

PHYSICALISM

Dualism is the view that reality consists of two separate kinds of things: material bodies and immaterial minds, each with their corresponding events. Monism, on the other hand, claims that reality consists of one kind of thing, which is either mental or material. The only traditional view of idealistic monism is George Berkeley's (discussed in some detail in a previous chapter).

If we reject the Cartesian hypothesis that minds are "mental substances" separate from "bodily substances," then we could say that a mind is extended equally with its body, and that it is simply the way that the body functions (insofar as it thinks, feels, and desires). Here the unity of the mind is a "functional" unity (just like the unity found in a properly functioning automobile). This non-Cartesian approach, of course, rejects the notion that minds and bodies are separate (or even separable), and thus does not solve the problem of connecting minds and bodies so much as dissolves it.

We will now examine below various materialistic forms of monism.

SUPPORT OF MATERIALISTIC MONISM

Apart from the problems noted above that plague dualism, materialistic monism is further supported by the following considerations.

First, Cartesian dualism assumes a clean break between those mechanical bodies that have minds, and those that don't.

Such a clean division, however, is belied by animal behavior, which indicates great similarities up and down the ladder of complexity, from human beings and other primates down to rats, birds, lizards, and worms. This was a problem pointed out even in Descartes' day: if non-human animal behavior is explicable in mechanical terms, then human behavior is as well, and vice versa. This continuum makes dualism highly suspect.

Second, Cartesian dualism results in a skepticism of other minds. (This is a problem for all dualistic theories.) As Gilbert Ryle muses, if Cartesian dualism is true, then "for all that we can tell, the inner lives of persons who are classed as idiots or lunatics are as rational as those of anyone else. Perhaps only their overt behavior is disappointing; that is to say, perhaps 'idiots' are not really idiotic..." (*The Concept of Mind*).

Finally, by segregating the mental world off as a separate substance, then psychology as a science becomes impossible. We cannot study other minds, since we cannot properly get at them (they are invisible, non-material, private, etc.). In the following, we will briefly consider three physicalist theories of mind.

MIND/BRAIN IDENTITY THEORY

Mind/Brain identity theory is the view that the mind just is the brain, or at least some part of it, and therefore that mental events are identical with certain physical events located in the brain. When a certain group of neurons fire in a certain way, that just is a visual image of a certain shade of red, or a certain feeling of sadness, or a memory of one's 12th birthday. Many physical events in the world have simply an outer or external aspect, but some events (many that occur within a brain) have an inner aspect as well as an outer aspect.

Identity theory, like Cartesian dualism, allows for us to think of the mind as a substance or thing. Unlike with dualism, however, the mind is now just a special kind of physical thing.

THE BRAIN

The adult human brain weighs, on average 1350 grams (about three pounds), and is about the size of your two fists pressed together. Our closest living cousins — the chimpanzees — have brains only one-third as large, while blue whales have brains five-times larger than ours. More significant, however, is not the absolute weight of a brain, but the brain/body weight ratio; here we find that the human brain is six-times as large as what would be expected from the ratio found in other mammals.

Brains are biologically expensive: with only 3% of the body's weight, they consume 17% of the total calories — this caloric requirement suggests a close relationship between the growth in human brain size and our diet during the course of our evolution.

Neurons — the cells that comprise about one-half the bulk of the brain — come in over 200 varieties, and there are about 100 billion of these cells in the brain. The interconnections among these neurons are estimated at 1000 trillion.¹

¹ The image comparing the brains of different species, and much of the information in this box, comes from Bruno Dubuc's excellent website: "The Brain from Top to Bottom," sponsored by the *Canadian Institutes of Health Research: Canadian Institute of Neurosciences, Mental Health and Addiction* (<http://thebrain.mcgill.ca>), accessed June 21, 2011. See also Douglas Fox, "The Limits of Intelligence" in *Scientific American* (July 2011), 37-43.

Possible problems with identity theory involve the location of mental events and the apparent privileged access one has to one's own mental events. First, the mind and its thoughts don't seem to be located in space, whereas physical events are very much located in space, and if mental events are identical with certain brain events, then the mental events do indeed occur in space. This may not be much of a problem, however, since it trades on perhaps dubious intuitions, and in any event it would also seem that thoughts clearly do occur in space, since they seem to be taking place in one's head.

A second possible problem is that I seem to have a "privileged access" to my own mental events, whereas the physical events of my brain are essentially open for anyone suitably situated to observe. The identity theorist will claim that this seeming privacy of the mental is an illusion. The neurologist can see the process occurring that just is the event of thinking (believing, experiencing, etc.) something.

FUNCTIONALISM

Is the actual stuff making up the brain important for there to be a mind? The identity theorist thinks it *does* matter, since the mind just is the brain: If there is no brain, then there is no mind. The functionalist, however, disagrees. Imagine replacing the brain — neuron by neuron — with electrical linkages. A neuron collects electrical charges from other neurons, and passes these charges down the line to the next neuron. Without too much difficulty we might replicate this causal chain by using electrical wires and switches.² Functionalism is the view that such a project — at least in principle — could be successful. The physical material that "embodies" the mind is not important. What matters is the "causal array" of that embodiment, or its functional state.³

Functionalism is in some ways a cleaned-up version of behaviorism. It holds that we can define mental states in terms of their cause, the effects they have on other mental states, and the effects they have on behavior. The net result is that talk about mental states is ultimately reducible to talk about sensory inputs and behavioral outputs.

Mental events and physical events are different ways of describing the same system. Mental events are individuated by their causal or functional role within the brain. The mind is a causal array or network, and as such could be implemented in all sorts of materials, including brains.

Functionalism is a materialist theory of the mind that avoids the problems of correspondence that trouble the mind-brain identity theory. Functionalism involves distinguishing between *physical descriptions* and *abstract (functional) descriptions* of systems, that is, the rules governing a function, and the physical manifestation of those rules or function. The physical manifestation might occur in a brain or in a computer.

Similarly, we can describe the brain in two ways: *physically* (giving a description of the neurons and their interconnections and order of firings) and *functionally* (using mental terms primarily for describing the function of those certain operations). A certain event in the brain will be an act of thinking not because it is a special *kind* of brain event, but because it performs the appropriate *function* in the brain's program. Functionalism is closely related to work on artificial intelligence, to which we turn in the next section.

[Poem]

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The Brain — is wider than the Sky —
For — put them side by side —
The one the other will contain
With ease — and You — beside —

The Brain is deeper than the sea —
For — hold them — Blue to Blue —
The one the other will absorb —
As Sponges — Buckets — do —

The Brain is just the weight of God —
For — Heft them — Pound for Pound —
And they will differ — if they do —
As Syllable from Sound —

— Emily Dickinson (1830-86)

² Researchers at the University of Lille (France) have recently accomplished something like this, developing organic transistors that mimic the synapse; see Dominique Vuillaume, *et al.*, "An Organic Nanoparticle Transistor Behaving as a Biological Spiking Synapse" in *Advanced Functional Materials* 20 (2010): 330-37.

³ Admittedly, this mechanical mind (as described) would be static. To have new experiences, neurons need to keep forming new synapses, and re-enforcing or degrading old ones. So for this thought experiment to work, we need the mechanical replacements to be capable of re-aligning themselves — something more easily done at the software level than the hardware level, but certainly *possible* at the hardware level.