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Flat Physicalism: Some Implications

1. Flat Physicalism

Consider a token event according to a consistent disjunction of some theories of fundamental physics.[1] For example, think of a particular event in which the fundamental physical structure of the entire universe is such that certain particles (in the sense of these theories) exist and interact (in the sense of these theories) in a particular way.[2] By the name "flat physicalism" I call the idea that where this token obtains, it is everything that there is.[3] In this section I provide a quick introduction of the idea, and in the next sections I describe some of its implications.

Suppose that the event just mentioned is one in which, using more mundane vocabulary, a particular piece of cork floats in a particular glass of

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[1] Since major theories of contemporary physics are inconsistent with each other (e.g., quantum mechanics and the general theory of relativity, in certain circumstances), and since some of their predictions seem to be empirically inadequate (for example, with astronomical observations), and since there also seems to be some incompleteness (since there is no accepted solution for the measurement problem in quantum mechanics), it is hard to say what fundamental physics is and what is the world picture it presents. A major project in contemporary physics and philosophy is to solve these problems. For instance, to solve the above consistency problem physicists work on developing theories that (when completed will) go by the names of quantum gravity and string theory. Part of this problem is often described in terms of Hempel's Dilemma, which I do not address here. For a description of this problem and some attempts to solve it, see Ney (2008).

[2] The terms "particles" and "interactions" in contemporary physics are not the intuitive ones, and it is of course not guaranteed that any of these concepts will survive in future physics. Everything I say below is compatible with this caveat in mind.

[3] For an overview of various meanings attached to the term "physicalism" in contemporary literature, consult Stoljar (2016).

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water. In flat physicalism, introducing this vocabulary adds nothing to the intended ontology. The meaning and significance of this last statement will become clear as we proceed.

Now focus your attention on an aspect of this particular token, given by some partial description of it. This aspect exists as part of the particular token (together, of course, with its other aspects).[4] In general, there may be other (counterfactual) tokens that share this aspect. The set of tokens that share this aspect, namely, all the tokens that form an equivalence set relative to it, forms a *type*. When we say that a certain token belongs to a certain type, all we do is provide a partial description of that token, pertaining to one of its aspects; we refer to the aspect of the *particular* token, and not to the set of counterfactual tokens that share this aspect. However there is, of course, theoretical advantage in talking about such sets of counterfactual tokens, since it enables us to discuss regularities and deduce predictions from them.[5]

For example, the term "floating cork" is the *name* of an aspect of the token alluded to above; this aspect is given by a partial description of that token. There are many counterfactual tokens that share this aspect: some of them may obtain at other moments, and some may never obtain. These counterfactual tokens differ in the details of the field excitations described by quantum field theory, but are identical to each other with respect to certain aspects of those field excitations (given by partial descriptions of these field excitations) and – according to flat physicalism, as I propose it here – the name of these shared aspects is "floating cork." Since in flat physicalism, when a token obtains, it is everything that there is, this is the only sort of types that can be.

[4] Portides (2017) uses a similar idea when he argues that a key element in the construction of scientific models is the *extraction* of relevant features of the system or process to be modeled, or *selective attention* to its features, rather than the substraction or change of features (as abstraction and idealization, respectively, are often understood). For more on "aspects" as given by partial descriptions in the special sciences, see Hemmo and Shenker (2015).

[5] Ben Menahem (2001) argues that when focusing on different aspects of the same system, different regularities may appear; see discussion in Shenker (2014). This is indeed the case in statistical mechanics, where the focus on partial features of the mechanical microstate of a system (sometimes called "macrovariables" in that context) reveals the thermodynamic regularities, including the time asymmetric approach to equilibrium; see Hemmo and Shenker (2012, 2016), Shenker (2017a, 2017b).

According to flat physicalism, when an observer (like us) interacts with an observed system that has this aspect, the observer's sense organs, due to their physical making, interact with that aspect (and not with other aspects of that token), creating a physical signal that is transferred to (say) the observer's brain, which then comes to have its own physical state, in which the observer has a mental state called "experiencing a floating cork." (More details below.) To the extent that there can be a physicalist account of intentionality (I think there can be, but I do not address this here), the reference of statements like "here is a floating cork" is the particular aspect of the particular token that obtains (or of a sequence of tokens that share this aspect during the observation) and with which the observer interacts. In this sense, in flat physicalism, a case of "floating cork" *is* a case of a particular aspect of a particular token (in the literature sometimes the phrase "is identical with" is preferred to "is," but I prefer the latter for reasons that I shall not discuss here).

2. A Flat-Physicalist Account of the Special Sciences

As I said above, according to flat physicalism using the terminology "floating cork" adds nothing to the ontology: it only denotes an aspect of a token that is given by its partial description, and that can be shared by other tokens. Here is the general account, in this picture, of the types that appear in the special sciences.[6] Consider three tokens in the above sense, call them A, B, and C, such that A and B are both instances of the kind P in some special science, but C isn't. In flat physicalism this means that tokens A and B share a physical aspect, and this aspect is (identical with) the special science kind P; and C does not have this aspect. Let me emphasize: the physical aspect that A and B share does not merely give rise to the special science kind P: rather, it just *is* the special science kind P.

When I am saying that this is the flat-physicalist account of special sciences kinds I am not saying that we know which are the (shared) physical aspects that are identical with those kinds. Of course, we do not know that: the world is complex and science is young. But, what I'm saying is that the kinds couldn't be anything else, because there isn't anything else. There are

[6] For a detailed analysis of some cases of special sciences types that are interesting and relevant for our context, see Polger and Shapiro (2016).

only tokens, and aspect of tokens given by their partial description. This is what I mean by flat physicalism about the special sciences.

Notice that in flat physicalism there are no levels of reality, not even level structures defined locally relative to a given mechanism: instead of high level and low level, what we have are different aspects, given by different descriptions, of the state of the universe; that is, they are all at the same level. Perhaps some of these descriptions are more coarse-grained and others are more fine grained descriptions of it (up to the precise full description of the token), but there needn't be a full ordering relation between the sets of tokens that make up the kinds. And if there is only one level of reality and of description, there is no room, and no need, for discussing inter-level relations.[7] Notions such as realization, grounding, constitution, and the like, ought (in this picture) to be understood as convenient ways of talking about either synchronous relations between different aspects of the single token (at each moment), or diachronous relations between aspects of different tokens (at different moments), such as causal relations (employing some appropriate concept of causation).

In flat physicalism a kind that is discussed by a special science (P in the above discussion) is nothing but an aspect of the physical fundamental state of the universe (an aspect of the microstates A and B above). Therefore, once the right physical aspect is identified, there is nothing more to say or explain concerning the special science kind: the very identification of the physical aspect of the state of the universe, which just is the special science kind, is its full explanation. What remains to be described is the structural and causal relations between the kinds, that is, between the various aspects of the token; and those are fully described by the fundamental theories of physics. Papineau (1993, 180–181) makes a similar point:

Consider this parable. Suppose that there are two groups of historians, one of which studies the famous American writer Mark Twain, while the other studies his less well-known contemporary, Samuel Clemens. The two groups have heard of each other, but their paths have tended not to cross. Then one year they both hold symposia at the American Historical Association, and late one night in the bar of the Chicago Sheraton the penny drops, and they realize they have both been studying the same person. At this stage

[7] See Shenker (2017b) on the argument of Bechtel (2017), who offers a critical discussion of causation in the levels picture that forms part of mechanistic explanations.

there are plenty of questions they might ask. Why did this person go under two names? Why did it take us so long to realize Mark Twain and Samuel Clemens were the same person? But it doesn't make sense for them to ask: why were Mark Twain and Samuel Clemens the same person? If they were, they were, and there's an end on it.[8]

Returning to the floating cork example, in this picture the cork is nothing but an assembly of particles that interact in a certain way as described by physics, and so are the water and the glass: they are nothing but aspects of the state of the world as described by the fundamental theories of physics. Both their constituents and the relations between those constituents are fully described by the physical theories, and no room is left for some further "metaphysical" elements (as for example in versions of "grounding" or "realization").[9] "Floating" is a certain kind of physical interaction between certain kinds of physical particles. Nothing more. In this sense one might aptly say that "atoms float."[10]

Here is an example of how this identity theory is applied in contemporary physics. According to each and every physical theory (such as classical mechanics or non-relativistic quantum mechanics) the world at any given time[11] is in a well-defined state that is describable in terms of that theory, and the theory takes it to be the complete and exhaustive state of the world. The instantaneous complete state according to a given theory is called a 'microscopic state' or 'microstate'. (In other contexts the term 'microscopic' sometimes means small, or part of a whole, but in physics the term 'microstate' denotes the complete state of the system.)

Prima facie, describing the universe in terms of its physical microstate seems not to capture properties that have central roles in biology or in psychology. Something seems to be *missing* here. However, if the physical microstate is complete, and if everything (according to flat physicalism) is physical, the only way to be informative and non-repetitive, is to say *less*, *not more* (in the slogan "less, not more" flat physicalism radically differs from non-reductive approaches like realization and grounding, all of which *add*

[8] I am grateful to Professor David Papineau for a stimulating discussion of this point.

[9] See Chang (2012, 2017).

[10] The challenge of this intriguing phrase was presented by Ken Aizawa in a discussion.

[11] The phrase "given time" calls for relativistic refinement, which I do not undertake here.

something to the complete microstate, as I show below.) Instead of describing the full physical microstate we have to focus on a partial description of it, of an aspect of it. The notion of so-called *high level* properties is explained as being merely a partial description: not an additional high level fact ("more"), but a partial description ("less").

Identity statements such as "heat is the motion of molecules" (Kripke 1980), which appear for example in the special science of thermodynamics,[12] are explained along these lines. The complete classical mechanical microstate of a system is the complete list of all the positions and velocities of its particles, but the temperature of an ideal gas in equilibrium is identified with the average kinetic energy of the particles of the gas, which is an aspect of the complete microstate, given by a very partial description of it.[13] In the jargon of physics, an aspect of the microstate is called a macrovariable. So the macrovariable of partial kinetic energy is temperature (in an ideal gas in equilibrium): it is not merely associated with temperature, it doesn't give rise to temperature, it doesn't ground temperature, and it doesn't realize temperature: it just *is* temperature. If A, B, and C are events (pertaining, say, to a sample of an ideal gas in equilibrium) such that A and B share the same temperature but C doesn't, then in cases A and B the microstates of the system of interest have the same average kinetic energy, and in case C the microstate does not have it.[14]

3. Multiple Realization in the Special Sciences (Except Psychology)

The case of temperature in an ideal gas in equilibrium illustrates one sort of special sciences kinds according to flat physicalism. Special sciences kinds of that sort are reducible to physical kinds, where physical kinds are

[12] Although thermodynamics is considered a theory of physics, it is not a fundamental theory, and has the status of a special science. It is a non-trivial achievement that (unlike other special sciences like biology), the physical aspects (macrovariables) that are the thermodynamic properties have been identified and their regularities described, in statistical mechanics (see Shenker 2017a, b).

[13] On the way in which thermodynamic quantities are associated with mechanical ones, see Shenker (2017a).

[14] All the mechanical magnitudes properly associated with "temperature," in all materials and conditions, share a macrovariable, either in the way described so far or in the way described below. I do not go into the details here.

understood in terms of aspects (or macrovariables) as explained above. But there is another sort of special sciences kinds that we need to look into. Special sciences kinds of this sort are sometimes seen as irreducible to physical kinds. If the world is taken to be fundamentally physical, then special sciences kinds of this latter sort are (on this view) seen as "*multiply realized*" by physical kinds. In this section I examine what this notion of multiple realization can mean, and how the impression that it obtains in some cases can arise, within a flat physicalist approach.

Suppose that A, B, and C are token states: for example, they can be three possible microstates of some system S, such that (as before) A and B are cases of the special science kind P but C isn't.[15] But this time (unlike the case discussed in the previous section) suppose that tokens A and B do not share *any* relevant physical aspect, despite being two instances of the special science kind P: we shall say that A and B are physically *heterogeneous* relative to P.

Two remarks concerning the above characterization are important. First: By insisting that A and B are heterogeneous – that is, that they do not share *any* relevant physical aspect – I mean that in order to account for the fact that A and B are P but C isn't one cannot appeal to some "similarity" between A and B (but not C), since "similarity" means that there are aspects, possibly coarse grained properties, in which A and B are *identical*, and this takes us back to the case discussed in the previous section. The result is that C – which is not a case of P – is as physically different from A and B relative to P, as A and B are from each other relative to P.

Second: Perhaps mathematically *any* two token microstates share *some* aspect. In this case we shall suppose that none of these aspects, shared by A and B, is the property P. Unless we make this assumption all the special sciences kinds are reducible to physical kinds in the way presented in the previous section, and there are no cases of multiple realization. This may well be the case, but since I want to discuss possible meanings of the notion of multiple realization I do not want to start with this conclusion.

There is only one physical account of the case where A and B appear to share a property P despite being physically heterogeneous, and it is this. In addition to the system S, of which A and B are microstates, there is another

[15] A, B, and C can also be the microstates of several systems S1, S2, etc., but hereafter I ignore this case, for simplicity. It is easy to generalize the argument below for this case.

system, call it M, such that when S is (or starts out) in states A or B, M is (or ends up) in states K or L, and the states K or L share the physical aspect P. There are different versions of this case: It may be that S interacts with M in such a way that if S starts out in states A or B then, following these interactions, system M reaches microstates K or L (respectively) that share the physical aspect P. Alternatively, some common cause may be in action. All these options are acceptable, as long as they are describable in physical terminology. (In particular I do not want to be committed to any notion of causation or law.) On this picture one might say that A and B *share the physical fact* that when S is (or starts out) in microstates A or B, M is (or ends up) in a microstate with aspect P. This fact is not a physical aspect of the microstates A and B in and of themselves, but is a physical aspect of the entire relevant physical scenario that includes S, M, their microstates (A and B of S and K and L of M) and their interactions. (Therefore P may be seen as a "contextual property.")[16] And so this case is reducible to physics: there is an account of what is going on here in physical terms.

To say that this is a case of "multiple realization of the kind P by physical kinds" is to interpret the fact that the microstates K and L of system M share the aspect P, as indicating that the (physically heterogeneous) microstates A and B of system S share a property, also called P (let's call it for a second P', to avoid confusion). Importantly, this property P' (of A and B) is *not* the abovementioned "causal power" (or something like that) to bring it about that M will have property P. Were the property P' (shared by A and B) such a "causal power," the conclusion would be that A and B *share* a physical property, and therefore are not physically heterogeneous after all; but if P' would be a physical property shared by A and B, we would not have a case of multiple realization of a "non-physical" kind by a "physical" kind.

Such an interpretation is tempting and natural, especially where the system M is us, (human) observers. For suppose that our brain M is in microstates K or L that share the aspect P, whenever (we know that) A or B (respectively) obtain. (I address multiple realization in psychology in the next section.) It is natural to jump to the conclusion that the explanation of this shared experience is a shared property of the "observed" states A and B. But natural as it may be, this interpretation is neither analytic, nor entailed by physics:

[16] In quantum mechanics contextuality may have a different meaning and different implications, depending on the interpretation.

the case where it may obtain was addressed in the previous section, in which case A and B did share a physical aspect. Here, however, we address a case where it does *not* obtain, since A and B are heterogeneous. This natural (and in this case mistaken) interpretation leads to the further mistaken conclusion that, since A and B are physically heterogeneous, the property that they (seemingly!) share must be non-physical. It is here that the unfortunate talk about "brute facts" and mysterious "irreducible" properties enters the picture (e.g., Fodor 1974, 1997; Putnam 1967; I address Davidson 1970 in more detail below).

To opt for the non-reductive line of thinking is to choose the interpretation that whenever we (as M) have the same experience (of P) then A and B *must* also share a property (P' above). And in this line of thinking one is committed to the conclusion that the (alleged) non-physical facts, that (supposedly) make tokens A and B cases of the same kind, must obtain *in each and every token*. When, for example, token A obtains (and token B does not obtain) we experience the particular token A (since this is everything that obtains in that case),[17] and we experience *it* as having the property P, and we predict the evolution of that particular token on the basis of this particular fact. And so this is a case of *token dualism*. This dualism is not only about kinds, and is not only about sets, but is a fact about each and every individual token. Whether it is property dualism or substance dualism doesn't matter here.

Tom Polger and Larry Shapiro, in their recent (2016) *The Multiple Realization Book,* argue that whether or not multiple realization holds in our world is a question of fact. I agree with them (though not with all the details of their argument). But if multiple realization holds in our world then dualism holds as well. And this if–then conclusion is not empirical, but analytical.

Calling a position dualism is not pejorative. I use this term to denote every position according to which there are things beyond those postulated by physics. Dualism may be a coherent position, and in this sense it is a serious candidate for being true of the world (I do not endorse it, for reasons that I do not address here). By contrast, the idea of *non-reductive physicalism* is, as we saw, conceptually incoherent. It is, therefore, not a candidate for being true of the world. (It is therefore no wonder that closely examined cases turn out to be ones of identity, not of multiple realization; see examples in

[17] When A obtains (and B does not obtain) we ascribe the property P to A, not to {A or B}, especially if the sets in question are open, as Fodor (1997) emphasizes.

Polger and Shapiro 2016. Although I do not endorse their notion of multiple realization, their case analyses are useful.)

Remark on functionalism: it is often said that the fact that makes A and B, for instance, cases of P despite their being physically heterogeneous is that they are, or are part of, a "function." I will not address this line of thinking here, except making the following comment. If the "function" P that is common to A and B is physical, then it is a physical fact that is shared by A and B, and there is no multiple realization. If the "function" P is not physical, then this is a case of dualism, in the above (non-pejorative) sense. This holds also for the case addressed in the next section.

4. The Case of Psychology

An interesting consequence of the understanding gained so far is that the special science of psychology is very different from the other special sciences like biology. And the difference has nothing to do with the so-called hard problem or even with the so-called explanatory gap, since the unique nature of psychology appears even within the framework of flat physicalism, that is, even if we accept that each and every token is completely physical.

And the difference is this. In both biology and psychology, if tokens A and B of system S belong to type P (but C doesn't), this can be the result of their sharing an aspect P (that C doesn't share with them). But while in special sciences like biology or thermodynamics, a type can also be the result of another system M having aspect P following its interaction with A or B (but not C), this route is not open for psychological types. Here is why. In psychology A and B are already tokens of the observer M. If they share the aspect P, then they are not multiply realized; but if they do not share it, then bringing in another device M' that will measure them and end up having aspect P means bringing in another observer (an observer M' of the observer M), which is the beginning of a possible regress. The regress can be stopped only by conceding that the very last observer in this chain arrives at two microstates (following its indirect interactions with A and B) that share the aspect P; so in principle we could make this concession already with the first observer, M. M' (and the other observers of observers) can be seen as cases of the *homunculus fallacy*. Since the homunculus brings with it an infinite regress, it is unhelpful, and so we reject this option. And so there are only one physicalist account for the fact that tokens A and B are both of the same psychological kind P: they must share the physical aspect P. Consequently, whereas there is a flat-physicalist account of apparent (though not genuine) multiple realization in biology, and other special sciences, this option is not available in psychology. There, appearance of multiple realization *must*, as a matter of principle, be an indication of a mistake or of an unfinished research or, alternatively, of implicit token dualism.

To emphasize this point suppose that we encounter another token D for the first time, and see that it is of the psychological kind P. For example, suppose that the world, including my brain, is in some physical token state in which my brain is in the token state D, and that I'm in pain (of a particular sort), which is the mental kind P. And suppose that D does not share any (relevant) physical aspect with tokens A and B that can be identified with this mental state: A, B, and D are heterogeneous with respect to P, so that D is as different (relative to P) from A and from B as it is from C (which is not P). In this sense the fact that makes D a case of P cannot be in the physics of D. Since P is a mental type, there is no external system – no homunculus – outside the physical tokens which unifies them under the type P. So in case D (in which, recall, I feel pain), the only thing that makes it the case that my mental state is of kind P is a "brute" non-physical fact. And so this is a case of *token dualism*. (This is the case whether, in order to be in the mental state P, I interact with this non-physical fact, or I am that non-physical fact.) Again, dualism is not a pejorative term, but one must be clear about one's ontological commitments.

5. *Anomaly of the Mental Is Compatible with Reductive Type-Physicalism*

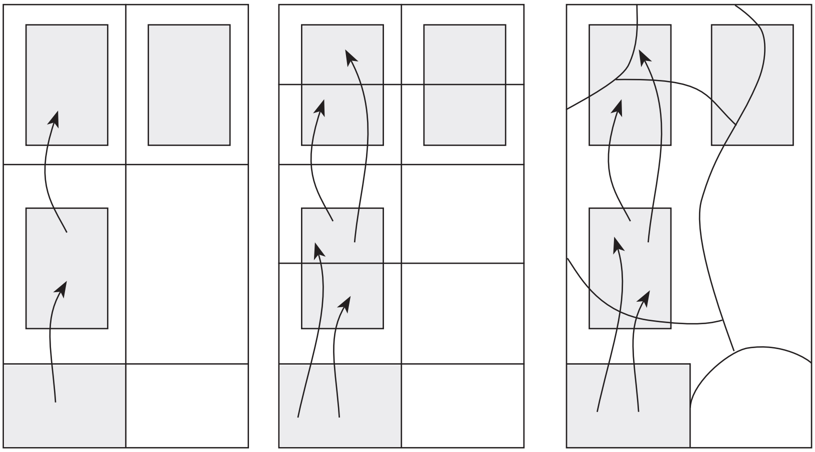
By way of summing up let me illustrate the strength and flexibility of flat physicalism. Davidson (1970) famously claimed that the mental is anomalous, and since the physical is subject to strict laws, he had to free the mental from the physical by giving up the requirement that the mental should supervene on the physical. Kim (1992) pointed out to Davidson that this is a problematic move, and Davidson (1993) made a slight concession by endorsing weak supervenience. I do not know if indeed the mental is anomalous. This is a question of fact. But what I want to show is that even if it is, Davidson didn't have to give up supervenience. He could account for the anomaly of the mental within type identity physicalism, in the framework of flat physicalism. (Davidson was not a physicalist: he took himself, and many take him, to be a monist. I think that his views concerning what "physical" and "mental" are, namely (roughly), alternative ways of descriptions of events, or of partitioning events into sets, are incompatible with monism, and Davidson is therefore an implicit *substance dualist*. I argue for this in Shenker (2014). But here I wish to show how the very idea of anomaly of the mental is compatible with flat physicalism, and so this is not intended to be made a part of Davidson's general ontological framework.)

Accounting for the possibility of anomalous mental kinds in a type-physicalist framework like flat physicalism requires some technicalities. I will not go into them, and just outline the idea, using some jargon of physics (for more details on this jargon consult Hemmo and Shenker 2016 and Shenker 2017a). Consider the figure presented below, which depicts three cases of the state space of a system (or of the universe), in which each point represents the system's microstate. I begin with the feature common to the three cases, and then discuss the differences between them.

In all the three cases, the system is prepared (or the universe starts out) in a microstate that belongs to the set of microstates at the bottom left, that is, in a microstate that has the aspect shared by all the microstates in that set (this is how we prepare systems for experiments, in the most general sense of the term). Due to the strict laws of physics,[18] each microstate in that initial bottom left set evolves, after some time Δt1, to a microstate in the next grey rectangle, and then after another interval Δt2 to another microstate in the next set, and so forth, as illustrated with the arrows in the figure. (The sequence of grey rectangles in the figure are the Poincaré sections of the bundle of trajectories of the time evolution of that initial set of microstates, at several points of time.) In all three cases the dynamics is the same: every given microstate evolves in the same way, and therefore if all we know is that the microstate is a member of the bottom left set at the initial time, and follow all the counterfactual microstates in that set, then the evolution of the sets is identical in the three cases.

Now the differences between the three cases. In each of the three cases the microstates in the state space are partitioned into sets in a different way. In each set, in each of the three cases, the microstates share an aspect, and each of the three cases corresponds to different aspects of the microstates. In each such set the microstates form an equivalence set relative to a given aspect,

[18] The case of probabilistic laws is essentially the same, only more complicated.



and are indistinguishable relative to a partial description that pertains to that aspect. For convenience of exposition, all three cases share the same bottom left set, but differ in all other sets.

Let us now combine the partitions and the dynamics. In the first case, there is a nice harmony between the evolution of the system and the partition according to aspect: every (grey) set, to which the initial set evolves according to the dynamics, is completely contained within a set that shares an aspect of interest. Therefore the evolution of the system, when described in terms of these aspects, appears regular and even deterministic. In the second case, the partition is finer, into smaller sets, and at the level of the aspects the evolution appears to satisfy a probabilistic law. In the third case there is no harmony at all between the evolution and the partition, and in the long run we may not see any regularity at all in the evolution of the aspects. This case appears to be anomalous. The mental macrovariables could be of this kind. This is how even the anomaly of the mental can be given a reductive type-identity physicalist account. Alluding to Davidson, we might call this *anomalous flat physicalism*. Once again, which of the three cases best describes the mental regularities (or lack thereof) is a matter of fact, to be discovered scientifically.[19]

[19] Of course, in saying this I reject the idea that the mental *has* to be anomalous since, for example, it is subject to norms such as rationality. But I do not expand on this here.

The above account of the case of anomaly of the mental shows that in the type identity theory presented here, flat physicalism, there is an important sense in which the special sciences are autonomous. They are autonomous in that they discover, *which* are the aspects of the physical tokens that are significant and interesting and that exhibit regularity. Had we been Laplacean demons, had we known the complete microstate of the universe, we could derive the special sciences kinds and laws. But the complexity of the universe is such that this is not possible, and it is reasonable to guess that it will remain so, and so we can only access these significant aspects via their appearance in the special sciences. At the same time we must realize that at bottom these special sciences types are nothing but aspects of the fundamental physical structure of the world. The special sciences are, fundamentally, branches of physics. This is the only coherent physicalist approach: any attempt to salvage the autonomy of the special sciences by opting for non-reductivism is either a form of token dualism or simply incoherent.

6. Conclusion

Whether or not multiple realization holds in our universe, and in particular with respect to mental types, is a question of fact. But if there is genuine psycho-physical multiple realization, then there is genuine psycho-physical dualism: and this conclusion is analytical and not empirical. Many have hoped to escape this conclusion by way of the so-called non-reductive physicalism, but what I have shown here is that this is not an option.

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