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THE MIND–BODY PROBLEM: BACKGROUND AND HISTORY

What Is the Mind–Body Problem?

From a logical point of view, the mind–body problem is easy to understand, and it can be expressed clearly, in just four propositions or statements. The following formulation is one I have adapted from Keith Campbell.[1]

(1) The mind is a nonphysical thing.
(2) The body is a physical thing.
(3) The mind and the body interact.
(4) Physical and nonphysical things cannot interact.

It is very hard to deny any of these four propositions. But they cannot consistently be held to be true together. At least one of them must be false, and the attempt to

show the exact way in which this plays out is the work of developing a solution to the mind–body problem.

As formulated above in (1)–(4), the mind–body problem is an entirely logical problem. The four propositions simply *cannot* consistently be maintained together; nothing can change that. There really is a contradiction to be derived from them, and the problem is the tension *between* the propositions. Of course, it is also possible to maintain vague propositions very similar to all four propositions, but which do not have the hard-and-fast relationships that are suggested by the formal terms in which the inconsistent group is stated.

Figure 1 shows how the four terms "mind," "body," "physical," and "nonphysical" are related in the four propositions in such a way as to produce an inconsistency. The

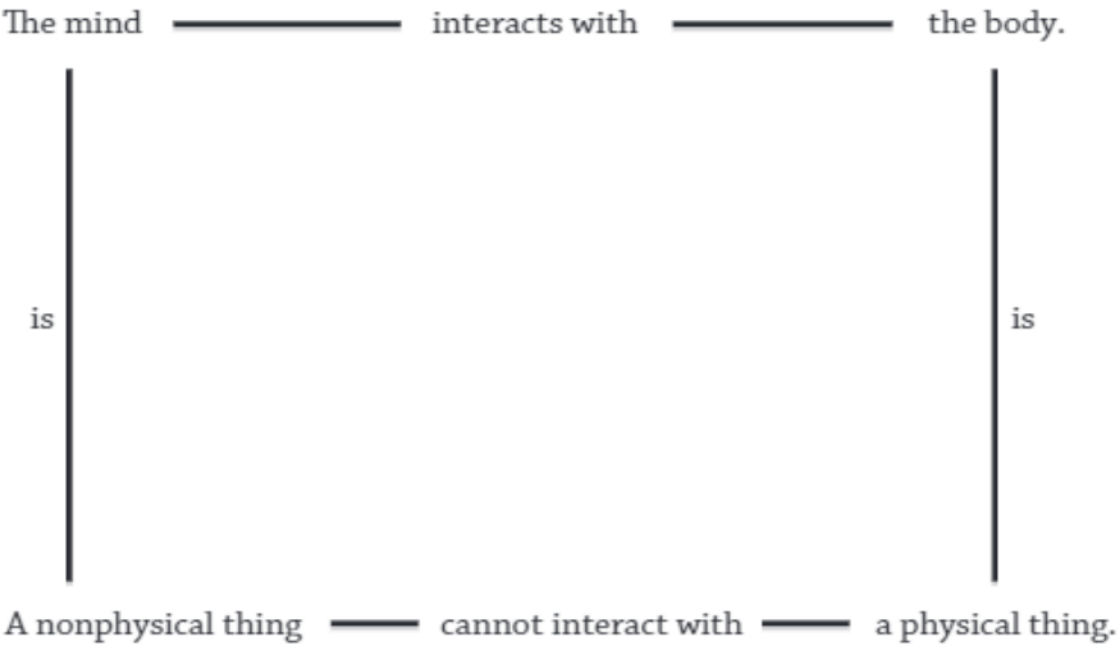

Figure 1

point of putting the problem in this rather formal way is that the four propositions are what philosophers and logicians sometimes call an "inconsistent tetrad." What this phrase means is that of the *four* propositions (the tetrad) any *three* can be true at the same time, but if they are, then the *fourth* is false. Here is the inconsistency. For example, if (1), (2), and (3) are true, then (4) is false. If the mind is a nonphysical thing, and the body is a physical thing, and mind and body interact, then it follows that at least one nonphysical thing and one physical thing *do* in fact interact, and so it is false that physical and nonphysical things cannot interact; and the fourth proposition is false.

Or suppose the last three propositions, (2), (3), and (4), are true. Suppose that physical and nonphysical things cannot interact, that mind and body do interact, and that the body is a physical thing. Then it follows that the mind is not a nonphysical thing, which is to say that the mind is a physical thing. The mind must be a physical thing, because the body is a physical thing, and it interacts with the mind. But physical and nonphysical things, we assumed, cannot interact. So (1) must be false.

It is fun to play around with the four original propositions (1) through (4) in this way, choosing any three, and then deriving the opposite or negation of the fourth. By doing this one can get a good sense of how the mind–body problem is a logical problem. It is a problem that *cannot* be solved, if by solving it one means holding onto all four

propositions at once. When one has seen that holding onto all four propositions is not a logical option, one can see clearly that the first and most basic question is *which* one of the four propositions one is going to deny.

We can also describe the mind–body problem in less formal terms. Consider the human body, with everything in it, including internal and external organs and parts, such as the stomach, nerves and brain, arms, legs, eyes, and all the rest. Even with all this equipment, especially the sensory organs, it is interesting and surprising that we can consciously perceive things in the world that are far away from us. For example, I can open my eyes in the morning, and see a nice cup of coffee waiting for me on the bedside table. There it is, a foot away, and I am not touching it, yet somehow it is making itself manifest to me. How does it happen that I *see* it? How does the visual system convey to my awareness or mind the image of the cup of coffee?

The answer is not particularly simple. Very roughly, the physical story is that light enters my eyes from the cup of coffee, and this light impinges on the two retinas at the backs of the eyes. Then, as we have learned from physiological science, the two retinas send electrical signals past the optic chiasm down the optic nerve. These signals are conveyed to the so-called visual cortex at the back of the brain. And then there is a sort of a miracle. The visual cortex becomes active, and I *see* the coffee cup. I am *conscious*

of the cup, we might even say, though it is not clear what this means and how it differs from saying that I *see* the cup.

How did the physical state of the brain produce in me the exciting awareness of the presence of the cup of coffee? One minute there are just neurons firing away, and no image of the cup of coffee. The next, there it is; I see the cup of coffee, a foot away. I am not aware of all those neurons firing, and I certainly don't see them. The neurosurgeon is the one who sees *them*. What *I* see is a cup of coffee. How did my neurons contact me or my mind or consciousness, and stamp there the image of the cup of coffee for me? How did the sensation of a cup of coffee arise from the mass of neurons?

It's a mystery.

That mystery is the mind–body problem, or part of it.

We might want to divide the problem up this way. Let us call the "visual experience" the mental state that, in this case, contains the image of the cup of coffee. The mental state is related in some way, still to be determined, to whatever is going on objectively and physically when we see the cup.

In addition to these two sets of events (the mental experience and the physical events that underlie it) there is said to be the "subjective character" of what is seen. This subjective character is something for which some philosophers have adopted the phrase "what it is like," as in the phrase "what it is like to have the experience of seeing a

cup." What it is like to have the experience of seeing a cup is to be identified with the *consciousness* of seeing a cup. To be conscious of the cup is for there to be something *it is like* to have that experience. The phrase originates with the philosopher Timothy Sprigge, and was also used later and made popular by Thomas Nagel.[2] It is intended to capture this extra bit of what experience involves. What is it like to see a cup of coffee? Or, in more general terms, what is it like to be a conscious human being?

Compare this with the question of what it is like to be a stone. Well, there is *nothing* it is like to be a stone. So by the criterion of Sprigge and Nagel, the stone has no consciousness.

This "what it is like" has also received from philosophers and others the name *quale* (Latin, singular, pronounced "kwa-lay," to rhyme with "parlay") and *qualia* (Latin, plural, pronounced "kwa-lee-ah," to rhyme with "la-dee-dah").

When I see or otherwise perceive a cup of coffee, I am aware of the quale that attaches to the experience, and which is presumably altogether absent from a video feed carrying the same information. Video displays do not have consciousness. For consciousness to come into the picture, someone has to be *looking* at the video picture.

The idea of the quale is unfortunately not altogether clear. Some philosophers have used the term to refer not to *properties* of experiences, such as the white cup shape that

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I see when I see the cup, as I have outlined their role above, but to the experiences themselves.

There is a genuine ambiguity here, and the two philosophical usages are inconsistent. If qualia are experiences, then they themselves are properties of the subjects who have them, and they are psychological entities. If they are properties *of* experiences, then they are not properties of the subjects who have the experiences; they are independent metaphysical entities, for example *the color white*, and *the shape of the cup*, which somehow turn up in the subjects' minds.

There is also the question whether when I see a white cup I have one quale or many. Do I have one white cup quale, or many smaller white-colored cup qualia that together make up the whole cup image? Neither answer is satisfactory. How many qualia do I have when I look at a speckled hen, to take a famous example? I cannot see how many spots or speckles there are, especially if the hen is running about, with its head bobbing, and there may not even be a definite number. Or how many different qualia do I have when I look at a quality changing smoothly over time, say, the reds across the spectrum? The point is that the same difficulty does not attack concepts like *a color*, or *being colored*, for example in the claim that the bread is brown in color, even though specks of it are white, say, or gray. *Color* and *being colored* are more tolerant concepts than the quale.

I shall use the words "qualia" and "quale" when the context or the author I am discussing calls for them, and "phenomenal property" when the emphasis is more on the quality that is the object of experience. I regret to say that the history of the terminology is sufficiently confused to allow such latitude. The term "qualia" has an interesting and one might say chequered history. In the past the phrases and words "*cogitationes*," "ideas," "experiences," "sense data," "qualities," "perceptions," "sensations," "properties of sensations," "percepts," "raw feels," "nomological danglers," "phenomenal properties," and "qualitative properties" have been used to try to get at something approximately like the same idea. The confused history of the different terminologies is enough to alert the thoughtful student of recent philosophy to the fact that all is not as it should be in the kingdom of the qualia. Why the frequent changes in terminology, and the zigzag of complicated arguments to try to get across what ought to be a fairly straightforward idea, or set of ideas?

There is a well-known story about Herbert Feigl giving a lecture about the mind and the brain at UCLA in 1966, in which he discussed a part of the problem of the relation of mind and brain to which he simply couldn't see the solution, in spite of his materialism, namely the problem of "raw feels." The distinguished philosopher Rudolf Carnap was in the audience, and he announced in the Q&A that he had a solution to the problem of raw feels. Feigl was

excited, and asked what it was. "The solution to your problem, Herbert," replied Carnap, "is the α-factor." Feigl got even more excited and wanted to know what the α-factor was, as, in spite of his scientific education, the concept was new to him. "Well, Herbert, you tell me what a raw feel is, and I'll tell you what the α-factor is," Carnap responded. It was a fair point.

The conceptual and linguistic difficulties of describing qualia or phenomenal properties are formidable enough, yet it remains a fact that though a scientist can take a scan of my brain, say, recording my blood flowing or my neurons firing, there is no equivalent scan for my experiences. There do seem to be two different worlds here that are related—but how are they related?

It is also important to be aware that the mind–body problem is about the relationship between the human *mind* and the human physical *body*. (It is also about the relationship between animal minds, if there are any, and animal bodies, but in this book I will restrict discussion to the human case.) The relationship between mind and body exists with or without qualia. If I am in the mental state involved in unconsciously seeing a cup of coffee, or unconsciously thinking about a problem, one might very well wonder how that mental state is related to the physical body, even if no qualia attach to it.

It is easier to see what the problem is if we consider the mind–body problem going in the opposite direction.

Consider the body again. There are my arms, outside the blankets, and I reach out with my right hand and take hold of my cup of coffee, because I want to have a sip of coffee. How did I do that? How did my *mental* desire for a sip of coffee get my *physical* arm to reach out to the cup? Well, we know the answer, at least partly. My muscles moved my arm. But how did my *mental* desire move my physical muscles? Did my mind somehow reach into my arm and move the muscles?

Again, we know the answer, or think we do. Electrical signals from the brain moved the muscles, not mental energy directed at them. Yet the question persists. How did my *mental* desire cause the *physical* electrical signals to start up and then to run down my arms and move the muscles? Again, physiology provides an answer. It was not my mind—"the mental"—that produced the physical electrical signals, but the neurons firing in my brain. All right, but now we get to the nerve of the problem (so to speak). How did my *mental* desire, carrying its associated quale along with it, cause my *physical* neurons to fire? We seem to have some form of telekinesis here, the moving of objects by mental energy alone. If the response is that it is *other* neurons, rather than my mental want, that caused the neurons to fire, then the question has been avoided rather than answered. How does my mental desire cause those *other* neurons to fire?

There might be no qualia associated with this desire. Or there might be an unconscious mental desire. But the question remains of how it causes the neurons to fire and to initiate the moving of my arm. So qualia are part of the mind–body problem, but the problem also involves any relationship between the mind and the body, including unconscious states of mind and physical states.

Matter or the physical can somehow affect the mind; and the mind can somehow move the physical body. These "somehows" are difficult to understand, though, because we cannot see either how there could be aspects of mental experience or qualia floating around amid the neurons, or desires trailing clouds of their attendant qualia, physically digging into the neurons and making them fire.

Descartes and the Discovery of the Problem in 1641

There is a very common view which states that, in the *Meditations on First Philosophy* of 1641, and also in the *Treatise on Man*, written some years earlier, the French philosopher René Descartes discovered, or invented, the problem that today we call the mind–body problem.

Our mind–body problem is not just a difficulty about how the mind and body are related and how they affect one another. It is also a difficulty about how they *can* be related and how they *can* affect one another. Their characteristic

properties are very different, like oil and water, which simply won't mix, given what they are.

According to Descartes, matter is essentially *spatial*, and it has the characteristic properties of linear dimension. Things in space have a position, at least, and a height, a depth, and a length, or one or more of these. Areas are two-dimensional, and lines are one-dimensional, but both have a place in space. Objects are three-dimensional, apparently, at least in ordinary experience. Mental entities, on the other hand, do not have these characteristics. We cannot say, of a mind, or any part of it, that it is a two-by-two-by-two-inch cube or a sphere with a two-inch radius, for example, located in a position in space inside the skull. This is not because it has some other shape in space, but because it is not characterized by space at all. What is characteristic of a mind, Descartes claims, is that it is *conscious*, not that it has shape or consists of physical matter. Unlike the brain, which has physical characteristics and occupies space, it does not seem to make sense to attach spatial descriptions to the mind. We can ask, "How much space does the mind occupy?" or "What shape is it?" or "Is it three-dimensional or two-dimensional?" or "Where is it in physical space?" But these questions have no answers, as the questions make no sense.

There is no need to claim, as Descartes did, that *the* essence of the physical is space; we need merely that something's being *in* space is a necessary condition for its

being physical at all. It is interesting that this straightforward test of physicality has survived all the philosophical changes of opinion since Descartes, almost unscathed. Even some strange entity in physics that is said not to be in space does not automatically count as a counterexample, for there is nothing to prevent us from saying that, with such entities, physics is dealing with something nonphysical—nonphysical just because it does not have a position in space. And typically, entities that are said not to have a position in space are more the creatures of mathematics than of physics. To drive this point home, we should ponder Noam Chomsky's celebrated view that we do not even know what the mind–body problem is because we do not have a clear concept of the physical or of body: "Lacking a concept of 'matter' or 'body' or 'the physical,' we have no coherent way to formulate issues related to the 'mind–body problem.'"[3] But we *do* have a concept of space laid out before us, and of physics as dealing with whatever it contains. Our bodies are certainly in space, and our minds are not, in the very straightforward sense that the assignation of linear dimensions and locations to them or to their contents and activities is unintelligible.[4]

Such issues aroused considerable interest following the publication of Descartes's *Meditations*, starting with the "Objections" to Descartes. The "Objections" were written by a group of distinguished contemporaries, and in return Descartes wrote his "Replies." The "Objections and

Replies" were included in the first edition of the *Meditations*. Though we do find in the *Meditations* itself the distinction (the "real distinction") between the mind and the body, drawn very sharply by Descartes, in fact he makes no mention of our mind–body problem. Descartes is untroubled by the fact that, as he has described them, mind and matter are very different: one is spatial and the other not, and *therefore one cannot act upon the other*. Something lacking a position in space cannot act upon something in space, say at a point. The problem is simply not there in his text. Descartes himself writes in his Reply to one of the Objections:

> The whole problem contained in such questions arises simply from a supposition that is false and cannot in any way be proved, namely that, if the soul and the body are two substances whose nature is different, this prevents them from being able to act on each other.[5]

Descartes is surely right about this. The "nature" of a baked Alaska pudding is very different from that of a human being, no doubt about this at all, since one is a pudding and the other is a human being, but the two can "act on each other" without difficulty. The human being can eat the baked Alaska pudding, for example, and the baked Alaska can give the human being a stomachache.

The difficulty, however, is not merely that mind and body are different. It is that they are different in such a way that their interaction is impossible because it involves a contradiction. It is the nature of bodies to be in space, and the nature of minds not to be in space, Descartes claims. For the two to interact, what is not in space must act on what is in space. Action on a body takes place at a position in space, however, where the body is. So mind, or a bit of it, must get up next to the space inhabited by the body. But (to repeat) minds are not in space and nor are they spatially related to it, so they cannot even get near it.

Apparently Descartes did not see *this* problem. It was, however, clearly stated by two of his critics, his correspondent Princess Elisabeth of Bohemia, and his respondent Pierre Gassendi. They pointed out that if the soul is to affect the body, it must make contact with the body, and to do that it must be in space and have extension. In that case the soul is physical, by Descartes's own criterion.

In a letter dated May 1643, Princess Elisabeth wrote to Descartes,

> I beg you to tell me how the human soul can determine the movement of the animal spirits in the body so as to perform voluntary acts—being as it is merely a conscious substance. For the determination of the movement seems always to come about from the moving body's being propelled—to depend on the

> kind of impulse it gets from what it sets in motion, or again, on the nature and shape of this latter thing's surface. Now the first two conditions involve contact, and the third involves that the impelling [thing] has extension; but you utterly exclude extension from your notion of soul, and contact seems to me incompatible with a thing's being immaterial.[6]

Propulsion and "the kind of impulse" that set the body in motion require contact, and "the nature and shape" of the surface of the site at which contact is made with the body require extension. We need two further clarifications to grasp this passage. The first is that when Princess Elisabeth and Descartes mention "animal spirits" (the phrase is from Galen) they are writing about something that plays roughly the role of signals in the nerve fibers of modern physiology. For Descartes, the animal spirits were not spirits in the sense of ghostly apparitions, but part of a theory that claimed that muscles were moved by inflation with air, the so-called balloonist theory. The animal spirits were fine streams of air that inflated the muscles. ("Animal" does not mean the beasts here, but is an adjective derived from "anima," the soul.)

The second clarification is that when Princess Elisabeth writes that "you utterly exclude extension from your notion of soul," she is referring to the fact that Descartes defines mind and matter in such a way that the two are

mutually exclusive. Mind is consciousness, which has no extension or spatial dimension, and matter is not conscious, since it is completely defined by its spatial dimensions and location. Since mind lacks a location and spatial dimensions, Elisabeth is arguing, it cannot make contact with matter. It cannot possess a contacting surface or an impulse that operates on an extended surface. Here we have the mind–body problem going at full throttle.

Pierre Gassendi was one of the philosophers and scientists who wrote one of the so-called Objections to Descartes's *Meditations*. He puts one of his criticisms this way:

> For how, may I ask, do you think that you, an unextended subject, could receive the semblance or idea of a body that is extended?[7]

By "semblance" Gassendi means something like what we would call an image. It is worth noting that images, in a perfectly precise photographic sense, are carried by light to the eye. The sense is that a photograph of the object can be taken from anywhere between us and the object, or from any other place at which light carries the information of the image.

Descartes himself did not yet have the mind–body *problem*; he had something that amounted to a *solution* to the problem. It was his *critics* who discovered the problem, right in Descartes's *solution* to the problem, although it is

also true that it was almost forced on them by Descartes's sharp distinction between mind and body. The distinction involved the defining characteristics or "principal attributes," as he called them, of mind and body, which are consciousness and extension.

Though Descartes was no doubt right that very different kinds of things can interact with one another, he was not right in his account of how such different things as mind and body do in fact interact. His proposal, in *The Passions of the Soul* of 1649, was that they interact through the pineal gland, which is, he writes, "the principal seat of the soul" and is moved this way and that by the soul so as to move the animal spirits or streams of air from the sacs next to it. He had his reasons for choosing this organ, as the pineal gland is small, light, not bilaterally doubled, and centrally located. Still, the whole idea is a nonstarter, because the pineal gland is as physical as any other part of the body. If there is a problem about how the mind can act on the body, the same problem will exist about how the mind can act on the pineal gland, even if there is a good story to tell about the hydraulics of the "pneumatic" (or nervous) system.

We have inherited the sharp distinction between mind and body, though not exactly in Descartes's form, but we have not inherited Descartes's solution to the mind–body problem. So we are left with the problem, minus a solution. We see that the experiences we have, such as experiences

We see that the experiences we have, such as experiences of color, are indeed very different from the electromagnetic radiation that ultimately produces them, or from the activity of the neurons in the brain.

of color, are indeed very different from the electromagnetic radiation that ultimately produces them, or from the activity of the neurons in the brain. We are bound to wonder how the uncolored radiation can produce the color, even if its effects can be followed as far as the neurons in the visual cortex. In other words, we make a sharp distinction between physics and physiology on the one hand, and psychology on the other, without a principled way to connect them. Physics consists of a set of concepts that includes *mass*, *velocity*, *electron*, *wave*, and so on, but does not include the concepts *red*, *yellow*, *black*, *pink*, and the like. Physiology includes the concepts *neuron*, *glial cell*, *visual cortex*, *membrane potential*, and so on, but does not include the concept *red* and all the other color concepts. The color red is something that we see. In the framework of current scientific theory, "red" is a *psychological* term, not a physical one. Then our problem can be very generally described as the difficulty of describing the relationship between the physical and the psychological, since, as Princess Elisabeth and Gassendi realized, they possess no common relating terms.

Was there really no mind–body problem before Descartes and his debate with his critics in 1641? Of course, long before Descartes, philosophers and religious thinkers had spoken about the body and the mind or soul, and their relationship. Plato, for example, wrote a fascinating dialogue, the *Phaedo*, which contains arguments for the

survival of the soul after death, and for its immortality. Yet the exact sense in which the soul or mind is able to be "in" the body, and also to leave it, is apparently not something that presented itself to Plato as a problem in its own right. His interest is in the fact *that* the soul survives death, not *how*, or in what sense it can be in the body. The same is true of the religious thinkers. Their concern is for the human being, and perhaps for the welfare of the body, but mainly for the welfare and future of the human soul. They do not formulate a problem with the technical precision that was forced on Princess Elisabeth and Gassendi by Descartes's neatly formulated dualism.

Something important clearly changed in our intellectual orientation during the mid-seventeenth century. Mechanical explanations had become the order of the day, such as Descartes's balloonist explanation of the nervous system, and these explanations left unanswered the question of what should be said about the human mind and human consciousness from the physical and mechanical point of view. What happens, if anything, for example, when we decide to do even such a simple thing as to lift up a cup and take a sip of coffee? The arm moves, but it is difficult to see how the thought or desire could make that happen. It is as though a ghost were to try to lift up a coffee cup. Its ghostly arm would, one supposes, simply pass through the cup without affecting it and without being able to cause it or the physical arm to go up in the air. It would be no less

remarkable if merely by thinking about it from a few feet away we could cause an ATM to dispense cash. It is no use insisting that our minds are after all not physically connected to the ATM, and that is why it is impossible to affect the ATM's output—for there is no sense in which they are physically connected to our bodies. Our minds are not *physically* connected to our bodies. How could they be, if they are nonphysical? That is the point whose importance Princess Elisabeth and Gassendi saw more clearly than anyone had before them, including Descartes himself.