The Alleged Supervenience of Everything on Microphysics

Abstract. Here is a view at least much like Lewis’s “Humean supervenience,” and in any case highly influential—in that some endorse it, and many more worry that it is true. All truths about the world are fixed by the pattern of instantiation, by individual points in space-time, of the “perfectly natural properties” posited by end-of-inquiry physics. In part, this view denies independent variability: the world could not have been different from how it actually is, in the ways depicted by common sense and the special sciences, without differing in the punctiform instantiation of fundamental physical properties. In part, it makes an ontological claim: what it is for one of the objects recognized by common sense or special sciences to be there in the world, bearing the properties attributed by a true description, is “nothing over and above” the obtaining of fundamental physical properties at points, and fundamental physical relations among points. I argue that this view is untenable. I concede that for every true claim in familiar discourses, there is a state of affairs at the level of fundamental microphysics that is the truth-maker—some state of affairs sufficient for truth in the familiar claim. The problem is that the view needs to posit not just truth-makers at the level of microphysics, but truth-conditions—states of affairs the obtaining of which is required for truth in any familiar claim, and the failure of which renders the familiar claim false. That is, the view must posit necessary conditions, at the level of microparticles, for truth in familiar claims. This it cannot plausibly do.

David Lewis’s famous doctrine of Humean supervenience is many-faceted. In this paper I will look at just a single facet, and will look from just one particular point of view. Thus narrowly focused, Humean supervenience is, I shall argue, untenable. There are more things in heaven and earth, my dear Horatio, than are dreamt of in David Lewis’s philosophy. That, at least, will be the verdict at which this short paper gestures.

One aspect of Humean supervenience is the primacy of the local. All truths about the world, Lewis holds, are fixed by “the vast mosaic of local matters of particular fact” (Lewis 1986, p. ix). This aspect of the doctrine is, of course, controversial in its own right. What about negative existentials? Can such a view really capture the nomic force of laws of nature?

Another aspect—and the one on which I shall focus—concerns the nature of these “local matters of particular fact”. Lewis holds that ultimately, all truths supervene on the instantiation by individual
points in spacetime of the “perfectly natural” properties recognized by fundamental physics (Lewis 1994, e.g. at p. 474). I shall make the assumption that the crucial role assigned here to individual points in spacetime is not a matter of Lewis presuming to tell theoretical physics what the bearers are, of the perfectly natural properties that it will eventually recognize, but instead a gesture of deference to theoretical physics: Lewis is supposing, I shall assume, that given the current state of physics, the best prediction is that a perfected physics will posit points in spacetime as the bearers of the properties that it recognizes. On this assumption, if physics should end up saying that the fundamental properties are properties of quarks or of strings, then it will be, for Lewis, “local matters of particular fact” featuring quarks or strings that form the ultimate supervenience base (cf. Lewis 1994, p. 474, on instantiation of fundamental properties by point-tuples). Lewis did after all distinguish the philosophical defensibility of the claim that the fundamental properties are instantiated by spacetime points from the question whether that claim amounted to defensible physics (1994, p. 474); and it seems likely that the actual, historical Lewis thought that the best theory had to be defensible in both ways. In any case it is the broader view that has achieved resonance with a range of philosophers (e.g. Horgan and Potrč 2007, p. 171; Heil 2003, Ch. 5)—the view that all the truths about the world are fixed by the particular matters of fact, whatever in detail they may turn out to be like, that are recognized by a perfected fundamental physics.

I shall, as I say, be viewing this one aspect of Humean supervenience—the nature of the basic “particular matters of fact”—from just one the particular point of view. I shall be viewing it as a claim that has ontological significance. Any claim of supervenience, ontological or not, asserts that the facts about Xs fix all the truths about Ys (or about Ys and As and Bs, etc.). But so far forth, the claim of supervenience is compatible with the position that Ys are ontologically just as fundamental and self-standing as Xs are, and that the truths about Ys track the facts about Xs because of substantive laws of nature. Consider, for example, a scientifically-minded dualist about the mind. Such a philosopher might hold that all the truths about what mental states a given person lives through are fixed by the facts about physical states of that person’s brain or of components of that person’s brain. The mental cannot vary independently of the physical, for this sort of dualist; different mental states could have been experienced
only if different physical states had characterized elements in the brain. But the reason why there is no independent variability on the part of the mental states, for this sort of dualist, lies in the obtaining of substantive psycho-physical laws, which are as much an element of reality as are physical states or mental states themselves. There are mental states; there are physical states in the brain; and there are psycho-physical laws that tie the former to the latter.

Quite often, however, claims of supervenience are understood as having ontological significance. This happens when the claim of supervenience incorporates not just an assertion that the truths about Ys cannot vary independently of variations in the facts featuring Xs, but also a distinctive explanation of why such independent variation cannot occur (Heil 1998, p. 146; Horgan 1993, §8; cf. Kim 1998, p. 13). This explanation is that the truths about Ys are “nothing over and above” the facts about Xs. What it is for a Y to be there in the world, according to this explanation, having one or another of the characteristic properties that the truths about Ys attribute, is “nothing but” the possession by certain Xs of certain ones of their characteristic properties and relations. It might be far beyond our intellectual powers to re-express the truths about Ys as the facts about Xs that they really amount to. Truths about individual Ys might, on different occasions, be truths about different sorts of groupings or arrangements of Xs, and the predicates attributed by such truths might likewise have as their truthmakers different complex characterizations of Xs on different occasions. But the ontological point would remain. Claims about Ys would have no ability to vary in truth-value independently of the facts about Xs because the states of affairs that those claims report would have no character or content of their own, separable from the facts about Xs.

Did Lewis intend his thesis of Humean supervenience as having just this sort of ontological significance? The question is not straightforward. On the one hand, he did speak of the entities mentioned in certain sorts of truths as more “fundamental”, ontologically, than the entities mentioned in other sorts of truth, and did speak as if the bedrock layer of fact—the mosaic on which everything else was erected—was the instantiation by spacetime points of the perfectly natural properties of fundamental physics. But did this mean that the claims asserted by, say, belief-desire psychology or ethology or
economics or “folk physics” reported states of affairs that by nature had no character or content independent of the bedrock layer of fact? Maybe not, since “Humean supervenience” was supposed to be something contingently true, for all its great importance.

Here we have an issue of Lewis exegesis that I propose to leave to one side. There is a doctrine plausibly associated with the title “Humean supervenience” that is robustly ontological, that many philosophers either endorse or find disturbingly plausible, and that ties the truths about everything to the facts that obtain on the level of microphysics. Exponents of such a view, over the past fifteen years, include Horgan, Horgan and Potrč, and Heil. Calling this view “Humean supervenience” might be poor terminology, since Lewis’s prominence will keep that phrase anchored to what he thought, and what he thought is not entirely clear. So from here out I will call the view “SEM”—the supervenience of everything on microphysics.

I

I now will start on my argument to the effect that SEM is untenable. The heart of this argument will be that SEM needs to posit not just sufficient conditions but also necessary conditions. On the one hand I will grant to SEM that that it is easy enough to believe that, for any truth reported by common sense or by one of the special sciences, there are states of affairs at the level of the microparticles sufficient for the truth of that familiar report. But I will dispute that SEM can plausibly posit states of affairs at that level necessary for the truth of familiar reports—and I will argue that this is a crucial failing in SEM.

But let me begin by noting first a danger for SEM—a way in which its central claim might seem to be all smokescreen and no substance. The central claim is that true all statements made by common sense or by one of the special sciences are true in virtue of ways the world is at the level of the microparticles. But then for each individual true claim made in such familiar discourses, there must be some one particular truth-making way the world is at the level of the microparticles. At the same time,
though, SEM tells us that spelling out this microphysical truth-maker may well be far beyond our cognitive powers. Why then should we not regard the hypothesis of a microphysical truth-maker as an empty boast, or a mere piece of superstition? Can the proponent of SEM at least tell us what the shape of the relevant truth-maker would be, even if we have little prospect of saying which microparticles and microphysical arrangements populate that shape?

The answer is Yes—he can tell us the shape of the relevant truth-maker—and the recipe that the SEM proponent must follow can be found in the way materialists use supervenience in the philosophy of mind. First, there is the familiar denial of independent variability. The experiences that a given person lives through cannot vary, say materialists, independently of neurochemical goings-on in that person’s brain. Ultimately, indeed, the occurrence and character of a person’s experiences is fixed by what is going on in that person’s brain at the level of the microparticles. But second, materialists offer, in explanation for this failure of independent variability, a “nothing buttery” claim of the standard sort. What it is for there to be a mind or a person there in the world, experiencing such-and-such mental events, is “nothing over and above” there obtaining, among the billions upon billions of microparticles that populate (as we say) that person’s brain, certain specific sorts of microparticle arrangements. (Well, perhaps these microparticle arrangements also embroil microparticles in the person’s body that lie outside the brain.) Further, we can—thanks to the functionalist articulation of materialism—say something definite, if higher-order, about which sorts of microparticle arrangements must obtain. Functionalism says that a particular causal profile—a particular set of complexly-conditioned behavioral dispositions—is constitutive of whatever mental states it is, that we suppose the person to be living through. And what underlies the obtaining of this particular causal profile? Our widespread allegiance to “bottom up” causal explanations makes us quick to say: ultimately, that particular causal profile obtains because of how the microparticles in (as we say) that person’s brain are characterized and arranged towards one another. So we do know the general shape of the microphysical truth-maker for a true attribution of particular mental states: it is just that state of affairs, realized in billions upon billions of microparticles, that underlies the causal profile tacitly asserted by the attribution of mental states.
This “causal profile” recipe can be applied to a whole host of true reports made in familiar discourses—made by common sense or by special sciences—and can enable the proponent of SEM to tell us at least the general shape of that state of affairs, at the level of the microparticles, that makes the familiar report true. Thus consider so simple a claim as “there is a dog lying over there”. At the level of perceptual psychology and animal ethology, one would say that the causal import of this claim is the (rather modest) prediction that if persons look in the direction indicated, they will have sensory experiences as of a lying dog, and that if a noisy vacuum cleaner is moved into that location, the dog will scurry away, and observers will have sensory experiences as of a scurrying dog. The truth-maker for “there is a dog lying over there”, then, will be that in the region indicated—and perhaps in other locations, about which more below—there are microparticles that are, in the widely used phrase, “dog-wise arranged” (cf. Merricks 2001). That is, there are microparticles that individually have the right microphysical properties, and that are related to one another by the right microphysical relations, that the implicit predictions of perceptual and behavioral outcomes will come out as true.

Or consider two other (somewhat simplified) examples. To say of a person that she wants to drink water predicts—let us allow—that in the right psychological setting, that person will reach for a glass of water if one is placed nearby. The truth-maker for this ascription of desire will be (to a first approximation) that microparticles located within the person are so arranged, microphysically, that that prediction of a reaching for water will come out true. Or, to switch from psychology to biology: to say that some fitness-enhancing mutation occurs at a certain locus in a genome, is to predict, in the right circumstances and with a certain probability, that some phenotypic innovation will be found in offspring of the organism in which the mutation occurs. The truth-maker for this special-science assertion will be that microparticles located where the biologist supposes the mutated gene to be have some microphysical properties and interrelations or other, such that the prediction of phenotypic alteration will come out true.

The proponent of SEM, then, has a response to the first challenge—the challenge that her position is smokescreen and empty boast. The response is that a statement in some familiar discourse always has some causal import; but all real causing is causing by microparticles; so the truth-maker for the familiar
statement must be that microphysical properties and relations are present, in microparticles located at particular locations, that ground a power to cause a particular outcome implicitly predicted by the special-science statement.

II

But now a second challenge appears—and this challenge forms the core of my objection to SEM. SEM posits a microphysical truth-maker for every true report uttered in a familiar discourse, a truth-maker shaped by “what suffices at the level of the microparticles” to yield a certain causal profile—a power to produce a particular outcome identified by that familiar discourse itself. But when that outcome really is produced, the truth that it is being produced must itself fall under the “nothing buttery” claim. In other words, for every outcome that lies in the causal import of a statement made by a special science, there must be some state of affairs at the level of the microparticles which exhausts what it is for that outcome to occur—some microphysical state of affairs, the obtaining or non-obtaining of which renders true or renders false the report that that outcome is occurring. It is therefore fair to ask: just what does it come to, at the level of microparticles, that the report “she is reaching for a glass of water” is true—or that “the dog is scurrying away” is true, or “the offspring has extra hemoglobin in his blood”?

The first thing one wants to say is surely that the truth of any of these reports does not come to just one thing—just one sort of state of affairs—at the level of microphysics. Surely there are many, many different ways that microparticles might be so “arranged”—so characterized by intrinsic properties and so related to one another—that any one of these reports is rendered true. Here is an illustration. Imagine that there is an extremely powerful microscope—not just an electron microscope, but a quark microscope, say—that instantaneously reveals the microphysical state of every microparticle within a person who is reaching for a glass of water. Then the microscope has revealed one thing that the truth of “she reaches for a glass of water” can come to, at the level of microparticles. (Or, at the least, the microscope has revealed most of what is involved, at the level of microparticles, in the being-true of that
report. Perhaps the microphysical goings-on do not amount to truth for the claim that she reaches for water unless H₂O is what is in the glass. In that case we must alter the illustration: we must say that the microscope takes a snapshot of all the microparticles within the person and in her surroundings.) In any case, it seems abundantly clear that the next time a token of “she reaches for a glass of water” is true, our microscope will reveal a different state of affairs, at the level of the microparticles, that renders the token true.

Can we imagine that the disjunction of microphysical sufficient conditions, for the truth of tokens of “she reaches for a glass of water”, has a finite length—that there is a highly disjunctive sort of microphysical event that is not only a sufficient condition for the truth of “she reaches for a glass of water”, but that is also a necessary condition? The proponent of SEM should hope that the answer is Yes, as I now shall explain. But it is very implausible that the answer is Yes, even for SEM, as I shall subsequently argue.

III

Return again to SEM’s “nothing buttery” thesis. This says that what it is for any assertion at the level of the special sciences to be true is nothing but, nothing over and above, the world’s being a certain way with respect to the microparticles. What this position asserts is a two-fold dependence. On the one hand, the position says that if a statement in the special sciences is true, it is so in virtue of the world’s being some way at the level of the microparticles; but on the other hand, the position says that if that same statement is false, it is so in virtue of the world’s failing to be some way at the level of the microparticles. In other words: if, for any statement in the special sciences, there is a truth-condition at the level of microphysics, there is some way for the world to be, microphysically, that is necessary for the truth of the statement.

At the same time, there is the point that the statements affirmed in the special sciences include not just (what Quine called) “occasion sentences”—statements such as “she is reaching for a glass of water”,
“the observers are having sensory experiences as of a dog”, “the offspring has extra hemoglobin”—but also generalizations. Psychology might say that any person who desires to drink water will, under such-and-such circumstances, reach for a glass of water that is placed nearby. Discussions of perception might say that, under normal viewing conditions, any observer who looks in the direction of a dog will have doggish sensory experiences. Genetics might say that any genetic mutations, involving such-and-such important genes, will lead either to failures of intrauterine development, or to the presence of phenotypic alterations.

Here is why the point about generalizations matters. Even if some powerful mind has been running our quark microscope for some time, and has taken snapshots of many different microphysical sufficient conditions for the truth of “she reaches for a glass of water”, it still can be true that some microphysical arrangement in some agent has the power to bring about some microphysical outcome that renders true a token of “she reaches for a glass of water”, even though that arrangement does not have the power to bring about one of the outcomes of which the microscope has taken a snapshot. For there to be a truth-condition at the level of the microparticles, for a generalization that talks generally about reachings-for-glasses-of-water—a generalization that says that any person who desires water will, under certain circumstances, reach for a nearby glass of water—there has to be a fact of the matter as to all that a reaching-for-water could amount to, at the level of microparticles.

The proponent of SEM must therefore say that the answer to our earlier question is Yes. That is, for any outcome that lies within the causal import a statement made by a special science, there must be a finite and closed disjunction of microphysical states of affairs, that is what it is for reports of that outcome to be true. There must be, at the level of the microparticles, a necessary condition for the truth of the outcome-report.

But this very position seems highly implausible, from the standpoint of SEM itself. No disjunction of microphysical arrangements actually recorded in the snapshots taken by our quark microscope, at all times up to a given point in the world’s history when the special-science reports of the outcome have been true, can be counted on to tell us all that the truth of such reports can amount to,
at the level of microphysics. Now as it stands, of course, this is just an epistemological point. We may never have warrant for claiming that we have recorded, at the level of the microparticles, all that a particular special-science outcome could amount to. Even so, one might think, there could be a fact of the matter as to what the disjunction of all sufficient conditions for that outcome amounts to, at the level of microphysics—that is, a fact of the matter as to a microparticle-level necessary condition.

But what might the disjuncts in this rambling disjunction all have in common, by virtue of which they could collectively qualify as all the ways—the only ways—that microparticles can be arranged, so as to add up to just that special-science outcome? Pretty clearly one is imagining that what the disjuncts all have in common is that they are answers to a particular problem of “reverse engineering”. We start with one special-science outcome or another, which already has a nature in its own right. Then we ask: just how might God arrange microparticles, in such a way as to ensure that an outcome having just that special nature does occur? But precisely what the “nothing over and above” claim constitutive of SEM asserts is that statements in the special sciences do not report states of affairs that have their own distinctive nature. On the contrary, says the “nothing over and above” claim: truth and falsity, for claims in any special science, cannot but track ways that the world is at the level of the microparticles, for these statements do not report states of affairs distinct in their natures from ways that the world may be at the level of the microparticles. So we do not have a unitary starting point, from which to start a ramifying project of reverse engineering. So we do not have something in virtue of which the disjuncts can collectively qualify as all the disjuncts that there can be.

Let me approach this same point from a different angle. Imagine a sprawling disjunction. Each disjunct inventories what is recorded on one of the photographs taken by our quark microscope—one photograph of sufficient conditions, at the level of the microparticles, for some particular special-science outcome. The longer we run the microscope—the more disjuncts we add—the more it will appear that our disjunction as a whole is an undisciplined rabble, a “garbage collection”. The proponent of SEM needs to claim that there is a connecting thread running through these seemingly ill-assorted disjuncts. For only so can she claim that there is, at the level of microparticles, a necessary condition for that
special-science outcome; only so, that is, can she claim there is a fact of the matter as to *which* disjuncts are *all* the disjuncts that belong in our disjunction. But SEM itself forbids its proponent from adverting to a higher level at which this connecting thread might be manifest. There are just the disjuncts. Garbage is garbage.

SEM involves a distinctive “nothing over and above” claim. Proponents of SEM have not adequately asked themselves just how that claim can be articulated and defended. My own judgement is that it cannot be defended, and that SEM is untenable.
References


