

The Mind-Body Problem

Information philosophy views the mind as the *immaterial* information in the brain, which is seen as a biological information processor. Mind is software in the brain's hardware.

The “stuff” of thought is pure information. Information is neither matter nor energy, though it needs matter for its embodiment and energy for its communication.

In ancient philosophy, mind and body formed one of the classic dualisms,¹ like idealism versus materialism, the problem of the one (monism) or the many (pluralism), the distinction between essence and existence, between universals and particulars, between the eternal and the ephemeral.

When mind and body are viewed today as a dualism, it is because the mind is considered to be fundamentally different from the material brain, though perhaps not another “substance.” We propose an easily understandable and critically important physical difference between matter and *immaterial* information. Whereas the total amount of matter is conserved, the universe is continuously creating new information - by rearranging existing matter into new information structures. The total amount of information (a kind of order) in the universe is increasing, despite the second law of thermodynamics, which requires that the total amount of disorder (entropy) is also increasing.²

Matter, along with energy (mc^2), cannot increase. It is conserved, a constant of the universe. Information is not conserved. As information grows, it is the source of genuine novelty in the universe. The future is not determined by the past and present, because the future contains unpredictable new information. New information is continuously created.

If mind and matter then are to be considered part of a dualism, it will not be a “material substance” dualism, but it can still be a “physical substance” dualism, since mind and matter are both physical and are “substantial,” in the sense of having real causal

1 See chapter 3 for more on dualisms.

2 See appendices A and B for how this is possible.



power. We recognize that something *immaterial* with causal power also fits the description of *metaphysical*. See chapter 2 on metaphysics.

A mind-body dualism coincides with Plato's "ideas" as pure form, distinct from matter. The ontology and the nature of an idea is different from that of matter. The ancients asked about the existential status of Platonic Ideas. On the other hand, monists may see both mind and body as pure physicalism, since information embodied in matter corresponds to a mere reorganization of the matter. This was Aristotle's more practical view. For him, Plato's Ideas were mere abstractions generalized from many existent particulars.

Mind-body as a "problem" is generally traced to RENÉ DESCARTES, who asked how the *immaterial* mind (or soul) could influence the material body. Would not the interaction between the two have to partake somehow of the character of both? Descartes famously identified the tiny pineal gland as the point of contact between mind and body.

Importantly, Descartes also made the mind the locus of *freedom*. He saw the body as a mechanical system of tiny fibres causing movements in the brain (the afferent sensations), which then can pull on other fibres to activate the muscles (the efferent nerve impulses). This is the basis of stimulus and response theory in modern physiology(reflexology).

The popular idea of animals as machines included the notion that man too is a machine - the body obeys strictly deterministic causal laws - but that man has a soul or spirit that is exempt from determinism and thus from what is known today as "causal closure." But how can the mind both cause something physical to happen and yet itself be exempt from causal chains?

Interactionists

In modern times some philosophers and scientists have proposed interactionist models and have also attempted to locate specific parts of the brain (beyond Descartes' pineal gland), for example at the synapses between neurons, where quantum effects



might be important. The neuroscientist JOHN ECCLES and philosopher KARL POPPER considered such models in their articles and books over many years.

Attempts to use the mysterious properties of quantum mechanics to explain the mysterious problems of consciousness and psycho-physical relations between mind and body have resolved little, since they explain one mystery with another mystery.

Information philosophy identifies the (immaterial) mind with the incredible biological information processing going on in the brain. This processing operates on two levels.

At the macro level, the mind/brain is adequately determined to make its decisions and resulting actions in ways that are causally connected with the agent's character and values. It is everything that determinist and compatibilist philosophers expect it to be.

At the micro level, the mind/brain leaves itself open to significant thermal and quantal noise in its retrieval of past experiences. This generates creative and unpredictable alternative possibilities for thought and action. This is our best hope for a measure of libertarianism.

Our mind/brain model emphasizes the abstract information content of the mind. Information is neither matter nor energy, yet it needs matter for its concrete embodiment and energy for its communication. Information is the modern spirit, the ghost in the machine.

Because it is *embodied* in the brain, this mind can control the actions of a body that is macroscopic and is normally unaffected by its own quantum level uncertainty (excepting when we want to be creative and unpredictable).

Thus our mind-body model explains how an *immaterial*, "free," unpredictable, and creative mind can control the adequately determined material body through the self-determinate and responsible actions selected by the will from an agenda of alternative possibilities.



Moreover, since some “mental events” are large enough information structures to be adequately determined, these mental events can act causally on lower biological and physical levels in the hierarchy, in particular, the mind can move the body and all its contained physical particles, thus solving the mind-body problem.

A specific example of the mind causing an action, while not itself being caused by antecedent events is the following. Faced with a decision of what to do next, the mind considers several possible alternatives, at least some of which are creatively invented based on random ideas that just “come to mind.” Other possible alternatives might be familiar options, even habits, that have frequently been done in earlier similar situations.

Some of these mental alternatives are *new information* that show up as “neural correlates” - brain neurons firing. When the alternatives are evaluated and one is selected, the selected action results in still other neurons firing, some of which connect to the motor cortex that signals muscles to move the body.

Apart from the occasional indeterministic generation of new information in the creative new alternative ideas, this whole causal process is adequately determined and it is downwardly causal. Mental events are causing physical body events.

The Mind-Brain Identity Theory

In the mid-twentieth century a number of philosophers proposed a monistic and physicalistic solution to the mind-body problem by simply identifying the mind and brain as one physical thing, subject to the normal laws of physics.

Holistic critics attacked this view as reducing the mind to the brain, leaving the mind merely an epiphenomenon or illusion. This fit well into the reductionist program of the logical empiricists of the Vienna Circle, who promoted the idea of the Unity of Science. All events should be reducible to physical events, and in particular, all explanations should be traceable to causes originating in the physical material components of the universe.



The first philosophers to argue for an identity of mind (or consciousness) and brain include ULLIN T. PLACE, HERBERT FEIGL, and J.J.C.SMART (1959).

Place explicitly describes “consciousness as a brain process,” specifically as “patterns” of brain activity. He does not trivialize this identity as a succession of individual “mental events and physical events” in some kind of causal chain. He compares this identity to the idea that “lightning is a motion of electrical charges.”³

Feigl’s work was independent of Place’s, but he said that the fundamental idea had been held by many earlier materialist (monist) thinkers. He thought it was stated clearly by Vienna Circle philosopher RUDOLF CARNAP in 1925. Feigl describes his own thesis:

The identity thesis which I wish to clarify and to defend asserts that the states of direct experience which conscious beings “live through” and those which we confidently ascribe to some of the higher animals, are identical with certain (presumably configurational) aspects of the neural processes in these organisms.⁴

Smart clarified and extended the identity theory of Place.

When I say that a sensation is a brain process or that lightning is an electric discharge, I am using “is” in the sense of strict identity. (Just as in the — in this case necessary — proposition “7 is identical with the smallest prime number greater than 5.”) When I say that a sensation is a brain process or that lightning is an electric discharge I do not mean just that the sensation is somehow spatially or temporally continuous with the brain process or that the lightning is just spatially or temporally continuous with the discharge.⁵

Smart is a strong materialist. He says “A man is a vast arrangement of physical particles, but there are not, over and above this, sensations or states of consciousness.” (*ibid.*) Compare ANTHONY CASHMORE, who says in the *Proceedings of the National Academy of Sciences* that we are “just a bag of chemicals.”⁶

Eliminative Materialism

Philosophers who accept the idea that all laws of nature are deterministic and that the world is causally closed still cannot under-

3 *British Journal of Psychology*, 47, pp.44-50 1956

4 *Concepts, Theories, and the Mind-Body Problem*, Feigl, 1958, p.150

5 *Philosophical Review*, 68 pp.141-156 (1959)

6 *PNAS*, vol. 107, no. 10, p. 4500



stand how an immaterial mind can be the cause of an action. On this view, every physical event is reducible to the microscopic motions of physical particles. The laws of biology are reducible to those of physics and chemistry. The mind is reducible to the brain, with no remainder.

These philosophers of mind are content to simply eliminate the mind. *Psychology without a psyche!*

For these philosophers of mind, essentially no progress has been made on the mind-body problem since Descartes. “Reductionists” who accept “causal closure” think that every brain event must have been determined by causes coming “bottom-up” from the brain’s atoms and molecules. Any additional mental cause should be excluded, according to JAEGWON KIM.

Since the early twentieth century, quantum mechanics adds the possibility that some processes are indeterministic, but random quantum-mechanical events have generally been thought to be unhelpful by philosophers of mind. Adding indeterminism to mental events apparently would only make our actions random and our desires the product of pure chance. If our willed actions are not determined by anything, they say, we are neither morally responsible nor truly free. Whether mental events are reducible to physical events, or whether mental events can be physical events without such a reduction, the interposition of indeterministic quantum processes apparently adds no explanatory power. And of course if mental events are epiphenomenal, they are not causally related to bodily actions. Epiphenomenal access to quantum physics would not help.

Mental causation is a special case of the more general problem of downward causation, for example the downward control of the motions of a cell’s atoms and molecules by supervening biological macromolecules. Is the molecular biology of a cell reducible to the laws governing the motions of its component molecules, or are there emergent laws governing motions at the cellular level, still different laws at the organ level, at the organism level up to the mental level?

Emergent properties or laws at the higher levels of a physical-chemical-based biological system would have to prevent those higher levels from being reduced to the properties and laws of the



base physical level? These emergent properties are not a new kind of “stuff,” but they are nevertheless often described as an emergent dualism, specifically a property dualism.

Is it illogical to deny reductionist ideas of bottom-up causation (because of indeterministic quantum noise) and yet to defend adequately determined downward causation (because quantum effects are averaged out by macroscopic objects)? The arguments are subtle and depend on the complementary roles of determinism (Schrödinger evolution of the wave function) and indeterminism (wave-function collapse) in quantum physics.

Perhaps the most critically important emergent law of all is the abstract idea of determinism itself. Determinism in the macroscopic world emerges from the indeterministic microscopic quantum world by averaging over vast numbers of atoms and molecules. Even before quantum mechanics, LUDWIG BOLTZMANN knew that the macroscopic gas laws were only adequately or statistically determined by the average motions of extremely large numbers of molecules.

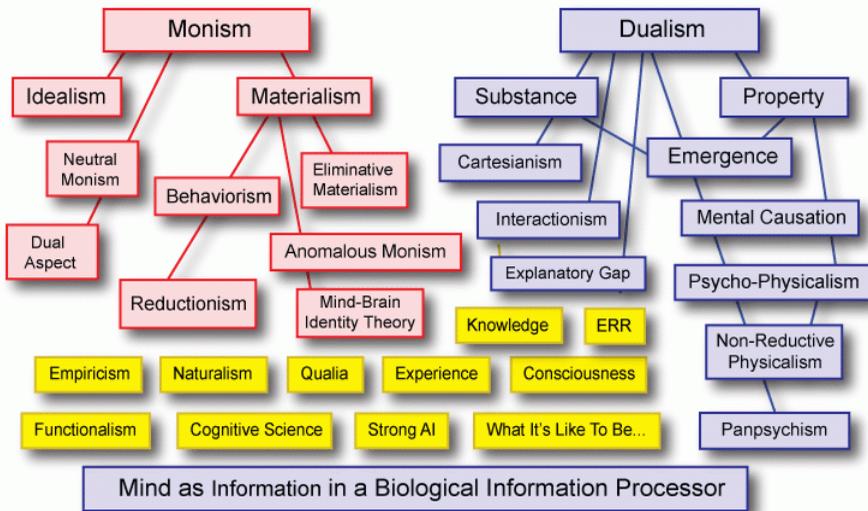


Figure 13-5. A taxonomy of philosophy of mind positions.

Idealism claims that all is mind, perhaps a Western panpsychism or Eastern philosophical ideas like Advaita Vedanta or Mahayana Buddhism? The neutral monism of WILLIAM JAMES, ERNST MACH,



and BERTRAND RUSSELL is closely related to CARL JUNG's "dual-aspect" monism. They are looking for a basic underlying substance.

BARUCH SPINOZA claimed mind and body are one ontological substance. The mind-brain identity theory of HERBERT FEIGL, J. J. C. SMART, and U. T. PLACE is a materialism and an epiphenomenalism. DANIEL DENNETT, the CHURCHLANDS (Paul and Patricia), FRANCIS CRICK, CHRISTOF KOCH, and JAEGWON KIM are eliminative materialists.

DONALD DAVIDSON's anomalous monism may be a non-reductive physicalism? Property dualisms assume just one substance, so are in a sense monistic. KARL POPPER and JOHN ECCLES' interactionism and JOSEPH LEVINE's "explanatory gap" are modern forms of Cartesianism.

GOTTLIEB LEIBNIZ's pre-established harmony is psycho-physicalism or psycho-physical parallelism. It denies interactionism, which remains unexplained. In later years, Leibniz' monadology leaned toward a monism. Occasionalists are parallelists who say God creates an interaction when needed. GALEN STRAWSON's realistic physicalism or "realistic monism" resembles ARTHUR STANLEY EDDINGTON's panpsychism.

Panpsychists can hold that there is a material world, but that every material object has some mentality. DAVID CHALMERS has leaned toward panpsychism in recent years. Other panpsychists include MICHAEL LOCKWOOD, WILLIAM LYCAN, and THOMAS NAGEL. They argue that panpsychism removes the need to identify a time and place for the emergence of the mind.

For over 20 years, HENRY STAPP has attempted to reconcile WERNER HEISENBERG's quantum mechanics, especially the "free choice" of the experimenter, with ALFRED NORTH WHITEHEAD's idea that quantum theory and his process philosophy might explain panpsychism. Today "Quantum Whiteheadians" include STUART HAMEROFF, ROGER PENROSE, and ABNER SHIMONY.

Non-reductive physicalism is an emergent dualism in which mental events are physical and have causal powers over brain events and the material body.



The information philosophy mind model is a dualist non-reductive physicalism. The mind is physical, but immaterial. Thoughts have causal powers because they are considered as freely generated alternative possibilities for actions by a will that is adequately determined by the agent's reasons, motives, desires, feelings, etc. - in short, by the agent's character.

Mind/Body and the ERR

As opposed to the philosophers above who *identify* the mind with the brain, we look to those philosophers and scientists such as Popper and Eccles who have proposed interactionist models and have also attempted to locate specific parts of the brain, for example at the synapses between neurons, where quantum effects might be important.

But all the attempts to use the mysterious properties of quantum mechanics to explain the mysterious problems of consciousness and psycho-physical relations between mind and body have been just that, explaining one mystery with another mystery.

Information philosophy identifies the *immaterial* mind with the incredible biological information processing going on in the brain. What we might call pre-processing is happening in the experience *recorder*, which is growing new synapses in the brain where neurons have fired in response to current experiences.

Abstract information, the stuff of the mind, is being *embodied* in those newly wired neurons.

What we might call post-processing is when the experience *reproducer* is stimulated to generate those older patterns of information that most resemble current experience, because they lie in nearby neurons of the brain.

Reproducing information is likely to be very noisy and thus the source of genuinely new *alternative possibilities*.

The experience recorder and reproducer (ERR) is both mind and body, both information and its embodiment. Although the ERR implements both levels, it does not make them *identical*.

