17.E: the ***Philosophyldeas*** overview of

Mind as Physical

The doctrine of Physicalism says that nothing exists apart from physical matter. A more cautious formulation says that 'nothing exists except the postulates of physics', which leaves the details of the theory to scientists. Since new particles are often added to the theories of physics, the theory includes future physical discoveries, and even surmised matter which can't be directly discovered. In whatever form, this theory entails that minds are entirely physical.

The theory first arose as an implication of the ancient theory of **atomism**, which said that nature consists entirely of atoms, and the mind is movement among them (perhaps with an extra degree of freedom). The modern view appeared when atoms were revived (as 'corpuscles'), but was not popular, because it clashed with religious commitment to the soul. Only quite recently has the theory gained great popularity, and it is probably the dominant view among neuroscientists.

Support for the theory has increased with new knowledge of the brain. Scanning shows that many modes of thought have precise **locations** in the brain, where vigorous thought is seen to consume energy. Learning of the brain's huge **complexity** (with perhaps three hundred thousand trillion synaptic junctions) makes the physicality of mind more believable than when the brain seemed to be smoothly homogeneous. The development of **computers** has also shown that many mental skills can be implemented on machines which are entirely physical, and mentally rotating a geometrical shape shows that our speed of thought is limited by our biological hardware. The approach to artificial intelligence called 'connectionism' is often cited for its success in emulating quite flexible parts of our thought in a physical system (though other parts of thinking, such as handling background assumptions, looks almost hopeless).

The argument most frequently cited in support of physicalism of mind concerns the role of causation in thought. The traditional assumption (which still has a lot of support) is that if I choose to move my arm, a causal sequence leads from pure thought to a physical event, and so the arm movement is explained by a purely mental event (which is taken to be non-physical). Convinced dualists are left with the difficult 'interaction problem', of how the non-physical causes can have physical effects. How can a ghost lift a brick? In biology and neuroscience, arm movements seem to fit into a continuous physical sequence, but dualism requires a break in this sequence, where pure mind intervenes. It seems to physicalist that we have both too many causes here, and an unnecessary mystery.

The '**overdetermination**' of the arm movement arises if there is adequate cause for it in the physical activity, and an additional cause cited from the mental activity. Who is in charge here? So the physicalist argues that only a unification of mental and physical can give a decent account of the causes of behaviour. The '**gap**' in brain activity is also a challenge to physics, because physical events are assigned a non-physical cause. At the start and end of each gap there will be brain activity which can never be explained. The doctrine of the 'closure' of physics (the completeness of its general picture of reality) allows no possibility of activity in this 'gap' in brain events.

If physicalism is true, more detail is still needed. Mental events like pains, perception, beliefs and memories seem utterly different to us from observations of brain tissue under a microscope, but the theory says they are 'identical', so how can this be? One response is to say the science is right, so our normal 'folk psychology' talk of beliefs etc. is just false. Talk of 'beliefs' is a convenient description, like talk of the 'weather', but is not part of the actual biology. Against this '**eliminativist**' view, most physicalists prefer '**reductivism**', which says the mental events are real enough, but are entirely caused by (and can be explained by) the physical events, just as lightning can be wholly explained when we identify it with electrical discharge.

Presumably each mental event is identical with some physical event, but is my thinking of tomatoes an identical type of physical event each time, and might it even require exactly the same neurons? Flexible computer memory suggests that the latter is not necessary, but the same *pattern* may be required each time. This means that a bird could only think of tomatoes if its neurons could produce that pattern, so it is common to say that ideas are 'multiply realisable' (producible in many ways), leading to the 'functionalist' theory of mind (which may still be physicalist).

Type-Type Identity Theory says the same pattern is always needed for a given thought. The looser **Token-Token** Identity Theory (favoured by property dualists) just says that all thoughts have *some* physical aspect. Early versions of physicalism said the identity between a thought and its neurons was *contingent* (meaning the thought might have been realised in some other form), but it was pointed out that if two things are identical they are just one thing, so they can't come apart, so the identity is *necessary*. If I think of tomatoes twice is the second thought identical to the first (like the same car driving past), or just a thought of the same type (like a car of the same make going past)? It is challenging for physicalists to give a precise account of the 'identity' needed in their theory.

Accepting a wholly physical account of the mind worries many philosophers, because it is hard to conceive of the most important aspects of our lives (wisdom, beauty, love, reason, moral values, creativity, mathematics) as mere wiggling neurons. An array of arguments has emerged as resistance to this ruthless reduction of what is most interesting to what seems rather boring. Features such as raw experience ('qualia'), thoughts being 'about' something other than neurons ('intentionality'), the sense of what we *ought* to think ('normativity'), the ability to see necessities ('a priori thought'), our independence in making choices ('free will'), the subjective nature of thought ('what's it like to be' a brain), and the deep privacy of thought (the 'other minds' problem) are all invoked as facts that cannot be explained in wholly physical terms. For example, it is said (in the 'knowledge argument') that if you had a complete physical account of how brains experience colour, but had never actually seen colour, then an experience of red would be a fundamental addition to the theory, showing that the complete physical theory had missed something.

Explaining *qualia* (the subjective qualities of things) seems particularly challenging for physicalists. If I experience orange, why don't some of my neurons turn orange? And if thoughts are physical, do I get heavier when I learn something? Physicalism sounds simple, but it has a long way to go before it can satisfy its critics.