Jerry Fodor and his "Special Sciences"

So, what *are* "special sciences?" –ones that are particularly *dear* to the author? ("*Oh dear. I **am** touched. Psychology is just, so, well, **special**!*")

The use of "special" in this context should be understood in contrast with "general," in the very same sense that distinguishes Einstein's "Special Theory of Relativity" from his "General Theory." The intended contrast here (to reverse the order) is between a generalization and specific or "special" instances of it. Consider Einstein's Relativity Theory. His first work on this subject, the "Special Theory of Relativity," dealt only with objects moving at constant velocities (i.e., whose direction and speed of motion did not change). But, of course, not all objects move at a constant velocity, so this theory was not perfectly general, but applied only to a limited class of cases. Later, Einstein extended his theory to include objects in all kinds of motion, both constant velocities, and those undergoing acceleration. This is his "General Theory of Relativity." This is the use of "special" in Fodor's discussion of "special sciences." They are "sciences," or sets of laws, that are seen as "special cases" of some more general set of laws. Just as Einstein's Special Theory is consistent with and implied by his General Theory, so should Fodor's special sciences be consistent with and implied some more general science.

Physicalism is (or entails) the view that everything is physical and falls under physical laws. So if physicalism is true, then physics is the "final" or "most general" science, and so all the "other" sciences (e.g., chemistry, biology, physiology, etc.), since the domains they describe are ultimately comprised of physical things bound by the laws of physics, should turn out to be just "special cases" of the more general laws of physics, in just the way that special relativity is a "special case" of general relativity. And so these sciences (or, the laws which comprise them) should all turn out to be consistent with and entailed by the laws of physics. The belief that this can (in principle) be carried out (or the program of trying to explain this) is known as "reductionism." So, is it true that, for example, chemistry can be *reduced* to physics? Can biology? Whatever difficulties may arise in these sorts of cases, things get dicey-er still when we get to psychology, as we then confront, in addition, all the myriad of philosophical issues connected with the "mind-body" problem. The difficulties in describing just what such a "reduction" (of the special sciences to physics) actually amounts to, is the subject matter of Fodor's essay. And he is none too optimistic about the prospects of success.

Fodor begins by looking at what, exactly, such a reduction of the laws of the special sciences to physics must mean. He considers a purported law in such a special science:

(1) $S_1x \rightarrow S_2y$

S_1 and S_2 are understood to be predicates in the science we wish to reduce to physics, and so what this formula says is that x having property S_1 brings it about that y has property S_2. Now if reductionism is correct, then whatever is a law in a special science must be a special case of a law in physics, so if the above is a law in some special science, S, it must then be reducible to some law in physics, such as,

(3) $P_1x \rightarrow P_2y$

where P_1 and P_2 are predicates in physics.

Of course, P_1 and P_2 can't be just any old predicates in physics: they must themselves, at the very least, be extensionally equivalent to (i.e., true of exactly the same things as) predicates S_1 and S_2 in the special science. And so, not only must the formula above be a law of physics, it must also be a law that

(2a) $S_1x \leftrightarrow P_1x$

and

(2b) $S_2y \leftrightarrow S_2y$.

That is, it must be a law that a thing has property S_1 (i.e., that it "satisfies" S_1) if and only if it also has (satisfies) P_1, and that a thing satisfies property S_2 if and only if it also satisfies property P_2. These latter two formulae Fodor calls "bridge laws," since they bridge the two sciences. They say that it is a law that something has a property of the special sciences when and only when it likewise has a given physical property.

The question then arises as to how we should understand $\leftrightarrow$. I said above that, at the very least, it must mean that the special science predicate S and its physics predicate counterpart P be extensionally equivalent, i.e., that they be true of all and only the same things. But this, Fodor says, is not strong enough. According to Fodor, formulae like $S_1x \leftrightarrow P_1x$ and $S_2y \leftrightarrow S_2y$ must be (contingent: I guess Fodor hasn't read Kripke!) identity statements. That is, they must say x's having property S_1 is *the very same thing (event)* as x's having P_1. If this were not the case, that is, if S_1 and P_1 are merely extensionally equivalent but not identical, it could be the case that S_1x and P_1x are different *events*. It could be that even though x having P_1 is a physical event, x having S_1 is a non-physical event. As Fodor claims:

> If bridge laws are not identity statements, then formulae like (2) claim at most that, by law, *x*'s satisfying of a P predicate and *x*'s satisfying of an S predicate are causally correlated. It follows from this that it is nomologically necessary [i.e., that it is a law] that S and P predicates apply to the same things …. But, of course, this is compatible with a non-physicalist ontology, since it is compatible with the possibility that *x*'s satisfying S should not itself be a physical event. On this interpretation, the truth of reductionism does *not* guarantee the generality of physics *vis-à-vis* the special sciences, since there are some events (satisfaction of S predicates) which fall in the domain of a special science (S), but not in the domain of physics…. The upshot would be a kind of psychophysical dualism of a non-Cartesian variety, a dualism of events and/or properties rather than substances. [p. 505]

O.K., there are a number of points in this that we need to explain. First, there is the claim that if $S_1x \leftrightarrow P_1x$ is not understood as an identity statement, then S_1x and P_1x might

constitute different events. Keep in mind that "*x*" here stands for the same entity in each S_1x and P_1x, so we are talking about one and the same thing satisfying an S predicate and satisfying a P predicate. Now, if $S_1x \leftrightarrow P_1x$ is not an identity statement but merely says S_1 and P_1 are extensionally equivalent, it is still possible that S_1 and P_1 are different properties that x might have, or, alternately, that x being S_1 and x being P_1 are different events.

Let's consider an example: Suppose that whenever someone thinks "Metaphysics is harder than I thought it would be!" they have a particular brain state, say, BS_1. Likewise, whenever they have BS_1 they are thinking "Metaphysics is harder ...." This scenario is possible even if, as the dualist believes, thinking "Metaphysics is hard" is not the same thing as being in BS_1. The (Cartesian, i.e., substance) dualist believes that it is *one* thing that does the thinking (i.e., the mind) and *another* thing that has BS_1 (i.e, the body), even though the two (distinct) events are universally correlated.

But, of course, we said that it was the *very same thing*, namely, *x*, that *does* the thinking and *has* the brain state. This implies a rejection of substance dualism, which claims that the mental substance (which has the thought) is not identical to the physical substance (that has the brain state). If *x* is the very same thing that has the thought and has the brain state, then there is only one substance involved here, contrary to what the substance dualist says.

This, however, still leaves open the possibility that the S property and the P property are *different properties*, but that happen to be nomologically related (i.e., it is law that we have the S property when and only when we have the P property). Using our example above, we might say that even though having the property of thinking "Metaphysics is hard" is a different property than being in BS_1, they are properties had by one and the same thing—me (or, my brain). This amounts to what in known as *property dualism*, i.e., that while there is only one fundamental kind (presumably physical) of substance, there are, nevertheless, two fundamentally different kinds of properties, physical properties and mental properties, which these (physical) substances might have. (And, since "a thing having a property" is an *event*, if there are two fundamentally distinct kinds of properties a thing might have, there are likewise two fundamentally distinct kinds of events it might occur in.)

On this view, even though all things are physical things, it is not the case that all properties are physical properties or that all events are physicals events. But this is contrary to what reductionism claims. Reductionism claims that, ultimately, all things are physical things, all properties (and events) are physical things (and events) and that all laws are physical laws. Consequently, if the bridge laws that we are considering are laws that allow us to reduce a special science to physics, then they must be understood as identity statements. It must be that the special science predicates and the physical predicates be *identical* and not merely extensionally equivalent. Anything short of this is inconsistent with the belief that physics is the ultimate science.

Fodor summaries these conclusions thus:

> Given these sorts of considerations, many philosophers have held bridge laws like formula (2) ought to be taken to express contingent event identities, so that one would read formula (2a) in some such fashion as 'every event which consists of *x*'s satifying S_1 is identical to some event

> which consists of *x*'s satisfying P_1 and vice versa'. On this reading, the truth of reductionism would entail that every event that falls under any scientific law is a physical event, thereby simultaneously expressing the ontological bias of reductionism and guaranteeing the generality of physics *vis-à-vis* the general sciences. [p. 505]

We are almost to the point where we can explicitly formulate Fodor's thesis, but we still need a bit more terminology. We need to compare reductionism (which we have just clarified) with "token-physicalism, type-physicalism, and materialism.

First, recall the distinction we made in our discussion of universals, between tokens and types. Consider, again,

A A

How many letters do we have here? Both "One" and "Two" are appropriate answers. There are two letter *tokens*, i.e., individual, spatiotemporally located marks, but only one letter *type*, i.e., capital "A." So we have, two tokens, but one type.

Contrast the above with:

A B

Here we have two tokens but also have two types. Now consider:

play

How many words do we have here? Clearly there is only one token, but this single group of letters has two different meanings—it spells out two different words, "something we do for fun" and "something we watch at a theatre." So, although we have but one word-*token*, we have two word-*types*. We this we can define these concepts:

Token physicalism: this is the view that all things (all particles and all events) are physical things (physical particles and physical events). As Fodor says, "… classical reductionism … entails the truth of what I shall call 'token physicalism'. Token physicalism is simply the claim that all the events that the sciences talk about are physical events." [pp. 505-506]

Token physical must be distinguished from:

Materialism: "Materialism claims *both* that token physicalism is true *and* that every event falls under the laws of some science or other." [p. 506] So, as far as reductionism is concerned, materialism entails token physicalism plus the claim that what we have called "bridge laws" are indeed scientific *laws*.

Finally, we have:

Type physicalism: This is the claim that not only are all tokens (all individuals) physical tokens, but all types (all properties) are physical types (are physical properties).

So, type physicalism is stronger than token physicalism: type physicalism implies token physicalism, but token physicalism does *not* imply type physicalism.

(Recall the example of "play" above. Here we have token-identity (one token) but type diversity (two types). So, token identity does not imply type identity. Hence, token physicalism does not imply type physicalism.)

Back to Fodor:

> It will be one of my morals that reductionism cannot be inferred from the assumption that token physicalism is true. Reductionism is a sufficient, but not a necessary, condition for token physicalism. [p. 506]

What he is saying here is that reductionism requires not only that all individual things are physical things (i.e., token physicalism), but that all properties and laws are physical properties and laws (type-physicalism). His view is that type-physicalism is too strong, or, at least, that it is inconsistent with our understanding of the way the sciences actually work. So, he will reject reductionism in its classical form (the form in which we have been considering it). But he also claims that we don't *need* reductionism in order to understand the "unity of science." For that, we need only token, not type physicalism:

> I now want to argue that reductionism is too strong a constraint upon the unity of sciences, but that, for any reasonable purposes, the weaker doctrine will do. [p, 506]

O.K., enough for today. That gives us the problem and Fodor's thesis. Next time we will look at his defense of this thesis.