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Man as a Mechanism*

My subject is a very earthy one. We are, as it were, progressing towards the animal kingdom, and I am briefed to say something about the way in which man's body and brain can be studied as a mechanism, in the kind of way that other mechanical systems are studied: If you like, about the way in which man's 'personality-mediating' parts, his brain and nervous system, can be analysed and understood in the same sort of way as his heart, his lungs, or his kidneys.

You might think that this was a field in which, from the religious point of view, one of the battles for the mind was raging or was likely to rage. I think that in principle this is a possible danger; it is possible that if we as Christians do not read our Bibles carefully enough and think clearly enough, we could find ourselves trying to fight a battle with scientific results over questions of the mechanical explicability of man's brain, in the kind of way that during last century many Christian people joined battle with the biochemists over the chemical explicability of biological processes.

There is indeed today a 'battle for the mind', as a recent book has reminded us, but I want to suggest that it is not the same kind of battle. It arises because men are discovering how to manipulate one another, to treat one another as things subject to their dictates. This raises a very serious religious, ethical, and moral problem, and I have no doubt that if things go as we have seen them go in some parts of the world today, there will be a continuing struggle for human values, for the spiritual dignity of man against the forces of those who are not above manipulating people as things. I want to suggest, however, that this is something quite different from any issue raised by a study of man as a mechanism: that we have no battle on our hands as Christians to prove that man's brain somehow or other will defy physical explanations, or disobey physical laws, nor have we any battle to prove that some kind of non-physical forces are active in man's brain.

That summarises negatively what I want to say, that this kind of stress and struggle would be all wrong in approaching man as a mechanism, but that instead we ought to have as peaceably open minds

* Transcribed with minor alterations from the recorded proceedings.

in investigating this particular material part of God's creation as in studying any other.

The Three-fold Emphasis of the Bible

Now, of course, if this attitude which I am recommending is defensible, it has to be considered in the light of the Bible and what Christian doctrine has to say about man; and in a short time, I won't do more than remind you, in three 'headlines', what this is, because we are all quite familiar with it.

First, at the mechanical level, the Bible describes man as 'dust', continuous with the rest of God's physical creation.

Secondly, at the psychological level, the Bible speaks of man as 'ensouled', as, if you like, an organism. He is of a piece with the animal kingdom as distinct from the inanimate kingdom on the one hand, and on the other hand he is in some sense able to commune with God, able to be addressed by God as a person. So the first reference to man in this respect in the book of Genesis refers to him as becoming 'Nephesh', which, I believe, is best translated as 'organism' or a mind-body. There is an important point here. As Dr White has already emphasised, the Bible is not suggesting that man has a soul as a watertight extra plugged into a bodily compartment; rather the Bible leads us to *amplify* the conception of man from first, the body, the material, to second, the ensouled body. This 'has more to it' than body; it has an aspect referred to as 'soul', or sometimes 'spirit'.

But then the Bible does not stop there. In a sense its key emphasis is on yet another aspect of man's being—the possibility of his receiving 'spiritual life'. It says emphatically that man is by nature spiritually dead so that when we speak of spiritual life we must mean something different from that which by nature we all have, and sometimes refer to loosely as spiritual.

Therefore, I say, we must distinguish three levels of the Biblical idea of man, the mechanical, the psychological and the spiritual—in this particular sense in which spiritual life is not automatically a property of the human being, but rather his gift from God in the power of Christ.

The Scientific Study of Man

With the Biblical background in our minds then, let us look at the way in which scientists can study man as a mechanism, and see what this sort of study has so far indicated.

First, one must say that the scientific study of man is not new; it has been going on now for several centuries; but the reason why it has never been much in the news until recently is, I think, that with the coming of electronics (the power to amplify minute electrical signals and to control mechanisms with electric currents) a new acceleration has appeared in the tempo of the scientific study of man. It has become possible on the one hand to pick up signals from the single tiny nerve fibres of which we have about ten thousand million in the body, and to study how, for example, the signals from the eye travel back into the brain and how they are coded in the form of electrical impulses along these fibres. In other words, investigation on a scale of size utterly different from anything that was possible before, has been made possible just in this century. Conversely, it has been found possible to stimulate parts of the brain electrically. Thus, for example, a patient who is fully conscious under local anaesthetic can be stimulated in certain parts of his brain so that his hand moves. You can ask him, 'Why did you move your hand?' and he says, 'I didn't—it moved itself'. On the other hand, you can stimulate other parts of the brain in such a way that a man suddenly says, 'I'm thirsty', or in some other way *accepts into his personality* events which you have fed into his brain. You can, by stimulating some parts of the brain (admittedly in epileptic people, since these are normally the sort of patients who allow their heads to be opened), evoke sometimes whole trains of experience. For example, a woman describes herself as 'suddenly back home', and she 'can hear the kids playing at the foot of the stairs'. She is reliving, in a sense, this part of her ordinary experience. In yet other parts stimulation can evoke visual images.

Dr White has already touched on this, and I mention these only as samples of this new power of minute investigation, whereby the science of the organisation of the brain has mushroomed in our century to become one of the biggest and most detailed of the sciences. Out of it all, as Dr White has said, it becomes quite clear that there is a continual two-way connection between what we can say about people's mental experience and what we can say about what is going on in their brains.

Does 'mind' Require 'gaps' in the Scientific Picture?

It is a desperately limited picture that we have as yet; a tiny fraction of one per cent of what we would like to know is beginning to be clear, and every few years theories, some of them rather exotic, get

upset and replaced with others which in turn look very queet a few years later. This applies among others to the theories which Dr White cited, so that the field is always changing. The picture of the brain is enormously incomplete, so there is plenty of room for people to speculate and say, 'Aha, you will never be able to explain the whole of it scientifically. I believe that the mind operates in these regions that we do not yet understand.'

What I want to ask is whether what the Bible means by human personality encourages us to this way of talking: whether it makes sense from the Bible's point of view to look for the mind in the gaps in what we understand about the brain, or whether, in fact, the relationship should be a quite different one.

As a start we have to ask whether, and in what sense, the Bible ever gives us ground for considering the human personality apart from its embodiment. Throughout the Bible we find words like 'flesh' used, as it were, interchangeably with 'person'—'all flesh is as grass'; 'my flesh faints and fails'. I do not of course mean this to be a theological study, nor to put undue pressure on individual metaphors; but it does seem that the Bible gives very little encouragement to the idea that we should regard ourselves as somehow seated in a chariot, our body, which is quite separate from us.

What kind of image, then, might begin to do justice to the way in which the Bible does talk about us? For of course it does take very seriously our spiritual nature; and incidentally from the philosophical point of view, quite apart from the Biblical, nothing is more fallacious, as Dr White again pointed out, than the idea of a man sawing off the branch he is sitting on by saying he 'does not believe in mind'. Indeed, I think Dr White would agree that, to do the Behaviourists justice, most even of them would have prefaced such a remark by such saving clauses as 'for scientific purposes' or 'in the laboratory'. When they philosophised and forgot this, of course, it was indeed fatal.

Now, if this is so, if it is possible that the analysis of the body could be carried on without reference to mind, what kind of image can we reasonably use? No one image could be entirely adequate, I am convinced, because to be an ensouled body or an embodied soul or, if you like, to be a person, is a thing unique in our experience. There is no perfect analogy for it; but I want to suggest that there are one or two analogies in our experience which are a little more helpful than the image of a charioteer sitting in a chariot. I should mention, by the way, the big difficulty with the charioteer model: that whereas the earlier

scientists who sometimes used it thought that there were plenty of loose ends in the brain on which, as it were, the soul in its chariot could pull and push to control the way the machine moves, the recent discoveries, thin though they are, seem to indicate that all the really important control links are closed loops, so that there are no loose ends of the sort that are wanted for this kind of job.

Multiple Aspects and the Fallacy of 'nothing-buttery'

Well then, positively, what can we suggest? I want to begin with an illustration which is familiar to all of us—the use of lamps to signal from ships at sea.* When a man sends a message from ship to shore, then in a sense all that is coming from the ship is a series of flashes of light; but the trained man who sits on the shore watching this light intently, says, 'I see a message ordering so and so to proceed somewhere', or, 'Goodness, they're in trouble!' Now why does he say this? All he has seen is 'nothing but' flashes of light. The whole pattern of activity can be perfectly well described thus by a scientist, so completely that from the same description he could reproduce at any time exactly what the man on shore saw. He does not *add* the message as a kind of 'extra' at the end, and it is clearly silly to say he is 'leaving out the message' as if it were very wrong to do so. What he has done is to choose one way of approaching a complex unity, namely the sending-of-a-message-from ship to shore, one aspect of which, if you like, is purely optical, purely physical, allowing of complete description in such terms as the wavelengths of the light and the time pattern. On the other hand, when he reads it as a message, it is not as if he has found something *mysterious* going on *as well as* the flashing. Instead, he has discovered that the whole thing, when he allows it, as it were, to hit him in a different way, can be *read* and can make sense. The message here is related to the flashing of light, not as an effect is to a cause, but rather as one aspect of a unity is related to another aspect.

Take another illustration. Two mathematicians start arguing about a problem in geometry. They take chalk, they make a pattern of dots and lines on the board, and the fun waxes fast and furious. Can we imagine some non-mathematician coming in, and saying in amazement 'I can't see what you're getting het up about—there's nothing there but chalk'? Once again this would illustrate what I like to call 'nothing buttery'—the idea that because in one sense, at one level, or viewed from

* *Footnote*: with apologies for some repetition of points made on p. 82 (Author).

one angle, there *is* nothing there but chalk, therefore it is unnecessary, it makes no sense, it is superfluous to talk about what is there in any other terms. Again, if the mathematicians protest, 'But there is a figure there—we are talking about these angles', and so forth, they are not suggesting that the other chap's eyes are failing to detect something on the board that they are seeing. Both of them are detecting exactly the same light waves. It is not that the mathematicians have a sixth sense or anything queer that enables them to receive from the board some invisible emanations that the other fellow is not receiving. The point is that as a result of a different 'set', a different *attitude* to what is there, they have the power to see in it or, if you like, to abstract from it, an *aspect* which the other chap misses. Of course, in this case he can be trained to it. There is no great difficulty in their eventually coming to agreement, and he then realises that the geometry pattern is related to the chalk on the board, not indeed as effect is to cause, but rather as one aspect is to another.

A Relationship more Intimate than 'Cause-and-effect'

I want to clarify this alternative to 'cause-and-effect' if I can, because it does bear on the questions that Dr White raised earlier about the 'causation' of bodily action by mental activity. If an argument were to come up as to whether the light causes the message or the message causes the light, whether the chalk-distribution causes the geometry problem, or the geometry problem causes the chalk-distribution, we would see at once that the word 'cause' is the wrong word there. Causality is a relationship between *two* events or sets of events—the cause and the effect. Here we have not two events or situations, but one. You cannot have the flashing of the light without the message: they are one set of events. You cannot have the chalk-distribution without there being at the same time the problem on the board. On the other hand you could have the same message or problem in a different embodiment; and therefore I would rather say that the one 'embodies' the other.

Man as a Mental-bodily Unity

Now let us pass to the problem of relating mental activity and bodily activity in the human being. What I would like to suggest is not indeed that the relation between them is as simple as the relation between the geometry problem and the chalk, but that in the same kind of way it

would be a mistake for us to try to regard either of them as the 'cause' of the other. We should rather recognise that they are a unity in the same kind of sense, so that, given either, you have the other; and yet it would be absurd to say that one was 'nothing but' the other because, of course, it all depends on the purpose for which you are approaching the situation. If you tell the man that what is coming from the ship is nothing but light, when in fact it is an instruction that unless he gets out there in half an hour he is 'for it', he will laugh at you or do worse. Similarly if a man says, 'I have a decision to make and I feel it is a heavy one and I will be responsible for it', then for any one to say, 'Oh, but my dear chap, once the scientists have explained all that is going on in your brain it will be nothing but a matter of physico-chemical activity' would be to miss the whole point of what the man is doing. He is indeed talking of the same unity, but from a different 'angle' or at a different logical level, or, if you like, from the inside rather than from the outside. What he says may be as important and valid from his angle as what the scientist would say from his. I have deliberately said 'as' and 'as' rather than 'more' and 'than', because for certain purposes what the scientist says about the brain may be crucially important, particularly in cases of mental disease.

It could be terribly important to realise that a man's hallucinations or what have you, that have suddenly sprung up, have at the mechanical level a physico-chemical corollary, so to speak—in other words, something that corresponds to each in the kind of way that the chalk does to the geometry. This might, for example, be the result of a brain tumour, so that if you could get the tumour out without taking out too much that matters along with it, that man's hallucinations might cease and he might then be able to live a normal life.

Similarly, I would say, we must not belittle the importance of understanding the mechanism of what goes on in a man when he is taking a decision—it can be terribly important. But for all such normal activities, when there is nothing going wrong in our brains, and by the mercy of God we are normally functioning human beings, then when we face decisions the language in which it makes sense to discuss the thing, the level at which it makes sense, are those of personal decision and responsibility, and not bio-chemical activity. The tag about the little girl who said 'It ain't my fault, it's my glands' illustrates the fallacy which arises from confusing this relationship between 'dual aspects of a unity', with the relationship of cause and effect. I suggest for discussion that it is misleading and dangerous to discuss the relation

between mental activity and bodily activity as cause and effect, whichever we make the cause. I would say that this is trying to tear apart something which does not admit of that sort of tearing apart, any more than do the geometrical figure and the chalk in which it is embodied. If the chalk changes its distribution, you have indeed a new figure on your hands at the other level. But you cannot have the one changed without the other, and the one is necessary for the other. So it is a relation of necessity but not a relation of causality.

The Reality of Human Decision

Now, of course, this raises many specific problems. I would like to refer only to one, and I will do it briefly because in a recent paper in the journal FAITH AND THOUGHT (Vol. 90, p. 103) I have discussed it at a little more length. The problem might be put in this way. Suppose that a man is undertaking a decision, and for the sake of argument, suppose that all the enormous gaps were filled up in our ignorance of what goes on in his mechanism, so that it were conceivable that some super-scientist should know from the outside what is going on in his brain and should be able to calculate what is about to happen. Would not this mean that the super-scientist would know the 'real truth' about the decision before the man had made it, and therefore the decision would not be a real one? This is the way in which the dilemma is often put. If my brain is a mechanical system which could, in principle, be explained completely as such, then does not this mean that my decisions are an illusion, something about which an outside observer would know the real truth while I only 'thought' that I was taking my decision?

The answer to this question may seem a little startling, but I believe it to be inescapable. At first sight, you might suppose that if a scientist, looking at your brain from the outside, can write down on a piece of paper a description of what he sees, then if he has seen correctly, what he has written down on paper must be 'the truth'—a true fact about you. But let us think what would happen if you yourself were to believe what he has written on the paper. If what he has written on the paper describes, let us say, the part of your brain that is concerned with your bodily metabolism, then there is no great difficulty; you can believe it and it makes no difference. If it is the part of your brain that is dealing with the rate of your breathing, well then, perhaps the excitement of reading what is on the paper will alter the rate of your

breathing and so will make the description a little bit out-of-date. But if a scientist knows in advance that he is going to show it to you, then he can, in this case, calculate in advance what effect it will have on you and so eventually arrive at a description which he can give to you, and it will have the effect on you which will make your breathing correspond to what is described.

Logical Indeterminacy

But now what if the description that he writes on the paper refers to the part of your brain which at the moment is, so to speak, lying blank waiting to receive the description? He is then in a really tough logical dilemma; because whatever he writes on the paper is going to change your brain to a new state when it lands. He cannot possibly allow in advance for the effect, because then your brain would already have to be in the state which the description would have to produce in landing on it. In short, the description written on the paper, if you believed it, would change your brain in such a way that it no longer corresponded to the description. It is quite clear, I think, that whatever else you can say about the description on paper, for you that description is not valid. In a very strict sense it is incredible—not only because you do not *feel* like believing it, but because any attempt on your part to believe it would make it out of date. We therefore have the logical paradox that what the man has written on the paper, although it may be valid for him as long as he keeps it to himself, is not 'the truth', because 'the truth' is something that anyone would be right to believe; but here is something which *you* would be *wrong* to believe—and which he knows you would be wrong to believe. If you believed it, you would make it out-of-date, and he would be wrong to believe it too. For you, it is *logically indeterminate.**

This, I think, goes very deep. It may not be obvious at first sight, but the point is that even the most accurate scientific descriptions or predictions, based on such states of the brain as we have been discussing, cannot be said to be universally 'true' and cannot be valid for the man whose brain it is.

The Necessity for Multiple Accounts of Man

We thus arrive at, to my mind, the real mystery of what it is to be a man, viewed from the mechanical level—not, I suggest, that anything

* See my paper 'On the logical indeterminacy of a free choice,' in *Mind*, **69**, 31-40, 1960.

necessarily is physically queer in the brain, but that there is something intensely queer at the logical level about scientific descriptions of his brain. While people who are sufficiently detached from him, as it were, as outside observers—who are able to prevent such descriptions from having any effects on the agent—may regard these descriptions as valid-for-them, they cannot claim that they are 'true'. That is the odd thing because, we remember, if they were 'true', the agent would be right to believe them; whereas in fact if the agent believed them they would not be true; they are not valid for him.

In other words I think this illustrates the logical necessity for at least *two* viewpoints on the activity of a man; and this is what distinguishes man as a mechanism from all other mechanisms that we know in the world. Of any other mechanisms in the world, descriptions can be written down at a scientific level, as it were, which can be said to be true (or false) and there is nothing logically wrong about saying it. Anyone and everyone would be equally right (or wrong) to believe them. But descriptions of any man's brain, if they go into sufficient detail, can in the end only be said to be valid from the partial viewpoint of the observer. In the very strongest sense they are *invalid* for the agent, and hence not 'true', because anything that is 'true' is valid, of course, for everybody.

We have therefore to admit that what the agent may rightly believe about his action must be something *different* from what the observer has written on the paper. He would be wrong to believe that, therefore presumably he would be right to believe something else. I want to suggest that what he would be right to believe is that he has a decision to make, that unless he makes it, it won't be made, that the way he makes it, it will be made, that he had better get on with it and that he will be responsible for the way it is made. The validity of this, I suggest, depends not on a *physical* gap in the chain of cause and effect in his brain, but on a *logical* gap in the structure of what he can validly believe.

The Irrelevance of Physical Indeterminacy

If, as I believe, this kind of 'gap' is wide enough for all that religion requires here, there would seem to be no religious justification for any secret hope that science will come up against physical snags in explaining the physical brain. There *are* plenty, of course! To mention only one, there is the well-known fact that when you come down to the

scale of the elements of matter, electrons and so forth, then it is physically impossible (as far as we know now) to predict the way in which two electrons will go after they have collided. They scatter in a way that we cannot predict on any basis known to physics, so that, if we *wanted* to predict the detailed behaviour of a brain, that would be impossible anyway. But what I am suggesting is that this kind of physical awkwardness is not *necessary* for seeing a place, and indeed a logical place, for the reality of human decision and other mental activity. What we have seen suggests that we have here a 'unity' which demands, to do justice to it, at least two levels of discussion, the level of the mechanical from the outside, the level of the personal from the inside standpoint of the agent himself. [The latter, of course, can be shared by other agents through their mutual knowledge of what it is to be an agent.]

Finally, what of 'spiritual life'? Could we perhaps agree now that in the kind of way that we see psychological life 'embodied' in the *physical* brains of persons, it is at least not implausible to see, in Biblical terms, spiritual life as 'embodied' in the *psychological* mechanism of a man, if God by his grace is willing to give that man that life?

The suggestion would be then that the breath of spiritual life, in the Biblical New Testament sense, does not necessarily entail something which is 'unscientific' psychologically. In other words, I do not think the Christian has any more reason to do battle with the psychology of religion, even the psychology of religious conversion, than with the physiology of the brain. We may well doubt that such a private matter will yield much grist for the scientific mill; but that is not to say that the scientist is wrong to look for 'laws' in what data he can get. I am suggesting, then, that spiritual life may be thought of in a general way as related to the scientific mechanistic structure of psychological theory (with which Freud among others has dealt) in the kind of way that psychological life can be said to be related to the activity of the nerve cells and other mechanical components (with which physiology is concerned).

True conversion, as distinct from superficial, is the only way known to Christian faith of bringing about this transformation in a way which 'follows on' and does not do violence to the personality embodied. I can perhaps illustrate what I mean by coming back for a moment to our geometry problem. The geometry problem, on the one hand, could be viewed as nothing but chalk, and on the other hand, could be viewed as a figure of lines and angles. Now the problem can be altered

in any number of ways by rearranging the chalk. If you do violence to it as a problem by laying down new lines or rubbing out lines and changing them, then you get a new problem, or your problem is removed, but you have achieved it only at the cost of doing violence to it. The mathematicians are concerned with the only kind of resolution that interests them, namely by discussing the thing at its own level, respecting its nature, and not forcing or distorting it. Now similarly, I suggest that, while in principle one might imagine that by suitable surgical manipulations you might turn an angry man into a peaceable man, and so forth, this would not amount to conversion in the biblical sense, for you would have solved the man's problem at this level by doing violence to the man. In a sense you have ended up with a different man. As I understand it, the claim of Jesus Christ, that only through Him could eternal life come to us as personalities, indicates that only by His power as the Creator and Upholder of our whole being can our personality be reshaped in a way that does not do violence to us. Only His way of Love preserves the continuity between us as we are now, with the problem of our self-centredness and our rebellion against God, and us as we shall be when He has turned our hearts to God.

In summary, then, I would suggest not only that I see harmony between the study of man as a psychological being and the study of man as a mechanism, but that in some doubtless crude and imperfect way this even throws a little light on the relation between the spiritual life which is offered to man and the psychological structure in which that spiritual life must, by God's grace, be embodied.

Major C. W. HUME said: With regard to Professor MacKay's point about choice being influenced by prediction, I would like to ask these questions. (1) Suppose a super-physiologist does not communicate his prediction truthfully to his subject? He might write down, 'My calculations show that if I tell this man he is going to choose porridge, that will make him choose prunes out of cussedness. I will therefore predict that he will choose prunes, but tell him that I predict that he will choose porridge.' Does this possibility invalidate the argument? (2) Is it possible to set up an analogous situation in a computer programme?

I would like to call attention to an interesting book, *Chance and Providence* (Faber and Faber), by William G. Pollard, who is both a parson and a nuclear physicist. His contention is that it is only for

convenience that scientists have mainly studied situations in which a unique prediction can be made, as in the case of eclipses, for instance, and that the laws of nature must for the most part be expressed in terms of probability. Thus there are two kinds of uncertainty, that due to human ignorance, and that which is inherent in the nature of things, notably Heisenberg uncertainty in atomic theory, which may also be applicable to genetic mutations. Pollard extends this idea to macroscopic phenomena, such as fluid motion, which seems to me to be stretching it rather far. But might it not be applicable to brain cells, which must be subject to random noise?

Professor MACKAY replied: Major Hume's super-physiologist cannot claim that what he is communicating to his subject *ought* to be believed. If *what he has written down*, i.e. what he himself believes, were offered to his subject, it would in turn lose its predictive validity. This is my point.

The logical aspects of this situation can indeed be set up in a computer programme, but as a computer handles only the symbolic *tokens* of beliefs, the question of their truth for the computer does not arise. It is persons who believe, and not their brains. Computers may in some respects be analogous to brains; but to attribute to machinery of any kind, whether biological or otherwise, the activities of persons (e.g. thinking, believing, etc.) would be a logical solecism.

My criticism of Pollard's thesis would be along the lines of part 2 of my recent paper on 'Brain and Will' in FAITH AND THOUGHT, vol. 90. I have there suggested that brain cells may sometimes be physically indeterminate to a significant extent; but such 'noise' does not seem to me to provide the right kind of indeterminacy for the attribution of personal responsibility in human decisions.