

*TWENTY YEARS ON – 'IS CONSCIOUSNESS STILL A BRAIN PROCESS?'*

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Since the discovery of the electroencephalogram by Hans Berger in 1929 we now know beyond all reasonable doubt what had long been suspected, namely: that whenever a human being engages in some kind of mental activity such as performing an arithmetical calculation in his head, or simply paying attention to sensory stimulation in one or other of the sensory modalities, there is a corresponding change in the pattern of neural activity in his brain. And although we are still a long way from the stage of being able to read a man's private thoughts from a study of the electrical activity in his brain, the complexity and variety of the patterns of electrical activity revealed by the electroencephalogram are more than sufficient to justify the belief that all the complexity and variety of the thought processes and conscious experiences of an individual human being are exactly and completely reflected in the complexity and variety of the concurrent brain activity. More recently, the development of computer technology and the theory of artificial intelligence has made it possible to explain how the brain might be supposed to carry out virtually all those operations traditionally attributed to the mind. At the same time neurological evidence of the way in which behaviour and intellectual performance depend on the integrity and proper functioning of the brain as a whole and its constituent parts has shown beyond all reasonable doubt that intellectual performance and behaviour are generated and controlled by the brain not merely, as Descartes supposed, at the level of tactical execution, but at the level of strategic decision also.

Faced with evidence such as this, it is no longer possible to hold with Descartes that when a man thinks there are two quite distinct processes taking place, namely, a mental process which strictly speaking has no extension or position in physical space and which constitutes the thought process as it appears in the consciousness of the individual in question, and a concomitant physical process located in his brain whose function is merely to provide the separate mental process with information from the sense organs about the current state of the environment and organise the execution of the

appropriate movements of the body when the mental process has reached the point of deciding what to do.

The reason why this so-called dualist interactionist view is no longer tenable in the light of the empirical evidence I have mentioned has recently been made clear by Donald Davidson in his paper 'The Individuation of Events'.<sup>1</sup> Davidson points out that the *principium individuationis* of events and processes, the principle hereby we distinguish one event or process from another, is the unique position which it occupies in a causal nexus or causal chain. It follows from this principle that you cannot have two events or processes with the same causal antecedents and the same consequences or effects. Now as we have seen, the empirical evidence shows that whenever a mental process occurs there also occurs a brain process which has exactly the same causal antecedents and the same consequences or effects as the mental process appears to have. But since by Davidson's principle only one process can have *that* particular set of causal antecedents and consequences, we are compelled to conclude either that the mental process and the brain process are one and the same process or if, as most philosophers have held, they are two different processes, then one of these processes cannot in fact have the causal antecedents and consequences that it appears to have.

Since the evidence for the causal efficacy of brain activity is overwhelming, the doctrine of mind-body dualism can only be sustained in the face of such evidence by holding either with the epiphenomenalist that mental processes are a wholly ineffective by-product of the brain activity, having no effect on the overt behaviour of the individual, or with the psycho-physical parallelist that mental processes lie wholly outside the network of causal relations governing the physical world and that mental processes and their concomitant brain processes are correlated like Leibniz's two clocks which keep constantly in time with one another without any causal interaction between the two.<sup>2</sup>

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<sup>1</sup> Davidson, D. (1969) in Rescher, N., *Essays in Honour of Carl G. Hempel*, Reidel, Dordrecht, pp. 216-34

<sup>2</sup> Leibniz, G.W.F. von, January, 1696. Letter to Basnage de Beauval. The relevant passage is reproduced in Flew, A. (1964) *Body, Mind and Death*, Macmillan, New York, pp. 152-153.

Not only do these theories conflict with the intuitions of common sense, in that they both deny that our thought processes and sensations have any effect on the way we behave; they also have the character of those gratuitous ad hoc assumptions calculated to protect a theory from any possible falsification by the empirical evidence which, as Karl Popper has repeatedly argued,<sup>3</sup> are unacceptable in a genuine scientific theory.

It follows from this that the hypothesis that mental processes are the same processes as the brain processes concurrent with them is the only hypothesis which is consistent with the empirical evidence, with our commonsense belief that how and what we think and feel affects what we say and do and with the properties of scientific method. Moreover, were it not for the widely held belief that there are insuperable logical and philosophical objections to the entertainment of such a view, *that* is the conclusion that would undoubtedly have been drawn by any scientist, or any intelligent layman for that matter, when confronted by the evidence I have described.

Twenty-one years ago in 1956, I published a paper entitled '[Is consciousness a brain process?](#)' in which I presented the first systematic attempt to show that the philosophical objections to accepting this identification of mental processes with brain processes are not insuperable. This paper, together with Herbert Feigl's paper 'The "Mental" and the "Physical"' which appeared in 1958<sup>4</sup> and J. J. C. Smart's paper 'Sensations and Brain Processes' which appeared in 1959<sup>5</sup> are frequently identified as the three primary sources for what is somewhat misleadingly called the mind-brain identity theory. In fact the mind-brain identity theory was first proposed in 1933 by the psychologist E.G. Boring in

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<sup>3</sup> Popper, K. (1959) *The Logic of Scientific Discovery*, Hutchinson, London.

<sup>4</sup> Feigl, H. (1958) 'The "Mental" and the "Physical"', in Feigl, H., Scriven, M. and Maxwell, G. (eds), *Minnesota Studies in the Philosophy of Science* Vol. II, University of Minnesota Press, Minneapolis, pp. 370-497.

<sup>5</sup> Smart, J.J.C. (1959) 'Sensations and Brain Processes', in *Philosophical Review*, Vol. LXVIII, pp. 141-156

his book *The Physical Dimensions of Consciousness*.<sup>6</sup> Boring however did not make any serious attempt to meet and rebut the logical and philosophical objections to the thesis he proposed.

Indeed the effective defence of the mind-brain identity theory was only made possible, at least as far as my own contribution is concerned, by three important publications which appeared in the late 1940's and early 1950's, namely Gilbert Ryle's *The Concept of Mind*,<sup>7</sup> and English translation of a selection from *The Philosophical Writings of Gottlob Frege*,<sup>8</sup> and Ludwig Wittgenstein's posthumous *Philosophical Investigations*.<sup>9</sup> These three publications correspond to the three crucial steps of the argument as I presented it in 'Is consciousness a brain process?'

The first step was to simplify the problem of the mind-body relationship by restricting the discussion to mental activities and mental processes. This was made possible by the success and partial failure of Ryle's attempt in *The Concept of Mind* to show that the mental concepts of ordinary language do not, as had been generally supposed by philosophers and psychologists since the time of Descartes, refer to occurrences in a private world accessible only to their owner. According to Ryle, when we describe someone as knowing, believing, understanding, wanting or intending something, or as vain, irritable or intelligent, we are not talking about his inner life, nor are we talking about any kind of outward process or occurrence taking place at the time in question, we are talking about the way in which he would or could audibly talk and visibly behave if he were asked certain specifiable kinds of circumstance. On this view, to understand an instruction is simply to be able to do what one has been able to do what one has been told to do, to know what, which, where, whether or when, is to be able to supply the correct answer to the question, should the occasion arise, to intend to do

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<sup>6</sup> Boring, E.G. (1933) *The Physical Dimensions of Consciousness*, Century, New York.

<sup>7</sup> Ryle, G. (1949) *The Concept of Mind*, Hutchinson, London

<sup>8</sup> Geach, P. and Black, M. (eds.) (1952) *Philosophical Writings of Gottlob Frege*, Blackwell, Oxford.

<sup>9</sup> Wittgenstein, L. (1953) *Philosophical Investigations* (trans. G. E. M. Anscombe) Blackwell, Oxford.

something is to be liable or prone to do what one intends to do when the appropriate opportunity occurs. The virtue of this dispositional interpretation of the mental concepts of ordinary language is that it explains why mental states should not be susceptible to immediate visual inspection by other people and why it is often necessary to interrogate their putative owner in order to determine their presence or absence, without introducing the supposition that these states are parts or aspects of an inner world to which only their owner is privy. If and in so far as it is correct, it makes the traditional theories of the mind-body relationship, including the mind-brain identity theory, redundant, since it is precisely with this relationship between occurrences in the individual's private world and those taking place concurrently in his brain that these more traditional theories are concerned.

In fact although the logical behaviourist account of the mental concepts of ordinary language works very well, and is, I would still argue, substantially correct as an account of mental state concepts like 'knowing', 'believing', 'understanding', 'watching', 'listening', 'attending', 'concentrating', 'studying', 'thinking' (in the activity sense of that word), 'pondering', 'deliberating', 'calculating', 'imagining', 'picturing', 'dreaming' and 'day-dreaming'. The reason for this is that processes and activities differ from states in that while both states and processes are extended over time, processes and activities involve continuous change or a continuous sequence of changes from their inception to their conclusion, whereas states, though they may, as in the case of dispositional state, involve the occurrence of specific changes from time to time, remain unchanged, *qua* states, so long as they persist, But in the case of mental processes and activities this continuous change or sequence of changes can and often does occur without leaving any visible, audible, or tangible mark on the outward behaviour or demeanour of the person concerned. In such cases we are wholly dependent on what he tells us about it, for our knowledge of what has been going on in someone else's mind.

In the light of these considerations I restricted the application of the mind-brain identity thesis in my 1956 paper to the case of mental processes and activities and endorsed Ryle's logical behaviourist account of mental states and dispositions. Similar considerations led Feigl to restrict his

1958 version of the thesis to what he calls the ‘raw feels’ of private experience, the one aspect of the mental which the psychologist E.C. Tolman, in his book *Purposive Behavior in Animals and Men*,<sup>10</sup> had conceded that he could not define in terms of the publicly observable behaviour of a rat running a maze. Smart likewise restricted the application of his 1959 version of the thesis even more narrowly to the concept of ‘having a sensation’, the only part of the so-called official doctrine of the mind as an inner process with which Ryle had reluctantly conceded that he found himself unable to dispense in his chapter on Sensation and Observation in *The Concept of Mind*.<sup>11</sup>

This restriction of the identity theory to mental processes, ‘raw feels’ and sensations was subsequently challenged by David Armstrong in his book *A Materialist Theory of the Mind*<sup>12</sup> in which he proposes the extension of the mental-cerebral identification to mental states as well as mental processes and mental events. Armstrong bases this extension of the identity theory to cover all mental concepts on a total rejection of logical behaviourism in the form in which it was developed by Ryle. Owing to limitations of space I cannot give an adequate exposition of the arguments which Armstrong puts forward in support of his position or my reasons for rejecting them and for continuing to endorse Ryle's logical behaviourist account as far as mental states are concerned. There is however one criticism of Armstrong's position which should be mentioned, namely that it obscures the second crucial step in the argument for the mind-brain identity theory as I presented in ‘Is consciousness a brain process?’.

In presenting the materialist thesis, as he does, as a rival and alternative instead of as a supplement to Ryle's logical behaviourist account of mental state concepts, Armstrong obscures the important logical difference between logical behaviourism and the mind-brain identity theory as

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<sup>10</sup> Tolman, E.C. (1932) *Purposive Behavior in Animals and Men*, Appleton-Century, New York.

<sup>11</sup> Ryle, G. *op.cit.* pp. 199-201.

<sup>12</sup> Armstrong, D.M., (1968) *A Materialist Theory of the Mind*, Routledge and Kegan Paul, London.

originally proposed. Logical behaviourism, as presented by Ryle, is a conceptual thesis. It is a thesis about the meaning of words, about the psychological vocabulary of ordinary language. It holds that when we use these ordinary psychological concepts what we are talking about, and *all* we are talking about, is the publicly observable talk and behaviour of human beings. The identity theory on the other hand is *not* a thesis about the meaning of psychological words. It is a thesis about the actual processes, events and states to which these psychological words, or some of them, refer. It does of course *imply* a view about the meaning of psychological words in so far as it assumes that at least some of them involve or contain a reference to and commit the speaker to the occurrence or existence of processes which are not ordinarily susceptible to public observation, but which are in some curious way accessible to the individual in whom they exist or occur and which constitute something over and above the actual and potential publicly observable talk and behaviour of the individual concerned. Clearly unless there *is* something over and above the individual's publicly observable talk and behaviour to which we advert when we use psychological words, there is nothing for the identity theory to apply to. But the identity theory itself is not a theory about the sense or meaning of psychological words; it is a theory about the nature of the actual processes, to which we sometimes refer when we use some, at least, of those psychological words. To put it, as Feigl and Smart did in their papers, in terms of Frege's distinction between sense and reference, it is a theory not, like logical behaviourism, about the *sense* of psychological descriptions, but about the *referents* of such descriptions. It is the theory that the referents of certain psychological descriptions are, as a matter of contingent fact, the same actual processes, events or states as those referred to in certain neurophysiological descriptions which have a quite different sense or meaning.

The recognition that the identity theory can only be made plausible if it is presented as a contingent truth about the actual processes referred to in psychological descriptions rather than as a necessary truth about the sense or meaning of those descriptions constitutes the second of the three crucial steps in the argument as I presented it in 'Is consciousness a brain process?'. As I see it, it was

this recognition which more than anything else accounts for the success of the theory as propounded in the 1950's as compared with Boring's earlier presentation of the same view in the 1930's.

The third and final step in the argument was to examine and rebut the *a priori* philosophical arguments which purport to show that the materialist thesis is logically untenable. Since the mind-brain identity thesis, as it was presented by Feigl, Smart and myself, is a contingent proposition about a matter of fact and not a necessary truth, it follows that no one who proposes such a thesis would wish to advance a purely *a priori* argument in its favour. It is true that some defenders of the thesis, particularly Boring and Smart, have appealed in this connection to the principle of parsimony in the formulation of scientific hypotheses, generally known as Ockham's razor. But it has never been held that this is more than a heuristic principle to be applied in cases where there is no other way of deciding between two alternative hypotheses which are equally well supported by the empirical evidence. The application of such a principle will never decide an issue in the face of counter-evidence tending to show that the conclusion reached in this way is false or an *a priori* objection which shows that it is either logically incoherent or inconsistent with some other principle which we know to be true on other grounds. As I pointed out at the beginning of this paper what the mind-brain identity theorist maintains is not so much that the thesis is true, but that there are no conclusive *a priori* objections which show it to be false. Provided *that* can be established, we can safely leave it to the physiologists and psychologists to provide the empirical evidence on the basis of which its truth or falsity will ultimately be decided.

It follows from this that in order to sustain the thesis as a philosophical thesis, what we have to do is to counter the various *a priori* arguments which have been or might be adduced in order to show that mental processes and private experiences cannot be brain processes or indeed any other kind of physical process. These arguments fall into two classes. On the one hand there are the traditional arguments for a radical mind-body dualism which originate from the work of Descartes. On the other hand there are the specific objections made to the mind-brain identity thesis since its



formulation which seek to show that mental processes and brain processes cannot be one and the same thing, either because brain processes have characteristics which no mental process could have or because mental processes have features which no brain process could have, from either of which it follows by Leibniz's Law of the Identity of Indiscernibles that the two cannot be one and the same thing.

The central principle on which the traditional Cartesian argument for mind-body dualism is based is the principle of what we may call 'the epistemological primacy of private experience'. Stated in terms which are rather more empiricist and Berkeleyan than the way that Descartes himself states it, the principle of the epistemological primacy of private experience holds that all knowledge of the external physical world comes to us through sensory experience. But whereas our knowledge of the current state of our private experience is direct and immune from error. Our knowledge of the external physical world is both indirect, in that it involves an inference from the characteristics of our current sensory experience to what is the case and what is going on in our current physical environment, and open to error, our knowledge of the external physical world is both indirect, in that it involves an inference from the characteristics of our current sensory experience to what is the case and what is going on in our current physical environment, and open to error and uncertainty, in that we can never be entirely sure that the inference that we make from the current state of our sensory experience to the current state of the physical environment is correct. It follows from this principle that the way we come to know about our private experience is very different from the way in which we come to know about the physical world, that our knowledge of our own private experience is more basic and more certain than our knowledge of the external world and from this it is concluded that these two worlds, the world of our private experience and the physical world external to it, are two radically different worlds of which the world of private experience is the more fundamental of two.

Although this argument from the epistemological primacy of private experience is by no means a conclusive demonstration of the ultimate metaphysical distinctness of mind and body, its

power to persuade philosophers and other who have come in contact with it either that, as the dualist holds, the two worlds are radically different or, as the idealist holds, that the world of private experience is the only ultimate reality, is undeniable. Certainly it is very difficult to see how the mind-brain identity theory could have been made plausible within the context of such a view.

The demonstration that this doctrine of the epistemological primacy of private experience is radically incoherent depends firstly on what I take to be the basic principle of linguistic philosophy in all its forms, the principle which is expressed in Wittgenstein's remark (Tractatus 7) where he says 'Worüber man nicht sprechen kann, darüber muss man schweigen'. (i.e. Concerning those things about which one cannot speak one must keep silent.) While it is no doubt true, as the late Michael Polanyi has repeatedly argued, that there are many things which we can properly be said to know which we never put into words, there is no way in which we can evaluate the claim that somebody knows something unless and until what it is claimed of someone that he knows has been put into words in the form of an indicative sentence expressing a proposition. Only when it has been put into words can we raise the question whether or not the proposition so expressed is true or false and only if we decide that it is true are we justified in claiming it as knowledge. Furthermore unless the words which express the proposition in question are understood and understood in the same sense and as referring to the same object or state of affairs by more than one person, there is no way in which the proposition in question can come up for consideration by more than one person, no way in which its truth or falsity can be debated or decided and, hence, no way in which two or more people can discuss or decide whether or not they or anyone else can properly be said to know it.

If this principle is accepted and is then applied to the case of the knowledge of our own private experience on which, according to the doctrine of the epistemological primacy of private experience, our knowledge of the external world is based, it now turns out in the light of Wittgenstein's private language argument that we cannot put into words what we know about our own private experience in such a way that what we say can be understood by another person *without* presupposing a whole body

of knowledge on the part of both the speaker and his audience about the present and past states of the three-dimensionally extended public environment which is common to both of them and about the correlations between the states of that common environment and the private experiences of both speaker and audience. For if we consider what would be involved in putting into words what we know about our own private experience, without presupposing any knowledge about the present and past states of the external world and about the relationship between these states of the public world and our private experience, we are confronted with the situation which Wittgenstein envisaged in section 243 of the *Investigations* in which we try to construct a language such that ‘the individual words of this language are to refer to what can only be known to the person speaking; to his immediate experience. So another person cannot understand the language.’

In light of what we have already said, we are forced to conclude from this argument of Wittgenstein's either that the knowledge that we have our own private experience is incommunicable, in which case there are no propositions about our private experience whose truth and falsity is available for public discussion, or we have to concede that any knowledge about our private experience which *is* communicable and is therefore available for public discussion necessarily presupposes that we already know a very great deal about the public external world, in which case the claim that our knowledge of the external world depends upon our prior knowledge of our private experience turns out to be the very reverse of what is in fact the case.

If we take the first of these alternatives and conclude that our knowledge of our private experiences is incommunicable we are led to draw the implausible conclusion that words like ‘pain’ which are ordinarily understood as referring to a private sensation or experience on the part of the sufferer cannot so refer because there is no way a word which is intelligible to no one apart from the speaker could come to refer to a private sensation of his. Hence the suggestion which is explored by Wittgenstein that the sentence ‘I have a pain’ does not express a proposition of which it makes sense to ask whether it is true or false; it is rather to be considered as an exclamation, a verbal expression of

the disposition to wince and cry in which, on this view, the state of being in pain consists. This leads to the extreme form of logical behaviourism to which all mental concepts, without exception, are completely analysable in terms of publicly observable behaviour, since there is nothing else, on this view, to which they can be plausibly taken to refer.

But if, as I would argue we must, we reject this extreme form of logical behaviourism, we cannot avoid drawing the following conclusions in the light of this argument.

1. Any language which is capable of being used and understood by more than one person must consist in the first instance of words and expressions whose primary semantic function is to pick out or to refer to recurrent features of the common public environment of speaker and audience.
2. The fundamental empirical propositions which provide, in some sense of that term, the foundations of all our empirical knowledge are, and in so far as they are available for public discussion necessarily must be, particular propositions about the current state of their common publicly observable environment, the truth of which can be agreed between speaker and audience, since without that agreement there can be no agreement between them as to how the words which serve to express those propositions are being used and hence no possibility of mutual understanding between them.
3. The only way we have, or conceivably could have, of characterising a private experience of ours in such a way that what we say about it is intelligible to another, the only way in which we can, or conceivably could, explain what a word like 'pain' means, where 'pain' is one of that very small group of bodily sensation words which are the names of a particular kind of private experience, is by pointing to the standard publicly observable state of affairs in the environment which normally produces the experience in question and whose presence in our environment we normally recognise by virtue of that experience, or else by pointing to the

kinds of publicly observable things which an experience for that kind characteristically inclines us to say or do.

It is this third conclusion from Wittgenstein's private language argument, as I interpret it, which is of crucial importance for the mind-brain identity theory. For if it is the case that all we ever say or conceivably could say in giving a description of a private experience is that it is the kind of experience we normally have when so-and-so is the case in our public environment, or which tends to make us behave in a particular publicly identifiable manner, it follows, as I put it in my critique of what I called the 'phenomenological fallacy' in 'Is consciousness a brain process?' that

there is nothing that the introspecting subject says about his conscious experiences which is inconsistent with anything the physiologist might want to say about the brain processes which cause him to describe the environment and his consciousness of that environment in the way he does.