

Consciousness and the Incompleteness of Science

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Abstract: Physicalism, which provides the philosophical basis of modern science, holds that consciousness is solely a product of brain activity, and more generally, that mind is an epiphenomenon of matter, that is, derivable from and reducible to matter. If mind is reducible to matter, then it follows that identical states of matter must correspond to identical states of mind. In this discourse, I provide a cogent refutation of physicalism by showing examples of physically identical states which, by definition, cannot be distinguished by any method available to science but can nevertheless be distinguished by a conscious observer. I conclude by giving an example of information that is potentially knowable by an individual but is beyond the ken of science.

Who are you?

When you hear a question like that, what is the first response that comes to mind? You might say something like “I’m John Smith,” but your name is just a label; it doesn’t really describe who you are. You might go on to elaborate, saying, “I’m a doctor” or “I’m a millionaire,” but you could lose your job and your money and still be you.

Some people identify with their bodies, considering themselves to be handsome or beautiful or healthy or physically fit, but you could lose those things over time and still be you.

If not your body, then what about your mind? We recall Descartes’ famous observation: “I think, therefore, I am.” But what part of your mind? Your memories, perhaps? But you could lose your memories through amnesia or just plain forgetting and still be you.

How about your critical faculties? Well, have you ever had a dream, where, upon awakening, you said to yourself, or perhaps to someone else present, “Gee, that was a weird dream!” Yet at the time of the dream, the weirdness of the situation didn’t call itself to your attention, so in that case, at least, your critical faculties were, if not completely absent, at least substantially diminished.

So, we see that the things about you that we have mentioned so far – your health, your memories, and even your critical faculties – are all *attributes*, in that you can have them or not have them and still be you. Is there one thing that can be said to be your *essence*, that without which you would not exist? I submit that your essence is your *consciousness*, your awareness of being or self-awareness, because while it is possible for your body to exist and even carry on its vital functions in the absence of your consciousness, without your consciousness, you as a sentient being are not present.

Now, given that you are, in essence, your consciousness, it follows that one of the most important, if not *the* most important, questions for you to consider is “What is the nature of consciousness?” Why is this question worthy of your consideration? Well, there’s intellectual curiosity, which for some is a sufficient reason in itself, but for those of you of a more practical bent, considered this. Depending upon the nature of consciousness, your consciousness may or

may not survive bodily death. Now, if you believe in the existence of life after so-called death, then you would probably find it worthwhile to devote some time and effort in this life to making preparations for your life in the hereafter, which you wouldn't have any reason to do if you didn't believe in an afterlife. Thus, we see that your belief regarding the nature of consciousness can affect the way you live your life. What could be more practical than that?

So, what *is* the nature of consciousness? There are two schools of thought regarding this question. There's *physicalism*, also referred to as materialism, according to which consciousness is solely a product of brain activity, and more generally, that mind is an epiphenomenon of matter, that is, derivable from and reducible to matter, where I'm using the term matter is the sense of modern physics to include energy as well. Now, if consciousness is solely a product of brain activity, then it follows that when your brain ceases to function, that is, when you're brain-dead, you as a conscious entity cease to exist, so for the physicalist, the answer to the question "Is there life after death?" is a definite "No."

The other school of thought is what I shall refer to as the *spirit hypothesis*, according to which consciousness is contained in an immortal nonphysical vehicle, referred to as the spirit or soul, which interacts with and controls the body during life and at the time of so-called death, separates from the body and continues its existence in another realm, referred to as the spirit world or heaven. Thus, a proponent of the spirit hypothesis would answer the question "Is there life after death?" in the affirmative.

Now, let's consider the arguments and evidence supporting each of these two hypotheses. We begin by noting that physicalism provides the philosophical basis of modern science. Thus, since science has been so effective in aiding humanity in the understanding and control of nature, the burden of proof is on the proponents of any competing hypothesis to show that physicalism is inadequate, if not fundamentally flawed.

A second argument supporting physicalism is that it is consistent with the observed interaction between consciousness and the body. For example, if you step on a nail, you will experience pain, which is a state of consciousness. Also, consciousness can be influenced by certain drugs that affect brain chemistry and by electrically stimulating certain areas of the brain. Conversely, your consciousness can affect your body, most directly by deliberately moving your body and indirectly via certain emotional states, such as fear and anger, which can cause physiological changes in your body.

A third reason for favoring physicalism over the spirit hypothesis is based on the principle known as *Occam's razor*, according to which the simplest explanation that accounts for all of the observations is the one to be preferred. Now, the spirit hypothesis is clearly the more complex hypothesis because, in addition to the physical universe required by physicalism, it postulates the existence of a separate realm inhabited by discarnate spirits.

Now, let's consider the spirit hypothesis. We note that the spirit hypothesis is a tenet of most if not all religions. However, this fact alone cannot be used to bolster the case for the spirit hypothesis because religious tenets are accepted on faith, unlike scientific hypotheses, which are subject to the requirements of testing and verification.

What about psychic phenomena, or *psi phenomena*, such as remote viewing or out-of-body experiences, during which the subject is able to obtain information about a remote location that cannot be accounted for by normal means? Now, psi phenomena do indeed pose a challenge to physicalism, but in this discourse, I intend to challenge physicalism on epistemological rather than phenomenological grounds.

In what follows, I will show that physicalism is fundamentally flawed by refuting one of its core tenets, namely, that consciousness is an epiphenomenon of matter.

We begin by observing that there are two ways of knowing, or epistemological categories, if you will. There's *subjective experience*, or personal experience, by which I mean those experiences that are uniquely your own, although other people may have similar experiences. Pain is a good example. Only you can experience your own pain. If someone says to you "I feel your pain," what that person really means is that he is experiencing pain in sympathy with your expression of pain, but it is *his* pain that he is feeling, not yours. Other examples of subjective experience include those experiences associated with various emotional states, such as fear, anger, and joy; other bodily sensations, such as hunger and thirst; and the experiences associated with sensory perceptions.

The second epistemological category is what is sometimes referred to as objective reality, or *consensus reality*. I shall use the latter term because it is more descriptive of the concept that I wish to convey. For the purpose of this discourse, let us formally define consensus reality as those aspects of reality on which two or more people can agree.

Physical objects exist in consensus reality. For example, if you and I both see a table, our subjective experience associated with seeing that table will, in general, be different because we would necessarily be observing the table from different physical locations and hence see different images of that table. Nevertheless, we can agree that we are seeing the same table based on our knowledge and experience regarding how physical objects appear in three-dimensional space.

Once we are clear as to the distinction between subjective experience and consensus reality, the next thing to observe is that science is a consensus reality based system. All scientific observations and measurements are *consensus reality observations*, by which I mean observations on which two or more people can agree. Likewise, all entities capable of being investigated by science are either themselves *consensus reality observables*, that is, capable of being observed via consensus reality observations, or else derivable from consensus reality observables.

Now if, as I have stated, science is a consensus reality based system, then how is it possible for science to investigate subjective experiences, such as states of mind and mental operations, which are not consensus reality observables? To address this question, let us consider what a scientist actually does during such an investigation. For example, a neurophysiologist can determine which areas of the brain are involved in particular mental processes by monitoring a subject's brain activity via a PET or fMRI scanner while having that subject perform various mental tasks, such as mental arithmetic or memory recall. As another example, a research

psychologist can investigate the nature of mental operations by observing how subjects behave in response to various stimuli or by analyzing reports in which the subjects describe their experiences. The important point to note here is that the scientist cannot directly observe the mental activity of another person but can only infer its existence and nature by observing and monitoring the *consensus reality correlates* of such mental activity, such as physiological changes in the body and brain as well as verbal and nonverbal behavior.

In spite of its inability to directly observe subjective experience, science has nevertheless made considerable progress in determining the nature of the brain and mind and the interrelationship between the two. However, the question that we need to consider at this point is following: Is the consensus reality based description provided by science complete with respect to subjective experience? In other words, can subjective experience be uniquely characterized by its consensus reality correlates? Put another way, do distinct states of mind necessarily correspond to distinct states of matter? The importance of these questions lies in the fact that if their answers can be shown to be negative, then this would constitute a cogent refutation of physicalism. For example, if an instance could be shown in which two different states of mind correspond to identical states of matter, then it cannot be the case that mind is solely derivable from matter. I shall refute physicalism by showing examples of subjectively distinguishable states that cannot be distinguished by their consensus reality correlates. Before doing so, however, I shall illustrate the method that I will be using with a simple example.

For our illustrative example, let us consider the following question: Is the geometric description complete with respect to physical objects? Clearly, such is not the case, but how can we prove it? We begin by noting that the geometric description involves the size and shape of objects. In particular, objects that have the same size and shape have identical geometric descriptions, that is, they are *geometrically equivalent*. Thus, in order to prove that the geometric description is incomplete with respect to physical objects, it suffices to show an instance of two geometrically equivalent physical objects that are nevertheless distinguishable.

For our example of geometrically equivalent physical objects, let us use two cubes, each a centimeter on a side, and let one of the cubes be composed of solid gold and the other of solid lead. Imagine that you are seated at a table on which the cubes are resting, with the gold cube on your left and the lead cube on your right. The first thing that you notice is that the gold cube has a shiny yellow color – gold color, if you will – while the lead cube is a dull dark gray. Now, imagine that you reach forward and pick up the cubes, one in each hand. You will find that the gold cube is noticeably heavier than the lead cube. That's because while gold and lead are both dense metals, gold is significantly denser. Thus, we see that the gold cube and the lead cube can be distinguished by observation in two ways, namely, by color and weight.

In addition to being distinguishable by observation, the cubes are also distinguishable by preference. Given a choice between the two, you would choose the gold cube because it is more valuable, in that you could get more of what you want in exchange for it.

In summary, we have shown an example of two geometrically equivalent physical objects, namely, a gold cube and lead cube of equal size, that are nevertheless distinguishable in three ways, any one of which would have been sufficient to prove the thesis that the geometric description is incomplete with respect to physical objects.

Now, let's apply this methodology to the problem of interest, namely, proving that the consensus reality description is incomplete with respect to subjective experience. We begin with some definitions.

Let us define a *state of nature* as the way things are in this universe or in a hypothetical universe at a given point in time. Now, by "the way things are," we mean the state of all consensus reality observables in the universe under consideration together with the mental states of all sentient beings in or associated with that universe.

We will say that two states of nature are *consensus reality equivalent at time t* provided they cannot be distinguished by any consensus reality observation or combination of such observations made within the respective universes at time t or later, where t is a point in time relative to the time as measured within each of the universes. Now, it follows from this definition that if two states of nature are consensus reality equivalent at time t , then they are consensus reality equivalent at all times later than t but not necessarily at times prior to t .

Since all physical properties are consensus reality observables or derivable therefrom, it follows that consensus reality equivalent states of nature are necessarily physically identical and, therefore, cannot be distinguished by any method available to science. However, physically identical systems are not necessarily consensus reality equivalent unless each such system happens to be an entire universe. The reason is that two physical systems in the same universe cannot occupy the same space at the same time and can, therefore, be distinguished by observing their locations with respect to the rest of the universe. For example, if we replace the lead cube in our previous example with a gold cube of equal size, then the two gold cubes, although physically identical, can still be distinguished by observation by virtue of their different locations on the tabletop.

We will call two states of nature *subjectively distinguishable* if they are subjectively distinguishable either by observation or by preference. Now, when I use the term subjectively distinguishable, I need to specify who the subject is who will be making the distinctions. I mean that subject to be *you*, the person or persons to whom this argument is being directed, so I would like you to consider yourself to be the subject of the thought experiments that I am going to be describing as we go along.

We will say that two states of nature are *subjectively distinguishable by observation at time t* if when you are given a description of each of the universes and inserted into one of them at time t , where t is a point in time relative to the time as measured within that universe, and you are not told into which of the universes you had been inserted, you will be able to ascertain into which universe you had been inserted by making observations within that universe.

We will refer to two states of nature as being *subjectively distinguishable by preference at time t* if when you are given a description of each of the universes, you would have a definite preference for being inserted into one of the universes at time t , as compared to the other universe at that same time t .

Now, in order to prove my thesis that the consensus reality description is incomplete with respect to subjective experience, it suffices to show an example of two states of nature that are consensus reality equivalent at time t but are nevertheless subjectively distinguishable at that same time t , either by observation or by preference. For good measure, I shall provide two such examples. The first example will be a case of two consensus reality equivalent states of nature that are not subjectively distinguishable by observation but nevertheless subjectively distinguishable by preference. How, you might ask, is it possible to prefer one alternative to another yet not be able to tell them apart by observation? Wouldn't that be like saying that you prefer Coke to Pepsi but cannot taste any difference between them? I'll describe both states of nature and let you be the judge.

Both of the alternate universes in this first example have the following in common. A loved one of yours is on an airplane and that airplane crashes into a mountain, killing everyone aboard. The impact of the crash is so great that all evidence of what happened on the airplane before the crash is completely obliterated.

In one of the alternate universes, your loved one dies instantly without having had any foreknowledge of the impending crash. In the other universe, your loved one becomes aware of the impending disaster for several minutes before the event and suffers from the knowledge of imminent death. You are to be inserted into one of these universes at a point in time after the crash, at which it is assumed that both universes are in physically identical states, that is, consensus reality equivalent, so that you cannot determine by observation into which of the universes you had been inserted.

Are these two states of nature subjectively distinguishable by preference? In the groups before which I have given this presentation, almost everyone indicated by a show of hands that they would have preferred to be inserted into the universe in which their loved one died instantly without having suffered from the foreknowledge of impending death.

For the second example, I will show a case of two consensus reality equivalent states of nature that are subjectively distinguishable by observation and, optionally, by preference as well. When you are inserted into either one of the alternate universes to be described, say, Universe 1 or Universe 2, you will immediately know into which of the two universes you had been inserted. You will find yourself in a room with another person. Although you can talk to this person and speak his language, try as you might, you will be unable to convey to him the information as to whether you both are in Universe 1 or Universe 2. How is that possible?

In order to describe the universes in this example, we need to introduce a hypothetical device: a matter duplicator. This device has two chambers of equal size, which may each be visualized as having the dimensions of a telephone booth.

The matter duplicator operates as follows. The item to be duplicated is placed in one of the chambers, designated as Booth 1. Both chambers are hermetically sealed. When the device is activated, any material initially in Booth 2, including the air, is annihilated; the contents of Booth 1 are scanned; and an exact atom-for-atom duplicate of the contents of Booth 1 is created in Booth 2. The duplication is assumed to occur within a time interval sufficiently short so that no

significant change occurs to the contents of either booth during the duplication process, except, of course, the change in Booth 2 due to the duplication itself.

Now, suppose that you enter Booth 1, the matter duplicator is activated, and a duplicate of your body is created in Booth 2. In which body would your consciousness now reside? In the body of Booth 1, of course, since creating a duplicate of your body does not affect the original you, any more than taking your photograph captures your soul, notwithstanding the belief of certain primitive people to the contrary.

Let us now modify our matter duplicator so that immediately following the duplication operation previously described, the device exchanges a designated subset of the contents of Booth 1 with the corresponding portion of the contents of Booth 2. We assume that the time required for the combined duplication and swap operations is sufficiently short so that no significant change occurs to the contents of either booth during that interval, other than the duplication and exchange.

Suppose, for example, that you enter Booth 1, and the device is set to exchange your right arm with that of your duplicate. After the duplication and swap, where would your consciousness be? In the body in Booth 1, since the duplication process does not affect the location of your consciousness and, since your consciousness does not reside in your arm, neither does the swap. Now, suppose that your brain is switched with that of your duplicate. In which body would your consciousness now reside? According to physicalism, consciousness is a product of brain activity. In particular, *your* consciousness is a product of *your* brain's activity. Thus, your consciousness would follow your brain into the body (sans brain) of your duplicate in Booth 2. Is it permissible to invoke a tenet of physicalism when my aim is to show that physicalism is fundamentally flawed? Yes, because I am using an accepted technique of logic known as a proof by contradiction, in which one temporarily assumes for the sake of argument the hypothesis one is attempting to disprove.

We are now ready to define the two states of nature for this second example. In both of the alternate universes, you enter the matter duplicator, which is set to operate as follows. Immediately following the duplication operation, the device will at random and with equal probability either (1) take no further action or (2) exchange your brain with the brain of your duplicate. We assume that no record is kept in the device as to which course of action it has taken.

We define Universe 1 as the case where the device stops after creating your duplicate and Universe 2 as the case where your brain is switched with that of your duplicate. We set the time at which you are to be inserted into one of these universes to be immediately after the matter duplicator has performed its sequence of operations.

If you are inserted into Universe 1 at the designated time, you will find yourself in your original body in Booth 1, whereas if you are inserted into Universe 2, your consciousness will be in the body in Booth 2, that body consisting of your original brain with the rest of the body being that of your duplicate. If we specify that the booth numbers appear inside the respective booths so as

to be clearly visible to the person within, then the two states of nature that we have defined are immediately subjectively distinguishable by observation.

It remains to show that these two states of nature are consensus reality equivalent. Regarding the contents of the booths, the only difference is that in Universe 2, unlike Universe 1, your brain is exchanged with that of your duplicate. Since your duplicate's brain is an atom-for-atom copy of the original, and exchanging two physically identical material structures does not alter the physical state of a system, the contents of the booths are physically identical in both universes at the time of insertion. Likewise, the matter duplicator itself is in a physically identical state in both universes at the time of insertion because no record is kept in that device as to which course of action it has taken. Finally, we note that the universe outside of the device is not affected by whether or not a brain swap has occurred. We have thus established that the two universes are in physically identical states and therefore consensus reality equivalent at the time of insertion. Recall that in my preliminary description of this example, I stated that after insertion, you would immediately know into which universe you had been inserted but would be unable to communicate that information to another person present in the room with you. To see how this is possible, let's elaborate on the description of this example as follows. After insertion, you note the number of the booth in which you find yourself and then exit from that booth. You then meet the operator of the matter duplicator, who explains to you that he has been performing unauthorized experiments with human subjects and, to cover his tracks, must dispose of the duplicate that he has just created. "No problem. I'm the original," you state.

Just then, you observe you duplicate running up to the device operator, shouting: "Not so fast! I'm the original!" Since you and your duplicate have the same set of memories at the time of duplication, your duplicate sincerely believes that he or she is you. Furthermore, since both states of nature are physically identical, you would be behaving in the same way that your duplicate is now behaving had you been inserted into the other universe, so there is no way for the device operator to determine which is the original you.

If the device operator had decided to dispose of the person emerging from Booth 2, then you would have a definite preference for being inserted into Universe 1, where your consciousness would be in the body in Booth 1.

To recapitulate, we have seen two examples of consensus reality equivalent states of nature that are nevertheless subjectively distinguishable and thereby established that the consensus reality description of science is incomplete with respect to subjective experience. The question naturally arises as to whether we can make the scientific description complete with respect to subjective experience by explicitly incorporating mental states into the state description used by science, as we have done, for example, in our definition of a state of nature. The answer is that doing so will allow science to *formally* but not *operationally* distinguish between subjectively distinguishable states of nature that happen to be consensus reality equivalent. For example, we could formally distinguish between the states of nature in our example involving the matter duplicator by observing that in one state of nature your consciousness resides in the body in Booth 1, whereas in the other state, your consciousness is in the body in Booth 2. We note that the legal system formally distinguishes between the states of nature in our example involving the plane crash, in

that the families of the victims will, in general, be entitled to greater compensation if the victims suffered before they died.

In order for the distinction between subjectively distinguishable but consensus reality equivalent states of nature to be meaningful from a scientific perspective, these states of nature must be operationally distinguishable, that is, there must be some means by which the information regarding which state of nature corresponds to which description can be determined and made publicly available. The problem is that if two states of nature are consensus reality equivalent, then, by definition, at most one person would be able to distinguish between those two states by observation, and that person would be unable to communicate that information to anyone else. We saw this problem illustrated in our example involving the matter duplicator, in which you were unable to convince the device operator that you were the original you.

It should be noted that this limitation is not unique to science but applies to any system requiring the communication of information. For example, the legal system would be unable to operationally distinguish between the states of nature in our example involving the plane crash because in the absence of physical evidence regarding the circumstances of the crash, which, by hypothesis, doesn't exist, the judge or jury would have no rational basis for determining whether or not the victims had suffered before they died.

To illustrate the limitations of science resulting from its inability to operationally distinguish between subjectively distinguishable but consensus reality equivalent states of nature, let's set our matter duplicator so that after a duplicate of the subject is created, half of the subject's brain, say, the right hemisphere, is exchanged with the corresponding portion of the brain of the subject's duplicate. Now, if you were to enter the matter duplicator so that the right hemisphere of your brain was exchanged with that of your duplicate, would your consciousness remain with your left hemisphere in the body in Booth 1, or would it follow your right hemisphere into the body in Booth 2? The only way to know for certain would be by actually being the subject of such an experiment. However, since you wouldn't be able to communicate the result to anyone else, such an endeavor would be useless as a *scientific* experiment. One might wonder whether everyone who was the subject of such an experiment would have their consciousness end up in the body having the same original brain hemisphere, or whether the result would perhaps depend upon which of the subject's brain hemispheres was dominant. The answer to such a question lies beyond the reach of science.