Brain and Mind*

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How are brain and mind related? What connection is there between the highly complex neurophysiologies of minded creatures and their being minded? It is clear that there is some intimate connection because only beings with very complex nervous systems have mental states like perceivings, sensings, emotions and beliefs, but what is it exactly?

The connection between the two is spelt out nicely by the functionalist identity theory. Kick a stone and nothing much happens to the stone. It moves a bit and that's about all. Kick a person, and lots happens; and moreover what happens depends in a highly intricate way on current circumstances, past happenings, prospects, attitudes and beliefs, and so on and so forth. For stones there is a relatively simple function from input to output, not so for people. This difference is (i) crucial for our believing people are minded, and (ii) explained by people having and stones lacking central nervous systems.

We can (unoriginally) develop this into a philosophy of mind as follows. The defining characteristic of minded organisms is that there is a set of internal states—the mental states—each of which plays or occupies in the organism the functional role of being responsible for the complex and varied relations between input or stimulus, output or response, and also others of these internal states. It is these relations which mark off us and sentient creatures in general from stones and non-sentient creatures in general.

Two distinguishable questions arise. How to pair off mental state and functional role, and how to pair off mental state and occupant of functional role. In a bank a teller, the accountant and the manager fill three different functional roles—which involve inputs, outputs and their own inter-relations—and we can specify these roles without knowing who is teller, accountant or manager. That is the first kind of question; while the second concerns, for example, whether it is Smith or Jones who is the accountant.

What we know to date makes it highly plausible that states of the brain occupy the functional roles definitive of the mental states, though we do not know exactly which states of the brain fill which roles. The theory just sketched is thus a kind, a functionalist kind, of identity theory. Each mental state is what occupies a certain functional role; what occupies that role is a state of the brain; hence, each mental state is a state of the brain.

Much of Mario Bunge's book can be read as concerned with the question of how to pair off mental states and functional roles. His discussions of memory, sensation, perception, consciousness, will et al. aim to tell us enough about the role each plays in us to enable us to make the brain state identifications, if only we knew enough of the neurophysiology. He gives plasticity a central role in his account. We are plastic in two ways—as time changes the functional roles

occupied change (contrast yourself now with yourself as a baby), and also what occupies a given role may change (perhaps when re-learning after brain damage, perhaps in the normal course of events). (The same dual plasticity applies to banks, of course.)

Bunge therefore is a kind of functionalist identity theorist, but not the usual kind. He holds an emergentist or non-reductive version rather than the reductive version of, for example, D. M. Armstrong (1968) or David Lewis (1966). I will discuss his version in §2. By contrast, John C. Eccles' book is a total rejection of the functionalist identity theory approach to the brain-mind question. He defends a strong dualist interactionism (akin to Descartes') according to which mental states and the self causally interact with, but are quite distinct from, brain states. He holds that investigation of the brain cannot tell us what mental states are though it may cast light on the locus of the causal interaction. I will discuss Eccles' arguments against the identity theory in §1.

1. **Eccles' objections to identity theories**

Eccles gives four arguments specifically directed against the identity theory and materialism in general. He also claims at a number of points throughout his book that neuropsychological investigations of the phenomenon there under discussion—be it depth perception, certain perceptual illusions, intention, the unity of consciousness, the stability of visual experience, or creativity—present problems that can only be solved by dualist interactionism. Eccles thinks that what we now know about the brain favours dualist interactionism over materialism as the theory with the greater explanatory power.

Eccles' first objection is that while 'Great display is made by all varieties of materialists that their mind-brain theory is in accord with natural law... nowhere in the laws of physics or in the laws of the derivative sciences, chemistry and biology, is there any reference to consciousness or mind' (Eccles, p. 20).

This objection overlooks the distinction between reference simpliciter and reference as such. I refer to heat as such by using 'heat'; I refer to it simpliciter by using any of 'heat', 'molecular kinetic energy', 'what I've just been talking about'...

It is a petitio principii for Eccles to hold that there is no reference simpliciter to consciousness or mind in the sciences. Identity theories hold precisely that there is when reference to the appropriate brain states is made. Of course there is (as yet) no reference as such to consciousness or mind but that is as relevant as contrasting the heat-kinetic-energy identification that when it was first made the Atomic Theory made no reference to heat as such. Imagine someone in the past objecting to that identification by saying 'Great display is made of the fact that their heat-kinetic-energy theory is in accord with Atomic Theory, but nowhere in Atomic Theory is there any reference to heat'.

Eccles' second objection is that 'all materialist theories of the mind are in conflict with biological evolution. Since they all (panpsychism, epiphenvenomism, and the identity theory) assert the causal ineffectiveness of consciousness per se, they fail completely to account for the evolution of consciousness, which is an undeniable fact' (Eccles, p. 20). Leaving aside the extraordinary—and undefended—classification of epiphenvenomism and panpsychism as varieties of materialism, it simply is not true that identity theorists assert the causal ineffectiveness of consciousness per se. They say that consciousness (each instance of it) is a state of the brain, and states of the brain are causally efficacious of course.

Perhaps—I am speculating on the presence of per se—Eccles has in mind the point that what makes a given brain state an instance of consciousness according to functionalist identity theorists is not the kind of brain state it is, but the functional role it occupies, what it does in the organism. Hence it might be argued that the identity theorist's giving the brain state which is consciousness a causal role is not giving consciousness per se such a role. But the causal consequences of the occurrence of a certain brain state depends on more than the kind of brain state it is. They depend also on the whole setting in which it occurs, and that is the kind of thing which makes it consciousness according to the identity theory.

Eccles' third objection is the familiar one that the identity theory is incompatible with rational belief in it. He does not discuss, or indeed mention, the familiar objections to this objection and I will not pursue the matter further.

His fourth objection is, as far as I know, quite novel. Eccles holds that 'my experienced uniqueness lies not in the uniqueness of my brain, but in my psyche' (Eccles, p. 237), and he argues that 'If my uniqueness of self is tied to the generic uniqueness that built my brain, the odds against myself existing are 10^100000 against! Hence I must reject this materialistic doctrine' (Eccles, p. 239).

If Eccles has in mind the problem of my numerical uniqueness—why I am self-identical—there is no problem. It is logically impossible for something to be identical with something other than itself. And even if there were a problem, the self-identity of psyches could hardly be easier to explain than that of brains. If though Eccles has in mind the problem of my qualitative uniqueness—why no-one else is quite like me—the identity theorist has a clear answer to his criticism. Yes, it is antecedently fantastically improbable that someone just like me should exist. Far from being a criticism, that is the plain truth of the matter; and it does not follow that I should then believe I do not exist. Every time a really sharp dart is thrown at a really big dartboard, the antecedent probability that it should hit a given molecule is fantastically small; nevertheless it does hit some particular molecule or other.

Typical of Eccles's arguments for the greater explanatory power of dualist interactionism is what he says about intention in chapter four. He describes experiments in which subjects are asked to make certain finger movements at their own volition, and not on any external signal. Indeed they are carefully shielded from outside sensory inputs during the time they make the finger movements. He observes that these experiments suggest that certain negative potentials, called 'readiness potentials' (RP), over the parietal areas of the cortex are 'the electro-physiological counterpart[s] of willing a free voluntary movement'.

How is this supposed to support dualist interactionism? Well the RP is not triggered by outside influences—we know this from the way the experiment is set up—so the trigger must be a mental act of will acting across the interface of a dualistically conceived mind and the modules of the cerebral cortex. (The locus of mind-brain interaction according to Eccles, see chapter two.) The obvious objection to this argument is that the fact that there is no outside trigger does not show that there is not an internal one in the brain. To this Eccles has the reply that it 'overlooks the essential point of the Kornhuber experiment: namely that the subject is consciously willing the movements... The only alternative is to maintain that the subjects are illudged in their belief that they voluntarily initiate the movements, whereas the movements are being entirely generated by the neuronal machinery. This would be an explanation in accord with Identity theory...' (Eccles, p. 106).

All this is a petitio principii against the identity theory. For it assumes that what is entirely generated by neuronal machinery cannot be generated by acts of will. But according to the identity theory acts of will are neuronal processes.
supposing that there is an opposition here Eccles is assuming dualism, not giving an argument for it.

This is Eccles’s most recent of a series of writings, see e.g., Eccles (1979) and Popper and Eccles (1977), in defense of dualist interactionism, and from the tone and content of many of his remarks it is clear that he is disinterested and uninterested that philosophers in particular have not taken his defense more seriously. The reason for this emerges from what I have already said. His arguments are very unconvincing.

2. BUNGE’S NON-REDUCTIVISM

Functionalist identity theories are typically a part of the naturalization of man and sentient organisms in general. The aim is to see us as a part of nature not different in kind, though differing enormously in degree of complexity, from the rest of nature. In particular no new properties and laws are needed to handle sentient organisms. Bunge is not this sort of identity theorist. He makes this very clear on p. 6, where he says that the reductive version “does not square with the qualitative variety of reality and talks of ‘properties and laws peculiar to living things and, moreover, very peculiar ones’; and later he makes it clear that it is substantial dualism that he objects to, not property dualism, indeed on p. 15 he declares himself to be a property pluralist.

The attraction of this kind of position is undeniable. Many have complained that while what reductive identity theorists say about, for instance, pain makes excellent sense from a third-person point of view—his or her pain is nothing but a brain state which is playing a certain functional role in him or her—it is less appealing from a first-person point of view. Doesn’t the same story about my pain leave me feeling out? Isn’t the harshness an extra property we need to add to the story?

Nevertheless reductive materialists have been so good reasons, and Bunge never makes clear how he would resist them given his general sympathy for a materialist, science-oriented approach to the mind.

Bunge properly makes much of how mysterious the laws relating mental events and brain events would be if substantial dualism were true. Indeed it is impossible to make even a start on fitting these laws into the picture modern science is building of our world. But what about the laws Bunge himself must believe in governing the emergence of new properties? He says nothing at all about this question, yet it seems that what is sauce for the substances is sauce for the properties.

Similarly, what about the causal role of these new properties? His discussion on p. 15 suggests he sees them playing a causal role—that is, the fact that a biosystem instantiates them makes a difference to what happens in the world. And this would be the obvious position for him to hold, for then what is special to sentient creatures would be causally worth having. Now suppose one of these special properties is part of the causal explanation of my turning the next page of Bunge’s book (an adoption of his example on p. 15). Turning a page is arguably not one and the same event as a certain movement of molecules, but nevertheless it intimately involves that movement. The movement of the molecules is in some sense a part of the action. Hence if the special property is part of the cause of the action, it is part of the cause of the movement of molecules. How so? How do molecules get moved by emergent properties? Does this show that physics and chemistry are in principle inadequate to explain what makes molecules move? Is there any energy transfer in such action that would violate conservation laws? What are the laws governing such action? Aficionados of criticisms of substantial versions of interactionist dualism will recognize these questions and it is a pity that Bunge really says nothing about them in his defense of what is—when all is said and done—a kind of attribute pluralism.

Bunge’s lack of sympathy for reductionist identity theory is partly explained by his misascribing to it an absurd feature. (Bunge is at places a little careless in his characterizations of philosophical positions. For example on p. 104 my italics, he ridicules the causal theory of perception for holding that ‘perceptions are fully determined [caused] by the perceived objects’. It does not.) On p. 214, discussing how your social situation can affect you—his example is ulcers—he says ‘Ignoring the social level, which is what every good reductionist does, won’t do in such cases’. But reductionists do not ignore the social level. They give an account of it in terms of the interactions of very big collections of molecules. Maybe this kind of account fails, but it needs argument to show this.

3. CONCLUSION

My conclusion is that functionalist identity theorists are going to be quite unmoved by either Eccles’ or Bunge’s books. This is a pity. Despite the very great attractions of the functionalist identity theory, some of which we have touched on very briefly, there is much to be said on the other side.

REFERENCES