

## 6. Mind and Soul

‘I think, therefore, I am.’

RenéDescartes

‘I simply believe that some part of the human Self or Soul is not subject to the laws of space and time.’

CarlGustav Jung

Whatever their differences of opinion about the nature of God, I know of no religion that does not teach that God is a mind. In the Christian religion God is omniscient – infinitely knowledgable. He is also infinitely free to act as he wishes. There can be no mind greater than God's, for God is the supreme being.

But what is mind?

This burning question has long been debated by theologians and philosophers. Today, however, the study of mind also comes within the province of science, through psychology and psychoanalysis, and more recently in brain research, computing and so-called ‘artificial intelligence’. Some of these new developments have cast a wholly different light on the age-old enigma of the mind and its relation to the material world. The consequences for religion are profound. The only minds of which we have direct experience are those associated with brains (and arguably computers). Yet nobody seriously suggests that God, or departed souls, have a brain. Does the notion of a disembodied mind, let alone a mind completely decoupled from the physical universe, make any sense? In this chapter and the next we shall examine the topics of consciousness, the self and the soul, and ask whether mind can survive bodily death.

It is helpful to begin by drawing a clear distinction between the mental and physical worlds. The physical world is populated by material objects that occupy locations in space and have qualities like extension, mass, electric charge and so on. These objects are not inert, but move about, change and evolve in accordance with dynamical laws, the study of which forms a branch of physics. The physical world is (at least to a large extent) a public world, accessible by observation to everybody.

In contrast the mental world is populated not by material objects but by thoughts. Thoughts are obviously not located in space, but seem to occupy a universe of their own which is, moreover, a private universe, inaccessible to other observers. Thoughts can change, evolve, interact and otherwise behave kinetically in a variety of ways, the study of which forms a branch of psychology.

So far none of this appears controversial. Problems arise, however, when the physical and mental worlds interact. Our universe of thoughts is not isolated from the physical universe around us, but strongly coupled to it. Through our senses our minds receive a constant stream of information which proceeds to generate mental activity, either by stimulating the appearance of new thoughts or reshaping existing ones. If, when reading the sentence, you hear a loud bang from outside, the thought 'a tile has dropped from the roof' or perhaps 'a car has backfired' will intrude into your deliberations. The physical world therefore, acts as the source of new thoughts and has the effect of rearranging the mental world.

Conversely the mental world acts on the physical world through the phenomenon of volition. You decide to investigate the bang, and your legs move, the book is put down, doors open. The thoughts in your mind trigger physical activity via the intermediary of your body which then rearranges material objects in your environment. Indeed, nearly everything we ordinarily see in our environment is the result of mental activity realized through physical operations. Houses, roads, wheat fields, windmills, all originated with some intellectual activity involving planning, and decisions being converted into 'concrete reality'.

Though this all may seem obvious, there are already some disturbing features creeping in. What is the mechanism whereby matter acts on mind and, worse still, mind on matter?

Let us trace how a particular thought is 'implanted' in the mind by an external stimulus — the loud noise, for example. The sound waves impinge on the ear drum and set it into motion. The motion is transmitted through three delicate bones to the cochlea, whereupon a membrane receives the vibration and imparts it to a fluid inside the inner ear. The fluid in turn disturbs some sensitive filaments which generate electric impulses. The impulses travel along the auditory nerve pathways to the brain, where the electrical signal encounters a complex electrochemical network and the sensation of sound is registered. But how? How does the straightforward, if complex, chain of physical interactions suddenly promote a mental event — the *sensation* of sound? What is it about that particular electrochemical pattern in the brain that makes you actually *hear* something, and thereby trigger a sequence of thoughts?

Still more paradoxical is the response. You decide to investigate the sound. Your legs move — how? Brain cells fire, messages buzz along nerves, muscles tense; you move.

How would a physicist view this activity in your brain? In the first instance as processes in a complex electrical circuit, with input and output connections represented by the various nerve pathways to the sense organs and muscles. Being thoroughly familiar with the laws of electrical circuitry, the physicist might suppose that, if he could obtain a comprehensive knowledge of the electrical condition of your brain (a complete wiring diagram and detailed monitoring of the input signals) then by a stupendous computation he would be able to predict accurately the output signals of this electrical network and thereby infer what you will do next. Will you investigate the noise or not? The electrical signals will tell him.

Now nobody would suppose for one moment that such a prediction could ever be achieved. The point is, that viewed as a tangled mass of electrical circuitry, the brain seems to be completely deterministic, and therefore, in principle at least, predictable. Nerve cells fire to command your legs to move because the pattern of currents in the circuitry has a certain form. A different pattern would fail to trigger the cells and you would remain reading.

The paradox here is that these seemingly down-to-Earth physical events involving ordinary electrical impulses are paralleled by mental events: 'What is that sound? Has something broken? Should I investigate? Yes' — and the brain cells activate. But although the mental description thus far is consistent with the physical, there is a crucial element that does not tie in; namely, the fact that you *decide* to investigate the noise. The motion of the legs, setting aside of the book, and so on is the result of a conscious act of volition, a choice. Where is there room in the deterministic predictive laws of electrical circuitry for *free will*?

One answer is to view the mind as rather like the operator in control of a complicated machine. Just as a power station operator can push various buttons and light up a city, so can the mind fire the relevant brain cells (neurons) to activate the body in accordance with its decisions. But how does the conscious decision to investigate a noise *cause* the relevant brain cells to fire? What of the laws of electrical circuitry that are supposed to already determine the output signals? Are these laws violated? Can the mind somehow reach into the physical world of electrons and atoms, brain cells and nerves, and create electrical forces? Does mind really act on matter in defiance of the fundamental principles of physics? Are there, indeed, two causes of movement in the material world: one due to ordinary physical processes and the other due to mental processes?

The puzzling issue of free will and the mechanism of interaction of mind on matter will be dealt with more fully in Chapter 10. However, our problems do not rest there. We still have not discovered what consciousness is and how it arises. Are chimpanzees conscious? Dogs? Rats? Spiders? Worms? Bacteria? Computers? Is a human foetus conscious at eight months? One month? One second? Few people would answer yes to all these. So does consciousness grow gradually, is it a quality that can be quantified in some way, so that on a scale of 100 for an adult human we may assign, say, 90 for a chimpanzee, 50 for a dog, 5 for a rat, 2 for a five-month-old foetus, 0.1 for a spider and so on? Or is there a 'threshold of development' at which consciousness abruptly blossoms forth like a fuel that suddenly ignites at a critical temperature?

How can we recognize consciousness when we see it? Each of us directly experiences our own consciousness but, being located in a private, non-physical universe of thoughts and sensations it is not possible for our consciousness to be observed by anyone else. Instead, one can only infer consciousness in others through their behaviour and through communication with them via the physical universe. Jones may tell Smith that he, Jones, is conscious and Smith, observing that Jones seems a normal sort of fellow and is conducting his dialogue in a coherent way, believes him. If Jones were mute, or only

spoke an obscure dialect of Eskimo, Smith would still feel confident in drawing the same conclusion through observation of Jones's conduct, with special attention to his response to stimuli, execution of complex tasks and so on.

In the case of a dog, we are on shakier ground. Dog-human communication is minimal and can be ambiguous, and much dog-behaviour seems mindless, instinctive. Yet few dog-owners would be prepared to deny that their pets are conscious and have minds, albeit less developed (in some obscure sense) than humans. But when it comes to lower creatures — spiders for example — it would be very hard to make a case that they have minds. True, they still display behaviour, but it is easy to be convinced that it is automatic — programmed by instinct.

In considering this downward progression, it is easy to be persuaded that there is an asymmetry between the way in which the active and passive aspects of mind peter out. To be conscious in the sense of registering sense-data somehow seems less accomplished than the ability to plan, decide and act. A new-born baby undoubtedly experiences sensations resulting from bodily stimuli, but is almost entirely passive in this awareness. Perhaps spiders likewise know what's going on around them but have an extremely limited capacity to respond by anything other than through a reflex action. It is often said that the ability to assess situations, plan and act accordingly, is uniquely human. That is surely a fallacy (particularly if extraterrestrial intelligent life exists). However, it may be that these more active qualities of the mind have to do not merely with awareness, but *self-awareness* (a topic discussed in the next chapter). It could be that the concept of the self is not well developed in animals.

The rapid development of powerful electronic computers has directed attention as never before to the mechanisms that underlie human thinking capabilities, and has led to some searching analyses of the relation between mind and brain. At the centre of this study is the simple yet loaded question: Can machines think?

This is not the place to review the vast literature and multiplicity of opinions about so-called 'artificial intelligence'. All experts are at least agreed that, at this time, even the most advanced computers fail to resemble the human mind in operation. As is well known, computers can usually outperform humans in arithmetic, filing and chess playing, but they still under-achieve in the composition of music and poetry. This disparity has less to do with the structural hardware of computers than the way in which they are programmed (the software). Most computers are designed to perform rather specific low-level tasks (such as huge amounts of simple arithmetic), where speed and accuracy are the overriding criteria. A computer which makes mistakes, sulks, has 'off' days or behaves in an otherwise erratic manner is of little use to most operators, though the possession of such irrational characteristics might enable it to more closely approximate human intelligence. Of course, nobody has the slightest idea how to program a computer with such human qualities, or indeed whether such a possibility exists. Nor is very much known about the operation of the human brain in this regard.

In spite of current technological limitations, the question of whether (in principle at least) machines can have 'minds' is a burning one. Anyone who has had the experience



of using a powerful computer will have soon learned that, in a limited sense, it can communicate with its operator in a quasi-human fashion. Modern 'interactive' techniques enable a sophisticated dialogue to take place, on a question and answer basis, between man and machine, though the range of conversation is severely limited.

I have argued that the existence of other minds than our own can only be deduced by analogy. If one asks the question: 'How do I know that Smith has a mind?' the answer can only be: 'I have a mind, Smith behaves as I do, talks as I do, professes to have a mind, as I do, so I conclude he has a mind as I have.' But this reasoning could equally well apply to a machine as a human being. As you can never occupy the mind of another human being and experience their consciousness at first hand (and even if you could the occupied person would no longer be him, but you), any assumption about the existence of other minds is necessarily an act of faith. So the answer to the question 'Can machines think?' must be that one has no reason to rank men above machines on grounds of performance (in certain intellectual tasks) which is the only external criterion by which one can assess the machine's 'internal' experiences. If a machine could be made to respond in the same way as a human being to all external influences then there would be no observable grounds for claiming that the machine did not think, or did not have a consciousness. Moreover, if we are willing to concede that dogs think, or that spiders or ants possess some rudimentary consciousness, then even presently available computers could be regarded as conscious in that limited sense.

In 1950, the mathematician Alan Turing addressed the question 'Can machines think?' in an article entitled 'Computing Machinery and Intelligence' in the journal *Mind*. He suggested a simple test that would reveal the answer. Turing called it the 'imitation game'. The idea is that a man goes into one room, and a woman into another. An interrogator communicates with them via a teletype contraption and tries, by using a question and answer sequence, to decide which respondent is male and which female. The man and woman are asked to try and persuade the interrogator that each is the woman. Thus, the man must be a knowledgeable and accomplished liar. Turing's machine intelligence test now consists of replacing the man by the machine in this game. If it succeeds in fooling the interrogator that it is a woman, Turing maintains that the machine really does think.

A number of arguments have been deployed against the claim that such full-blown artificial intelligence is possible. One line of reasoning is that computers, locked as they are in strictly rational, logical modes of operation, are inevitably cold, calculating, heartless, mindless, soulless, unemotional automata. Being purely automatic in operation, they will achieve only what has already been programmed into them by their human operators. No computer can take off and become a self-motivated creative individual, able to love, laugh, cry or exercise free will. It is no less a slave to its controllers than a motor car.

The trouble with this argument is that it can backfire. At the neural (brain cell) level, the human brain is equally mechanical and subject to rational principles, yet this does not prevent us from experiencing feelings of indecision, confusion, happiness, boredom

and irrationality.

The principle religious objection to the idea of artificial intelligence is that machines do not have souls. The concept of the soul, however, is hopelessly vague. Early ideas were inextricably bound up with the concept of a life-force — some vital, animating influence. The Bible, especially the Old Testament, has very little to say on the subject, which seems to owe its origin more to the Greek classical tradition, under the influence of philosophers such as Plato. Early biblical references present the soul as synonymous with breath or life, but the concept sharpens somewhat in the New Testament, where the soul comes to be identified with the self and takes on the features that we might today call the mind. Indeed, the use of the word soul has declined in the modern era, and is now confined mainly to theological circles. Even the Catholic Encyclopedia settles for a definition of the soul as the ‘source of thought activity’.<sup>1</sup> The relation between soul and mind has therefore been rather vague, and they will be used inter-changably in what follows.

Central to religious doctrine is the idea that the soul (or mind) is a *thing*, and a sharp distinction must be drawn between body and soul. This so-called dualist theory of the mind (or soul) was developed by Descartes and has been widely incorporated in Christian thinking. It also comes closest to the belief of the ordinary man. Indeed, so ingrained in our culture and language are the ideas of dualism that Gilbert Ryle in his book *The Concept of Mind* calls it ‘the official doctrine’.

What are the features of the dualist theory of the mind? The ‘official doctrine’ goes something like this. The human being consists of two distinct, separate kinds of thing: the body and the soul, or mind. The body acts as a sort of host or receptacle for the mind, or perhaps even as a prison from which liberation may be sought through spiritual advancement or death. The mind is coupled to the body through the brain, which it uses (via the bodily senses) to acquire and store information about the world. It also uses the brain as a means to exercise its volitions, by acting on the world in the fashion described earlier in this chapter. However, the mind (or soul) is not located inside the brain, or any other part of the body; or indeed anywhere in space at all. (I am discounting here the ‘unofficial’ doctrine of some mystics and spiritualists who claim to witness some sort of aetheric body or soul in close spatial association with the physical body.)

An important feature of this picture is that the mind is a thing; perhaps even more specifically, a substance. Not a physical substance, but a tenuous, elusive, aetherial sort of substance, the stuff that thoughts and dreams are made of, free and independent of ordinary ponderous matter.

Descartes's conception of body and soul is summarized by R.J. Hirst as follows:

The essential notions seem to be: first that there are two distinct orders of being or substances, the mental and the material. Mind or mental substance is neither perceptible by the senses nor extended in space; it is intelligent and purposive and its essential characteristic is thought, or rather consciousness.<sup>2</sup>

Ryle expresses it thus:

Though the human body is an engine, it is not quite an ordinary engine, since some of its workings are governed by another engine inside it — this interior governor-engine being one of a very special sort. It is invisible, inaudible and it has no size or weight. It cannot be taken to bits and the laws it obeys are not those known to ordinary engineers. <sup>3</sup>

Ryle dubs this interior governor ‘the ghost in the machine’.

The soul's insubstantial quality would appear to be necessary for two reasons. First, we do not see souls or detect their physical presence in any direct way, nor are they revealed during brain surgery. Secondly, the world of matter must comply with the laws of physics which, on the macroscopic level (i.e. ignoring quantum effects) are deterministic and mechanical, and hence incompatible with free will — a fundamental attribute of the soul. (The reasoning is mistaken, as we shall see in due course.) But these arguments only tell us what the soul is not, not what it is. We get the suspicion that the idea of a soul or mind as a *thing* has been floated out of nowhere, and given a spurious and illusory impression of reality simply by attaching meaningless words to it. The mind is not mechanical, so it is ‘non-mechanical’, as though this adjective conveys some sort of meaning for us. According to Ryle, ‘Minds are not bits of clockwork, they are just bits of non-clockwork’. <sup>4</sup>

Difficulties also lie in store when we try to understand where, precisely, the soul is located. If it is not to be found in space, where is it? (It is interesting to note, however, that Descartes believed the small pineal gland in the brain was the seat of the soul, or at least was the structure that provides the elusive physical link between mind and brain.) Can the new physics, with its weird concepts of spacewarps and higher dimensions provide a suitable location?

We have seen how physicists think of space and time as a sort of four-dimensional sheet (or perhaps balloon) with the possibility of other disconnected sheets. Could the soul reside in one of these other universes? Alternatively, spacetime may be envisaged as enfolded by, or embedded in, a higher dimensional space, much as a two-dimensional surface or sheet is embedded in three-dimensional space. Might not the soul inhabit a location in this higher dimensional space which is still (geometrically speaking) close to our physical spacetime, but not actually in it? From this higher dimensional vantage point the soul could ‘lock on’ to the body of an individual in spacetime, without itself being part of spacetime.

For those who wish to believe that departed souls travel to Heaven, a more complicated arrangement would be necessary, for presumably the place which souls inhabit during the Earthly life of an individual is not the same as Paradise. If such ideas strain credulity as much as geometrical intuition, it is surely because of the dubious assumption that the soul has a location. To say that the soul occupies a *place* means that it exists in some sort of space, either the one we ordinarily perceive, or some other. In that case one may then ask questions about the size, shape, orientation and motion of the soul, all concepts that are totally inappropriate to something composed of thoughts

rather than materials.

But the fund of ideas from modern physics is not yet exhausted. As explained in Chapter 3, some physicists now think of space and time as derived, rather than primitive concepts. They believe that spacetime is built up out of subunits (not places or moments, but abstract entities) that would also embody quantum features. It could then be that the physical universe extends beyond (in a figurative sense) what we ordinarily call spacetime; that only a fraction of these subunits have come together in an organized way to produce spacetime, leaving 'elsewhere' a sort of ocean of disconnected bits. Could this ocean be the realm of the soul? If so, the soul would not occupy a place, because the subunits would not be assembled into places, so concepts like extension or orientation would be meaningless. Indeed, even topological concepts such as inside, outside, between, connected and disconnected, might be undefined. I leave the question open.

Further problems crop up when one turns to the question of time. A soul is not in space, but is it in time? Presumably the answer is yes. If the soul is the source of our perceptions, then this must include our perception of time. Moreover, many recognizably human mental processes are explicitly time-dependent: planning, hoping, regretting, anticipating, for instance.

There would be grave logical difficulties with a timeless soul. What meaning do we then attach to the soul's existence *after* death, if the before–after relation is transcended by souls? What about the soul's situation before the birth of the body? This issue is tackled by the Catholic Encyclopedia with a rare touch of humour:

The notion that God has a supply of souls that are not any body's in particular until He infuses them into human embryos is entirely unwarranted by any evidence...  
The soul is created by God at the time it is infused into matter.<sup>5</sup>

The message is unmistakable. There are times (before birth) when the soul does not exist. Such notions clearly conflict with the idea of the soul transcending time.

The same basic temporal dilemma runs through all discussions of immortality. On the one hand is the desire for a continuation of the personality after Earthly life has ended — not merely in a frozen or timeless existence, but involving some sort of activity. Jesus spoke of 'life everlasting', which carries connotations of the unending passage of time.

On the other hand, such notions are strongly tied to our perception of time in the physical world, and do not accord well with the alleged separation of the physical and spiritual realms. The difficulty is exacerbated if one entertains the possibility (to be discussed in Chapter 15) that there may actually be an end to time: there may be no 'everlasting' anyway.

The arguments presented here, and others, have suggested to many people that the concept of the soul or mind and its immortality is at best wrong and at worst incoherent.

Several alternatives to dualism have been discussed by philosophers. At one extreme is materialism which denies the existence of mind altogether. The materialist believes that



mental states and operations are nothing but physical states and operations. In the field of psychology materialism becomes what is known as behaviourism, which proclaims that all humans behave in a purely mechanical way in response to external stimuli. At the other extreme is the philosophy of idealism which asserts that it is the physical world that does not exist; everything is perception.

It seems to me that the dualist theory falls into the trap of seeking a substance (the mind) to explain what is really an abstract concept, not an object. The temptation to reduce abstract concepts to things is apparent throughout the history of science and philosophy, illustrated by discredited concepts like phlogiston, the fluid theory of heat, the luminiferous aether and the life-force. In all these cases the associated phenomena require explanation in terms of the abstract, such as energy or fields.

The fact that a concept is abstract rather than substantial does not render it somehow unreal or illusory. A person's nationality cannot be weighed or measured, it does not occupy a location inside their bodies, and yet it is a meaningful and important part of their make-up as anyone unfortunate enough to find themselves stateless knows only too well. Concepts like usefulness, organization, entropy and information do not involve 'things' in the sense of objects, but relationships between, and conditions of, objects.

The fundamental error of dualism is to treat body and soul as rather like two sides of a coin, whereas they belong to totally different categories. Ryle blames such a category mistake for all the muddle, confusion and paradox concerning the mind and its relation to the body:

It is perfectly proper to say, in one logical tone of voice, that there exist minds and to say, in another logical tone of voice, that there exist bodies. But these expressions do not indicate two different species of existence. <sup>6</sup>

The statements 'there exist rocks' and 'there exist Wednesdays' are both correct, but it would be meaningless to place rocks and Wednesdays alongside each other and discuss their interrelation. Or, to use one of Ryle's analogies, it would be absurd to discuss whether there had been any discourse between the House of Commons and the British Constitution. These institutions belong to different conceptual levels.

Ryle thus anticipates much of the 'holistic' discussion of recent years. As we saw in the previous chapter, the relation between mind and body is similar to that between an ant colony and ants, or between the plot of a novel and the letters of the alphabet. Mind and body are not two components of a duality, but two entirely different concepts drawn from different levels in a hierarchy of description. We are back to holism versus reductionism once more.

Many of the old problems of dualism fall away once it is appreciated that abstract, high-level concepts can be equally as real as the low-level structures that support them, without any mysterious extra substances or ingredients. Just as a life-force is an unnecessary addition for matter to become animate, so a soul-substance is unnecessary for matter to become conscious:

Our world is filled with things that are neither mysterious and ghostly nor simply constructed out of the building blocks of physics. Do you believe in voices? How about haircuts? Are there such things? What are they? What, in the language of the physicist, is a hole — not an exotic black hole, but just a hole in a piece of cheese, for instance? Is it a physical thing? What is a symphony? Where in space and time does 'The Star Spangled Banner' exist? Is it nothing but some ink trails on some paper in the Library of Congress? Destroy that paper and the anthem would still exist. Latin still *exists*, but it is no longer a living language. The language of the cavepeople of France no longer exists at all. The game of bridge is less than a hundred years old. What sort of a thing is it? It is not animal, vegetable, or mineral.

These things are not physical objects with mass, or a chemical composition, but they are not purely abstract objects either — objects like the number  $\pi$ , which is immutable and cannot be located in space and time. These things have birthplaces and histories. They can change, and things can happen to them. They can move about — much the way a species, a disease, or an epidemic can. We must not suppose that science teaches us that every *thing* anyone would ever want to take seriously is identifiable as a collection of particles moving about in space and time. Some people may think it is just common sense (or just good scientific thinking) to suppose *you* are nothing but a particular living, physical organism — a moving mound of atoms — but in fact this idea exhibits a lack of scientific imagination, not hardheaded sophistication. One doesn't have to believe in ghosts to believe in *selves* that have an identity that transcends any particular living body. <sup>7</sup>

The brain consists of billions of neurons, buzzing away, oblivious of the overall plan (like the ants in the colony discussed in the previous chapter). This is the physical, mechanical, world of electrochemical hardware. On the other hand we have thoughts, feelings, emotions, volitions and so on. This higher level, holistic, *mental* world is equally oblivious of the brain cells; we can happily think while being totally unaware of any help from our neurons. But the fact that the lower level is ruled by logic need not contradict the fact that the upper mental level can be illogical and emotional. Hofstadter has given a vivid illustration of this neural-mental complementarity:

Say you are having a hard time making up your mind whether to order a cheeseburger or a pineappleburger. Does this imply that your neurons are also balking, having difficulty deciding whether or not to fire? Of course not. Your hamburger-confusion is a high-level state which fully depends on the efficient firing of thousands of neurons in very organized ways. <sup>8</sup>

To use an analogy, a competently written novel will consist of a sequence of grammatical constructions conforming to rather precise logical rules of language and expression. Yet this does not prevent the characters in the novel from loving and laughing, or behaving in a completely unruly way. To claim that because the book is built out of logical word constructions obliges the story itself to comply with rigid logical principles would be absurd. It is to confuse two distinct levels of description. MacKay has also emphasized the importance of avoiding level-confusion when discussing neural

versus mental activity: 'The idea that one and the same situation may need two or more accounts, each *complete* at its own logical level, may sound abstract and difficult. But as we have seen, it can be illustrated by numerous examples.' Discussing his analogy of the illuminated advertising display which is completely explicable in terms of electrical circuit theory, MacKay points out that it has a complementary description in terms of the commercial message: 'When properly disciplined, these (two descriptions) are not rivals, but complementary, in the sense that each reveals an aspect which is there to be reckoned with, but is unmentioned in the other.'

Thus, when it comes to the mind:

The notion, popularized by writers like Teilhard de Chardin, that if men are conscious there must be some traces of consciousness in atoms, is quite without rational foundation... Consciousness is not something we expect to be forced to recognize as the end-product of an argument about the behaviour of physical particles...<sup>9</sup>

In more modern parlance, the mind is 'holistic'.

None of this, of course precludes the possibility of artificial minds, thinking machines, and so forth. It is curious that many people who readily accept that their pets have minds shudder at the thought of a computer with a mind. Perhaps it is an egocentric reaction to the threat that one day computers may have minds of greater intellectual power than our own. Or perhaps it is more subtle.

The two-level (or multi-level) description of mind and body is a great improvement on the old idea of dualism (mind and body as two distinct substances) or materialism (mind does not exist). It is a philosophy that is rapidly gaining ground with the emergence of what are known as the cognitive sciences: artificial intelligence, computing science, linguistics, cybernetics and psychology. All these fields of enquiry are concerned with systems that process information in one way or another, whether man or machine. The development of concepts and language associated with computers, such as the distinction between hardware and software, has opened up new perspectives on the nature of thought and consciousness. It has forced scientists to think more clearly than ever before about the mind.

These scientific advances have been matched by the appearance of a new philosophy of mind, closely tied to the ideas presented above, called functionalism. Functionalists recognize that the essential ingredient of mind is not the hardware — the stuff your brain is made of or the physical processes that it employs — but the software — the organization of the stuff, or the 'program'. They do not deny that the brain is a machine, and that neurons fire purely for electrical reasons — there are no mental causes of physical processes. Yet they still appeal to causal relations between mental states: very crudely, thoughts cause thoughts, notwithstanding the fact that, at the hardware level, the causal links are already forged.

That there is no incompatibility between the causal connections at the hardware and software levels is taken for granted by most computer programmers. In one breath they

will say: 'The computer is simply a lot of circuitry and anything it can do is determined by the laws of electricity. Its output is an automatic consequence of its following predetermined electrical pathways.' Then they will talk about the computer solving equations, making comparisons and decisions and arriving at conclusions based on information processes, i.e. pushing ideas round. So it is possible to live with two different levels of causal description — hardware and software — without ever having to grapple with how the software acts on the hardware. The old conundrum of how the mind acts on the body is seen to be just a muddle of conceptual levels. We never ask 'How does a computer program make its circuits solve the equation?' Nor do we need to ask how thoughts trigger neurons to produce bodily responses.

What does functionalism imply for religion?

It seems to be something of a double-edged sword. On the one hand functionalism denies that mind is uniquely human, and claims that machines can also think and feel, at least in principle. It is hard to reconcile that viewpoint with the traditional notion of God endowing man with a soul. On the other hand, by liberating mind from the confines of the human body, it leaves open the question of immortality:

The software description of the mind does not logically require neurons... it allows for the existence of disembodied minds... Functionalism does not rule out the possibility, however remote it may be, of mechanical and ethereal systems having mental states and processes. <sup>10</sup>

Functionalism solves at a stroke most of the traditional queries about the soul. What stuff is the soul made of? The question is as meaningless as asking what stuff citizenship or Wednesdays are made of. The soul is a holistic concept. It is not made of stuff at all.

Where is the soul located? Nowhere. To talk of the soul as being in a place is as misconceived as trying to locate the number seven, or Beethoven's fifth symphony. Such concepts are not in space at all.

What of the problems about time and the soul? Does existence in time but not space make any sense?

Here the issue is more subtle. We frequently talk about rising unemployment or changing fashions, implying the time-dependence of things that cannot be meaningfully pinned down at a distinct place. There seems to be no reason why the mind cannot evolve with time even though it is not to be found anywhere in space.

We may therefore choose to reject the belief that mind is nothing but brain cell activity, for that is to fall into the reductionist trap. Nevertheless, it seems that the existence of the mind is supported by that activity, and so the question arises of how disembodied minds can exist. To resort yet again to analogy, a novel is built out of words, but the story could equally well be stored vocally on magnetic tape, coded on punched cards or digitally on computer, for example. Can the mind survive the death of the brain by being transferred to some other mechanism or system? Clearly this would be possible in principle.

Most people, however, do not contemplate the survival of their entire personality; so



much of our makeup is tied to our bodily needs and capabilities. Sexuality, for example, in the absence of a body or a need for procreation, would be ridiculous. Many would also not wish for the negative aspects of their personality — the greed, jealousy, hatred and so forth — to survive. The enduring core of mind would have to be stripped of its more obviously bodily associations and unpleasant features. But would anything then be left? What about personal identity — the *self*?