

CHAPTER 3

A LAYERED WORLD

3.1. LEVELS OF ORGANIZATION

Let us now see in more detail how the world looks from a physicalistic point of view. By far the most popular elaboration of physicalism is the layered-world view. Kim (1998a, 15-6) lucidly describes this view as

the familiar multilayered model that views the world as stratified into different “levels”, “orders”, or “tiers” organized into a hierarchical structure. The bottom level is usually thought to consist of elementary particles, or whatever our best physics is going to tell us are the basic bits of matter out of which all material things are composed. As we go up the ladder, we successively encounter atoms, molecules, cells, larger living organisms, and so on. The ordering relation that generates the hierarchical structure is the mereological (part-whole) relation (...). It is part of this layered picture that at each level there are properties, activities, and functions that make their first appearance, or “emerge,” at that level (...). Sometimes the layered model is couched in terms of concepts and languages rather than entities and their properties. Talk of levels of *organization*, *description* or *languages*, of *analysis*, of *explanation*, and the like is encountered everywhere—it has thoroughly permeated primary scientific literature in many fields (...) as well as philosophical writings about science.

According to this model, nature is such that apart from lawful regularities governing micro-entities (such as quarks and neutrinos), there are *other* regularities and patterns on different, relative macro-scales (such as that of cells or organisms). The vocabulary of ‘levels’ is metaphorical in its distinction between ‘high’ and ‘low,’ but the metaphor is harmless as long as we realize that lower-level corresponds with less complex, while higher-level with more complex (I skip the question of how we are supposed to measure complexity). Note that higher-level and lower-level is *not* just a matter of micro and macro, or mere scale: stars, for instance, are lower-level compared to bacteria, because they lack the complex kind of organization of the latter.²⁸

Also, the term ‘levels’ suggests a world built from multiple domains, one ‘on top of’ the other. But something can only be on top of something else when it is distinct from what it is on top of: something cannot be on top of

²⁸ In this context, see Kim’s own criticism of the layered model (2002).

itself. Therefore, given the account of physicalism that avails itself of the free lunch principle, we should beware of taking the term ‘levels’ too literally.

Note also that there is no suggestion that there is always a crisp distinction between the levels (should we locate a bee colony on the level of organisms or societies?), or that they have to be causally insulated from each other. True, the doctrine of causal closure precludes ‘downward causation,’ the perturbation of causal processes on the physical and, presumably, lower levels in general, by higher-level processes. But organisms, for instance, do interact with photons, chemicals, viruses, tables and chairs and societies just as well as with other organisms. So the hierarchy of the layered model is by no means very strict.

There are various accounts of the relations between different levels in this layered-world picture. We have already encountered the notion of supervenience, but we will also have a look at, in turn, emergence, upward causation, and type identity. I will argue that none of these is any good in spelling out physicalism, and that ‘physical realization’ is the only appropriate term in this context. My argument against type identity theory will consist of a discussion of, in turn, the phenomenon of multiple realizability, and the physical realization of relational states of affairs.

A position that I will not discuss in this chapter is token physicalism. In general, token physicalism is just the assertion of token identity of particulars of all types with physical particulars. In that sense I have earlier declared myself a token physicalist. In the philosophy of causality and of mind, however, token physicalism is also the claim that *events* or *states* of all types are token identical with physical events or states; especially mental events and states. This claim is far less innocent than the former one, and I will later on argue that token physicalism in this sense is seriously misguided.

3.2. EMERGENCE

As Kim (1993c) points out, the notion of emergence, developed by Broad, Morgan and Alexander in the first half of the 20th century,²⁹ is similar to our contemporary notion of supervenience in various respects. The emergentists held, against vitalism and Cartesianism, that life and mind were not separate factors, or entities, that were added to physical reality in the way of vital

²⁹ For a good introduction to the work of these British emergentists, as well as their relevance to contemporary philosophy of mind, see Beckermann, Flohr and Kim 1992.

spirits or Cartesian minds, but that they somehow arose out of complex configurations of matter alone.

Yet, being nonreductionists, they also held that life and mind were *more than* mere physical phenomena. In their view, emergent phenomena were 'unpredictable,' or 'new' relative to the physical phenomena that gave rise to them. Also, emergent phenomena were said to bring along their own causal powers. Sometimes emergence was seen as a diachronic process (such as the emergence of consciousness in the course of evolution); but it was also seen as something synchronous, just like supervenience.

There are various problems with emergentism in this classical form. First, the fact that emergent properties are 'unpredictable' might mean that emergence is a matter of ignorance on our part, which disqualifies it as a relation with metaphysical significance (see Stephan 1992). But if 'unpredictable' means that properties do not emerge as a matter of necessity, law, or regularity, emergentism can no longer be regarded as an account of higher-lower level dependence. In both cases the concept of emergence seems of little metaphysical use.

Secondly, the doctrine of new causal powers can easily be interpreted as entailing downward causation, i.e., violation of causal closure. Finally, the term 'emergence' seems more descriptive than explanatory. This is perhaps not a criticism that we should level at the classic emergentists: these philosophers were interested in articulating a middle way between materialism and various forms of dualism, not in explaining the fact of emergence itself. But in the present context this *is* what we want an account of. And here we see that the concept of emergence is in the same boat with that of supervenience: it is explanandum rather than explanans.

It is true that the concept of emergence is quite popular among contemporary authors. But these tend to apply it in a metaphysically innocuous sense. Searle, for instance, regards liquidity as an emergent property (see below) while at the same time holding that it can be fully explained in physical terms. Indeed, most contemporary authors who use the term seem to have dropped the element of essential unpredictability. Looijen (1998) sees no conflict at all between emergence and reducibility, and an author like Holland (1998) even attempts to mathematize the concept.

Emergence is also a phenomenon actively pursued by cognitive scientists and roboticists: the concept plays an important role in debates on artificial life.³⁰ But here, emergence seems to be mainly a methodological concept, not a metaphysical one. This can be appreciated when we realize that the concept only makes sense in a framework that already takes physical realization for granted. If a property is said to be emergent, this is a matter of how

³⁰ See, for instance, Boden 1996.



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