Chapter One – What's the problem?

What is the world made of?

The problem of consciousness is related to some of the oldest questions in philosophy: What is the world made of? How did it get here? Who or what am I? What is the point of it all? In particular it is related to the mind–body problem; that is, what is the relationship between the physical and the mental?

In the early twenty-first century many people use the term 'consciousness' quite unproblematically in everyday language to refer to their inner experience or awareness. It is no longer synonymous with 'mind', which has many other meanings and uses, and seems to have lost some of its mystery. At the same time we are rapidly learning how the brain works. We know about the effects of brain damage and drugs, about neurotransmitters and neuromodulators, and about how changes in the firing of brain cells accompany changes in a person's experience. We might expect all this knowledge to have clarified the nature of conscious awareness, but it doesn't seem to have done so. Consciousness remains a mystery.

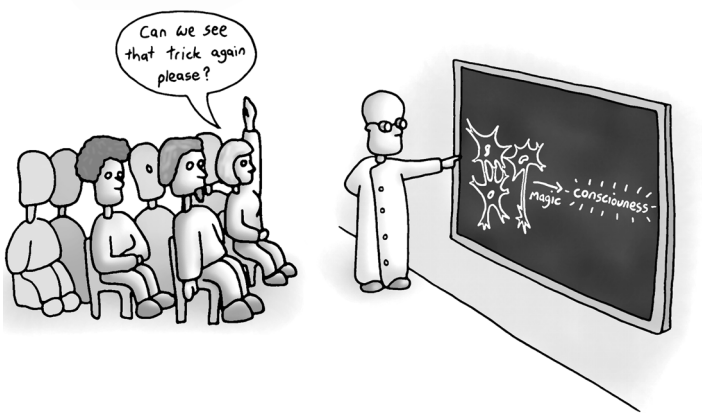

Figure 1.1

In many other areas of science increasing knowledge has made old philosophical questions obsolete. For example, no one now agonises over the question 'what is life?'. The old theories of a 'vital spirit' or *élan vital* are superfluous when you understand how biological processes make living things out of non-living matter. As the American philosopher Daniel Dennett puts it, 'the recursive intricacies of the reproductive machinery of DNA make *élan vital* about as interesting as Superman's dread kryptonite' (Dennett, 1991, p 25). The difference is not that we now know what *élan vital* is but that we don't need it any more. The same is true of the 'caloric fluid' which was once needed to explain the nature of heat. Now that we think of heat as a form of energy, and know how various types of energy are transformed into each other, we no longer need the idea of 'caloric fluid'.

'There is nothing that we know more intimately than conscious experience, but there is nothing that is harder to explain.'

(Chalmers, 1995a: 200)

Might the same happen with consciousness? The American philosopher Patricia Churchland thinks so, arguing that when our framework for understanding consciousness has evolved, consciousness '...may have gone the way of "caloric fluid" or "vital spirit"' (1988, p 301). Maybe it will. But so far it has not. Indeed, the more we learn about the brain and behaviour, the more obviously difficult the problem of consciousness seems to be.

In essence it is this. Whichever way we try to wriggle out of it, in our everyday language or in our scientific and philosophical thinking, we

seem to end up with some kind of impossible dualism. Whether it is spirit and matter, or mind and brain, whether it is inner and outer, or subjective and objective, we seem to end up talking about two incompatible kinds of stuff. You may disagree. You may, for example, say that you are a materialist – that you think there is only one kind of stuff in the world and that mind is simply the workings of that stuff – problem solved. I suggest that if you take this line, or many other popular ways of tackling the problem, you will only find that in thinking about consciousness the dualism pops up somewhere else. Let's take an example.

'There exists no accepted definition of consciousness'

(Dietrich, 2007: 5)

Pick some simple object you have to hand and take a good look at it. You might choose a chair or table, the cat curled up on your desk, or a book. Anything will do. Let's take a pencil. You can pick it up, turn it round, play with it, write with it, put it down in front of you. Now ask yourself some basic questions. What do you think it is made of? What will happen if you hold it two feet above the floor and let go? If you leave the room and come back will it still be there?

Now think about your experience of the pencil. You may have felt its sharp point and texture, smelt its distinctive smell when you sharpened it, seen its colour and shape, and written with it. These experiences are yours alone. When you hold the pencil at arm's length you see the pencil from your own unique perspective. No one else can have exactly the same pencil-watching experience as you are having now. And what about the colour? How do you know that the way you see that yellow paint would be the same for someone else? You don't. This is what we mean by consciousness. It is your private experience. No one else can know what it is like. No one else can get it from you. You can try to tell them, but words can never quite capture what it is like for you to be holding that pencil right now.

So where has this got us? It has forced us into thinking about the world in two completely different ways. On the one hand there is our private and intimately known experience of holding the pencil, and on the other there is the real pencil out there in the world. How can unsharable, private sensations be related to real, existing objects in space? Does the activity in the visual cortex of your brain *cause* the private experience of pencil watching? If so, how? What makes the smell like *this* for you?

Probably everyone has a different sticking point on this. For me it is this – I find that I have to believe both in subjective experiences (because I seem unquestionably to have them) and an objective world (because otherwise I cannot possibly explain why the pencil will drop when I let go, will still be here when I get back, or why you and I can agree that it is blunt and needs sharpening). Even with all my understanding of brain function, I cannot understand how subjective, private, ineffable suchness of experience arises from an objective world of actual pencils and living brain cells. These subjective and objective worlds seem to be too different from each other to be related at all. This is my own version of the problem of consciousness – my own sticking point. You should look hard at the pencil and find out where yours lies.

Practice – Am I conscious now?

For this first exercise I shall give you more detailed guidance than for future ones. All the rest build on the same foundation, so you should find that if you practise this one frequently all the others will be easier.

The task is simply this.

As many times as you can, every day, ask yourself '**Am I conscious now?**'.

The idea is not to provide an answer – for example 'Yes' – twenty or a hundred times a day, but to begin looking into your own consciousness. When do you answer 'Yes' and when 'No'?. What does your answer mean?

You might like to ask the question and then just hold it for a little while, observing being conscious now. Since this whole book is about consciousness, this exercise is simply intended to get you to *look* at what consciousness is, as well as to think and argue about it intellectually.

This sounds easy but it is not. Try it and see. After a day of practising or, if you are working through the book, before you go on to the next chapter, make notes on the following:

- How many times did you do the practice?
- What happened?
- Did you find yourself asking other questions as well? If so, what were they?
- Was it difficult to remember to do it? If so, why do you think this is?

You may have found that you had intended to do the practice but then forgot. If you need reminding you might try these simple tricks:

- Ask the question whenever you hear or read the word 'consciousness'.
- Always ask the question when you go to the toilet.
- Write the question on stickers and place them around your home or office.
- Discuss the practice with a friend. You may help remind each other.

These may help. Even so, you may still find that you forget. This is odd because there is no very good excuse. After all, this little practice does not take up valuable time when you could be doing something more useful. It is not like having to write another essay, read another paper, or understand a difficult argument. You can ask the question in the middle of doing any of these things. You can ask it while walking along or waiting for the bus, while washing up or cooking, while cleaning your teeth or listening to music. It takes no time away from anything else you do. You just keep on doing it, pose the question and watch for a moment or two.

You must be interested in consciousness to be reading this book. So why is it so hard just to look at your own consciousness?

Are you conscious now?

Philosophical theories

Philosophers over the millennia have struggled with versions of this problem. Their solutions can be roughly divided into monist theories – which assert that there is only one kind of stuff in the world – and dualist theories – which propose two kinds of stuff.

Among the monist theories, some claim that the mental world is fundamental and others that the physical world is. So, for example, you might doubt that real pencils actually exist out there and decide that only ideas or perceptions of pencils exist – making you a mentalist or an idealist. This does away with the awkward division but makes it very hard to understand why physical objects seem to have enduring qualities that we can all agree upon – or indeed how science is possible at all. Even so, there have been many philosophical theories of this kind. The British empiricist George Berkeley (1685–1753), for example, replaced matter with sensations in minds.

At the other extreme are materialists who argue that there is only matter, and that the physical universe is causally closed. This means that the laws governing the interactions between matter and energy exhaust all the forces of the universe, so there is no room for non-physical minds or consciousness to intervene. Materialism includes identity theory, which makes mental states identical with physical states, and functionalism, which equates mental states with functional states. In these theories there is no mind, or mental force, apart from matter. Note that materialism does not necessarily imply that consciousness can be *reduced* to physical properties. For example, consciousness might supervene on matter, meaning that any difference in consciousness must be accompanied by a difference in the brain, but the reverse is not true. So the same conscious experience might be possible given two different brain states.

Some people find materialism unattractive as a theory of consciousness because it seems to take away the very phenomenon, subjective experience, that it was trying to explain. In particular, the powerful feeling we have that our conscious decisions *cause* our actions is reduced to purely physical causes. Another problem is the difficulty of understanding how thoughts and feelings and mental images can really *be* matter when they seem to be so different. Materialism makes it hard to find any way of talking about consciousness that does justice to the way *it feels*.

The doctrine of epiphenomenalism is the idea that mental states are produced by physical events but have no causal role to play. In other words, physical events cause or give rise to mental events, but mental events have no effect on physical events. This idea is sometimes attributed to Julien Offray de La Mettrie (1748), whose book *Machine Man* horrified eighteenth-century French readers. He claimed that human bodies are clever machines and that 'the diverse states of the soul are always correlative with those of the body'. Thomas Henry Huxley (1825–1895), the English biologist and paleontologist who did so much to promote Darwin's

Profile

René Descartes

(1596–1650)

Descartes was born near Tours in France, educated at a Jesuit college and was a staunch believer in an omnipotent and benevolent God. On 11 November 1619 he had a series of dreams which inspired him with the idea of a completely new philosophical and scientific system based on mechanical principles. He was not only a great philosopher, now often called 'the father of modern philosophy', but also a physicist, physiologist and mathematician. He was the first to draw graphs, and invented Cartesian coordinates, which remain a central concept in mathematics. He is best known for his saying, 'I think, therefore I am' *(je pense, donc je suis*), which he arrived at using his 'method of doubt'. He tried to reject everything which could be doubted and accept only that which was beyond doubt, which brought him to the fact that he, himself, was doubting. He described the human body entirely as a machine made of 'extended substance' (*res extensa*), but concluded that the mind or soul must be a separate entity made of a non-spatial and indivisible 'thinking substance' (*res cogitans*) that affected the brain through the pineal gland. This theory became known as Cartesian dualism. For the last twenty years of his life he lived mostly in Holland. He died of pneumonia in Sweden in 1650.

theory of evolution by natural selection, was one of the best known epiphenomenalists. He did not deny the existence of consciousness or of subjective experiences but denied them any causal influence. They were powerless to affect the machinery of the human brain and body, just as the sound of a locomotive's steam whistle cannot influence its machinery, or a shadow cannot affect the person who casts it. He referred to animals, including humans, as 'conscious automata'. One problem with epiphenomenalism is this: if conscious experiences can have no effect on anything whatsoever, then we should never know about or be able to speak about them since this would mean they had had an effect. Another difficulty is that if mind is a by-product or side effect of the physical world but is not actually physical itself, then epiphenomenalism is really a kind of dualism. Nevertheless, scientific or methodological behaviourism is built on one version of this idea.

Trying to avoid the extremes of materialism and idealism are various kinds of 'neutral monism', which claim that the world is all made of one kind of stuff but a stuff that cannot be classified as either mental or physical. William James started with 'the supposition that there is only one primal stuff or material in the world, a stuff of which everything is composed' (James, 1904, p 477). He suggested a world of possible or actual sense-data or 'pure experience' to avoid reducing mind to matter or doing away with matter altogether. 'A science of the relations of mind and brain must show how the elementary ingredients of the former correspond to the elementary functions of the latter,' (James, 1890, i, p 28) he said, but he did not underestimate the difficulty of this task.

Another attractive way of trying to get round the problem is panpsychism, the view that all material things have associated awareness or mental properties, however primitive. In some versions this means that everything in the universe is conscious, including electrons, clouds, rivers and cockroaches. In other versions everything has mental properties but this can include both conscious and unconscious minds. Panpsychism raises difficult questions: Is a stone aware? If so, is each of its molecules also separately aware? Are the loose bits on the edge of the stone separately aware when they are just hanging on or only when they are completely knocked off? What would it mean for something as simple as an electron to have mental attributes? In some versions panpsychism implies

that everything has both physical and mental properties, and in this case it is really a form of dualism and hasn't avoided the problem at all.

Given the difficulty of uniting the world it is not surprising that dualism remains enduringly popular, in everyday language if not in philosophy. The best-known version is that of René Descartes, the seventeenth-century French philosopher, and is therefore called Cartesian dualism. Descartes wanted to base his philosophy only on firm foundations that were beyond doubt. If he had been holding your pencil he might have imagined that it did not exist and that his senses were deceiving him, or even that an evil demon was systematically trying to fool him. But, he argued, in a famous passage in *The Meditations* (1641), even the cleverest deceiver would have to deceive someone. And the fact that he, Descartes, was thinking about this was proof that he, the thinker, existed. In this way he came to his famous dictum 'I think, therefore I am'. Descartes concluded that this thinking self was not material, like the physical body that moves about mechanically and takes up space. In his view the world consists of two different kinds of stuff – the extended stuff of which physical bodies are made, and the unextended, thinking stuff of which minds are made.

Descartes' theory is a form of substance dualism, which can be contrasted with property dualism or dual aspect theory. According to property dualism, the same thing (e.g. a human being) can be described using mental terms or physical terms, but one description cannot be reduced to the other. So, for example, if you are in pain, this fact can be described in mental terms, such as how it feels to you, or in physical terms, such as which sorts of neurons are firing where in your nervous system. This theory avoids the need for two different substances but leaves open many questions about the relationship between the physical and mental properties, and therefore comes in many different versions.

The insuperable problem for substance dualism is how the mind interacts with the body when the two are made of different substances. For the whole theory to work the interaction has to be in both directions. Physical events in the world and the brain must somehow give rise to experiences of that world – to thoughts, images, decisions, longings, and all the other contents of our mental life. In the other direction, thoughts and feelings must be able to influence the physical stuff. How could either of these work? Descartes supposed

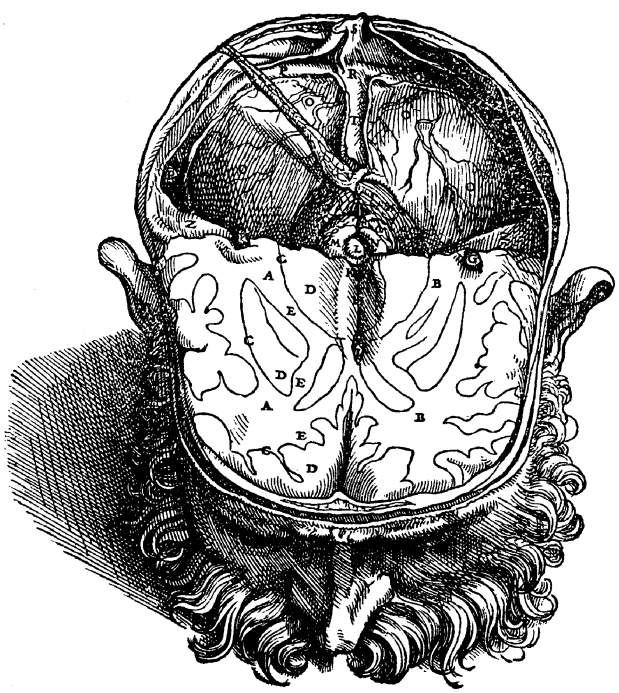

Figure 1.2 According to Descartes, the physical brain worked by the flow of animal spirits through its cavities. The immaterial soul was connected to the body and brain through the pineal gland which lies in the midline.

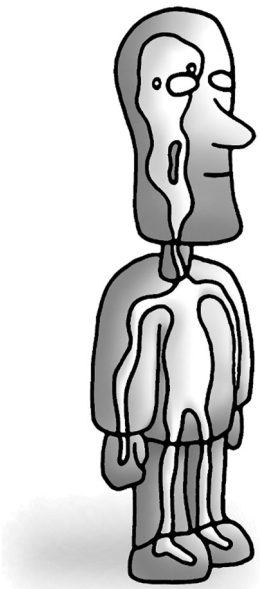

Figure 1.3 Gilbert Ryle dubbed the Cartesian view of mind 'the dogma of the Ghost in the Machine'.

that the two interacted through the pineal gland in the centre of the brain, but proposing a place where it happens does not solve the mystery. If thoughts can affect brain cells then either they work by magic or they must be using some kind of energy or matter. In this case they are also physical stuff and not purely mental.

Dualism does not work. Almost all contemporary scientists and philosophers agree on this. In 1949 the British philosopher Gilbert Ryle derided dualism as 'the dogma of the Ghost in the Machine' – a phrase that has entered into common parlance. He argued that when we talk of the mind as an entity that does things we are making a category mistake – turning it into something it is not. Instead he saw mental activities as processes, or as the properties and dispositions of people.

This kind of view is apparent in many modern descriptions of mind and self: 'Minds are simply what brains do' (Minsky, 1986, p 287); '"Mind" is designer language for the functions that the brain carries out' (Claxton, 1994, p 37); mind is 'the personalization of the physical brain' (Greenfield, 2000, p 14) and self is 'not what the brain *is*, but what it *does*' (Feinberg, 2009, p xxi). Such descriptions make it possible to talk about some mental activities and mental abilities without supposing that there is a separate mind. This is probably how most psychologists and neuroscientists think of 'mind' today, and they do not agonise about what 'mind' really is. But there is much less agreement when it comes to 'consciousness'.

'Human consciousness is just about the last surviving mystery.'

(Dennett, 1991: 21)

There are very few dualists today. In the last century, philosopher of science Sir Karl Popper and neurophysiologist Sir John Eccles (1977) proposed a theory of dualist interactionism. They argued that the critical processes in the synapses of the brain are so finely poised that they can be influenced by a non-physical, thinking and feeling self. Thus the self really does control its brain (Eccles, 1994). How it does so they admit remains mysterious. More recently, Benjamin Libet (1916–2007) proposed that a non-physical 'conscious mental field' is responsible for the unity and continuity of subjective experience and for free will (Libet, 2004). Somewhat like known physical force fields it emerges from brain activity but can then communicate within the cerebral cortex without using the neural connections and pathways. But how it does this he does not explain.

It seems that dualism, in its many forms, always arrives in the end at magic, or mystery, or something that science can never approach. As Dennett puts it, 'accepting dualism is giving up' (Dennett, 1991, p 37). But avoiding it is not easy.

Given the lurking spectre of dualism it is not surprising that psychology, as a discipline, has had such trouble with the concept of consciousness.

Activity – What is consciousness?

There is no generally recognised definition of consciousness, which is why I have not given one here. See whether you can find your own.

First get into pairs. One person proposes a definition of consciousness. Then the other finds something wrong with it. Don't be shy or think too long – even the silliest suggestions can be fun to try. So just throw up one idea and wait for it to be knocked down. Then swap over. Do this as quickly as you reasonably can until each of you has had several turns.

Get back together into the group and find out what kinds of objections you all came up with.

Why is defining consciousness so hard when we all think we know what it is?

Consciousness in psychology

The term 'psychology' first appeared in the eighteenth century to describe the philosophy of mental life, but it was towards the end of the nineteenth century that psychology first became a science. At that time several different approaches to the study of the mind were emerging. Some were more concerned with physiology and the idea of psychology as an objective science, and some were more concerned with the inner life, or studying subjective experience, but there was, as yet, no great split between the two.

William James's (1890) classic text *The Principles of Psychology* (perhaps the most famous book in the history of psychology) begins 'Psychology is the Science of Mental Life, both of its phenomena and their conditions'. James includes among these phenomena feelings, desires, cognitions, reasonings and volitions – in other words, the stuff of consciousness. Another contemporary textbook defines psychology, or 'Mental Science' as 'the science that investigates and explains the phenomena of mind, or the inner world of our conscious experience. These phenomena include our feelings of joy and sorrow, love, etc. …our conscious impulses and volitions, our perceptions of external objects as *mental* acts, and so forth' (Sully, 1892, i, p 1).

With his monist approach James dismissed the dualist concepts of a soul or of 'mind-stuff', and quickly pointed out that consciousness can be abolished by injury to the brain or altered by taking alcohol, opium or hasheesh. So he assumed that a certain amount of brain physiology must be included in psychology. Nevertheless, consciousness was at the heart of his psychology. He coined the phrase 'the stream of consciousness' to describe the apparently ever-changing and flowing succession of thoughts, ideas, images and feelings. His psychology was therefore very much an integrated science of mental life. Consciousness was at its heart, but was not divorced either from the results of experiments on attention, memory and sensation, or from physiological study of the brain and nervous system.

James was able to build on a large body of research in anatomy, physiology and psychophysics. Psychophysics was the study of the relationship between physical stimuli and reportable sensations – or, you could say, between outer events and inner experience. Psychophysicists such as Ernst Weber (1795–1878) and Gustav Fechner (1801–1887) studied the relationships between physical luminance and perceived brightness, weight and sensations of heaviness, or sound pressure and loudness. From this came the famous Weber–Fechner Law relating sensation to the intensity of a stimulus. Fechner also wanted to be able to relate sensations to excitations within the brain, but in his time this was simply not possible.

In 1850 Hermann von Helmholtz (1821–1894) made the first measurement of the speed of conduction of nerve signals. This was popularly referred to as the 'velocity of thought', although in fact he had measured

Am I conscious now?

peripheral processes and reaction times, and argued that conscious thought and the interaction of physical and mental processes goes on in the brain. He was especially interested in visual illusions and the tricks that our senses can play, and he proposed the new and shocking idea that perceptions are 'unconscious inferences'. This is close to the British psychologist Richard Gregory's (1966) much later notion that perceptions are hypotheses, or guesses about the world, and it fits well with much of modern neuroscience. James (1902) also talked about 'unconscious cerebration'.

This idea, that much of what goes on in the nervous system is unconscious and that our conscious experiences depend upon unconscious processing, seems quite natural to us today. Yet it was deeply disturbing to many Victorian scientists who assumed that inference and thinking, as well as ethics and morality, require consciousness. To them, the idea that thinking could go on without consciousness seemed to undermine the moral or spiritual superiority of 'Man'.

Note that this notion of the unconscious, derived from physiological studies, predated the psychodynamic notion of the unconscious developed by Freud (1856–1939). In Freud's theory the unconscious consisted of the impulses of the 'id', including biological desires and needs, the defence mechanisms and neurotic processes of the 'ego', and all the mass of unwanted or unacceptable material that was repressed by the 'superego' – a part of the mind acquired through education in childhood and the source of conscience and guilt. The effects of all these unconscious feelings, images or forbidden wishes might then appear in dreams or cause neurotic symptoms. Although Freud was trained as a neurologist, and frequently referred to his work as a 'new science', his theories were derived almost entirely from case studies of psychiatric patients and from his self-analysis. They were not based on scientific research and have not stood the test of time. In the late twentieth century Freud's unconscious was replaced by the idea of a 'cognitive unconscious' capable of many types of thinking, learning and memory without awareness, and then by what is sometimes called the 'new unconscious', which expands this notion to emphasise emotions, motivation and control (Hassin *et al*, 2005).

Other notable developments in Europe included the emergence of existentialism and phenomenology. Phenomenology is both a philosophy and a psychology based on putting subjective experience first. The German philosopher Edmund Husserl (1859–1938) argued for going back to 'the things themselves' by a systematic inquiry into immediate conscious experience. This was to be done without preconceptions by suspending or 'bracketing' any scientific and logical inferences about the world. This suspension of judgement he called the phenomenological reduction or epoché (see Chapter 25).

Husserl's phenomenology built on the earlier work of Franz Brentano (1838–1917) whose theory of consciousness was based on the idea that

every subjective experience is an act of reference. Conscious experiences are *about* objects or events, while physical objects are not about anything. For example, I might have a belief about horses, but a horse itself is not about anything. This 'aboutness' he called 'intentionality'.

It is most important to realise that this awkward word gets used in many different senses. By and large philosophers use it in Brentano's sense, as meaning, reference or aboutness. In psychology (and in ordinary language when it is used at all) intentionality usually means 'having intentions' or having plans or goals or aims. If you come across this word, ask yourself which meaning is intended, so you can avoid getting confused and will be able to spot some of the amusing muddles created by people who mix them up.

A separate approach to studying subjective experience was that of introspectionism, initially developed by the German physiologist Wilhelm Wundt. Wundt founded the first laboratory of experimental psychology in 1879, and for this he is often called the father of experimental psychology. While the physiology in which he was trained studied living systems from the outside, he wanted to build a psychology based on studying from the inside – in other words, introspection. This study had to be systematic and rigorous and so he trained people to make precise and reliable observations of their inner experience. Others, such as Wundt's student Edward Titchener (1867–1927), carried on these methods of introspectionism, primarily studying sensation and attention.

Wundt claimed to find that there were two kinds of 'psychical elements': the objective elements or sensations such as tones, heat or light, and the subjective elements or simple feelings. Every conscious experience depended on a union of these two types. Like many others around this time, he hoped to be able to build up a science of consciousness by understanding the units or atoms of experience which made it up (an atomistic approach to consciousness that William James utterly rejected). Although psychoanalysis, phenomenology and introspectionism all had the benefit of dealing directly with inner experience (or at least, with what people said about their inner experience), they faced apparently insuperable problems in dealing with disagreements. When one person claims to observe some private experience quite differently from another, how can you decide between them?

This was just one of the reasons why introspectionism fell out of favour and behaviourism became so successful. In 1913 its founder, the American psychologist John B. Watson, wrote: 'Psychology, as the behaviourist views it, is a purely objective, experimental branch of natural science which needs introspection as little as do the sciences of chemistry and physics' (Watson, 1913). He proposed to abolish such nonsense as introspection and consciousness and establish a psychology whose goal was the prediction and control of behaviour. One advantage of this new approach was that behaviour can be measured much more reliably than introspections can. Also, human psychology could build on the

considerable knowledge of the behaviour of other animals. As Watson proclaimed, behaviourism 'recognizes *no dividing line between man and brute*' (Watson, 1913, p 158).

Although Watson is usually credited with – or blamed for – the expulsion of consciousness from psychology, similar views were already gaining ground long before. In 1890 James wrote: 'I have heard a most intelligent biologist say: "It is high time for scientific men to protest against the recognition of any such thing as consciousness in a scientific investigation"' (James, 1890, vol 1, p 134).

Watson built many of his ideas on the work of Ivan Pavlov (1849–1936), the Russian physiologist famous for his work on reflexes and classical conditioning. He studied the way that repetition increased the probability of various behaviours and assumed that almost everything we do, including language and speech, is learned in this way. Subsequently the emphasis in behaviourism shifted to the study of operant conditioning, with B.F. Skinner's studies of rats and pigeons that learned by being rewarded or punished for their actions. For Skinner, human behaviour was shaped by the history of reinforcements, and he believed that with the right reinforcement schedules a human utopia could be created (Skinner, 1948). As for consciousness, he believed it was just an epiphenomenon and its study should not be the task of psychology. In the words of Watson's biographer David Cohen, 'Behaviourism was a self-conscious revolution against consciousness' (Cohen, 1987, p 72).

Figure 1.4 When the rat presses the lever it may receive a food pellet or a sip of water. Rats, pigeons and many other animals can easily learn to press a certain number of times, or only when a green light is on, or when a bell sounds. This is known as operant conditioning. Many behaviourists believed that studying animal learning was the best way to understand the human mind.

Behaviourism was enormously successful in explaining some kinds of behaviour, particularly in the areas of learning and memory, but it more or less abolished the study of consciousness from psychology, and even the use of the word 'consciousness' became unacceptable. Also, in sweeping away the worst excesses of introspectionism, behaviourism threw out the much more even-handed mind–body approach of William James's 'science of mental life'. This led to half a century of a very restricted kind of psychology indeed.

'… accepting dualism is giving up.'

(Dennett, 1991: 37)

By the 1960s behaviourism was losing its power and influence, and cognitive psychology, with its emphasis on internal representations and information processing, was taking over, but 'consciousness' was still something of a dirty word. In his widely read history *Psychology: The Science of Mental Life*, George Miller (1962) warned: 'Consciousness is a word worn smooth by a million tongues. Depending upon the figure of speech chosen it is a state of being, a substance, a process, a place, an epiphenomenon, an emergent aspect of matter, or the only true reality. Maybe we should ban the word for a decade or two until we can develop more precise terms for the several uses which "consciousness" now obscures' (Miller, 1962, p 40).

No one formally banned its use, but it was certainly more than a decade before the word 'consciousness' became acceptable again in psychology. It began creeping back in the 1970s with, for example, research on mental imagery (see Chapter 4), on altered states of consciousness such as sleep and drug-induced states (see Section 8) and in the disputes over hypnosis (see Chapter 4), and with the beginnings of computer science. But it was nearly three decades before the sudden explosion of interest in the 1990s.

Now we still cannot define consciousness (Dietrich, 2007), but at least we are allowed to talk about it.

The mysterious gap

'Human consciousness is just about the last surviving mystery', says Dennett (1991, p 21). He defines a mystery as a phenomenon that people don't know how to think about – yet. Once upon a time the origin of the universe, the nature of life, the source of design in the universe, and the nature of space and time were all mysteries. Now, although we do not have answers to all the questions about these phenomena, we do know how to think about them and where to look for answers. With consciousness, however, we are still in that

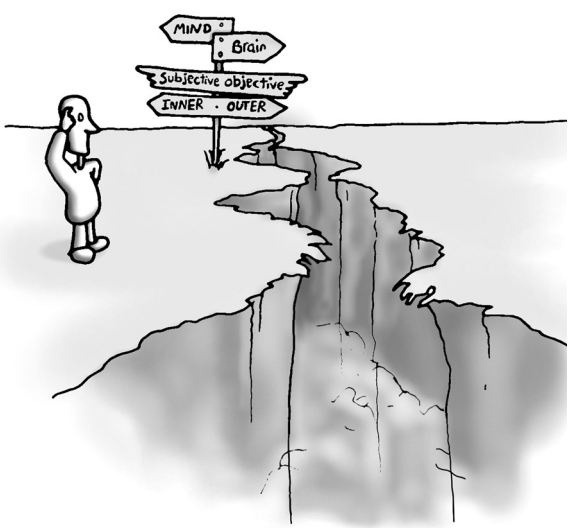

Figure 1.5

delightful – or dreadful – state of mystification. Our understanding of consciousness is a muddle.

The cause of that mystification, as we have seen in our quick look at the history of consciousness, seems to be a gap. But what sort of a gap is it?

'"A motion became a feeling!" – no phrase that our lips can frame is so devoid of apprehensible meaning.' This is how William James describes what he calls the '"chasm" between the inner and the outer worlds' (James, 1890, i, p 146). Before him, Tyndall had famously proclaimed: 'The passage from the physics of the brain to the corresponding facts of consciousness is unthinkable' (James, 1890, i, p 147). Charles Mercier, in his *The Nervous System and the Mind*, referred to 'the fathomless abyss' and advised the student of psychology to ponder the fact that a change of consciousness never takes place without a change in the brain, and a change in the brain never without a change in consciousness. 'Having firmly and tenaciously grasped these two notions, of the absolute separateness of mind and matter, and of the invariable concomitance of a mental change with a bodily change, the student will enter on the study of psychology with half his difficulties surmounted' (Mercier, 1888, p 11).

'Half his difficulties ignored, I should prefer to say,' remarks James. 'For this "concomitance" in the midst of "absolute separateness" is an utterly irrational notion' (James, 1890, i, p 136). He quotes the British philosopher Herbert Spencer as saying, 'Suppose it to have become quite clear that a shock in consciousness and a molecular motion are the subjective and objective faces of the same thing; we continue utterly incapable of uniting the two, so as to conceive that reality of which they are the opposite faces' (James, 1890, p 147). To James it was inconceivable that consciousness should have nothing to do with events that it always accompanied. He urged his readers to reject both the automaton theory and the 'mind-stuff' theory and, in the terms of his neutral monism, ponder the how and why of the relationship between physiology and consciousness (James, 1904).

'The hard problem … is the question of how physical processes in the brain give rise to subjective experience.'

(Chalmers, 1995b: 63)

As we have seen, the automaton theory gained ground and behaviourism, with its thorough-going rejection of consciousness, held sway over most of psychology for half a century or more. Behaviourists had no need to worry about the great gulf because they simply avoided mentioning consciousness, subjective experience or inner worlds. It was only when this period was over that the problem became obvious again. In 1983 the American philosopher Joseph Levine coined the phrase 'the explanatory gap', describing it as 'a metaphysical gap between physical phenomena and conscious experience' (Levine, 2001, p 78). Consciousness had been allowed back into science and the mysterious gap had opened up once more.

Then in 1994 a young Australian philosopher, David Chalmers, presented a paper at the first Tucson conference on consciousness. Before getting into the technicalities of his argument against reductionism

he wanted to clarify what he thought was an obvious point – that the many problems of consciousness can be divided into the 'easy' problems and the truly 'hard problem'. To his surprise, his term 'the hard problem' stuck, provoking numerous debates and four special issues in the newly established *Journal of Consciousness Studies* (Shear, 1997).

According to Chalmers, the easy problems are those that are susceptible to the standard methods of cognitive science and might be solved, for example, by understanding the computational or neural mechanisms involved. They include the discrimination of stimuli, focusing of attention, accessing and reporting mental states, deliberate control of behaviour, or differences between waking and sleep. All of these phenomena are in some way associated with the notion of consciousness, but they are not deeply mysterious. In principle (even though it may not really be 'easy'), we know how to set about answering them scientifically. The really hard problem, by contrast, is *experience*: what it is like to *be* an organism, or to *be in* a given mental state, to experience the quality of deep blue or the sensation of middle C. 'If any problem qualifies as the problem of consciousness,' says Chalmers 'it is this one ...even when we have explained the performance of all the cognitive and behavioral functions in the vicinity of experience – perceptual discrimination, categorization, internal access, verbal report – there may still remain a further unanswered question: *Why is the performance of these functions accompanied by experience?* ...Why doesn't all this information-processing go on "in the dark", free of any inner feel? Why should physical processing give rise to a rich inner life at all?' (1995a, pp 201–203). Stated at its most succinct: 'The hard problem ...is the question of how physical processes in the brain give rise to subjective experience' (Chalmers, 1995b, p 63). This is the latest incarnation of the mysterious gap.

Concept – The hard problem

The hard problem is to explain how physical processes in the brain give rise to subjective experience. The term was coined in 1994 by David Chalmers, who distinguished it from the 'easy problems' of consciousness. These include the ability to discriminate, categorise and react to stimuli, the integration of information by cognitive systems, the reportability of mental states, the focus of attention, deliberate control of behaviour and the difference between wakefulness and sleep. By contrast, the hard problem concerns experience itself, that is *subjectivity* or 'what it is like to be...'.

The hard problem can be seen as a modern version, or aspect, of the traditional mind–body problem. It is the problem of crossing the 'fathomless abyss' or 'chasm', or of bridging the 'explanatory gap' between the objective material brain and the subjective world of experience.

Mysterians say that the hard problem can never be solved. Some argue that new physical principles are needed to solve it, while many neuroscientists believe that once we understand the easy problems, the hard problem will disappear (see Chapter 2).

Further Reading

Bayne, T., Cleeremans, A. and Wilken, P. (2009) ***The Oxford Companion to Consciousness***, Oxford, Oxford University Press. Hundreds of short entries by over 200 authors on everything from access consciousness to zombies; provides an idea of the scope of consciousness studies.

Chalmers, D.J. (1995b) The puzzle of conscious experience. *Scientific American*, Dec. 1995, 62–68. The easiest version of Chalmers' 'hard problem'. For more detail read Chalmers 1995a and 1996.

Dennett, D.C. (1991) ***Consciousness Explained***. Boston, MA, and London; Little, Brown and Co. Read Chapter 2 for the mystery of consciousness and the problems of dualism.

Gregory, R.L. (2004) ***The Oxford Companion to the Mind***, Oxford, Oxford University Press. Contains short entries on most authors and ideas presented here, and a multi-author section on consciousness. Non-philosophers will find it helpful to look up philosophical concepts.