



The Traditional Problem of Body and Mind

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There is a question which has been argued about for some centuries now under the name of “Interaction”; this is the question whether minds really do act on the organisms which they animate, and whether organisms really do act on the minds which animate them. (I must point out at once that I imply no particular theory of mind or body by the word “to animate”. I use it as a perfectly neutral name to express the fact that a certain mind is connected in some peculiarly intimate way with a certain body, and, under normal conditions with no other body. This is a fact even on a purely behaviouristic theory of mind; on such a view to say that the mind M animates the body B would mean that the body B, in so far as it behaves in certain ways, *is* the mind M. A body which did not act in these ways would be said not to be animated by a mind. And a different Body B’, which acted in the same general way as B, would be said to be animated by a different mind M’.)

The problem of Interaction is generally discussed at the level of enlightened common-sense; where it is assumed that we know pretty well what we mean by “mind”, by “matter” and by “causation”. Obviously no solution which is reached ‘at that level can claim to be ultimate. If what we call “matter” should turn out to be a collection of spirits of low intelligence, as Leibniz thought, the argument that mind and body are so unlike that their interaction is impossible would become irrelevant. Again, if causation be nothing but regular sequence and concomitance, as some philosophers have held, it is ridiculous to regard psycho-neural parallelism and interaction as mutually exclusive alternatives. For interaction will mean no more than parallelism, and parallelism will mean no less than interaction. Nevertheless I am going to discuss the arguments here at the common-sense level, because they are so incredibly bad and yet have imposed upon so many learned men.

We start then by assuming a developed mind and a developed organism as two distinct things, and by admitting that the two are now intimately connected in some way or other which I express by saying that “this mind animates this organism”. We assume that bodies are very much as enlightened common-sense believes them to be; and that, even if we cannot define “causation”, we have some means of recognising when it is present and when it is absent. The question then is: “Does a mind ever act on the body which it animates, and does a body ever act on the mind which animates it?” The answer which common-sense would give to both questions is: “Yes, certainly.” On the face of it my body acts on my mind whenever a pin is stuck into the former and a painful sensation thereupon arises in the latter. And, on the face of it, my mind acts on my body whenever a desire to move my arm arises in the former and is followed by this movement in the latter. Let us call this common-sense view “Two-sided Interaction”. Although it seems so obvious it has been denied by probably a majority of philosophers and a majority of physiologists. So the question is:

“Why should so many distinguished men, who have studied the subject, have denied the apparently obvious fact of Two-sided Interaction?”

The arguments against Two-sided interaction fall into two sets: -- Philosophical and Scientific. We will take the philosophical arguments first; for we shall find that the professedly scientific arguments come back in the end to the principles or prejudices which are made explicit in the philosophical arguments.

Philosophical Arguments against Two-sided Interaction

No one can deny that there is a close correlation between certain bodily events and certain mental events, and conversely. Therefore anyone who denies that there is action of mind on body and of body on mind must presumably hold (a) that concomitant variation is not an adequate criterion of causal connexion, and (b) that the other feature which is essential for causal connexion is absent in the case of body and mind. Now the common philosophical argument is that minds and mental states are so extremely unlike bodies and bodily states that it is inconceivable that the two should be causally connected. It is certainly true that, if minds and mental events are just what they seem to be to introspection and nothing more, and if bodies and bodily events are just what enlightened common-sense thinks them to be and nothing more, the two *are* extremely unlike. And this fact is supposed to show that, however closely correlated certain pairs of events in mind and body respectively may be, they cannot be causally connected.

Evidently the assumption at the back of this argument is that concomitant variation, together with a high enough degree of likeness, is an adequate test for causation; but that no amount of concomitant variation can establish causation in the absence of a high enough degree of likeness. Now I am inclined to admit part of this assumption. I think it is practically certain that causation does not simply *mean* concomitant variation. (And, if it did, *cadit quaestio*.) Hence the existence of the latter is not *ipso facto* a proof of the presence of the former. Again, I think it is almost certain that concomitant variation between A and B is not in fact a sufficient sign of the presence of a *direct* causal relation between the two. (I think it may perhaps be a sufficient sign of *either* a direct causal relation between A and B *or* of several causal relations which indirectly unite A and B through the medium of other terms C, D, etc.) So far I agree with the assumptions of the argument. But I cannot see the least reason to think that the other characteristic, which must be added to concomitant variation before we can be sure that A and B are causally connected, is a high degree of likeness between the two. One would like to know just how unlike two events may be before it becomes impossible to admit the existence of a causal relation between them. No one hesitates to hold that draughts and colds in the head are causally connected, although the two are extremely unlike each other. If the unlikeness of draughts and colds in the head does not prevent one from admitting a causal connexion between the two, why should the unlikeness of volitions and voluntary movements prevent one from holding that they are causally connected? To sum up. I am willing to admit that an adequate criterion of causal connexion needs some other relation between a pair of events beside concomitant variation; but I do not believe for a moment that this other relation is that of qualitative likeness.

This brings us to a rather more refined form of the argument against interaction. It is said that, whenever we admit the existence of a causal relation between two events, these two events (to put it crudely) must also form parts of a single substantial whole. *E.g.* all

physical events are spatially related and form one great extended whole. And the mental events which would commonly be admitted to be causally connected are always events in a single mind. A mind is a substantial whole of a peculiar kind too. Now it is said that between bodily events and mental events there are no relations such as those which unite physical events in different parts of the same Space or mental events in the history of the same mind. In the absence of such relations, binding mind and body into a single substantial whole, we cannot admit that bodily and mental events can be causally connected with each other, no matter how closely correlated their variations may be.

This is a much better argument than the argument about qualitative likeness and unlikeness. If we accept the premise that causal relations can subsist only between terms which form parts of a single substantial whole must we deny that mental and bodily events can be causally connected? I do not think that we need.

(i) It is of course perfectly true that an organism and the mind which animates it do not form a physical whole, and that they do not form a mental whole; and these, no doubt, are the two kinds of substantial whole with which we are most familiar. But it does not follow that a mind and its organism do not form a substantial whole of some kind. There, plainly, is the extraordinary intimate union between the two which I have called “animation” of the one by the other. Even if the mind be just what it seems to introspection, and the body be just what it seems to perception aided by the more precise methods of science, this seems to me to be enough to make a mind and its body a substantial whole. Even so extreme a dualist about Mind and Matter as Descartes occasionally suggests that a mind and its body together form a quasi-substance; and, although we may quarrel with the language of the very numerous philosophers who have said that the mind is “the form” of its body, we must admit that such language would never have seemed plausible unless a mind and its body together had formed something very much like a single substantial whole.

(ii) We must, moreover, admit the possibility that minds and mental events have properties and relations which do not reveal themselves to introspection, and that bodies and bodily events may have properties and relations which do not reveal themselves to perception or to physical and chemical experiment. In virtue of these properties and relations the two together may well form a single substantial whole of the kind which is alleged to be needed for causal interaction. Thus, if we accept the premise of the argument, we have no right to assert that mind and body *cannot* interact; but only the much more modest proposition that introspection and perception do not suffice to assure us that mind and body are so interrelated that they *can* interact.

(iii) We must further remember that the Two-sided Interactionist is under no obligation to hold that the *complete* conditions of any mental event are bodily or that the complete conditions of any bodily event are mental. He needs only to assert that some mental events include certain bodily events among their necessary conditions, and that some bodily events include certain mental events among their necessary conditions. If I am paralysed my volition may not move my arm; and, if I am hypnotised or intensely interested or frightened, a wound may not produce a painful sensation. Now, if the complete cause and the complete effect in all interaction include both a bodily and a mental factor, the two wholes will be related by the fact that the mental constituents belong to a single mind, that the bodily constituents belong to a single body, and that this mind animates this body. This amount of connexion should surely be enough to allow of causal interaction.

This will be the most appropriate place to deal with the contention that, in voluntary

action, and there only, we are immediately acquainted with an instance of causal connexion. If this be true the controversy is of course settled at once in favour of the Interactionist. It is generally supposed that this view was refuted once and for all by Mr Hume in his *Enquiry Concerning Human Understanding* (Sect. VII, Part I). I should not care to assert that the doctrine in question is true; but I do think that it is plausible, and I am quite sure that Mr Hume's arguments do not refute it. Mr Hume uses three closely connected arguments. (1) The connexion between a successful volition and the resulting bodily movement is as mysterious and as little self-evident as the connexion between any other event and its effect. (2) We have to learn from experience which of our volitions will be effective and which will not. *E.g.*, we do not know, until we have tried, that we can voluntarily move our arms and cannot voluntarily move our livers. And again, if a man were suddenly paralysed, he would still expect to be able to move his arm voluntarily, and would be surprised when he found that it kept still in spite of his volition. (3) We have discovered that the immediate consequence of a volition is a change in our nerves and muscles, which most people know nothing about; and is not the movement of a limb, which most people believe to be its immediate and necessary consequence.

The second and third arguments are valid only against the contention that we know immediately that a volition to make a certain movement is the *sufficient* condition for the happening of that movement. They are quite irrelevant to the contention that we know immediately that the volition is a *necessary* condition for the happening of just that movement at just that time. No doubt many other conditions are also necessary, *e.g.*, that our nerves and muscles shall be in the right state; and these other necessary conditions can be discovered only by special investigation. Since our volitions to move our limbs are in fact followed in the vast majority of cases by the willed movement, and since the other necessary conditions are not very obvious, it is natural enough that we should think that we know immediately that our volition is the *sufficient* condition of the movement of our limbs. If we think so, we are certainly wrong; and Mr Hume's arguments prove that we are. But they prove nothing else. It does not follow that we are wrong in thinking that we know, without having to wait for the result, that the volition is a *necessary* condition of the movement.

It remains to consider the first argument. Is the connexion between cause and effect as mysterious and as little self-evident in the case of the voluntary production of bodily movement as in all other cases? If so, we must hold that the first time a baby wills to move its hand it is just as much surprised to find its hand moving as it would be to find its leg moving or its nurse bursting into flames. I do not profess to know anything about the infant mind; but it seems to me that this is a wildly paradoxical consequence, for which there is no evidence or likelihood. But there is no need to leave the matter there. It is perfectly plain that, in the case of volition and voluntary movement, there is a connexion between the cause and the effect which is not present in other cases of causation, and which does make it plausible to hold that in this one case the nature of the effect can be foreseen by merely reflecting on the nature of the cause. The peculiarity of a volition as a cause-factor is that it involves as an essential part of it the idea of the effect. To say that a person has a volition to move his arm involves saying that he has an idea of his arm (and not of his leg or his liver) and an idea of the position in which he wants his arm to be. It is simply silly in view of this fact to say that there is no closer connexion between the desire to move my arm and the movement of my arm than there is between this desire and the movement of my leg or

my liver. We cannot detect any analogous connexion between cause and effect in causal transactions which we view wholly from outside, such as the movement of a billiard-ball by a cue. It is therefore by no means unreasonable to suggest that, in the one case of our own voluntary movements, we can see without waiting for the result that such and such a volition is a necessary condition of such and such a bodily movement.

It seems to me then that Mr Hume's arguments on this point are absolutely irrelevant, and that it may very well be true that in volition we positively know that our desire for such and such a bodily movement is a necessary (though not a sufficient) condition of the happening of just that movement at just that time. On the whole then I conclude that the philosophical arguments certainly do not disprove Two-sided Interaction, and that they do not even raise any strong presumption against it. And, while I am not prepared definitely to commit myself to the view that, in voluntary movement, we positively *know* that the mind acts on the body, I do think that this opinion is quite plausible when properly stated and that the arguments which have been brought against are worthless. I pass therefore to the scientific arguments.

Scientific Arguments against Two-sided Interaction

There are, so far as I know, two of these. One is supposed to be based on the physical principle of the Conservation of Energy, and on certain experiments which have been made on human bodies. The other is based on the close analogy which is said to exist between the structures of the physiological mechanism of reflex action and that of voluntary action. I will take them in turn.

(1) The Argument from Energy.

It will first be needful to state clearly what is asserted by the principle of the Conservation of Energy. It is found that, if we take certain material systems, *e.g.*, a gun, a cartridge, and a bullet, there is a certain magnitude which keeps approximately constant throughout all their changes. This is called "Energy". When the gun has not been fired it and the bullet have no motion, but the explosive in the cartridge has great chemical energy. When it has been fired the bullet is moving very fast and has great energy of movement. The gun, though not moving fast in its recoil, has also great energy of movement because it is very massive. The gases produced by the explosion have some energy of movement and some heat-energy, but much less chemical energy than the unexploded charge had. These various kinds of energy can be measured in common units according certain conventions. To an innocent mind there seems to be a good deal of "cooking" at this stage, *i.e.*, the conventions seem to be chosen and various kinds and amounts of concealed energy seem to be postulated in order to make the principle come out right at the end. I do not propose to go into this in detail, for two reasons. In the first place, I think that the conventions adopted and the postulates made, though somewhat suggestive of the fraudulent company-promoter, can be justified by their coherence with certain experimental facts, and that they are not simply made *ad hoc*. Secondly, I shall show that the Conservation of Energy is absolutely irrelevant to the question at issue, so that it would be waste of time to treat it too seriously in the present connexion. Now it is found that the total energy of all kinds in this system, when measured according to these conventions, is approximately the same

in amount though very differently distributed after the explosion and before it. If we had confined our attention to a part of this system and *its* energy this would not have been true. The bullet, *e.g.*, had no energy at all before the explosion and a great deal afterwards. A system like the bullet, the gun, and the charge, is called a “Conservative System”; the bullet alone, or the gun and the charge, would be called “Non-conservative Systems”. A conservative system might therefore be defined as one whose total energy is redistributed, but not altered in amount, by changes that happen within it. Of course a given system might be conservative for some kinds of change and not for others.

So far we have merely defined a “Conservative System”, and admitted that there are systems which, for some kinds of change at any rate, answer approximately to our definition. We can now state the Principle of the Conservation of Energy in terms of the conceptions just defined. The principle asserts that every material system is either itself conservative, or, if not, is part of a larger material system which is conservative. We may take it that there is good inductive evidence for this proposition.

The next thing to consider is the experiments on the human body. These tend to prove that a living body, with the air that it breathes and the food that it eats, forms a conservative system to a high degree of approximation. We can measure the chemical energy of the food given to a man, and that which enters his body in the form of Oxygen breathed in. We can also, with suitable apparatus, collect, measure and analyse the air breathed out, and thus find its chemical energy. Similarly, we can find the energy given out in bodily movement, in heat, and in excretion. It is alleged that, on the average, whatever the man may do, the energy of his bodily movements is exactly accounted for by the energy given to him in the form of food and of Oxygen. If you take the energy put in food and Oxygen, and subtract the energy given out in waste-products, the balance is almost exactly equal to the energy put out in bodily movements. Such slight differences as are found are as often on one side as on the other, and are therefore probably due to unavoidable experimental errors. I do not propose to criticise the interpretation of these experiments in detail, because, as I shall show soon, they are completely irrelevant to the problem of whether mind and body interact. But there is just one point that I will make before passing on. It is perfectly clear that such experiments can tell us only what happens on the average over a long time. To know whether the balance was accurately kept at every moment we should have to kill the patient at each moment and analyse his body so as to find out the energy present then in the form of stored-up products. Obviously we cannot keep on killing the patient in order to analyze him, and then reviving him in order to go on with the experiment. Thus it would seem that the results of the experiment are perfectly compatible with the presence of quite large excesses or defects in the total bodily energy at certain moments, provided that these average out over longer periods. However, I do not want to press this criticism; I am quite ready to accept for our present purpose the traditional interpretation which has been put on the experiments.

We now understand the physical principle and the experimental facts. The two together are generally supposed to prove that mind and body cannot interact. What precisely is the argument, and is it valid? I imagine that the argument, when fully stated, would run somewhat as follows: “I will to move my arm, and it moves. If the volition has anything to do with causing the movement we might expect energy to flow from my mind to my body. Thus the energy of my body ought to receive a measurable increase, not accounted for by the food that I eat and the Oxygen that I breathe. But no such physically unaccountable

increases of bodily energy are found. Again, I tread on a tin-tack, and a painful sensation arises in my mind. If treading on the tack has anything to do with causing the sensation we might expect energy to flow from my body to my mind. Such energy would cease to be measurable. Thus there ought to be a noticeable decrease in my bodily energy, not balanced by increases anywhere in the physical system. But such unbalanced decreases of bodily energy are not found.” So it is concluded that the volition has nothing to do with causing my arm to move, and that treading on the tack has nothing to do with causing the painful sensation.

Is this argument valid? In the first place it is important to notice that the conclusion does not follow from the Conservation of Energy and the experimental facts alone. The real premise is a tacitly assumed proposition about causation; viz., that, if a change in A has anything to do with causing a change in B, energy must leave A and flow into B. This is neither asserted nor entailed by the Conservation of Energy. What it says is that, *if* energy leaves A, it must appear in something else, say B; so that A and B together form a conservative system. Since the Conservation of Energy is not itself the premise for the argument against interaction, and since it does not entail that premise, the evidence for the Conservation of Energy is not evidence against interaction. Is there any independent evidence for the premise? We may admit that it *is* true of many, though not of all, transactions within the physical realm. But there are cases where it is not true even of purely physical transactions; and, even if it were always true in the physical realm, it would not follow that it must also be true of transphysical causation. Take the case of a weight swinging at the end of a string hung from a fixed point. The total energy of the weight is the same at all positions in its course. It is thus a conservative system. But at every moment the direction and velocity of the weight’s motion are different, and the proportion between its kinetic and its potential energy is constantly changing. These changes are caused by the pull of the string, which acts in a different direction at each different moment. The string makes no difference to the total energy of the weight; but it makes all the difference in the world to the particular way in which the weight moves and the particular way in which the energy is distributed between the potential and the kinetic forms. This is evident when we remember that the weight would begin to move in an utterly different course if at any moment the string were cut.

Here, then, we have a clear case even in the physical realm where a system is conservative but is continually acted on by something which affects its movement and the distribution of its total energy. Why should not the mind act on the body in this way? If you say that you can see how a string can affect the movement of a weight, but cannot see how a volition could affect the movement of a material particle, you have deserted the scientific argument and have gone back to one of the philosophical arguments. Your real difficulty is either that volitions are so very unlike movements, or that the volition is in your mind whilst the movement belongs to the physical realm. And we have seen how little weight can be attached to these objections.

The fact is that, even in purely physical systems, the Conservation of Energy does not explain what changes will happen or when they will happen. It merely imposes a very general limiting condition on the changes that are possible. The fact that the system composed of bullet, charge, and gun, in our earlier example, is conservative does not tell us that the gun ever will be fired, or when it will be fired if at all, or what will cause it to go off, or what forms of energy will appear if and when it does go off. The change in this

case is determined by pulling the trigger. Likewise the mere fact that the human body and its neighbourhood form a conservative system does not explain any particular bodily movement; it does not explain why I ever move at all, or why I sometimes write, sometimes walk, and sometimes swim. To explain the happening of these particular movements at certain times it seems to be essential to take into account the volitions which happen from time to time in my mind; just as it is essential to take the string into account to explain the particular behaviour of the weight, and to take the trigger into account to explain the going off of the gun at a certain moment. The difference between the gun-system and the body-system is that a little energy does flow into the former when the trigger is pulled, whilst it is alleged that none does so when a volition starts a bodily movement. But there is not even this amount of difference between the body-system and the swinging weight.

Thus the argument from energy has no tendency to disprove Two-sided interaction. It has gained a spurious authority from the august name of the Conservation of Energy. But this impressive principle proves to have nothing to do with the case. And the real premise of the argument is not self-evident, and is not universally true even in purely intra-physical transactions. In the end this scientific argument has to lean on the old philosophic arguments; and we have seen that these are but bruised reeds. Nevertheless, the facts brought forward by the argument from energy do throw some light on the *nature* of the interaction between mind and body, assuming this to happen. They do suggest that all the energy of our bodily actions comes out of and goes back into the physical world, and that minds neither add energy to nor abstract it from the latter. What they do, if they do anything, is to determine that at a given moment so much energy shall change from the chemical form to the form of bodily movement; and they determine this, so far as we can see, without altering the total amount of energy in the physical world.

(2) The Argument from the Structure of the Nervous System.

There are purely reflex actions, like sneezing and blinking, in which there is reason to suppose that the mind plays any essential part. Now we know the nervous structure which is used in such acts as these. A stimulus is given to the outer end of an efferent nerve; some change or other runs up this nerve, crosses a synapsis between this and an afferent nerve, travels down the latter to a muscle, causes the muscle to contract, and so produces a bodily movement. There seems no reason to believe that the mind plays any essential part in this process. The process may be irreducibly vital, and not merely physico-chemical; but there seems no need to assume anything more than this. Now it is said that the whole nervous system is simply an immense complication of interconnected nervous arcs. The result is that a change which travels inwards has an immense number of alternative paths by which it may travel outwards. Thus the reaction to a given stimulus is no longer one definite movement, as in the simple reflex. Almost any movement may follow any stimulus according to the path which the afferent disturbance happens to take. This path will depend on the relative resistance of the various synapses at the time. Now a variable response to the same stimulus is characteristic of deliberate as opposed to reflex action.

These are the facts. The argument based on them runs as follows. It is admitted that the mind has nothing to do with the causation of purely reflex actions. But the nervous structure and the nervous processes involved in deliberate action do not differ in kind from those involved in reflex action; they differ only in degree of complexity. The variability

which characterises deliberate action is fully explained by the variety of alternative paths and the variable resistances of the synapses. So it is unreasonable to suppose that the mind has any more to do with causing deliberate actions than it has to do with causing reflex actions.

I think that this argument is invalid. In the first place I am pretty sure that the persons who use it have before their imagination a kind of picture of how mind and body must interact if they interact at all. They find that the facts do not answer to this picture, and so they conclude that there is no interaction. The picture is of the following kind. They think of the mind as sitting somewhere in a hole in the brain surrounded by telephones. And they think of the efferent disturbance as coming to an end at one of these telephones and there affecting the mind. The mind is then supposed to respond by sending an efferent impulse down another of these telephones. As no such hole, with efferent nerves stopping at its walls and afferent nerves starting from them, can be found, they conclude that the mind can play no part in the transaction. But another alternative is that this picture of how the mind must act if it acts at all is wrong. To put it shortly, the mistake is to confuse a gap in an explanation with a spatio-temporal gap, and to argue from the absence of the latter to the absence of the former.

The Interactionist's contention is simply that there is a gap in any purely physiological explanation of deliberate action; *i.e.*, that all such explanations fail to account completely for the facts because they leave out one necessary condition. It does not follow in the least that there must be a spatio-temporal breach of continuity in the physiological conditions, and that the missing condition must fill this gap in the way in which the movement of a wire fills the spatio-temporal interval between the pulling of a bell-handle and the ringing of a distant bell. To assume this is to make the mind a kind of physical object, and to make its action a kind of mechanical action. Really, the mind and its actions are not literally in Space at all, and the time which is occupied by the mental event is no doubt also occupied by some part of the physiological process. Thus I am inclined to think that much of the force which this argument actually exercises on many people is simply due to the presupposition about the *modus operandi* of interaction, and that it is greatly weakened when this presupposition is shown to be a mere prejudice due to our limited power of envisaging unfamiliar alternative possibilities.

We can, however, make more detailed objections to the argument than this. There is a clear introspective difference between the mental accompaniment of voluntary action and that of reflex action. What goes on in our minds when we decide with difficulty to get out of a hot bath on a cold morning is obviously extremely different from what goes on in our minds when we sniff pepper and sneeze. And the difference is qualitative; it is not a mere difference of complexity. This difference has to be explained somehow; and the theory under discussion gives no plausible explanation of it. The ordinary view that, in the latter case, the mind is not acting on the body at all; whilst, in the former, it is acting on the body in a specific way, does at least make the introspective difference between the two intelligible.

Again, whilst it is true that deliberate action differs from reflex action in its greater variability of response to the same stimulus, this is certainly not the whole or the most important part of the difference between them. The really important difference is that, in deliberate action, the response is varied *appropriately* to meet the special circumstances which are supposed to exist at the time or are expected to arise later; whilst reflex action

is not varied in this way, but is blind and almost mechanical. The complexity of the nervous system explains the *possibility* of variation; it does not in the least explain why the alternative which actually takes place should as a rule be appropriate and not merely haphazard. And so again it seems as if some factor were in operation in deliberate action which is not present in reflex action; and it is reasonable to suppose that this factor is the volition in the mind.

It seems to me that this second scientific argument has no tendency to disprove interaction; but that the facts which it brings forward do tend to suggest the particular form which interaction probably takes if it happens at all. They suggest that what the mind does to the body in voluntary action, if it does anything, is to lower the resistance of certain synapses and to raise that of others. The result is that the nervous current follows such a course as to produce the particular movement which the mind judges to be appropriate at the time. On such a view the difference between reflex habitual, and deliberate actions for the present purpose becomes fairly plain. In pure reflexes the mind cannot voluntarily affect the resistance of the synapses concerned, and so the action takes place in spite of it. In habitual action it deliberately refrains from interfering with the resistance of the synapses, and so the action goes on like a complicated reflex. But it *can* affect these resistances if it wishes, though often only with difficulty; and it is ready to do so if it judges this to be expedient. Finally, it may lose the power altogether. This would be what happens when a person becomes a slave to some habit, such as drug-taking.

I conclude that, at the level of enlightened common-sense at which the ordinary discussion of Interaction moves, no good reason has been produced for doubting that the mind acts on the body in volition, and that the body acts on the mind in sensation. The philosophic arguments are quite inconclusive; and the scientific arguments, when properly understood, are quite compatible with Two-sided Interaction. At most they suggest certain conclusions as to the form which interaction probably takes if it happens at all....

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