the history of the causal argument, and in particular the question of why it has become persuasive only recently.

1.2 The Causal Argument

Let me now outline what I take to be the canonical argument for materialism. Setting to one side all complications, which can be discussed later, it can be put as follows.

Many effects that we attribute to conscious causes have full physical causes. But it would be absurd to suppose that these effects are caused twice over. So the conscious causes must be identical to some part of those physical causes.

To appreciate the force of this argument, consider some bodily behaviour which we would standardly attribute to conscious causes. For example, I walk to the fridge to get a beer, because I consciously feel thirsty. Now combine this example with the thought that, according to modern physical science, such bodily movements are fully caused by prior physical processes in brains and nerves. The obvious conclusion is that the conscious thirst must be identical with some part of those physical processes.

Let me now lay out the above argument more formally. This will help us to appreciate both its strengths and its weaknesses.

As a first premiss, take:

(1) Conscious mental occurrences have physical effects.

As I said, the most obvious examples are cases where our conscious feelings and other mental states cause our behaviour.

Now add in this premiss ('the completeness of physics' henceforth):

(2) All physical effects are fully caused by purely physical prior histories.²

² What about quantum indeterminacy? A stricter version of (2) would say that the chances of physical effects are always fully fixed by their prior physical histories, and would reformulate the rest of the argument accordingly (with (1) then as 'Conscious mental occurrences affect the chances of physical effects', and so on). I shall skip this complication in most of what follows.
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In particular, this covers the behavioural effects of conscious causes to which our attention is drawn by premiss 1. The thought behind premiss 2 is that such physical behaviour will always be fully caused by physical contractions in your muscles, in turn caused by electrical messages travelling down your nerves, themselves due to physical activity in your motor cortex, in turn caused by physical activity in your sensory cortex, and so on.

At first sight, premisses 1 and 2 seem to suggest that a certain range of physical effects (physical behaviour) will have two distinct causes: one involving a conscious state (your thirst, say), and the other consisting of purely physical states (neuronal firings, say).

Now, some events are indeed overdetermined in this way, like the death of a man who is simultaneously shot and struck by lightning. But this seems the wrong model for mental causation. After all, overdetermination implies that even if one cause had been absent, the result would still have occurred because of the other cause (the man would still have died even if he hadn’t been shot, or, alternatively, even if he hadn’t been struck by lightning). But it seems wrong to say that I would still have walked to the fridge even if I hadn’t felt thirsty (because my neurons were firing), or, alternatively, that I would still have gone to the fridge even if my neurons hadn’t been firing (because I felt thirsty). So let us add the further premiss:

(3) The physical effects of conscious causes aren’t always overdetermined by distinct causes.

Materialism now follows. Premisses 1 and 2 tell us that certain effects have a conscious cause and a physical cause. Premiss 3 tells us that they don’t have two distinct causes. The only possibility left is that the conscious occurrences mentioned in (1) must be identical with some part of the physical causes mentioned in (2). This respects both (1) and (2), yet avoids the implication of overdetermination, since (1) and (2) no longer imply distinct causes.

1.3 The Ontology of Causes

The causal argument focuses on the way in which conscious occurrences operate as causes. It says that conscious causes must
We can usefully think of this abstract claim and the detailed correlational research as complementing each other. The abstract claim doesn't by itself tell us which physical property a given conscious property should be paired up with. And the correlational research, while promising to establish specific pairings, can't by itself establish that the paired properties are identical, as opposed to regularly accompanying each other. The abstract claim is important, then, since it is needed to license the move from detailed empirical correlations to property identifications. It tells the empirical researchers that conscious properties aren't just correlated with the physical properties they are regularly found with, but must be identical with them.

1.4 Epiphenomenalism and Pre-established Harmony

All this assumes, however, that the abstract claim does follow from the causal argument. Let us now examine this argument more closely.

As laid out above, the causal argument seems valid.\(^4\) So, to deny the conclusion, we need to deny one of the premises. All of them can be denied without contradiction. Indeed, all of them have been denied by contemporary philosophers, as we shall see. At the same time, they are all highly plausible, and their denials have various unattractive consequences.

Let me start with premise 1. This claims that, as a matter of empirical fact, particular conscious states have particular physical effects. This certainly seems plausible. Doesn't my conscious thirst cause me to walk to the fridge? Or, again, when I have a conscious headache, doesn't this cause me to ingest an aspirin?

Still, the possibility of denying this premiss is familiar enough, under the guise of 'epiphenomenalism' or 'pre-established harmony'.

The first philosopher to embrace this option was Leibniz. Unlike

\(^4\) However Sturgeon (1998) argues that the argument trades on an equivocation between the everyday sense of 'physical' (in premiss 1) and a quantum-theoretical sense (in premiss 2). I shall comment on Sturgeon's claim in section 1.10 below.
most other philosophers prior to the twentieth century, Leibniz was committed to the causal completeness of physics (see Appendix). But he was not prepared to accept the identity of mind with brain. So he opted for a denial of our premiss 1, and concluded that mind and matter cannot really influence each other, and that the appearance of interaction must be due to pre-established harmony. By this Leibniz meant that God must have arranged things to make sure that mind and matter always keep in step. In reality, they do not interact, but are like two trains running on separate tracks. But God fixed their starting times and speeds so as to ensure they would always run smoothly alongside each other.

Some contemporary philosophers (for example, Jackson 1982) follow Leibniz in avoiding mind–brain identity by denying premiss 1. But they prefer a rather simpler way of keeping mind and matter in step. They allow causal influences ‘upwards’ from brain to mind, while denying any ‘downwards’ causation from mind to brain. This position is known as epiphenomenalism. It respects the causal completeness of physics, in that nothing non-physical causally influences the physical brain. But it avoids the theological complications of Leibniz’s pre-established harmony, by allowing the brain itself to cause conscious effects.

Epiphenomenalism is not a particularly attractive position. For a start, it would require us to deny many apparently obvious truths, such as that my conscious thirst caused me to fetch a beer, or that my conscious headache caused me to swallow an aspirin. According to epiphenomenalism, my behaviour in both these cases is caused solely at the physical level. These physical causes may be accompanied by conscious thirst or a conscious headache, but these conscious states no more cause resulting behaviour than falling barometers cause rain.5

5 Chalmers (1996: esp. 134–6), following Russell (1927) and Lockwood (1989), argues that there is a way for dualism to avoid this epiphenomenalist inefficacy while respecting the completeness of physics. This is to identify phenomenal properties with the intrinsic properties of the physical realm. Chalmers’s idea is that physical science picks out properties like mass and charge only extrinsically, via their relations to observable features of the world. So maybe phenomenal properties can be identified with the intrinsic nature of such properties, suggests Chalmers, and thereby have their causal efficacy restored. This seems an entirely
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That epiphenomenalism has these odd consequences is not in itself decisive. The theoretical truth can often overturn claims which were previously regarded as the merest common sense. Moreover, there is nothing incoherent about epiphenomenalism. As I shall have occasion to stress in what follows, there is nothing conceptually contradictory in the idea of conscious states which exert no causal powers themselves. Still, epiphenomenalism is surely an empirically implausible position, by comparison with the materialist view that conscious states are simply identical to brain states.

If epiphenomenalism were true, then the relation between mind and brain would be like nothing else in nature. After all, science recognizes no other examples of ‘causal danglers’, ontologically independent states with causes but no effects. So, given the choice between epiphenomenalism and materialism, standard principles of scientific theory choice would seem to favour materialism. If both views can accommodate the empirical data equally well, then ordinary scientific methodology will advise us to adopt the simple view that unifies mind and brain, rather than the ontologically more profligate story which has the conscious states dangling impotently from the brain states.

There remains the possibility that the anti-materialist arguments to be examined later will show that conscious mind and brain cannot be identical. If this is so, then one of the premisses of the causal argument must be false. And in that case premiss 1 seems as likely a candidate as any. Certainly most contemporary philosophers who are persuaded by the anti-materialist arguments have opted for epiphenomenalism and the denial of premiss 1, rather than for any other way out of the causal argument.

My reaction is that the intrinsic features of the physical world with which Chalmers wants to identify phenomenal properties are themselves simply basic physical properties. Thus I am happy to agree with Chalmers that scientific theory picks out these intrinsic physical properties only via descriptions which refer to observable features of the world. Moreover, I agree that conscious properties should be identified with arrangements of such intrinsic physical properties, and thus that it is like something to have these arrangements of intrinsic properties. Indeed, I find it hard to see what a sensible materialism could amount to, except this combination of views. So, from my point of view, Chalmers’s suggested position is simply the optimal formulation of materialism.