

METAPHYSICS AND SUPERVENIENCE¹

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I. *Introductory*

An argued metaphysics should, I suppose, start with an *epistemological base*: something which pretty certainly exists. So much tribute would I pay Descartes. But, of course, I do not want a logically indubitable epistemological base. There are no such bases and, even if there were, too little would be logically indubitable to make such a base a suitable starting point.

The epistemological base which I favour is that unitary object: the world of space and time. It is not indubitable that such a world exists. Even to describe it as the world of space and time is to introduce a certain amount of scientific theorizing. But it does seem that, given our epistemological situation now, in the twentieth century, this is something which we know to exist. At the very least, to believe that there is such a world is a preeminently rational belief. I will call the view that this world exists the Weak Naturalist view.

My further hypothesis is that, not only is there a world of space and time, but that it is all that there is. I will call this the Strong Naturalist view, or, more simply, Naturalism. Strong Naturalism, of course, is not part of my favoured epistemological *base*.

There are plenty of non-philosophers who accept Weak Naturalism, but who do not accept the Strong view. They do so because they believe in the existence of the soul and/or God. They are joined in this position, of course, by a number of

¹ This paper was given at the Annual Conference of the Australasian Association of Philosophy in August 1982. It sketches some ideas which I am still in the course of working out.

philosophers. But in this paper I will not be concerned to argue against such views.²

Among philosophers who accept Weak Naturalism, however, it is quite common to find the Strong Naturalist view rejected, but not for the reasons which non-philosophers would give. Indeed, there are philosophers who regard doctrines of Cartesian souls and of a transcendent Deity as regrettable manifestations of tender-mindedness, who would be equally impatient with the rejection of Weak Naturalism, yet who reject Strong Naturalism. They do so because they think that metaphysics must find place for possibilities and/or classes and/or numbers and/or universals and/or objects of thought. They think, furthermore, that no place can be found for some or all of these entities in the world of space and time. If they are North Americans they may murder a good and useful word, and say that they believe in 'abstract' entities.

It is these philosophers whom I wish to argue against.

The argument which I will try to use against them may be called the Argument from Supervenience. It runs thus. Suppose that we are given a certain base. (It might be the world of space and time). Consider then whether the existence of this base entails the existence of certain entities. (For instance, given two individuals, a and b , the existence of the class $\{a, b\}$ is entailed.)³ Call entailed entities the supervenient entities. It may then be argued that the supervenient entities are not any ontological addition to the base.

This argument has a presupposition, of course: that if the existence of an entity entails the existence of an entity, then we do not have here wholly distinct entities. In a familiar phrase: there are no logically necessary connections between (wholly) distinct entities. The principle is in some degree controversial, and although I believe that it is true, I do not know how to *show* that it is true in the face of some awkward pos-

² My main line of objection to such entities is that (1) we have good scientific reasons to believe that the world of space and time is a causally self-contained system; (2) we have no good reason to postulate entities lying beyond this system which do not act causally on the system. See my 1977, and 1978, Chapter 12.

³ As also is the aggregate ($a + b$).

sible counter-examples. So because the principle is in some degree controversial, I will mount the argument in the cautious fashion which now follows.

It is clear, I take it, that *one good explanation* of a necessary connection between entities is that they are not wholly distinct from each other. If in particular cases it appears that certain sorts of entity are logically supervenient upon a certain base, then it may be the most plausible explanation of this fact that the entities and the base are not wholly distinct. An inference to the best explanation can then be made with some confidence. Now it appears to me that at least in the cases which we will be dealing with, the best explanation of supervenience is indeed absence of distinctness.

II. *Classes*

Let me begin with classes. One of the well-known features of classes is this. Starting with any ontological base we can form classes out of the things making up the base, go on to form classes out of these classes (second-order classes) and so on indefinitely. The ontological base can be as narrow and extraordinary as the null-class. Even so, logically supervenient upon the null-class is the second-order unit-class whose member is the null-class, the third-order unit-class whose member is this second-order class, and so on indefinitely.

Nelson Goodman (1956) took this promiscuous supervenience of classes to be clear indication that classes are not to be reckoned as items in any ontological base. If from any base at all you can proceed *a priori* and multiply classes indefinitely, then these classes are nothing over and above their bases. I take this to be an important ontological contribution by Goodman. Of course, this is not to ban *talk* about classes. We must be able to make class-statements, and we will often want to say of particular class-statements that they are true. But such true statements are *about* nothing but the things, whatever they are, which make up the ontological base. If that base is the world of space and time, then we do

not require classes which exist outside space and time, or, indeed, as additional entities at all.

It will be necessary to give a satisfactory account of the nature of talk about classes. What such an account should be is no doubt difficult and controversial. For myself, I am attracted to the Black/Stenius view (Black, 1971; Stenius 1974) that to refer to classes is to use a plural referring expression. Class-talk is plural talk. In many cases the referring expression 'a' stands to a in a one-one referring relation, as does 'b' to b . But 'the class $\{a, b\}$ ' sets up a one-many referring relation between that expression, and a and b , while 'the class of ducks' sets up a one-many referring relation between that expression and the individual ducks. Some recursive treatment must then be given of higher-order classes. (If this is correct, then unit-classes are degenerate cases of classes, and the null-class is still more degenerate.) But whether or not this account of class-talk is on the right lines, the original supervenience seems clearly to indicate that *no* metaphysician, and certainly not the naturalist, should countenance classes in his ontological base.

III. Possibilities

Now for something much harder. I am concerned here with logical possibility. What makes statements of (mere) logical possibility true? The special peculiarity of the logically possible is that it is not, in any obvious way, logically supervenient upon anything *actual* at all. Suppose that there is nothing (nothing actual) at all, a situation which is generally held to be a logical possibility. The innumerable logical possibilities will *apparently* be the same as they are for us. To manufacture classes, one needs an actual entity to start with, if only the null-class. But not even one actual entity seems needed for logical possibility.

David Lewis (1973) reacts to this situation by making his ontological base the set of all possible worlds, realistically conceived. (I suppose that it could be the aggregate of such worlds if you like possible worlds but do not like classes.)

He even goes on to make actuality world-relative, so that our world is not ontologically distinguished from any other world. But if we do not want to move beyond the actual, in particular beyond our actual world of space and time, we want an account of logical possibility without possibles.

The way to exhibit logical possibilities as supervenient upon the actual world may be to start from a simplified model. Consider a *Tractatus*-like universe which contains nothing but atomic (simple) objects having atomic (simple) properties and relations. (The properties and relations are universals.) No objects lack properties and relations, and no properties and relations fail to attach to objects. All these objects, properties and relations are automatically compossible. For instance, no two properties exclude each other, as opposed to the way that redness and greenness exclude each other from the same surface.⁴ Given this world of simple objects, simply propertied and simply related, all the complex objects, complex properties and complex relations are automatically given. The complexes are supervenient upon the arrangement of the simples. But not only this. Can we not argue that the logical possibilities in this universe are supervenient also? For are they not just all the permutations of the objects, properties and relations?

It is clear, I think, that the logical possibilities derived by permutation are supervenient in the way just described. The nature of the base determines the nature of the possibilities. But it may be wondered whether *this* supervenience shows that the possibilities are nothing over and above the base. For what recombinative possibilities do we admit? Those which are logically possible! We *apply* the notion of logical possibility to the base to get the recombinations. The base + logic gives us the possibilities, not just the base by itself. Superve-

⁴ There is a rather subtle question whether the *objects* are to be considered mere interchangeable pegs for properties and relations, so that 'changing' the objects without changing any properties or relations makes no difference, or whether instead such a change in *objects only* would create a new possibility. As I understand it, the latter is the 'haecceitist' view favoured by David Kaplan and others. This second view is too near Locke's substratum for my liking. But here the question can be left unsettled.

nience there may be, but what we get is an ontological addition to the base.

This is an attractive line of thought. But is it one which we have to accept? It is to be noted that exactly the same line of argument could have been mounted in the case of classes. In the case of classes, I do not see why we have to accept classes as additional entities. Principles of economy seem to call out for explaining their supervenience as flowing from identity. In the same way, I suggest, the supervenience of the logical possibilities on our (artificially limited) base suggests, *while not proving*, that they are nothing over and above the base. To take this line does, I suppose, involve holding that any principles of logic used are not substantive principles, that is, that they do not constitute an ontological addition to the base. Logic must be in a sense empty. But I do not see why we should not hold just that.

However, there is, of course, a great gap in my argument. I was led to this combinatorial view of logical possibility by Brian Skyrms in his paper 'Tractarian [sic] Nominalism' (1981). As he points out there, since there might be other objects, properties and relations than those which actually exist, a combinatorial view of possibility cannot be complete. What is needed in addition, he says, is a kind of Ramsey sentence approach. I suggest that we think of his approach in terms of an 'inner' and an 'outer' sphere of logical possibility. In the inner sphere, actual objects, properties and relations are recombined. They are *supervenient* logical possibilities. But there is an outer sphere also. To get the outer sphere, we add in thought further objects, properties and relations. Since, in the Tractatus-like scheme which we are considering, these are new *simple* things, they can only be postulated in an indeterminate way. There might exist further objects, properties and relations, but we cannot say anything further about them except how they might be linked to the actual objects, properties and relations. But it is clear that there is no limit to the number of new counters which may thus be put into the game. The various ways in which 'they' combine with the ac-

tual objects, properties and relations automatically creates the outer realm of logical possibility.

In this way, given only the notion that there logically might be indefinitely many *further* simple objects, properties and relations in addition to the original stock, the outer sphere of logical possibilities, like the inner sphere, is also automatically derivable. But what then is the basis, the truthmaker, for the proposition that these further, other, objects, properties and relations are logically possible? No other more perhaps than the meaning of the word 'other'.

If this line of thought is correct, then at least the inner sphere of logical possibility is logically dependent upon, logically supervenient upon, the actual. And it is only the inner sphere which can be grasped in any concrete way. The outer sphere can only be grasped *via* the existential quantifier. It is no more than the idea that quite other things might exist, and might then enter into combinations with the things which do exist.

Now I am far from thinking that the world must be, or is even particularly likely to be, of this simple Tractatarian sort. But if the account given for logical possibility is satisfactory for this simple case, then perhaps it can be extended to cover more complex cases. Let us relax the Tractatarian picture just a little. Suppose that an account of the spatio-temporal world can still be given in terms of objects, properties and relations (I am hopeful that this is indeed the case), but that there are no *simple* objects, properties or relations. The combinatorial picture seems still to apply. We will have complexity of object, property and relation at every level of analysis. But we can still halt, as it were, at each level, and see the inner sphere of logical possibility at that level as constituted by recombinations which do not go below that level. As so for every one of the infinite levels going down.

Physical possibility we can then think of as logical possibility subject to a certain restriction: *viz.* that the laws of nature are held constant. To uphold Naturalism, we would then require some wholly this-worldly account of the laws of nature.

IV. Numbers

Philosophers who are Platonistically inclined will naturally favour the view that numbers are entities which exist outside space and time. This tendency is reinforced by the formulations to be found in contemporary natural science, where ostensible *reference* is often made to such numbers. Given a certain sort of physical set-up, a certain function might take one to a certain number: some constant, perhaps. Here the number appears to be standing outside the set-up in Platonistic fashion.

This situation has recently been made the subject of reflection by Hartry Field in his book *Science without Numbers* (1980). If we think of a functional law of the sort mentioned above as an *explanation* of the physical set-up, then he calls it an *extrinsic* explanation. It is extrinsic because it ostensibly links the physical set-up to a causally impotent object outside space and time. Field suggests as a methodological principle that underlying every good extrinsic explanation there is an *intrinsic* explanation. The latter involves only the things actually causally operative in the set-up to be explained. He shows in detail how such an intrinsic explanation can be arrived at in the case of various theories (for instance, Newtonian Gravitational theory).

Field's principle seems immensely attractive. If it is true, then we can argue that extrinsically formulated laws are logically supervenient upon intrinsically formulated laws. We can then argue that the best explanation of this supervenience is that the laws require no entities over and above those which are ostensibly postulated by the intrinsic formulations of the laws. We will then not require Platonic numbers in our ontology.

Field tries to get along without properties as well as without Platonic numbers, although he has no very deep opposition to properties. Of course, properties themselves raise the spectre of Platonism, but the spectre can be laid to rest without too much difficulty by restricting properties to instantiated properties, instantiated within the world of space and time. And

if we *do* admit properties, then among them, I believe, ought to be included numerical or quasi-numerical properties of objects. I will develop this point a bit, because I think it helps to make the Fieldian approach still more attractive.

Descartes and Locke thought of number as a primary quality, on a level with properties like shape and motion. This view was attacked by Berkely (1710, Section 12) and Frege (1884, Sections 21-25), and their view is now the received wisdom. Number is not a property of first-order objects because, given a suitable choice of unit, such objects fall under innumerable numbers. *One* house is *many* bricks, *many more* atoms and *still more* fundamental particles.

I think that we should be suspicious of the Berkeley-Frege argument. Objects do not have any number — because they have so many numbers! If every object of necessity had every number, then I think that we would have to take Berkeley and Frege seriously. The plethora of numbers would be too good to be true.⁵ But this is far from being the case.

In the first place, consider properties such as *being made up of just five electrons*. This would seem to be an objective property, if any property is objective. It attaches not to a class, but rather to an *aggregate*: to any object, scattered or not, which has just five wholly disjoint electronparts, and no further parts disjoint from these. Such first-order properties will serve as a foundation for the application of number to the world.

It seems to me that there are still more abstract, topic-neutral, properties which objects have, properties which are close to actually being numbers. It is a matter of the number of *parts* which things have. There could be *no-parted* things. For instance, classical atoms would be of this nature. It may be that electrons are atomic in this sense, for they are not thought to have any size. A thing which was an aggregate of just two classical atoms would be a *two-parted* thing, but would possess no other property of this sort. An aggregate of

⁵ This is an application of what I call the Irish principle. See my 1978, Vol. II, p. 11.

just three classical atoms would be a two-parted thing (three times over, as it were), and also a *three-parted* thing, but would stop there. If there are genuinely continuous things in the world, then they would be *continuum-many parted*, as well as *one-parted*, *two-parted*, *denumerably-many parted*, etc.

I am inclined to argue that here we have genuine properties of things. I would draw the line at *no-partedness* being a property, because I reject negative properties. But for the others I think it is not simply the case that certain predicates apply. These are instantiated universals. Can we identify these properties with the numbers? Not quite. 0 and 1 are not provided for. Furthermore, supposing Cantor's diagonal proof to be sound, then there is no end to the set of infinite cardinals. But it is at least very unlikely that, for each infinite number, the space-time world contains objects with that number of parts. No doubt, for each infinite number, we can *conceive* of objects which have that number of parts. But if our ontological base is to be just the space-time world, we do not want to countenance uninstantiated properties.

But could we do the following? Could we treat an infinite cardinal to which there corresponds no object having that number of parts as a *merely possible* property? Such an infinite cardinal is the property that an object would have *if* there were an object having that number of parts. A mathematician would say that the cardinal *exists*. We translate this, however, by saying that is logically possible that the corresponding property should exist, that is, be instantiated. The combinational treatment of logical possibility already given, if adequate at all, should be adequate for such possible properties.

Even this quasi-identification of number with the partedness of things may be too ambitious. (After all, there is still the problem of 0 and 1.) But at least the partedness of things seems to be a property of things which provides an anchor in spatiotemporal reality for the concepts of the numbers.

(It may be that the logical concepts, or at least some of them, can be anchored to reality in some broadly similar way.)

But what of mathematical truth? That is a separate problem. As we have seen, there may be nothing in space-time to co-

respond to at least some of the infinite numbers. Yet we know truths about them. Traditionally, indeed, the truth of mathematics is thought to be independent of the existence of the physical world. What, then, is the truth-maker for mathematics?

Hartry Field suggests that mathematics is not true at all, or does not have to be true, although it must be consistent. The suggestion is a bit wild, but not unattractive.

However, I suspect that we do have to have a truth-maker. Indeed, as David Lewis has pointed out to me, even if we go along with Field we have to have a truth-maker for this truth: mathematics, though false, is consistent. And if we stick with the world of space and time as sole truth-maker, then I have nothing but the old, and currently rather unfashionable, suggestion that we fall back upon meanings. The truth-makers for the truths of mathematics (and also, I suppose, logic) will have to be the meanings of the terms in which they are stated. Meaning, I assume, is a notion which can be naturalistically explicated.

V. *Universals*

I am convinced that we must admit objective universals. Only so can we explain the sameness and differences of things, where the sameness and difference in question is not numerical. I believe that they should be restricted to *properties* and *relations*, and further restricted to those properties and relations required for total science. There is no need to admit uninstantiated universals: they are merely possible universals, and a merely possible universal is no more a universal than a merely possible horse is a horse. As a result, the acceptance of universals in no way contradicts Naturalism. The world of space and time is a world which exhibits objective, non-numerical, samenesses and differences. (See my 1978.)

The main argument for uninstantiated universals is the argument from the meanings of general terms. Upholders of that argument, however, think of these universals as superve-

nient upon these meanings (and possible meanings). As a result, our usual argument against supervenient entities may be invoked.

If this position on universals is correct, then they largely fall outside my present theme, which is the defence of Naturalism. For universals are only found as properties and relations instantiated in the world of space and time. But I should like to note in passing that the same theme of supervenience may be fruitfully illustrated with respect to these instantiated universals. Provided that we restrict properties to instantiated properties, then *conjunctive properties* are supervenient upon their conjuncts. The same may be said about *structural* universals —universals involving properties in relation— they are supervenient upon the properties and relations which are the elements of the structure. *Relational* properties are also supervenient — given objects, their nonrelational properties and their relations, then the relational properties of objects are given. *Internal relations* are also supervenient, supervenient upon the properties (including the relational properties) of the related objects. If there are disjunctive and negative properties, then they, too, will be supervenient upon positive properties. I believe, however, that the last two fail some very important tests for properties, and so should not be admitted at all.

Given non-relational properties and the spatio-temporal relations of objects, many believe, in particular Humeans believe, that causes and laws are supervenient. There however I think we have to call a halt. Laws, in particular, seem to require second-order relations, that is, relations between universals, which are *not* supervenient in this way.⁶ Again, however, there is no threat to Naturalism here. The space-time base is enriched, but it does not have to be expanded.

However, when Russell, Hilary Putnam and the functionalists about the mind speak of higher-order properties they

⁶ If the laws of nature are *necessary* relations between universals, then they are supervenient upon the universals, and so, presumably, nothing over and above the related universals. But I incline to the view that the relations involved are contingent. For an account of laws of nature, see my *What is a Law of Nature?* (forthcoming).

mean properties of first-order particulars, the property of having a property such that. . . where the blank may, for instance, specify a causal role. These properties *are* supervenient, although what they are supervenient upon may include the higher-order relations (in my sense of 'higher-order') involved in law and cause.

None of the supervenient universals discussed in this section need be considered anything over and above the universals which they are supervenient upon. In this way we effect a considerable ontological economy.

VI. *Objects of thought*

What finally of propositions, golden mountains, round squares and so on? I suggest that they are supervenient upon actual mental attitudes, states *etc.* If Materialism is true, then they are supervenient upon physical states of the brain. If so, we need not think of them as additions to the world of nature.

Lovers of such entities will protest. What makes this psychological state, this brain-state perhaps, the belief that the moon is a quarter-million miles away? Its relation to a certain proposition! Surely the proposition is required in order to identify the mind-state as just that belief-state?

But let us consider that in order for the belief-state to play whatever causal role it does in our mental life, it will have to be encoded for that information. The proposition itself is not going to burst into the causal order, which latter includes the psychological order.

It is true that there are those, Frege and Popper for instance, who believe that the 'third realm' or 'third world' which they recognize actually acts upon the world of physical objects, *via* its action upon the world of the mind. This is a scientifically implausible view. The natural world seems to be a causally self-enclosed affair. But even if propositions, objective concepts, *etc.* do act on the natural world from outside, surely they would do it by setting up a model of themselves in our minds? If we believe in objects of thought, and that they act on our minds, and then if one tries to spell out how the belief

and thoughts in our minds further affect our minds and the rest of nature, I think one is driven to the idea that the only *plausible* causal story is that the third world reduplicates portions of itself in minds. It transmits information. And if the third world is not causally active, if it does *not* transmit information, then all the more need, where we believe that the moon is a quarter of a million miles away, that our minds contain a structure reflecting the proposition believed.⁷

But once this point is established, then I think that we can use the encoding in the mind against the postulation of objects of thought outside nature. The objects of thought can be seen as supervenient upon the mental states: given a certain mental state, attitude, *etc.*, then the corresponding proposition or other object of thought must exist. And then once again we can employ our old argument: if the objects of thought are supervenient upon the mental, then we have reason to believe that they are not additional entities.

There is one obvious difficulty with such an approach. Objects of thought are regularly conceived of as existing when the corresponding mental state does not. For instance, we say that there are propositions that nobody has or ever will believe or even contemplate. The obvious reply, however, is to treat this 'outer' realm of objects of thought as supervenient upon merely logically possible mental attitudes, states, and so on. Once more, logical possibility becomes a critical notion, but we have seen that logical possibilities can perhaps be exhibited as supervenient upon the actual world.

Of course, none of this takes us very far towards a positive theory, compatible with Naturalism, of what it is to have a belief, entertain a concept, and so forth. We know that it is a difficult matter to arrive at a satisfactory theory of such matters. But my argument is meant to fortify the Naturalist in the conviction that the task can be accomplished.

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That concludes my defence of Naturalism against the strange additional entities postulated by certain philosophers. In con-

⁷ See my 1982.

clusion, I will not conceal my conviction that in these matters these philosophers (who include some of my best friends) lack a robust sense of reality. I find myself respecting more those metaphysicians who reject Naturalism because they believe in souls and in God.

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RESUMEN

En este artículo propongo y defiendo una base epistemológica para una metafísica. No creo que haya una base epistemológica lógicamente indudable, pero creo que la base que propondré, dada nuestra situación epistemológica actual, es una que sabemos que existe: ese objeto unitario, el mundo del espacio-tiempo. A mi propuesta, de que tal objeto existe, la denominaré la tesis naturalista débil. Una propuesta más fuerte, a saber que el mundo espacio-temporal es todo lo que hay, la denominaré la tesis naturalista fuerte, simplemente, naturalismo, a secas. Pero es claro que ésta no es parte de mi *base* epistemológica favorita.

Lo que deseo es argumentar en contra de aquellos filósofos que aun aceptando un naturalismo débil, no estarían dispuestos a aceptar un naturalismo fuerte, pero *no* por creer en una deidad trascendente o en una dualidad cartesiana, sino porque piensan que una metafísica tiene que dar cabida a posibilidades y/o a clases y/o a números y/o a universales y/o a objetos de pensamiento. Entidades éstas que, según creen, no pueden explicarse conforme a una base naturalista.

El argumento que emplearé en contra de tales filósofos, que puede denominarse el argumento de la superveniencia, tendrá la siguiente estructura: dada cierta base, se considerará si, la misma, implica formalmente la existencia de ciertas entidades (las que serán, en caso de hacerlo, las entidades supervenientes). Se argumentará, luego, que las entidades supervenientes *no* representan una adición ontológica a la base. El argumento, sin embargo, lo empleo con cierta cautela.

Para cada uno de los casos que considero (clases, posibilidades, números y universales), mi conclusión es que tales entidades pueden explicarse como supervenientes a la base elegida.

Como conclusión, no ocultaré mi convicción de que en estas cuestiones, tales filósofos (que incluyen algunos de mis mejores amigos) carecen de un fuerte sentido de la realidad. Me encuentro respetando más a aquellos metafísicos que rechazan el naturalismo porque creen en las almas y en Dios.

[J.A. Robles]