the denial of the doctrine with one of the components of the fourth.

I draw the following conclusions. First, the truth of the doctrine of psychophysical correlation provides in itself no sufficient grounds for eliminating any of the four ontological positions. Second, the falsity of the doctrine, while it eliminates the first of the four ontological positions ("on a technicality"), provides in itself no sufficient grounds for deciding among the remaining three positions. It follows that other criteria are required for such a decision; whether there are sets of them which do not include the doctrine of psychophysical correlation (or its denial) that are sufficient for any of the views, or whether that doctrine (or its denial) must be added to other criteria

⁶There is evidence that at least some psychophysical correlations are one/many. See Karl R. Pribram, "The Neurophysiology of Remembering," *Scientific American*, 220 (1969), p. 73 ff., for a model of the possible neural correlates of memories on holographic principles.

⁷For a thorough discussion of the varieties of causal relationships that might hold between mind and body, see David Randall Luce, "The Action of Mind on Body," *Philosophy of Science*, 27 (1960), pp. 171-182. Also, see his "Mind-Body Identity and Psycho-Physical Correlation," *Philosophical Studies*, 17 (1966), pp. 1-7.

in order to obtain a set that is sufficient to demonstrate the truth of one of the positions, will not be dealt with here, although I believe that the former is true.

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Having presented the foregoing, we are now in a position to assess a proposed set of criteria for mind/body identity suggested by Jerome Shaffer.⁸ Shaffer's papers have received considerable attention, as indicated by the number of articles responding to or citing them and by the fact that one of them has been reprinted in a number of collections.⁹ It is interesting to note that U.T. Place came up with a similar set of criteria some years earlier;¹⁰ but while his papers have received considerable attention, Shaffer's papers have been somewhat more widely reprinted and have received somewhat more discussion. Thus, at this historical juncture they are perhaps the more important and deserving of careful analysis, although much of what I have to say concerning Shaffer will apply, *mutatis mutandis*, to Place.

Shaffer suggests that upon being satisfied by any putative pair of individuals the following three criteria would show those individuals to be one and the same:

S1. The occurrence of [either] one must be an (empirically) necessary condition for the occurrence of the other.¹¹

S2. Both must be located in the same place.¹²

S3. The two must exist during the same time interval.¹³

While it is clear from his illustrations of identities which supposedly conform to these criteria (*e.g.*, water with H₂O, the Morning Star with the Evening Star, lighting with electrical discharges in the atmosphere) that the criteria are intended to hold generally and not merely in the specific context of the mind/body identity theory,

⁸Shaffer, *op. cit.*, especially "Could Mental States Be Brain Processes?"

⁹*E.g.*, James W. Cornman, "The Identity of Mind and Body," *The Journal of Philosophy*, 58 (1961), pp. 486-492; Robert C. Coburn, "Shaffer on the Identity of Mental States and Brain Processes," *The Journal of Philosophy*, 60 (1963), pp. 89-92; J.J.C. Smart, "Materialism," *The Journal of Philosophy*, 60 (1963), pp. 651-662; David K. Lewis, "An Argument for the Identity Theory," *The Journal of Philosophy*, 63 (1966), pp. 17-25; Richard Brandt and Jagwon Kim, "The Logic of the Identity Theory," *The Journal of Philosophy*, 64 (1967), pp. 515-537; Charles Taylor, "Mind-Body Identity, a Side Issue?," *Philosophical Review*, 76 (1967), pp. 201-213; Norman Malcolm, "Scientific Materialism and the Identity Theory," *Dialogue*, 3 (1964); John Hospers, *Introduction to Philosophical Analysis* (2nd ed.), Englewood Cliffs: Prentice-Hall, Inc., 1967; Charles Crittenden, "Ontology and Mind-Body Identity," *Philosophical Forum*, 2 (n.s.) (1970-71); Norman Malcolm, *Problems of Mind*, New York: Harper and Row, 1971.

The 1961 article (*see supra*, fn. 2) is reprinted in G.N.A. Vesey, ed., *Body and Mind*, London: George Allen and Unwin Ltd., 1964; John Hospers, ed., *Introductory Readings in Philosophical Analysis*, Englewood Cliffs: Prentice-Hall, Inc., 1968; C.V. Borst, ed., *The Mind-Brain Identity Theory*, New York: Macmillan & Co., 1970; W.T. Blackstone, ed., *Meaning and Existence*, New York: Holt, Rinehart and Winston, Inc., 1971; and by Bobbs-Merrill Reprints.

The 1963 article is reprinted in Borst, *op. cit.*; David Rosenthal, ed., *Materialism and the Mind-Body Problem*, Englewood Cliffs: Prentice-Hall, Inc., 1971.

¹⁰U.T. Place, "Is Consciousness a Brain Process?," *The British Journal for the Philosophy of Science*, 47 (1956), pp. 44-50; "Materialism as a Scientific Hypothesis," *The Philosophical Review*, 69 (1960), pp. 101-104. While Place's criteria are much the same, the ontological position he appears to favor on the strength of the supposed satisfaction of his criteria by C-states and B-processes differs from Shaffer's. *See* footnote 21, below.

¹¹Shaffer, "Could Mental States Be Brain Processes?," *op. cit.*, pp. 814-15.

¹²*Ibid.*, p. 816.

¹³*Ibid.*, p. 817.

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the criteria are introduced in the context of a discussion of the mind/body identity theories of J.J.C. Smart, Herbert Feigl, and others. I shall, accordingly, limit myself in this paper to a discussion of those criteria as he applies them in the narrower context, except in the last section.

Shaffer's claim, then, is this: If a certain conscious state (*e.g.*, an instance of feeling a pain, having an after-image, thinking about a problem — 'C-state' for short) and a certain brain process (*e.g.*, an instance of a particular pattern of firing of a certain neural circuit — 'B-process' for short)¹⁴ jointly satisfy the three criteria, they are identical. Two initial comments must be made.

First, to speak of the possibility of such being shown is to rule out eliminative materialism *a priori*; for, a prerequisite of showing that two individuals satisfy or fail to satisfy these criteria and thus that they are identical is that they both exist, and eliminative materialism denies the existence of mental characters and thereby of mental individuals. Hence, Shaffer's criteria cannot serve the programme of the eliminative materialist (although the latter may, *qua* materialist, accept the criteria for the purpose of establishing identities within the domain of the physical world (and thus, with respect to, say, colors, not be an *eliminative* materialist)).

The second point to be noted is that, given that satisfaction of these three criteria is a necessary condition for the identity of C-states and B-processes, (2) and (3) (reductive materialism and double-aspect materialism) turn out to be false. C-states do not have location in space, whereas B-processes do. My various C-states are not presented as having spatial location, nor are those C-states ever spoken of in spatial terms (except perhaps metaphorically or in implicit causal claims). Not only do we in fact not locate our thoughts, we have no ways of locating them. The result would seem to be that, given our present way of conceiving C-states, the identification of these with B-processes fails; any process in the brain is at a place where no mental event can be found. But reductive materialism and double aspect materialism both involve identification of C-states with B-processes (although, to be sure, the latter case involves only identity of individuals while the former involves identity of characters as well), with the result that C-states must have just those spatial properties that B-processes do.

Upon close inspection, one sees Shaffer's view to be that the failure of the mind/body identity theory to satisfy the three criteria is not due to the fact that C-states *are* non-spatial, but to the (linguistic) fact that

. . . we have no rules in our language either for asserting or for denying that they have a particular location.¹⁵

But, if materialism (of one form or another) is incorrect *only* for want of such rules, it seems (to him) unobjectionable to provide rules which would specify criteria for C-states having spatial location.

Shaffer then proposes the following convention as a way out for this identity theorist:

¹⁴'Conscious-state' and 'brain-process' are Shaffer's terms and I use them throughout the discussion. Those bothered by the apparent categorial difference between states and processes may substitute some neutral term (such as 'fact' or 'event') for them both without affecting the substance of the discussion.

¹⁵*Ibid.*, p. 816.

. . . for any C-state, if it has a corresponding B-process, it will be said to be located in that place where its corresponding B-process is located. Given this convention, it then becomes a matter for empirical investigation whether any C-state has location in space and where that location, if any, is.¹⁶

What does Shaffer mean by 'a *corresponding* B-process'? The weakest sense would be, roughly, the view that as a matter of fact, whenever some C-state or other is occurring, some B-process or other is occurring during the same interval of time. (I am supposing that he means the correspondence to be temporally coextensive, since, although he does not say so in the passage quoted above, everything he does say elsewhere points to this as presupposed.) That is, the correspondence would be one-many: a certain type of C-state would, each time it occurred, be correlated with a B-process of some type or other. But surely this is too weak: of course *something* is going on in the brain all the time; discrete neural events are much shorter in duration than any C-state; they occur continuously; without some criterion of process, any sequence of these neural events could count as a process; hence, it is almost trivially true that one could find a "corresponding" B-process for any type of C-state (I ignore, since we are dealing with empirical criteria, the question of disembodied C-states). Thus, this criterion would be compatible with the most exotic positions on mind and body in which there were no regular, repeating connections at all. The correspondence would accordingly seem to have to be between types of C-states and types of B-processes. But even this falls short of what is desired. Mere regular connection between types of events could be only accidental; such a case would not be a strong enough basis on which to predicate any identity claims. Accordingly, Shaffer adds the qualifier that each one must be an empirically necessary condition for the other. As he puts it,

In the case of C-states and B-processes we have assumed that investigations will show you cannot have either one without the other.¹⁷

Shaffer's proposed convention amounts, then, to this:

SC. For any C-state, if it occurs at the same time as some B-process, and if each is an empirically necessary condition of the other, then the C-state will be said to be located in the place where that B-process is located.

But in terms of the three criteria proposed earlier, that is just to say that

SCa. For any C-state and for any B-process, if criteria S1 and S3 are met, then we will say that criterion S2 is met.

Hence, on Shaffer's view, there is nothing to prevent us from introducing a convention which, given the sufficiency of the criteria S1 - S3 for establishing the identity of individuals which satisfy them, would allow us to conclude that two individuals are identical from the evidence that they satisfy S1 and S3.

Let us stop our exposition of Shaffer's position and take stock of what has happened. I should like to argue first that the conjunction of S1 and S3 amounts to no more than a generalized version of the doctrine of psychophysical correlation explicated above. That, it will be remembered, was the doctrine that, for every character that

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is mental there exists a physical character such that some individual has that mental character if and only if some individual has that physical character during the same time span. But S1 and S3 are merely the same doctrine with the necessary condition component and the simultaneity component separated, generalized, and set forth as criteria for the identification of any two individuals, as is shown in the following analysis.

(1) One may express S1 and S3 for the identification of a mental individual with a physical one as follows:

S1a. The occurrence of the mental individual is an empirically necessary condition for the occurrence of the physical individual, and vice versa.

S3a. The mental individual and the physical individual exist during the same time interval.

On my analysis, to be a mental individual is no more than to be an individual which exemplifies one or more mental characters; to be a physical individual is no more than to be an individual which exemplifies one or more physical characters. To say of each of two individuals that it is an empirically necessary condition of the other is merely to say that each occurs if and only if the other occurs. Finally, recall that we have remained uncommitted as to the ontological status of the referents of the terms "mental" and "physical," as noted above.

(2) That allows me to rephrase S1a as follows:

S1b. For every mental character there exists a physical one such that some individual has that mental character if and only if some individual has that physical character.

$$(f) (\psi f \supset (\exists g) (\exists x) (\exists y) (\varphi g \ \& \ (gx \equiv fy))).$$

But this differs from (5), the doctrine of psychophysical correlation, only in its lack of specification of a temporal relation between the individuals in question, which is what S3a does.

(3) When S3a is combined with our rephrased version of S1a, the result is the following:

S1b & S3a. For every mental character there exists a physical character such that, for any time, some individual has that mental character at that time if and only if some individual has that physical character at that same time.

$$(f) (\psi f \supset (\exists g) (\exists x) (\exists y) (t) (\varphi g \ \& \ (gx,t \equiv fy,t))).$$

Thus, we arrive at precisely the same position which was expressed as the doctrine of psychophysical correlation when criteria S1 and S3 are applied to C-states and B-processes.

Hence, if my translations of S1 and S3 into S1a and S3a, and my move thence to the conjunction 'S1b & S3a' are correct, we may now recast Shaffer's proposed convention for circumventing the failure of C-states to satisfy S2 as follows:

SCb. For any C-state and for any B-process, if they satisfy the requirement of psychophysical correlation, they will be said to occupy the same place.

But Shaffer's claim is that

The three conditions for identity so far discussed are jointly sufficient. If

all three are met, then B-processes and C-states are identical; if it is likely that all three are met, then it is likely that B-processes and C-states are identical. There is no room for any alternative.¹⁸

Hence, since he sees no reason to refrain from adopting the convention in question, and since the convention has the effect of making S1 and S3 the only criteria in the set whose independent empirical satisfaction suffices to establish the identity of C-states and B-processes, and since S1 and S3 in joint application to C-states and B-processes turn out to be no more than the doctrine of psychophysical correlation, Shaffer's entire position may be summed up as follows:

S. If C-states and B-processes satisfy the doctrine of psychophysical correlation, then it follows that they are identical

(where 'it follows that' is intended in the sense of logical necessity).

The earlier characterizations of the four ontological positions and the doctrine of psychophysical correlation, together with the discussion of their relations of compatibility and incompatibility, will now be seen to be relevant. For, it was the aim of the first part of this paper to show that any position like that which is summarized in S, is false: nothing follows about the truth or falsity of any one of the four ontological positions from the truth of the doctrine of psychophysical correlation; hence, any inference from the fact that a C-state and a B-process satisfy that doctrine to their identity is invalid, specifically because that fact is compatible with dualism. Shaffer sees no reason to refrain from adopting SCb. But we have in the first part of this paper a very strong reason for such restraint: since the doctrine of psychophysical correlation is logically compatible with such diverse ontological positions, any convention which makes it favor one over the others is wholly arbitrary. One is just as free to adopt a convention making the satisfaction of S1b and S3a sufficient for saying that a C-state does not occupy the same place as any B-process. I conclude, then, that Shaffer's three criteria, supplemented with his convention, are insufficient to demonstrate the truth of any of the four ontological views. Moreover, so far as I can see, the truth or falsity of the doctrine is irrelevant to the resolution of the dispute between the four views, with the one exception of eliminative materialism which would be falsified by either the non-vacuous truth or the falsity of the doctrine (for reasons already discussed). Hence, Shaffer's criteria are of no use to the ontologist who is wrestling with the problem of the ontological status of minds; such problems are not to be laid to rest by fiat.

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In conclusion, I should like to indicate, speculatively, what I take to be the probable source of the type of mistake that Shaffer makes, and how it is to be avoided. The source, I submit, lies in the tendency, fostered by the enormous success and prestige of science and technology, to confuse explanation with description. Causal questions, evidence for causal dependence, *et cetera*, are all issues in the context of explanation; the aim of science is to explain and of technology to control where possible the facts presented to us in experience. Description has as its function (logically prior

¹⁸*Ibid.*, p. 817.

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to that of explanation)¹⁹ the specification of those facts presented in experience which are to be explained. This is not to say that explanation deals *only* with what is presented in experience, for in explanation entities and laws are often discovered which themselves require explanation. But ultimately it is that which is given in experience which occasions the explanatory process.

In the process of constructing explanations containing existential hypotheses about unobservables, physical scientists have both supposed that the hypothesized systems of non-observable entities are constitutive of the observable objects which they explain, and that descriptions of such systems replace ordinary descriptions of the objects which they constitute. These suppositions are correct only if properly understood. To say that they are constitutive of the objects is only to say that (a) they are coextensive with them, and (b) they are causally productive (at least in part) of the observable characteristics of those ordinary objects. And to say that the description of the system replaces that of the ordinary object is only to say that, for certain purposes of a particular scientific endeavor, a (partial) scientific characterization is all that is required. One example of how a scientific characterization replaces a perceptual one is found in celestial mechanics, in which, for the purposes of explaining the location of a certain planet at a particular point in time, it and the other planets' actual dimensions can be ignored; they can be characterized as point-masses having particular velocities. Another example is that, for purposes of explaining why a certain white precipitate is obtained by bubbling CO₂ through lime water, the visual descriptions of the precipitate and of the lime water can be ignored and each characterized solely in terms of its chemical composition.

But it is an easy enough move psychologically from the discovery that the occurrence of the perceptual object's qualities are causally dependent upon its fine structure to the supposition that really only the fine structures exist — especially when the causal dependence also involves there being certain sorts of sentient beings whose fine structures interact with that of the object. Shaffer's three criteria applied to "two" perceptual objects (*e.g.*, the Morning Star and the Evening Star) are persuasive; we are tempted to say that their satisfaction in such cases does at least justify, if not necessitate, the identification of the individuals in question. When applied to a perceptual object and a physical system, the issue becomes more complex. If, as J.J.C. Smart claims²⁰ for example, color is an "anthropocentric" notion (*i.e.*, involves as one of its empirically necessary conditions the presence of sentient beings of certain sorts), then S1 is not satisfied by a number of the supposed identities which Shaffer cites (*e.g.*, a flash of lightning with a passage of electrons through the atmosphere, water with H₂O, and so forth), and, given that Shaffer's criteria are necessary conditions of all empirical identities, we would be forced to deny these identifications on Shaffer's own grounds.

But even if the identities of individuals is granted in the case of perceptual object and physical systems, or even in the case of C-states and B-processes, there remains

¹⁹I have argued this at length in my article, "Feyerabend's Attack on Observation Sentences," *Synthese*, 23 (1971-72), pp. 374-399.

²⁰J.J.C. Smart, *Philosophy and Scientific Realism*, London: Routledge & Kegan Paul, 1963 (esp. pp. 66-75).

unresolved the question of whether to preserve the distinctions between the characters of the former and the latter. So far as I can tell, Shaffer, unlike Place,²¹ (a) does not regard his criteria as adequate for identification of characters, and (b) does not think such possible. He thus qualifies (at least in the 1961 paper) as a double-aspect materialist; but I do not think the criteria he presents establish the view for C-states and B-processes, nor do I think the view can be so established.

What I want to emphasize, in closing, is this: we must have clear criteria for deciding what exists, if ontological issues are to be successfully resolved. I am inclined towards a tradition which claims that one's inventory of simple ontological entities is at least partly specified by what one is acquainted with; that what one is acquainted with forms the essential referent of his descriptive vocabulary; and that the ontological inventory may also be supplemented by what must be hypothesized in order to causally account for what is presented. But it is a most serious error to suppose either that the latter sort of entity is all that there is, or even that our knowledge of the latter sort is not logically dependent upon the existence of the former.

²¹Place's conclusions are a rather odd blend of positions (1) and (2): his acceptance of the criteria would seem to require according to C-states some independent recognition; but he appears unwilling to adhere to the view that any of their characteristics are different than those of B-processes. Whether he holds that there are mental characters which are identical with physical ones, or that there are no mental characters, I cannot tell.