Sensations and Brain Processes

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SENSATIONS AND BRAIN PROCESSES

SUPPOSE that I report that I have at this moment a roundish, blurry-edged after-image which is yellowish towards its edge and is orange towards its centre. What is it that I am reporting?[1] One answer to this question might be that I am not reporting anything, that when I say that it looks to me as though there is a roundish yellowy orange patch of light on the wall I am expressing some sort of *temptation*, the temptation to say that there *is* a roundish yellowy orange patch on the wall (though I may know that there is not such a patch on the wall). This is perhaps Wittgenstein's view in the *Philosophical Investigations* (see paragraphs 367, 370). Similarly, when I "report" a pain, I am not really reporting anything (or, if you like, I am reporting in a queer sense of "reporting"), but am doing a sophisticated sort of wince. (See paragraph 244: "The verbal expression of pain replaces crying and does not describe it." Nor does it describe anything else?)[2] I prefer most of the time to discuss an after-image rather than a pain, because the word "pain" brings in something which is irrelevant to my purpose: the notion of "distress." I think that "he is in pain" entails "he is in distress," that is, that he is in a certain agitation-condition.[3] Similarly, to say "I am in pain" may be to do more than "replace pain behavior": it may be partly to report something, though this

[1] This paper takes its departure from arguments to be found in U. T. Place's "Is Consciousness a Brain Process?" (*British Journal of Psychology*, XLVII, 1956, 44-50). I have had the benefit of discussing Place's thesis in a good many universities in the United States and Australia, and I hope that the present paper answers objections to his thesis which Place has not considered, and presents his thesis in a more nearly unobjectionable form. This paper is meant also to supplement "The 'Mental' and the 'Physical'," by H. Feigl (in *Minnesota Studies in the Philosophy of Science*, II, 370-497), which argues for much the same thesis as Place's.

[2] Some philosophers of my acquaintance, who have the advantage over me in having known Wittgenstein, would say that this interpretation of him is too behavioristic. However, it seems to me a very natural interpretation of his printed words, and whether or not it is Wittgenstein's real view it is certainly an interesting and important one. I wish to consider it here as a possible rival both to the "brain-process" thesis and to straight-out old-fashioned dualism.

[3] See Ryle, *Concept of Mind* (New York, 1949), p. 93.

something is quite nonmysterious, being an agitation-condition, and so susceptible of behavioristic analysis. The suggestion I wish if possible to avoid is a different one, namely that "I am in pain" is a genuine report, and that what it reports is an irreducibly psychical something. And similarly the suggestion I wish to resist is also that to say "I have a yellowish orange after-image" is to report something irreducibly psychical.

Why do I wish to resist this suggestion? Mainly because of Occam's razor. It seems to me that science is increasingly giving us a viewpoint whereby organisms are able to be seen as physico-chemical mechanisms:[4] it seems that even the behavior of man himself will one day be explicable in mechanistic terms. There does seem to be, so far as science is concerned, nothing in the world but increasingly complex arrangements of physical constituents. All except for one place: in consciousness. That is, for a full description of what is going on in a man you would have to mention not only the physical processes in his tissue, glands, nervous system, and so forth, but also his states of consciousness: his visual, auditory, and tactual sensations, his aches and pains. That these should be *correlated* with brain processes does not help, for to say that they are *correlated* is to say that they are something "over and above." You cannot correlate something with itself. You correlate footprints with burglars, but not Bill Sikes the burglar with Bill Sikes the burglar. So sensations, states of consciousness, do seem to be the one sort of thing left outside the physicalist picture, and for various reasons I just cannot believe that this can be so. That everything should be explicable in terms of physics (together of course with descriptions of the ways in which the parts are put together—roughly, biology is to physics as radio-engineering is to electro-magnetism) except the occurrence of sensations seems to me to be frankly unbelievable. Such sensations would be "nomological danglers," to use Feigl's expression.[5] It is not often realized how odd would be the laws

[4] On this point see Paul Oppenheim and Hilary Putnam, "Unity of Science as a Working Hypothesis," in *Minnesota Studies in the Philosophy of Science*, II, 3-36; also my note "Plausible Reasoning in Philosophy," *Mind*, LXVI (1957), 75-78.

[5] Feigl, *op. cit.*, p. 428.

whereby these nomological danglers would dangle. It is sometimes asked, "Why can't there be psycho-physical laws which are of a novel sort, just as the laws of electricity and magnetism were novelties from the standpoint of Newtonian mechanics?" Certainly we are pretty sure in the future to come across new ultimate laws of a novel type, but I expect them to relate simple constituents: for example, whatever ultimate particles are then in vogue. I cannot believe that ultimate laws of nature could relate simple constituents to configurations consisting of perhaps billions of neurons (and goodness knows how many billion billions of ultimate particles) all put together for all the world as though their main purpose in life was to be a negative feedback mechanism of a complicated sort. Such ultimate laws would be like nothing so far known in science. They have a queer "smell" to them. I am just unable to believe in the nomological danglers themselves, or in the laws whereby they would dangle. If any philosophical arguments seemed to compel us to believe in such things, I would suspect a catch in the argument. In any case it is the object of this paper to show that there are no philosophical arguments which compel us to be dualists.

The above is largely a confession of faith, but it explains why I find Wittgenstein's position (as I construe it) so congenial. For on this view there are, in a sense, no sensations. A man is a vast arrangement of physical particles, but there are not, over and above this, sensations or states of consciousness. There are just behavioral facts about this vast mechanism, such as that it expresses a temptation (behavior disposition) to say "there is a yellowish-red patch on the wall" or that it goes through a sophisticated sort of wince, that is, says "I am in pain." Admittedly Wittgenstein says that though the sensation "is not a something," it is nevertheless "not a nothing either" (paragraph 304), but this need only mean that the word "ache" has a use. An ache is a thing, but only in the innocuous sense in which the plain man, in the first paragraph of Frege's *Foundations of Arithmetic*, answers the question "what is the number one?" by "a thing." It should be noted that when I assert that to say "I have a yellowish-orange after-image" is to express a temptation to assert the physical-object statement "there is a yellowish-orange patch

on the wall," I mean that saying "I have a yellowish-orange after-image" is (partly) the exercise of the disposition[6] which is the temptation. It is not to *report* that I have the temptation, any more than is "I love you" normally a report that I love someone. Saying "I love you" is just part of the behavior which is the exercise of the disposition of loving someone.

Though, for the reasons given above, I am very receptive to the above "expressive" account of sensation statements, I do not feel that it will quite do the trick. Maybe this is because I have not thought it out sufficiently, but it does seem to me as though, when a person says "I have an after-image," he *is* making a genuine report, and that when he says "I have a pain," he *is* doing more than "replace pain-behavior," and that "this more" is not just to say that he is in distress. I am not so sure, however, that to admit this is to admit that there are nonphysical correlates of brain processes. Why should not sensations just be brain processes of a certain sort? There are, of course, well-known (as well as lesser-known) philosophical objections to the view that reports of sensations are reports of brain-processes, but I shall try to argue that these arguments are by no means as cogent as is commonly thought to be the case.

Let me first try to state more accurately the thesis that sensations are brain processes. It is not the thesis that, for example, "after-image" or "ache" means the same as "brain process of sort X" (where "X" is replaced by a description of a certain sort of brain process). It is that, in so far as "after-image" or "ache" is a report of a process, it is a report of a process that *happens to be* a brain process. It follows that the thesis does not claim that sensation statements can be *translated* into statements about brain processes.[7] Nor does it claim that the logic of a sensation statement is the same as that of a brain-process state-

[6] Wittgenstein did not like the word "disposition." I am using it to put in a nutshell (and perhaps inaccurately) the view which I am attributing to Wittgenstein. I should like to repeat that I do not wish to claim that my interpretation of Wittgenstein is correct. Some of those who knew him do not interpret him in this way. It is merely a view which I find myself extracting from his printed words and which I think is important and worth discussing for its own sake.

[7] See Place, *op. cit.*, p. 45, near top, and Feigl, *op. cit.*, p. 390, near top.

ment. All it claims is that in so far as a sensation statement is a report of something, that something is in fact a brain process. Sensations are nothing over and above brain processes. Nations are nothing "over and above" citizens, but this does not prevent the logic of nation statements being very different from the logic of citizen statements, nor does it insure the translatability of nation statements into citizen statements. (I do not, however, wish to assert that the relation of sensation statements to brain-process statements is very like that of nation statements to citizen statements. Nations do not just *happen to be* nothing over and above citizens, for example. I bring in the "nations" example merely to make a negative point: that the fact that the logic of A-statements is different from that of B-statements does not insure that A's are anything over and above B's.)

Remarks on identity. When I say that a sensation is a brain process or that lightning is an electric discharge, I am using "is" in the sense of strict identity. (Just as in the—in this case necessary—proposition "7 is identical with the smallest prime number greater than 5.") When I say that a sensation is a brain process or that lightning is an electric discharge I do not mean just that the sensation is somehow spatially or temporally continuous with the brain process or that the lightning is just spatially or temporally continuous with the discharge. When on the other hand I say that the successful general is the same person as the small boy who stole the apples I mean only that the successful general I see before me is a time slice[8] of the same four-dimensional object of which the small boy stealing apples is an earlier time slice. However, the four-dimensional object which has the general-I-see-before-me for its late time slice is identical in the strict sense with the four-dimensional object which has the small-boy-stealing-apples for an early time slice. I distinguish these two senses of "is identical with" because I wish to make it clear that the brain-process doctrine asserts identity in the *strict* sense.

I shall now discuss various possible objections to the view that

[8] See J. H. Woodger, *Theory Construction* (Chicago, 1939), p. 38 (International Encyclopedia of Unified Science, Vol. 2, No. 5). I here permit myself to speak loosely. For warnings against possible ways of going wrong with this sort of talk, see my note "Spatialising Time," *Mind*, LXIV (1955), 239-41.

the processes reported in sensation statements are in fact processes in the brain. Most of us have met some of these objections in our first year as philosophy students. All the more reason to take a good look at them. Others of the objections will be more recondite and subtle.

Objection 1. Any illiterate peasant can talk perfectly well about his after-images, or how things look or feel to him, or about his aches and pains, and yet he may know nothing whatever about neurophysiology. A man may, like Aristotle, believe that the brain is an organ for cooling the body without any impairment of his ability to make true statements about his sensations. Hence the things we are talking about when we describe our sensations cannot be processes in the brain.

Reply. You might as well say that a nation of slug-abeds, who never saw the morning star or knew of its existence, or who had never thought of the expression "the Morning Star," but who used the expression "the Evening Star" perfectly well, could not use this expression to refer to the same entity as we refer to (and describe as) "the Morning Star."[9]

You may object that the Morning Star is in a sense not the very same thing as the Evening Star, but only something spatio-temporally continuous with it. That is, you may say that the Morning Star is not the Evening Star in the strict sense of "identity" that I distinguished earlier. I can perhaps forestall this objection by considering the slug-abeds to be New Zealanders and the early risers to be Englishmen. Then the thing the New Zealanders describe as "the Morning Star" could be the very same thing (in the strict sense) as the Englishmen describe as "the Evening Star." And yet they could be ignorant of this fact.

There is, however, a more plausible example. Consider lightning.[10] Modern physical science tells us that lightning is a certain kind of electrical discharge due to ionization of clouds of water-vapor in the atmosphere. This, it is now believed, is what the true nature of lightning is. Note that there are not two things: a flash of lightning and an electrical discharge. There is one thing, a flash of lightning, which is described scientifically

[9] Cf. Feigl, *op. cit.*, p. 439.

[10] See Place, *op. cit.*, p. 47; also Feigl, *op. cit.*, p. 438.

as an electrical discharge to the earth from a cloud of ionized water-molecules. The case is not at all like that of explaining a footprint by reference to a burglar. We say that what lightning really is, what its true nature as revealed by science is, is an electric discharge. (It is not the true nature of a footprint to be a burglar.)

To forestall irrelevant objections, I should like to make it clear that by "lightning" I mean the publicly observable physical object, lightning, not a visual sense-datum of lightning. I say that the publicly observable physical object lightning is in fact the electric discharge, not just a correlate of it. The sense-datum, or at least the having of the sense-datum, the "look" of lightning, may well in my view be a correlate of the electric discharge. For in my view it is a brain state *caused* by the lightning. But we should no more confuse sensations of lightning with lightning than we confuse sensations of a table with the table.

In short, the reply to Objection 1 is that there can be contingent statements of the form "A is identical with B," and a person may well know that something is an A without knowing that it is a B. An illiterate peasant might well be able to talk about his sensations without knowing about his brain processes, just as he can talk about lightning though he knows nothing of electricity.

Objection 2. It is only a contingent fact (if it is a fact) that when we have a certain kind of sensation there is a certain kind of process in our brain. Indeed it is possible, though perhaps in the highest degree unlikely, that our present physiological theories will be as out of date as the ancient theory connecting mental processes with goings on in the heart. It follows that when we report a sensation we are not reporting a brain-process.

Reply. The objection certainly proves that when we say "I have an after-image" we cannot *mean* something of the form "I have such and such a brain-process." But this does not show that what we report (having an after-image) is not *in fact* a brain process. "I see lightning" does not *mean* "I see an electric discharge." Indeed, it is logically possible (though highly unlikely) that the electrical discharge account of lightning might one day be given up. Again, "I see the Evening Star" does not *mean* the same as "I see the Morning Star," and yet "the Evening Star and the Morning Star are one and the same thing" is a contingent

proposition. Possibly Objection 2 derives some of its apparent strength from a "Fido"—Fido theory of meaning. If the meaning of an expression were what the expression named, then of course it *would* follow from the fact that "sensation" and "brain-process" have different meanings that they cannot name one and the same thing.

Objection 3.[11] Even if Objections 1 and 2 do not prove that sensations are something over and above brain-processes, they do prove that the qualities of sensations are something over and above the qualities of brain-processes. That is, it may be possible to get out of asserting the existence of irreducibly psychic processes, but not out of asserting the existence of irreducibly psychic *properties*. For suppose we identify the Morning Star with the Evening Star. Then there must be some properties which logically imply that of being the Morning Star, and quite distinct properties which entail that of being the Evening Star. Again, there must be some properties (for example, that of being a yellow flash) which are logically distinct from those in the physicalist story.

Indeed, it might be thought that the objection succeeds at one jump. For consider the property of "being a yellow flash." It might seem that this property lies inevitably outside the physicalist framework within which I am trying to work (either by "yellow" being an objective emergent property of physical objects, or else by being a power to produce yellow sense-data, where "yellow," in this second instantiation of the word, refers to a purely phenomenal or introspectible quality). I must therefore digress for a moment and indicate how I deal with secondary qualities. I shall concentrate on color.

First of all, let me introduce the concept of a normal percipient. One person is more a normal percipient than another if he can make color discriminations that the other cannot. For example, if A can pick a lettuce leaf out of a heap of cabbage leaves, whereas B cannot though he can pick a lettuce leaf out of a heap of beetroot leaves, then A is more normal than B. (I am assuming that A and B are not given time to distinguish the

[11] I think this objection was first put to me by Professor Max Black. I think it is the most subtle of any of those I have considered, and the one which I am least confident of having satisfactorily met.

leaves by their slight difference in shape, and so forth.) From the concept of "more normal than" it is easy to see how we can introduce the concept of "normal." Of course, Eskimos may make the finest discriminations at the blue end of the spectrum, Hottentots at the red end. In this case the concept of a normal percipient is a slightly idealized one, rather like that of "the mean sun" in astronomical chronology. There is no need to go into such subtleties now. I say that "This is red" means something roughly like "A normal percipient would not easily pick this out of a clump of geranium petals though he would pick it out of a clump of lettuce leaves." Of course it does not exactly mean this: a person might know the meaning of "red" without knowing anything about geraniums, or even about normal percipients. But the point is that a person can be *trained* to say "This is red" of objects which would not easily be picked out of geranium petals by a normal percipient, and so on. (Note that even a color-blind person can reasonably assert that something is red, though of course he needs to use another human being, not just himself, as his "color meter.") This account of secondary qualities explains their unimportance in physics. For obviously the discriminations and lack of discriminations made by a very complex neurophysiological mechanism are hardly likely to correspond to simple and nonarbitrary distinctions in nature.

I therefore elucidate colors as powers, in Locke's sense, to evoke certain sorts of discriminatory responses in human beings. They are also, of course, powers to cause sensations in human beings (an account still nearer Locke's). But these sensations, I am arguing, are identifiable with brain processes.

Now how do I get over the objection that a sensation can be identified with a brain process only if it has some phenomenal property, not possessed by brain processes, whereby one-half of the identification may be, so to speak, pinned down?

My suggestion is as follows. When a person says, "I see a yellowish-orange after-image," he is saying something like this: "*There is something going on which is like what is going on when* I have my eyes open, am awake, and there is an orange illuminated in good light in front of me, that is, when I really see an orange." (And there is no reason why a person should not say the same

thing when he is having a veridical sense-datum, so long as we construe "like" in the last sentence in such a sense that something can be like itself.) Notice that the italicized words, namely "there is something going on which is like what is going on when," are all quasi-logical or topic-neutral words. This explains why the ancient Greek peasant's reports about his sensations can be neutral between dualistic metaphysics or my materialistic metaphysics. It explains how sensations can be brain-processes and yet how those who report them need know nothing about brain-processes. For he reports them only very abstractly as "something going on which is like what is going on when . . ." Similarly, a person may say "someone is in the room," thus reporting truly that the doctor is in the room, even though he has never heard of doctors. (There are not two people in the room: "someone" *and* the doctor.) This account of sensation statements also explains the singular elusiveness of "raw feels"—why no one seems to be able to pin any properties on them.[12] Raw feels, in my view, are colorless for the very same reason that *something* is colorless. This does not mean that sensations do not have properties, for if they are brain-processes they certainly have properties. It only means that in speaking of them as being like or unlike one another we need not know or mention these properties.

This, then, is how I would reply to Objection 3. The strength of my reply depends on the possibility of our being able to report that one thing is like another without being able to state the respect in which it is like. I am not sure whether this is so or not, and that is why I regard Objection 3 as the strongest with which I have to deal.

Objection 4. The after-image is not in physical space. The brain-process is. So the after-image is not a brain-process.

Reply. This is an *ignoratio elenchi.* I am not arguing that the after-image is a brain-process, but that the experience of having an after-image is a brain-process. It is the *experience* which is reported in the introspective report. Similarly, if it is objected that the after-image is yellowy-orange but that a surgeon looking into your brain would see nothing yellowy-orange, my reply is

[12] See B. A. Farrell, "Experience," *Mind,* LIX (1950), especially 174.

that it is the experience of seeing yellowy-orange that is being described, and this experience is not a yellowy-orange something. So to say that a brain-process cannot be yellowy-orange is not to say that a brain-process cannot in fact be the experience of having a yellowy-orange after-image. There is, in a sense, no such thing as an after-image or a sense-datum, though there is such a thing as the experience of having an image, and this experience is described indirectly in material object language, not in phenomenal language, for there is no such thing.[13] We describe the experience by saying, in effect, that it is like the experience we have when, for example, we really see a yellowy-orange patch on the wall. Trees and wallpaper can be green, but not the experience of seeing or imagining a tree or wallpaper. (Or if they are described as green or yellow this can only be in a derived sense.)

Objection 5. It would make sense to say of a molecular movement in the brain that it is swift or slow, straight or circular, but it makes no sense to say this of the experience of seeing something yellow.

Reply. So far we have not given sense to talk of experiences as swift or slow, straight or circular. But I am not claiming that "experience" and "brain-process" mean the same or even that they have the same logic. "Somebody" and "the doctor" do not have the same logic, but this does not lead us to suppose that talking about somebody telephoning is talking about someone over and above, say, the doctor. The ordinary man when he reports an experience is reporting that something is going on, but he leaves it open as to what sort of thing is going on, whether in a material solid medium, or perhaps in some sort of gaseous medium, or even perhaps in some sort of nonspatial medium (if this makes sense). All that I am saying is that "experience" and "brain-process" may in fact refer to the same thing, and

[13] Dr. J. R. Smythies claims that a sense-datum language could be taught independently of the material object language ("A Note on the Fallacy of the 'Phenomenological Fallacy,' " *British Journal of Psychology*, XLVIII, 1957, 141-144.) I am not so sure of this: there must be some public criteria for a person having got a rule wrong before we can teach him the rule. I suppose someone might *accidentally* learn color words by Dr. Smythies' procedure. I am not, of course, denying that we can learn a sense-datum language in the sense that we can learn to report our experience. Nor would Place deny it.

if so we may easily adopt a convention (which is not a change in our present rules for the use of experience words but an addition to them) whereby it would make sense to talk of an experience in terms appropriate to physical processes.

Objection 6. Sensations are private, brain processes are *public*. If I sincerely say, "I see a yellowish-orange after-image" and I am not making a verbal mistake, then I cannot be wrong. But I can be wrong about a brain-process. The scientist looking into my brain might be having an illusion. Moreover, it makes sense to say that two or more people are observing the same brain-process but not that two or more people are reporting the same inner experience.

Reply. This shows that the language of introspective reports has a different logic from the language of material processes. It is obvious that until the brain-process theory is much improved and widely accepted there will be no *criteria* for saying "Smith has an experience of such-and-such a sort" *except* Smith's introspective reports. So we have adopted a rule of language that (normally) what Smith says goes.

Objection 7. I can imagine myself turned to stone and yet having images, aches, pains, and so on.

Reply. I can imagine that the electrical theory of lightning is false, that lightning is some sort of purely optical phenomenon. I can imagine that lightning is not an electrical discharge. I can imagine that the Evening Star is not the Morning Star. But it is. All the objection shows is that "experience" and "brain-process" do not have the same meaning. It does not show that an experience is not in fact a brain process.

This objection is perhaps much the same as one which can be summed up by the slogan: "What can be composed of nothing cannot be composed of anything."[14] The argument goes as follows: on the brain-process thesis the identity between the brain-process and the experience is a contingent one. So it is logically possible that there should be no brain-process, and no process of any other sort, either (no heart process, no kidney process, no liver process). There would be the experience but no

[14] I owe this objection to Mr. C. B. Martin. I gather that he no longer wishes to maintain this objection, at any rate in its present form.

"corresponding" physiological process with which we might be able to identify it empirically.

I suspect that the objector is thinking of the experience as a ghostly entity. So it is composed of something, not of nothing, after all. On his view it is composed of ghost stuff, and on mine it is composed of brain stuff. Perhaps the counter-reply will be[15] that the experience is simple and uncompounded, and so it is not composed of anything after all. This seems to be a quibble, for, if it were taken seriously, the remark "What can be composed of nothing cannot be composed of anything" could be recast as an a priori argument against Democritus and atomism and for Descartes and infinite divisibility. And it seems odd that a question of this sort could be settled a priori. We must therefore construe the word "composed" in a very weak sense, which would allow us to say that even an indivisible atom is composed of something (namely, itself). The dualist cannot really say that an experience can be composed of nothing. For he holds that experiences are something over and above material processes, that is, that they are a sort of ghost stuff. (Or perhaps ripples in an underlying ghost stuff.) I say that the dualist's hypothesis is a perfectly intelligible one. But I say that experiences are not to be identified with ghost stuff but with brain stuff. This is another hypothesis, and in my view a very plausible one. The present argument cannot knock it down a priori.

Objection 8. The "beetle in the box" objection (see Wittgenstein, *Philosophical Investigations*, paragraph 293). How could descriptions of experiences, if these are genuine reports, get a foothold in language? For any rule of language must have public criteria for its correct application.

Reply. The change from describing how things are to describing how we feel is just a change from uninhibitedly saying "this is so" to saying "this looks so." That is, when the naive person might be tempted to say, "There is a patch of light on the wall which moves whenever I move my eyes" or "A pin is being stuck into me," we have learned how to resist this temptation and say "It *looks as though* there is a patch of light on the wallpaper" or

[15] Martin did not make this reply, but one of his students did.

"It *feels as though* someone were sticking a pin into me." The introspective account tells us about the individual's state of consciousness in the same way as does "I see a patch of light" or "I feel a pin being stuck into me": it differs from the corresponding perception statement in so far as (a) in the perception statement the individual "goes beyond the evidence of his senses" in describing his environment and (b) in the introspective report he withholds descriptive epithets he is inclined to ascribe to the environment, perhaps because he suspects that they may not be appropriate to the actual state of affairs. Psychologically speaking, the change from talking about the environment to talking about one's state of consciousness is simply a matter of inhibiting descriptive reactions not justified by appearances alone, and of disinhibiting descriptive reactions which are normally inhibited because the individual has learned that they are unlikely to provide a reliable guide to the state of the environment in the prevailing circumstances.[16] To say that something looks green to me is to say that my experience is like the experience I get when I see something that really is green. In my reply to Objection 3, I pointed out the extreme openness or generality of statements which report experiences. This explains why there is no language of private qualities. (Just as "someone," unlike "the doctor," is a colorless word.)[17]

If it is asked what is the difference between those brain processes which, in my view, are experiences and those brain processes which are not, I can only reply that this is at present unknown. But it does not seem to me altogether fanciful to conjecture that the difference may in part be that between perception and reception (in Dr. D. M. MacKay's terminology) and that the type of brain process which is an experience might be identifiable with MacKay's active "matching response."[18]

[16] I owe this point to Place, in correspondence.

[17] The "beetle in the box" objection is, *if it is sound*, an objection to *any* view, and in particular the Cartesian one, that introspective reports are genuine reports. So it is no objection to a weaker thesis that I would be concerned to uphold, namely, that if introspective reports of "experiences" are genuinely reports, then the things they are reports of are in fact brain processes.

[18] See his article "Towards an Information-Flow model of Human Behaviour," *British Journal of Psychology*, XLVII (1956), 30-43.

I have now considered a number of objections to the brain-process thesis. I wish now to conclude by some remarks on the logical status of the thesis itself. U. T. Place seems to hold that it is a straight-out scientific hypothesis.[19] If so, he is partly right and partly wrong. If the issue is between (say) a brain-process thesis and a heart thesis, or a liver thesis, or a kidney thesis, then the issue is a purely empirical one, and the verdict is overwhelmingly in favor of the brain. The right sorts of things don't go on in the heart, liver, or kidney, nor do these organs possess the right sort of complexity of structure. On the other hand, if the issue is between a brain-or-heart-or-liver-or-kidney thesis (that is, some form of materialism) on the one hand and epiphenomenalism on the other hand, then the issue is not an empirical one. For there is no conceivable experiment which could decide between materialism and epiphenomenalism. This latter issue is not like the average straight-out empirical issue in science, but like the issue between the nineteenth-century English naturalist Philip Gosse[20] and the orthodox geologists and paleontologists of his day. According to Gosse, the earth was created about 4000 B.C. exactly as described in *Genesis*, with twisted rock strata, "evidence" of erosion, and so forth, and all sorts of fossils, all in their appropriate strata, just as if the usual evolutionist story had been true. Clearly this theory is in a sense irrefutable: no evidence can possibly tell against it. Let us ignore the theological setting in which Philip Gosse's hypothesis had been placed, thus ruling out objections of a theological kind, such as "what a queer God who would go to such elaborate lengths to deceive us." Let us suppose that it is held that the universe just *began* in 4004 B.C. with the initial conditions just everywhere as they were in 4004 B.C., and in particular that our own planet began with sediment in the rivers, eroded cliffs, fossils in the rocks, and so on. No scientist would ever entertain this as a serious hypothesis, consistent though it is with all possible evidence. The hypothesis offends against the principles of parsimony and simplicity. There would be far too many brute and inexplicable facts. Why are

[19] *Op. cit.*

[20] See the entertaining account of Gosse's book *Omphalos* by Martin Gardner in *Fads and Fallacies in the Name of Science* (2nd ed., New York, 1957).

pterodactyl bones just as they are? No explanation in terms of the evolution of pterodactyls from earlier forms of life would any longer be possible. We would have millions of facts about the world as it was in 4004 B.C. that just have to be *accepted.*

The issue between the brain-process theory and epiphenomenalism seems to be of the above sort. (Assuming that a behavioristic reduction of introspective reports is not possible.) If it be agreed that there are no cogent philosophical arguments which force us into accepting dualism, and if the brain process theory and dualism are equally consistent with the facts, then the principles of parsimony and simplicity seem to me to decide overwhelmingly in favor of the brain-process theory. As I pointed out earlier, dualism involves a large number of irreducible psychophysical laws (whereby the "nomological danglers" dangle) of a queer sort, that just have to be taken on trust, and are just as difficult to swallow as the irreducible facts about the paleontology of the earth with which we are faced on Philip Gosse's theory.

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