

explanation, but we are simultaneously told that no such explanation is possible. Now, maybe this complaint can be met, and the alleged parallel between fundamental physical interactions and fundamental Mind/body relations can be restored: so our arguments here are perhaps not conclusive. But until we do get a clearly developed response from the dualist which makes some physiological sense, it is tempting to agree with Ryle's blunt assessment:

the connection between [events in the Mind and bodily events] is ... a mystery. It is a mystery not of the unsolved but soluble type, like the problem of the cause of cancer, but of quite another type. The episodes supposed [by the Cartesian] to constitute the careers of minds are assumed to have one sort of existence, while those constituting the careers of bodies have another sort; and no bridge-status is allowed. Transactions between minds and bodies [in order to be explicable] involve links where no links can be. (1949: 66)

In short, the dualist theory of the Mind seems to have a serious and intractable puzzle at its very heart.

6 Let's for the third time let the Cartesian off the hook, and give him the benefit of the doubt. We will pretend that he can side-step the 'Many Minds' challenge, sensibly accommodate the evolutionary facts, and outface the Philosophical Problem of how there can be Mind/body interaction. There is worse yet to come, in the form of the Scientific Problem for dualism.

If the Cartesian holds that mental events, which he conceives to be happenings in an immaterial Mind, can cause physical events such as the movements of human bodies, then this commits him to holding that there are some physical events which have immaterial causes. These physical events will presumably include events in the brain, involving changes in brain cells. For we know that bodily movements are caused in the first place by neural events; so if these neural events were not themselves caused by events in the Mind, then the Mind would after all have no part to play in the generation of action. Hence the dualist must hold that there are some changes in brain cells which are brought about, at least in part, by prior non-physical changes in immaterial Minds. More precisely, he must hold that there are changes in the biochemical and electrical properties of cells which are not uncaused, but which are also not purely the causal result of prior changes in the biochemical and

electrical properties of cells. *And this goes clean against a fundamental principle of the physical sciences, namely that the causes of physical changes are other entirely physical events.* Biochemical and electrical changes are to be explained in biochemical and electrical terms; the governing laws allow no room for extraneous immaterial causal influences.

Putting it schematically: it is a fundamental principle, deeply entrenched in the practice of science, that the physical world is 'causally closed' – i.e. there are no causal influences on physical events besides other physical events. The Cartesian who believes in Mind/body interaction has to deny this.

We need to be clear about the status of the scientists' closure principle. It plainly isn't the sort of thing that can be demonstrated outright by experimental test; however many cases we find of physical events whose causes are also entirely physical, it won't follow that *all* physical events must be like that. And the closure principle can't be experimentally refuted either. Suppose we locate a neural event for which we cannot at the moment find any explanation in terms of current physical theory: it doesn't follow that there really isn't any physical explanation – perhaps our current theory just needs revision. However, this sort of resistance to easy verification or falsification is typical of high-level scientific principles, so the closure principle is none the worse for that.

Putting it crudely, the principle says 'whatever the current difficulties in the case of the particular physical phenomenon type *P*, don't give up the search for purely physical causes for *P*, because there are such causes to be found!' And the rationality of sticking to this principle – even when doing neurological research – has been demonstrated by the continuing successes of scientists in their search for purely physical explanations of neural occurrences. Principles of cell biology, and more general principles of biochemistry, that have proved their worth in the study of non-human cell structures have been further developed and applied to the study of human cells in general and brain cells in particular. Not surprisingly, given the enormous complexity of the brain, there is a great deal about its functioning that we do not yet understand; but at no point in our neuro-physiological investigations have we encountered the slightest reason to deviate from the closure principle that has so successfully guided research into the non-human world. In brain science, as elsewhere, the presumption that physical changes have purely physical causes has remained triumphantly successful in

guiding research. Yet for all that, the interactionist dualist must say that the principle is false.

‘So much the worse’, the dualist might think, ‘for contemporary science and its closure principle: after all, the fact that sticking to the principle has so far been quite profitable doesn’t show that it is *true!*’ But this response is really not available. For to dismiss the principle – at least in its present application to human neuro-physiology – is not to reject an optional extra appended to contemporary physical theory: it is rather to reject something which lies at the very heart of that theory. Contemporary science is thoroughly wedded to two big ideas. First, that macro-phenomena such as the behaviour of human cells are the causal results of micro-phenomena (ultimately, the behaviour of the atoms which constitute the cells). Second, that the physical laws governing at least low-energy micro-phenomena at atomic level are now very well known, and leave no room at all for the possibility of immaterial causal influences. These two ideas together imply the closure principle (at least as applied to brain-functioning): so which is the Cartesian going to reject? Is he going to say that the physicists have got it horribly wrong about the physical laws governing (low energy) atomic events? Or is he going to say that the microbiologists have got it wrong in thinking that the functioning of cells is to be explained in terms of the functioning of cell-constituents? Neither option has anything much to be said for it at all.

In short, the dualist is committed to rejecting what have, since Descartes’s time, come to be held as utterly central scientific principles. He cannot really complain if the scientist laughs his armchair speculations out of court.

7 You will perhaps have noted that the objection raised in the last section is only to the idea that physical events can have immaterial *causes*. There is nothing there which damns the idea that physical events can have immaterial *effects*. We could consistently stick to the closure principle and hold that the physical world has (as it were) no causal input from outside, while asserting that it does have causal output affecting immaterial Minds. Noticing this point, the dualist might attempt a strategic retreat in the face of the problems just raised. Instead of claiming that there is two way causal interaction between Minds and bodies, he might concede

that the causal transactions here must all be one way, from bodies to Minds. On this view, happenings in Minds are a causal spin-off from the physical world but do not themselves have any physical upshots. So when, for example, Jill decides to raise her arm and her arm goes up, there is – contrary to appearances – no direct causal link between the decision and the action. Rather there is an event in Jill's brain which does all the causal work, i.e. it both causes an event in Jill's Mind (the conscious decision) and has further physical upshots (e.g. the arm rising). A dualism of this kind treats mental happenings as, so to speak, a side-show: they are phenomena which are tacked onto the physical world but can't affect the world. This rather bizarre view is standardly called *epiphenomenalism*.

The attractions of epiphenomenalism are very superficial indeed: the theory's only possible merit is that it avoids the Scientific Problem for interactionist dualism presented in the previous section (it is still vulnerable, of course, to all the difficulties raised in earlier sections). And it pays the price of being open to attack on a new front.

Suppose we ask the traditional dualist, perhaps Descartes himself, what grounds there are for thinking that anyone else has an immaterial Mind associated with her observable body. The reply would run roughly as follows: 'The hypothesis that there is a Cartesian Mind associated with Jill's body is required if we are to explain the intelligent behaviour which Jill manifests – this body is not a mere physical mechanism, but shows a complexity of response which can only be explained by supposing it to be animated by a rational soul'. Now, as our techniques for explaining complex human behaviour in neuro-physiological terms have increasingly improved, this line of reply has become correspondingly less plausible: but the point to note here is that the epiphenomenalist is in any case barred from offering any such reply. For *he* cannot claim to know that others have Minds because of the explanatory power of that hypothesis: *on his 'side-show' theory Minds play no part at all in explaining happenings in the observable physical world!* But if the assumption that other Minds exist has no explanatory force, then how can he justify this assumption? Even when he is talking to a fellow theorist who claims that she, at any rate, also has a Cartesian Mind, our epiphenomenalist could argue: 'These words on her lips are just sounds for which there can be a purely physical explanation which traces back their production to

neural events (indeed *all* her observable behaviour – and I have nothing else to go on – can be causally accounted for in physical terms); so even the evidence of her words doesn't prove that Jill really has a Mind associated with her body'. And it will not help to say 'Well, I know in my own case that there is a Cartesian Mind associated with my body, hence there must by analogy be a Mind associated with all these other human bodies': for that is just a wildly irresponsible generalisation from one case. In brief, the epiphenomenalist – as well as facing the 'Many Minds' challenge and problems about evolution – is also devoid of any good reason for thinking that other people have Minds at all. Hardly an attractive position to end up in.

8 In summary, the interactionist version of the dualist, two-component, picture of the person faces the following difficulties (among others):

- (a) there seems to be no way of demonstrating the truth of the standard 'One Mind' theory as against a rival 'Many Minds' theory, nor even of reaching the necessary understanding of what the difference between the truth of these rival theories could consist in;
- (b) the dualist theory cannot readily accommodate the evolutionary facts;
- (c) the nature of Mind/body interaction is necessarily a mystery;
- (d) the claim that happenings in the Mind cause physical upshots runs counter to our best scientific theories.

If the dualist admits (d) and retreats to epiphenomenalism then he faces another difficulty,

- (e) if Minds have no causal influence on bodies, then we have no reason for supposing that other bodies than our own actually have Minds associated with them.

Obviously, if the dualist retreats even further from interactionism – say by adopting the view which was in fact held by Leibniz, namely that Mind and body merely run in parallel with no causal transactions between them at all – then problem (e) just becomes more urgent.

All this adds up to a pretty damning indictment of dualism.