Australasian Journal of Philosophy
Vol. 64, No. 1; March 1986

AGAINST STRUCTURAL UNIVERSALS

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Introduction

At the 1983 conference of the A.A.P., there were two papers about the project of using abstract entities as ersatz possible worlds. One was mine, which distinguished three version of ersatzism and raised different objections against different ones.[1] The other was Peter Forrest's, which proposed that structural universals should serve as ersatz worlds; the actualised one is instantiated by the concrete world, the rest are uninstantiated (or instantiated only by proper parts of the concrete world—I omit this complication henceforth).[2]

Forrest and I both wondered where his proposal would fall in my classification, and which of my objections I might raise against it. I found it unexpectedly difficult to give a straight answer. I ended up posing trilemmas, and needing to know more about the doctrine of structural universals on which Forrest's proposal was to be based.

I concluded that, after all, I had little objection to Forrest's use of structural universals, for the most part uninstantiated, as abstract ersatz worlds. Instead, I objected to the structural universals themselves. But I needed to distinguish different versions of the doctrine of structural universals and raise different objections against different ones. And I found that, for the most part, what I had to say would parallel what I had to say against different versions of ersatzism.

Not long before, in 'New Work for a Theory of Universals',[3] I had taken a favourable but noncommital view of D. M. Armstrong's theory of universals—a theory which accepts structural universals, though not uninstantiated ones.[4] I said that it gave us one tenable way to draw an indispensable distinction between natural and unnatural classes. But I said that this distinction also could be had within a class nominalist theory, if we helped ourselves to a disagreeably complicated primitive notion of similarity. (The best way to do this might be to take naturalness of classes itself as primitive.) Armstrong's theory burdened us with more ontology;

[1] David Lewis, 'Ersatz Modal Realism: Paradise on the Cheap?' given at the 1983 A.A.P. Conference, Adelaide; a much revised version appears as Chapter III of Lewis, *On the Plurality of Worlds* (Blackwell, 1986).

[2] Peter Forrest, 'Ways Worlds Could Be', this issue of the *Australasian Journal of Philosophy*, pp. 15-24.

[3] *Australasian Journal of Philosophy* 61 (1983) pp. 343-377.

[4] D. M. Armstrong, *Universals and Scientific Realism*, two volumes (Cambridge University Press, 1978). Armstrong's principal discussion of structural universals is Volume II, pp. 69-71; see also Volume I, p. 117; Volume II, p. 39; and Volume II, pp. 120-127.

whereas an adequate form of class nominalism burdened us with a rather artificial-seeming primitive distinction. I took seriously the merits and drawbacks of both alternatives, and reckoned that between them the honours were about even. That judgement is now up for reconsideration.

I should have commended a sparse theory of tropes as a third alternative, no less meritorious than the two I considered. *Tropes* are supposed to be particularised properties: nonspatiotemporal parts of their instances which cannot occur repeatedly, but can be exact duplicates. I have in mind more or less the trope theory taught by D. C. Williams,[5] except for one thing: if natural classes of things are to be defined in terms of classes of duplicate tropes, then trope theory needs to be made sparse and selective in just the way that Armstrong's theory of universals is sparse and selective. Else there might be classes of duplicate disjunctive tropes, or of duplicate negative tropes, that would mark out unduly miscellaneous classes of things. Like a theory of universals, a theory of tropes burdens us with ontology that plain nominalism avoids; like class nominalism, it requires a primitive of similarity. However, its primitive of similarity—exact duplication of tropes—looks far less artificial, hence more acceptable, than primitive naturalness of classes.

If Armstrong is right in his arguments that a theory of universals ought to include structural universals, and if I am also right that structural universals are trouble, then together we bring bad news for universals. Trouble over structural universals would tend to show that the honours are not even after all, so that in my pursuit of natural classes, I ought to employ either primitive naturalness or tropes, and leave the universals out of it.

The discussion to follow is motivated by an interest in both projects: Forrest's pursuit of ersatz worlds, and my pursuit of natural classes. The projects differ. Forrest's project requires many structural universals to be uninstantiated, mine does not. Armstrong, of course, does not accept uninstantiated universals of any sort. So, although I must of course heed Armstrong's views on structural universals, my aim will not be just to discuss his theory.

What are Structural Universals?

What is a structural universal supposed to be? In the first place, it is a universal: something that does, or at least can, occur repeatedly. It is instantiated by different particulars, at different spatiotemporal positions; and wherever it is instantiated, there the whole of it is present. When it is instantiated, it is a nonspatiotemporal part of the particular that instantiates it.[6]

In the second place, it is a distinctive kind of universal. Anything that

[5] See D. C. Williams, 'On the Elements of Being', *Review of Metaphysics* 7 (1953) pp. 3-18 and 171-192, reprinted in Williams, *Principles of Empirical Realism* (Charles Thomas, 1966). Other versions of trope theory have recently been put forward in Keith Campbell, 'The Metaphysic of Abstract Particulars', *Midwest Studies in Philosophy* 6 (1981) pp. 477-488; and in Mark Johnston, *Particulars and Persistence*, Princeton dissertation, 1983.

[6] I mean what Armstrong calls the 'thick' particular, not the 'thin' particular which results from the mereological subtraction of the universals. See *Universals and Scientific Realism*, Volume I, pp. 114-115.

instantiates it must have proper parts; and there is a necessary connection between the instantiating of the structural universal by the whole and the instantiating of other universals by the parts. Let us say that the structural universal *involves* these other universals—a suitably nondescript word, leaving us free to ask later what 'involvement' may be. It is not required, or not at this stage, that the involved universals should themselves be simple. It is also not required that the involved universals should all be monadic. That is one special case; but often, a structural universal will involve dyadic (or, more generally, n-adic) universals as well. If it does, then for something to instantiate the structural universal is partly a matter of the properties of the parts of that thing, and partly a matter of how those parts are externally—say, spatiotemporally—related.

(Distinguish two senses in which a universal might be called 'simple'. It might be one that does not involve any others; that is, not a structural universal. This is what I have meant, and will mean henceforth. Or it might be mereologically *atomic*: it might have no proper parts, no parts other than itself. I would suppose that on any theory, simple universals come out atomic; but we shall later consider one theory according to which structural universals also are atomic.)

Example: suppose we have monadic universals *carbon* and *hydrogen*, instantiated by atoms of those elements; and a dyadic universal *bonded*, instantiated by pairs of atoms between which there is a covalent bond. (I should really be talking about momentary stages, but let's leave time out of it for simplicity.) Then we have, for instance, a structural universal *methane*, which is instantiated by methane molecules. It involves the three previously mentioned universals as follows: necessarily, something instantiates *methane* if and only if it is divisible into five spatial parts c, h_1, h_2, h_3, h_4 such that c instantiates *carbon*, each of the h's instantiates *hydrogen*, and each of the c-h pairs instantiates *bonded*.

Why Believe in Them?

Why should anybody believe in structural universals? Why not prefer a theory of universals even sparser than Armstrong's, which admits only simple universals?[7] Such a theory is simple and elegant. Why not be content with it?

One reason which might be given need not detain us long:

> (1) There is a universal for every predicate we can formulate, including complex predicate phrases; or for every class that things belong to. There are such predicates as 'is a methane molecule'; there are such classes as the class of all methane molecules. So there are the corresponding universals, and these must be structural.

But to hold a sparse theory of universals is, among other things, to reject the premise that there is a universal to correspond to just any predicate or

[7] As in the principal system of Nelson Goodman, *The Structure of Appearance* (Harvard University Press, 1951), except that I am considering a structure not of appearance but of reality generally.

class. And any theorist of universals as *immanent* had better hold a sparse theory; it is preposterous on its face that a thing has as many nonspatiotemporal parts as there are different predicates that it falls under, or different classes that it belongs to.

A second reason is better:

> (2) The main job of a theory of universals is to give an account of resemblance; and things may resemble one another by being alike in their structure, by being composed of like parts arranged in a like way. We need structural universals so that we can give an account of this sort of structural resemblance as the sharing of universals.

But it is one thing to say that resemblance is to be explained in terms of shared universals; it is another thing to say that whenever two particulars are alike, those particulars *themselves* share a universal. Why not say that structural resemblance of A and B is to be explained not as sharing of universals between the whole of A and the whole of B, but rather as sharing of universals between corresponding parts of A and of B? (Or more generally, as sharing of n-adic universals between corresponding n-tuples of parts.) Only the simplest way of explaining resemblance in terms of shared universals requires there to be shared structural universals.

Another reason is Forrest's:

> (3) Structural universals can serve as ersatz possible worlds and individuals, affording an objectual treatment of modality without requiring us to believe in an implausible abundance of otherworldly concrete particulars.

I do not dispute this—provided, of course, that an appropriate conception of structural universals could be had. I only warn that such ersatz worlds will not give us all the benefits of the real thing. In particular, I do not think Forrest's plan can afford an eliminative analysis of modality. For one thing, we may find appeals to modality within some conceptions of structural universals themselves—see below. But also, a theory of ersatz worlds needs to be able to explain what it means to say that so-and-so is the case *according to* (for short: *at*) an ersatz world. I can see how we might say, without modality, what it is to be an ersatz world at which such-and-such a pattern of instatiation of simple universals—such-and-such a spatiotemporal arrangement of masses, charges, and so forth—obtains. But what is it to be an ersatz world according to which there is a talking donkey? Or one according to which a turtle supports the Earth? I doubt that Forrest would countenance *being a talking donkey*, or *being a turtle*, as genuine universals; certainly Armstrong would not. So I do not see what alternative Forrest has to the modal answer:

> Such an ersatz world is a structural universal such that, necessarily, any particular that instantiates it has a talking donkey as a part, or has a turtle supporting (a counterpart of) the Earth as a part.

But if we waive this objection and grant that structural universals could do

all that we should ask of ersatz worlds, still that is an odd reason to believe in them. Ersatz worlds are meant to serve the cause of actualism; and we would expect an actualist first to settle the ontology of this world, and afterward to cut his treatment of modality to fit. If the demands of a treatment of modality control an actualist's theory of what universals there are for thisworldly things to instantiate, he seems to put his modal cart before his actual horse. Further, even if structural universals could do for ersatz worlds, other alternatives might do as well. For one thing, a theory of simple universals ought to provide an ideal setting for 'combinatorial' ersatzism; and, while that has problems of its own, I think it is as at least as well off as any version of Forrest's ersatzism of structural universals. Indeed, on one version—the 'linguistic conception' discussed below—structural universals and combinatorial ersatz worlds come out very much alike.

Armstrong, of course, would never suggest that we need a universal for every predicate. And it is only after he has already accepted structural universals that he commits himself to explaining structural resemblance in the simple way.[8] Nor could he endorse Forrest's program, since it takes unactualised ersatz worlds to be uninstantiated universals. His reasons for accepting structural universals are different. He has three, of which I take some to be more persuasive than others. In order of increasing weight:

> (4) Another job for a theory of universals is to provide resources for the anti-Humean theory of laws of nature which Dretske, Tooley, and Armstrong have advanced. This theory says that we have a (fundamental) law that *F*'s are *G*'s when a certain second-order lawmaking relation *N* holds between two first-order universals *F* and *G*. But if we confined ourselves to the case where *F* and *G* are simples, surely we could only get the simplest of laws, and it's unreasonable to think that we could cover all the laws of nature there are, still less all there might be, in such a simple way.[9]

I think this is a good reason, within the DTA theory of lawhood; my reasons for finding it unconvincing are just my reasons for preferring a fancy regularity theory to the DTA theory.[10] Even within the DTA theory, however, I think it is less than decisive. Another option is to have not just the one lawmaker relation, but a family of them, and put the complexity that is missing from the simple *F*'s and *G*'s into the *N*'s that apply to them. I take it that it would be possible to develop the DTA theory in such a way, but that the requisite family of fancy *N*'s would be a most unwelcome complication.

> (5) For structural universals, if not for universals in general, it is possible to say something about what makes one universal similar to, or

[8] *Universals and Scientific Realism*, Volume II, p. 96.

[9] See *Universals and Scientific Realism*, Volume II, pp. 149-153; Fred I. Dretske, 'Laws of Nature', *Philosophy of Science* 44 (1977) pp. 248-268; Michael Tooley, 'The Nature of Laws', *Canadian Journal of Philosophy* 4 (1977) pp. 667-698; and D. M. Armstrong, *What is a Law of Nature*? (Cambridge University Press, 1983).

[10] See my 'New Work for a Theory of Universals', p. 366.

> incompatible with, another. Armstrong uses the example of structural universals of length. If one stick is 9 meters long and another is 8 meters long, then, necessarily, a large part of the first stick is 8 meters long; and, necessarily, no stick is 8 meters long and also is 9 meters long. These necessities both follow from the necessary connections between the universals of length and other universals they involve: a stick 9 meters long must have two distinct proper parts, one of them 8 meters long and one of them 1 meter long. That is what makes the universals *9 meters long* and *8 meters long* be both similar and incompatible. A parallel account could be given for resemblance and incompatibility of shapes, and perhaps also colours.[11]

But don't we really need to understand how universals in general, whether structural or simple, can be similar or incompatible? For instance, positive and negative charge might be incompatible simple universals. If we need a general account, then the value of an account that works only for a special case is limited.

> (6) Can we be sure that there *are* any simples? If not, then we cannot dispense with structural universals in favour of the simples they involve; because they don't involve simples, just other structural universals. Take our previous example. We certainly didn't get down to simples: a carbon atom consists of electrons, protons, and neutrons in a certain structure of bonding; protons and neutrons consist in turn of quarks; it is speculated that quarks in turn are composite . . . . Maybe there is no end to this complexity. Maybe there are no simples, just structures of structures *ad infinitum*. (Or maybe there are simples but not enough of them—if *electronhood* were simple but *protonhood* were a matter of structures *ad infinitum*, that would be enough to defeat the plan of dispensing with *hydrogen* in favour of the simples it involves.) Even if we believe in (enough) simples, should we adopt a doctrine of universals that presupposes this, and leaves no room for even the possibility of infinite complexity?[12]

I take this last reason to be weightiest by far. Infinite complexity does seem, offhand, to be a genuine possibility. I might contemplate treating it as negotiable: if structural universals are trouble, and simple universals retain their charm, so much the worse for the alleged possibility that there are no simples! But that seems objectionably high-handed, if not downright intolerable.

Suppose we do acknowledge the possibility. That imposes a demand on a theory of universals—a severe demand, if I am right that structural universals are trouble. (It is unseemly that so far-fetched a possibility, as I take it to be, should do so much to constrain our theory of the constitution of this world.) If, like Armstrong, you think that universals afford the only tenable answer to the compulsory question about what it is for things to be

[11] *Universals and Scientific Realism*, Volume II, pp. 120-127.
[12] *Universals and Scientific Realism*, Volume II, pp. 67-68.

alike, then you will have to meet the demand as best you can. If, like me, you think that universals afford one of three *prima facie* tenable answers, you will want to take a closer look at the other alternatives.

I note that class nominalism, with a primitive distinction between natural and unnatural classes, has no problem with infinite complexity. It might happen that whenever we have a natural class, its members are composite individuals, and their parts (and pairs, triples, . . . of their parts) fall in turn into natural classes.

Likewise a trope theory has no problem with infinite complexity. It might happen that every trope is divisible into interrelated spatiotemporal parts, and that any two duplicate tropes are divisible in such a way that their corresponding parts are duplicates in turn.

The Linguistic Conception

Now I shall present three different conceptions of what a structural universal is, against which I shall raise different objections. I cannot prove these conceptions are the only ones available; it's just that I can't think of another. So one way to answer me would be to produce a fourth. I call these three conceptions (echoing my earlier classification of versions of ersatzism) *linguistic, pictorial,* and *magical.*

On the linguistic conception, a structural universal is a set-theoretic construction out of simple universals, in just the way that a (parsed) linguistic expression can be taken as a set-theoretic construction out of its words.[13] In fact, we think of the structural universal as being a complex predicate, in a language in which the words are the simple universals. Or rather, the simple universals are *some* of the words; they comprise the nonlogical vocabulary. We also need logical words—the usual connectives, quantifiers, and variables—and we need mereological predicates of identity, inclusion, and overlap. These words can be anything the resources of set-theoretic construction have to offer, it doesn't matter what. A language, in this generalised sense, needn't be something we can speak or write! What matters is that we have parsing and interpretation. The words of the language are interpreted by stipulation, and part of our stipulation is that each simple universal is to be a predicate which is satisfied by just the particulars that instantiate it. (Simple dyadic universals are two-place predicates, satisfied by pairs of particulars; and so on.) Complex expressions, including those that we take as the structural universals, are interpreted in a derivative way. Recursive rules are stipulated whereby the interpretation of a parsed expression depends on the interpretations of its immediate constituents under the parsing, and in one step or several we get down to the stipulated interpretations of the words from which that expression is built up. Thus we specify, in particular, what it is for something to satisfy a complex predicate in the language.

[13] As in my 'General Semantics', *Synthese* 22 (1970) pp. 18-67, reprinted in my *Philosophical Papers,* Volume I (Oxford University Press, 1983); or as in M. J. Cresswell, *Languages and Logics* (Methuen, 1973).

It is these predicates (or certain favoured ones of them, say the ones that are suitably nondisjunctive) that we take to be the structural universals; and to satisfy the predicate is to instantiate the universal. We have the required necessary connections between the instantiating of a structural universal by the whole and the instantiating of simpler universals by its parts. And there is no mystery about how these connections can be necessary: they hold by definition. They are just consequences of a semantic recursion which defines satisfaction of complex predicates in terms of satisfaction of the simple ones that are the vocabulary from which the complex predicate is built up; in other words, which defines the instantiation of structural universals in terms of the instantiation of simple universals they involve.

It is an easy matter to believe in structural universals, so understood. The hard thing would be not to believe in them. Once we have the simples, we need only believe in set-theoretic constructions out of things we believe in. There is no extra ontic commitment, apart from the commitment to sets that most of us accept as unavoidable.

Is it fair to call these constructions *universals*? I think so. It may stretch a point, given that they are sets whereas simple universals are individuals; but if so, that is a point we stretch routinely. A set of located individuals is itself located, in the plural way appropriate to a set: the set *is* where its members *are*. (It might be better to flout grammar and say that the set *are* where its members are.) Likewise for the higher ranks: a set of sets is where its members of members are, and in general a set-theoretic construction is where the individuals are whence it is constructed. In the case of one of our putative structural universals, those individuals are its simples; and as universals, they are wholly present in each of their instances; and among their instances are the appropriate parts of any instance of the structural universal; and that is how the structural universal itself is wholly present in each of its instances. The structural universal occurs repeatedly, as a universal should. Therefore it deserves the name.[14]

So far, so good; but the trouble with the linguistic conception should now be plain to see. Its structural universals are constructed out of simples. Armstrong's principal need for structural universals is exactly to cover the possibility that there are no simples, or not enough simples; and constructions out of simples are worthless to meet that need. Just when the need for structural universals is greatest, the wherewithal to make them is lacking.

If we put aside worries about infinite complexity, the structural universals of the linguistic conception might be some use. They could do for ersatz worlds, provided we are content to limit ourselves to possibilities which are fully given by arrangements of some stock of actually existing simples (and

[14] John Bigelow has noted a peculiarity: on the lingustic conception, a structural universal is apt to be present not only in its instances but elsewhere as well. Our universal *methane* will be wholly present, because its simples are, not only where there is a methane molecule but also wherever there is any sort of molecule that is made of carbon and hydrogen bonded together. So far as I can see, this is no real problem; we just have to take care to distinguish instantiation from mere presence.

provided we do not aspire to an eliminative analysis of modality); this amounts to a version of 'combinatorial' ersatzism. They are shared between things that are similar in the way that methane molecules, for instance, are, by being isomorphic in a pattern of instantiation of simples. Their sharing of substructures (constituent linguistic expressions) can provide a theory of similarity and incompatibility of lengths, shapes, or perhaps colours. They could be made the *relata* of a lawmaking universal, provided that a DTA theorist were prepared to allow such dubious entities as sets to instantiate genuine universals. But none of these manoeuvers really seems to depart from a very sparse theory of universals that confines itself to simples. Formulations are simplified, but we gain no additional strength. What we have are make-believe structural universals for those who do not accept the real thing.

The Pictorial Conception

On the pictorial conception, a structural universal is isomorphic to its instances. The methane atom consists of one carbon atom and four hydrogen atoms, with the carbon bonded to each of the four hydrogens; the structural universal *methane* likewise consists of several parts, one for each of the five atoms, and one for each of the four bonds. Compare a ball-and-spring model: one large central ball, and four smaller balls attached to it by springs. This model is a three-dimensional picture. It represents a methane molecule—any methane molecule, not any one in particular—by isomorphism.

The ball-and-spring model is a particular, and is wholly distinct from any of the methane molecules to which it is isomorphic. (Only in a much colder climate could we make it out of frozen methane.) The structural universal *methane*, on the other hand, is an immanent universal as well as an isomorph. It is wholly present as a nonspatiotemporal part of each methane molecule that instantiates it.

Since it is a universal, capable of repeated occurrence, its parts must be universals too. For wherever the whole is present, there the parts are present; so the parts must occur just as repeatedly as the whole; which they could not do if they were particulars. Then what can the parts be? An answer is immediate: they are the universals that are instantiated by the parts of the methane molecule. When the whole of the molecule instantiates the whole of the universal, the parts of the molecule instantiate the appropriate parts of the universal. The structural universal *methane*, we have supposed, involves three simpler universals: the monadic universals *carbon* and *hydrogen*, and the dyadic universal *bonded*. These are its parts. The central atom of any methane molecule instantiates *carbon*, the other four atoms instantiate *hydrogen*, and the four carbon-hydrogen pairs instantiate *bonded*. In this way, part by part under the isomorphic correspondence, the whole molecule instantiates the whole universal *methane*.

On this conception a structural universal is an individual, not a set. It is mereologically composite. The simpler universals it involves are present in it as proper parts. It is nothing over and above them, in the straightforward sense that it is nothing but their mereological sum. These simpler universals

may not yet be simples. In fact there may be no simples at all; this time, we have a conception that would permit infinite complexity. A universal is simple iff it is mereologically atomic; on this conception, we have no need to distinguish the two notions.

So far, so good. We have our structural universals, and we do not require them to be reducible to simples. But if there are simples, the structural universals are nothing over above their simple parts, just as a molecule is nothing over and above its atoms. A whole is an extra item in our ontology only in the minimal sense that it is not identical to any of its proper parts; but it is not distinct from them either, so when we believe in the parts it is no extra burden to believe in the whole. Likewise in general a structural universal is nothing over and above its simpl*er* parts, whether or not any of its parts are simple *simpliciter*. Further, we avoid the resources of set theory, with its queer way of spinning vast riches out of little or nothing; and we avoid the modal magic that I shall denounce later.

In the days when I was unworried about structural universals, I think I held the pictorial conception of them, though not in a perfectly explicit way. Does Armstrong hold the pictorial conception? Certainly his writing very often suggests it; certainly he affirms parts of it; and I cannot see how to extract an alternative conception from what he says. But also he sees what is wrong with it, and in that connection rejects one part of it. So we mustn't say outright that he holds it; what is unclear to me is how much of it he repudiates.

What *is* wrong? I hope I have been explicit enough to make the trouble stand out like a sore thumb. It is as follows. Each methane molecule has not one hydrogen atom but four. So if the structural universal *methane* is to be an isomorph of the molecules that are its instances, it must have the universal *hydrogen* as a part not just once, but four times over. Likewise for *bonded*, since each molecule has four bonded pairs of atoms. But what can it mean for something to have a part four times over? What are there four of? There are not four of the universal *hydrogen*, or of the universal *bonded*; there is only one. The pictorial conception as I have presented it has many virtues, but consistency is not among them.

* * *

Armstrong's discussion of the trouble is brief. He takes a simple example, one where the structure involves only a single monadic universal. (He rejects a dyadic universal of nonidentity.) He writes:

> Consider the structural property of *being (just) two electrons*, a property possessed by all two-member collections of electrons. We cannot say that this property involves the same universal, *being an electron*, taken twice over, because a universal is one, not many. We can only say that the more

> complex universal involves the notion of two particulars of a certain sort, two instances of the same universal state of affairs.[15]

What 'we can only say' is all very well; but it does not take the place of what 'we cannot say'. I should like to know what he thinks we *can* say, not about notions and not about instances, but about the universals themselves. Is it so or is it not that *being an electron* (taken only once) is part of *being two electrons*? If it is not, does that mean that the two universals (as opposed to their instances, or our concepts of them) are wholly distinct? If it is part, is it a proper part? Or is it the whole? If it is a proper part, what other part is there? If it is the whole, how do the two universals nevertheless differ?

It is part of Armstrong's theory that universals generally, and structural universals along with the rest, are abstractions from their particular instances.[16] Does this doctrine of abstraction somehow give us licence to set aside questions about the mereology of the abstracted universals themselves, and to speak only about the unproblematic mereology of the instances? Might it dissolve our difficulty? That depends what is meant when Armstrong says that a universal is an 'abstraction from' its instances. I know three things that could be meant, and three only. But two of them cannot be what Armstrong means, and the third cannot help us.[17]

(1) When one thing is said to be abstracted from others, the abstraction could be a mere verbal fiction. We could speak as if of some one 'surman' named Geach, when really the only entities we refer to are the many Geaches.[18] We could refer to them in an indeterminate and partial way, no more to one Geach than to another, and keep out of trouble by only saying things to which the differences between Geaches make no difference. We could even say there is only one, that being among the things that comes out true on every resolution of the indeterminancy of our reference. (Alternatively, we could say it by counting not by identity but by the namesake relation.) Then the surman Geach is nothing at all; or else he is some one of the many Geaches but we needn't ever settle which one. If this were meant when Armstrong tells us that a universal is an abstraction from its instances, then indeed our trouble over the mereology of structural universals would dissolve. For they and their parts alike would be dismissed as fictions and we would be left with the unproblematic mereology of the instances. But if this were meant, then also Armstrong would be a false friend of universals, and a most disingenuous nominalist; which assuredly he is not.

(2) When mathematicians abstract one thing from others, they take an equivalence class. The one direction common to many lines in the Euclidean

[15] *Universals and Scientific Realism*, Volume II, pp. 69-70.

[16] I find this stated most explicitly not in *Universals and Scientific Realism*, but in *What is a Law of Nature*?, pp. 83-84.

[17] Note well that my question concerns the relational phrase 'abstraction from'. On this occasion, I shall not even enter that quagmire of senses in which things are said to be 'abstract entities' although not abstracted *from* anything in particular.

[18] See P. T. Geach, *Logic Matters* (Blackwell, 1972), pp. 222-223 and 245-246. Of course it is not required that we join Geach in his rejection of absolute identity in order to regard surmen as mere verbal fictions.

plane is the equivalence class of those lines under the relation of being parallel. This way, our one abstracted from the many is at least not a fictitious entity (unless classes themselves are fictions). But it is only superficially a one; underneath, a class are still many. Otherwise my comment is as before. If Armstrong were a disingenuous class nominalist, that would indeed dissolve questions about the mereology of structural universals. But he isn't.

(3) What Armstrong *can* mean, without betraying his principles, is that the one universal is abstracted from its many instances in a mereological sense: all of them share it as a common part. That *is* Armstrong's view: he often speaks of immanent universals wholly present in their instances, and of the partial identity between different instances of the same universal. If he sometimes hesitates to say outright that a universal is part of its instances, I suppose that is just to placate those who insist on limiting the word 'part' to spatiotemporal parts, or to spatial parts, or even to well-demarcated spatial parts; and who go all bewildered when they hear the word used in its fully general sense. But to say that a universal such as *being an electron* or *being two electrons* is an abstraction from its instances, and to mean thereby that each universal is part of its instances, does nothing at all to answer or to dissolve our question whether the one universal is part of the other.

Variants of the Pictorial Conception

Perhaps there is some hope of a repair. How would it be if we dropped the isomorphism of the universal to its instances, but continued to hold that a structural universal is a mereological composite, having as parts the simpler universals that it involves? There are the three universals *carbon, hydrogen,* and *bonded*; the universal *methane* is composed of exactly these three parts, each entering into it only once; and it remains that whenever the universal is present in its instance its parts also are present, being instantiated by the appropriate parts of the instance, or pairs of parts.

But now consider butane. Its molecules consist of four carbon atoms in a straight chain, with adjacent atoms bonded; the end carbon atoms are bonded also to three hydrogen atoms each, and the middle ones to two. So we might have wanted to say that the structural universal *butane* consists of the universal *carbon* four times over, the universal *hydrogen* ten times over, and the dyadic universal *bonded* thirteen times over. But if we dump this strange talk of parts many times over, we'll just say that it consists of the three universals *carbon, hydrogen,* and *bonded*—just like the universal *methane.* So here we have two different universals, as witness the fact that some molecules instantiate the one and some the other; and both of them are composed of exactly the same three parts!

But how can two different things be composed of exactly the same parts? I know how two things can be made of parts that are qualitatively just the same—that is no problem—but this time, the two things are supposed to be made not of duplicate parts, but of numerically identical parts. That, I submit, is unintelligible.

Two bad rejoinders. (1) Sets do it.—I do not agree. It is a mistake to say

that sets afford a precendent wherein many things are composed, presumably in some special unmereological sense, out of the very same parts. What's true is that two sets—indeed, countless different sets—can be generated out of the very same individuals. We see this already with unit sets. Take Bruce, one individual: then we have his unit set, the unit set of his unit set, and so *ad infinitum*. But is this a case in which different things are composed of the same parts? No—it's not composition at all! When a unit set is made out of its sole member, one thing is made out of *one* thing; whereas composition is the combining of many things into one. If we want to find composition among sets, we must look elsewhere. The parts of a set are its (nonempty) subsets, and thus every many-membered set is composed, ultimately, of its unit subsets. This is genuine composition: many combined into one. It obeys all the canons of mereology. In particular, no two sets are ever composed of the very same subsets. The generation of sets out of their elements, as opposed to their subsets, is not some unmereological form of composition. Rather it is a mixture of the two things we have distinguished: the generation of unit sets from their members, which is not composition at all (God knows what it is); and the genuine, mereological composition of many-membered sets out of their unit subsets. Both of these together, applied in alternation, yield the entire hierarchy of (nonempty) sets. The set of Bruce and myself is the mereological sum of our unit sets; the set of Armstrong and Forrest and the aforementioned set is likewise a sum of three unit sets, one of which is the unit set of a sum of unit sets; and so on up the ranks.

(2) Different things can be made of the same parts at different times, as when the tinkertoy house is taken apart and put back together as a tinkertoy car.—I say that what's true is not that two things are made out of the very same parts, but rather that two things are made out of different parts, different temporal segments of the same persisting bits of tinkertoy. Admittedly, that answer is premised on a controversial view about how things persist through time. But if you reject that view, and think instead that the bits of tinkertoy endure identically through time, you still oughtn't to say that two things are made of the very same parts. Rather, *one* thing is made of those parts. This thing is not a house or a car *simpliciter*. Rather, it bears the house-at relation to some times and the car-at relation to other times. If you think that persistence is identical endurance, you keep having to transform plain classifications of things into fancy external relations of things to times, and so it is here.

* * *

Here is a second attempt at repair. We might restore the talk of parts many times over; agree that two different things cannot be made of the very same parts taken once each, but insist that two things can be made of the same parts if there is a difference in how many times over some part is taken. Such is the difference between the structural universals *methane* and *butane*. Further, we might take the 'many times over' adverbially: if A has B as part four times over that doesn't mean we have four of anything; the relevant entities are A and B,

there is only one of *B*, but 'four times over' is the *way* that *A* has *B* as a part.

I think such talk of having parts in one or another way is empty; and I should like to know what it can have to do with the fact that in the instances, we do have four of something. (I would suspect modal magic, of the sort to be discussed later.) But let that pass; there is a simpler objection. Consider isobutane. Where butane has a straight chain, isobutane branches. Its molecules consist of a central carbon atom bonded to three outlying carbon atoms; the central carbon atom is bonded also to one hydrogen atom, and each outlying carbon atom is bonded to three hydrogen atoms. So the structural universal *isobutane* consists of the universal *carbon* four times over, the universal *hydrogen* ten times over, and the dyadic universal *bonded* thirteen times over—just like the universal *butane*. But these two structural universals are different, as witness the different molecules that instantiate them. Even if our adverbial differences made sense, they would not solve our problem.

* * *

Here is a third attempt at repair. Again, we talk of having parts in one or another way, rather than composition *simpliciter*. And again we posit a *sui generis*, unmereological form of composition, whereby many things can be made out of the very same parts. Suppose that we have several different combining operations, each of which applies to several universals to yield a new universal. Each operation singly obeys a principle of uniqueness: for any given arguments, in a given order, it yields at most one value. But if we apply the operations repeatedly, starting with the same initial stock of univerals, we can produce many different structural universals depending on the order in which the operations are applied.[19] Whenever we apply the operations, we get a structural universal which involves the universals to which the operation was applied; the latter are in that sense simpler. But there is no need to assume that we start with simples, or that there are any.

My objection to this is that I do not see by what right the operations are called *combining* operations. An operation applies to several universals; it yields a new universal. But if what goes on is unmereological, in what sense is the new one *composed* of the old ones? In what unmereological sense are they present in it? After all, not just any operation that makes new things from old is a form of composition! There is no sense in which my parents are parts of me, and no sense in which two numbers are parts of their greatest common factor; and I doubt that there is any sense in which Bruce is part of his unit set.

If the friend of '*sui generis* composition' does not mean it seriously when he says that the new universal is composed of the old ones, if he takes this

[19] The operations that build structural universals out of the simpler universals they involve might be formally parallel to some of the operations that are used to build compound predicates in variable-free formulations of predicate logic; for instance, in the system of W. V. Quine, 'Variables Explained Away', in Quine, *Selected Logic Papers* (Random House, 1966). (Here I am indebted to Peter Forrest.)

to be a dispensable metaphor, if he does not insist that the old universals are still present in the new one, well and good. Then he is no longer any sort of pictorialist; rather, he favours the magical conception of structural universals, and I shall address his view later.

But if he does insist that his unmereological composition is nevertheless composition, in a perfectly literal sense, then I need to be told why. Saying so doesn't make it so. What is the *general* notion of composition, of which the mereological form is supposed to be only a special case? I would have thought that mereology already describes composition in full generality. If sets were composed in some unmereological way out of their members, that would do as a precedent to show that there can be unmereological forms of composition; but I have challenged that precedent already.

* * *

Here is a final attempt. I do not see that it faces any decisive refutation; but it strays a long way from any ordinary theory of universals, and eventually it becomes so bizarre that I cannot take it seriously. We might restore genuine isomorphism between the structural universal and its instances, and face the consequences. Let us concede that when the universal *methane* involves the universal *hydrogen*, we don't just have the one universal *hydrogen* after all. We *do* have four of something, and all four are parts of the universal *methane*. (And there are ten that are parts of the universal *butane*, not to mention the universal *dodecane*, or various high polymers!) Our new problem of one over many within the structural universal itself is to be solved by accepting the many.

Before, I argued that the parts of a universal had to be as capable of repeated occurrence as the universal itself; and that conclusion stands. So when we have many of something, instead of the one universal *hydrogen*, the many are still universals. Or at any rate they're not particulars. But it's not clear that they're universals either, because they're all alike. Universals were meant to explain similarity and duplication, and in such a way that two particulars are duplicates if and only if they share the very same universals. But then we'd better not have duplicate universals; else things could be duplicates without sharing the very same universals, if instead they had duplicate universals. It's hard to know what to call things that make like universals in the way they occur repeatedly, yet make like particulars in the way they duplicate one another. Let me call them *amphibians*.

We need four hydrogen amphibians as parts of the universal *methane*, one for each of the four hydrogen atoms in the molecules that instantiate it. In the special case of *methane* we might still get by with the one universal *carbon*; but for the case of *butane* we need carbon amphibians, and presumably it would be best to treat all cases alike.

How about *bonded*? Do we also need some dyadic amphibians? I think not—not if we are prepared to let the one universal *bonded* relate amphibians in the same way that it relates particulars. In that case, the fourfold occurrence

of *bonded* in the universal *methane* can be understood on a par with its fourfold occurrence in a particular molecule of methane: the one universal is instantiated by four different pairs. And we'd better let *bonded* relate amphibians, else we're still in trouble over the universals *butane* and *isobutane*. It would be no good just saying that each of them consists of four carbon amphibians, ten hydrogen amphibians, and thirteen dyadic amphibians of bonding. That does at least give us the required numerical difference between the two, if they were made of numerically different amphibians; but it leaves us with a mystery about why one universal is instantiated by the straight-chain butane molecules and the other by branched-chain isobutane molecules. We'd better have straight and branched chains of amphibians within the universals—as taking isomorphism seriously would require—and for that we need bonded amphibians, and if we have bonded amphibians we don't also need amphibians of bonding.

So we come to this: a structural universal is composed of parts; some of these parts are the amphibians which replace our original monadic universals; amphibians may be related by *n*-adic universals, in which case those *n*-adic universals also are parts of the structural universal. When the structural universal is instantiated by a particular, the particular consists of parts that correspond one-one to the amphibians that are parts of the universal. Each amphibian is wholly present, as a nonspatiotemporal part, in the corresponding part of the particular—perhaps we may still call this 'instantiation'. And the parts of the particular are related by the same *n*-adic universals that relate the corresponding parts of the universal.[20]

We face some fascinating questions. (1) What becomes of our original monadic universals, such as the one universal *hydrogen*? Do we have them as well as their amphibians, perhaps instantiated by their amphibians? (2) Does the same amphibian ever occur as part of two different structural universals? (3) If we have two hydrogen atoms in two different methane molecules, is there indeed a distinction between the case in which they instantiate the same amphibian of the structural universal *methane* and the case in which they instantiate different ones? I do not mean to put these questions forward as unanswerable. I might even suggest answers. But I shall not. I shall suggest indeed that the questions are too bizarre to take seriously. The theory that asks them just has to be barking up the wrong tree. There comes a time not to go on following where the argument leads!

* * *

I conclude that no version of the pictorial conception is satisfactory; it's

[20] Are amphibians tropes? No, though there are some points in common. Like tropes and particulars, amphibians may be duplicated; like tropes and ordinary universals, amphibians may be nonspatiotemporal parts of things; like ordinary universals but *un*like tropes, amphibians may occur repeatedly. Even if, like Campbell and Johnston, we say that trope-like things may persist by enduring identically, and to that extent may be wholly present at different times, we don't quite get amphibians; for amphibians can be repeated where there is no question of one thing persisting, as when one and the same hydrogen amphibian is present wherever there is a methane molecule.

no good thinking that a structural universal is composed of simpler universals which are literally parts of it.[21]

The Magical Conception

On the magical conception, a structural universal has no proper parts. It is this conception on which 'simple' must be distinguished from 'atomic'. A structural universal is never simple; it involves other, simpler, universals. (Simpler; perhaps not *simple*.) But it is mereologically atomic. The other universals it involves are not present in it as parts. Nor are the other universals set-theoretic constituents of it; it is not a set but an individual. There is no way in which it is composed of them.

Or rather, no way that is at all literal. We can speak of 'composition' to the extent, and only to the extent, that it is metaphorical; and what it is metaphorical for is the involving of one universal by another. If we say that the universal *methane* consists of the universals *carbon, hydrogen*, and *bonded*, the most that we may mean is that an *instance* of *methane* must consist, in a certain way, of *instances* of the others. Involving, in turn, is a matter of necessary connection between the instantiating of one universal and the instantiating of another; and on the magical conception, the universals so connected are wholly distinct atomic individuals.

Therein lies the magic. Why *must* it be that if something instantiates *methane*, then part of it must instantiate *carbon*? According to the linguistic conception, that is built into a recursive specification of what it means to instantiate *methane*. Fair enough. According to the pictorial conception, that is because *carbon* is part of *methane*, and the whole cannot be wholly present without its part. Fair enough. But on the present conception, this necessary connection is just a brute modal fact.

If you said that wherever *carbon* is instantiated, *bromine* must necessarily be instantiated next to it, that would make good enough sense as a matter of nomological necessity. There is no such law of nature, but there could have been. But suppose you said that it was a matter of necessity *simpliciter*—absolute 'logical' or 'metaphysical' necessity. Then what you say is not only false; it is entirely unintelligible how it could be true. Why couldn't anything over here coexist with anything else over there, and in particular why couldn't the presence of an instance of *carbon* over here coexist with the absence of any instance of *bromine* over there?

[21] There is a different place for mereology in a theory of universals. Suppose we have two monadic universals F and G; and we want a conjunctive universal *F&G* that is instantiated by just those things that instantiate both *F* and *G*. Then it would be quite natural to take *F&G* as the mereological sum of *F* and *G*. (More generally, we could conjoin *n*-adic universals by summation, so long as *n* is the same for all conjuncts.) Thus we insure that the conjuncts must be present wherever the conjunction is, and also that the conjunction is nothing over and above its conjuncts; both of which conclusions are desirable. Universals are mereologically atomic only if they are nonconjunctive; there may or may not be any such, for here too we may allow a possibility of infinite complexity.

I have no quarrel with any of this. We have no need for conjuncts taken many times over, or for isomeric conjunctive universals that differ because they have the very same conjuncts differently aranged, so we avoid the troubles that threaten composition of structural universals. For simplicity, however, I shall ignore conjunctive universals in what follows.

To be sure, the case of a structural universal and the simpler universals it involves is not quite that bad. The particulars in question are not distinct: the instance of *carbon* is supposed to be a proper part of the instance of *methane*. But how does that help, when the universals in question *are* wholly distinct? What is it about the universal *carbon* that gets it involved in necessary connections with *methane*? Why *carbon*? Why not some other universal, say *rubidium*? After all, the universal *carbon* has nothing more in comon with the universal *methane* than the universal *rubidium* has! They are three distinct atomic individuals, and that is that. There is no conceivable reason why the universal *methane* should, by the strictest necessity, drag the universal *rubidium* around with it wherever it goes. How does it manage, then to drag around *carbon*?

It may seem that I am making a great fuss over something very easy. By definition, methane consists of carbon and hydrogen bonded together in a certain arrangement, so of course we must have an atom of carbon as part of every molecule of methane. Carbon atoms instantiate the universal *carbon*, methane molecules instantiate the universal *methane*, so of course there must be an instance of the one universal as part of every instance of the other. What could be easier than that?

But you can make any problem look easy if you state it so as to presuppose that it is already solved. To name one universal '*methane*' and the other '*carbon*' (or, more longwindedly, '*being a methane molecule*' and '*being a carbon atom*') is to name them descriptively, in other words tendentiously. To be sure, no two universals deserve those two names unless the first drags the second around with it; unless it is somehow necessary, *inter alia*, that every instance of the first contains an instance of the second as its central part. Of course. But our question is: how can two universals—universals understood as atomic—possibly deserve those two names? How can two universals, which we might at first call by the neutral names 'Matthew' and 'Carl', possibly enter into the necessary connection which would entitle us to call them '*methane*' and '*carbon*' instead? It only conceals our problem if we call them that from the start. The magician makes our problem vanish by verbal sleight of hand.

Structural universals, conceived magically, make a striking test case in philosophical method. It is really very clear what sort of necessary connections are required, and how these connections are to be used in explaining how a structural universal involves simpler universals. It ought to be child's play to formalise this conception systematically in a suitable modal language. And that is all that many philosophers would ask. But that just goes to show that their standards of intelligibility are incomplete. Although we understand just what necessary connections are supposed to obtain, we are given no notion how they possibly could. I might say that the magical conception carries an unacceptable price in mystery; or perhaps I would do better to deny that there is any *conception* here at all, as opposed to mere words.

Uninstantiated Structural Universals

Forrest's plan to use structural universals as ersatz possible worlds requires

us to accept uninstantiated structural universals. These are the unactualised ersatz worlds, and they are in the overwhelming majority. Armstrong, on the other hand, has a general objection to uninstantiated universals, structural or simple. In this final section, let us consider whether uninstantiated structural universals are any more problematic than instantiated ones.

(I hasten to say that my question concerns universals that are uninstantiated *simpliciter*. There is surely no special problem about universals that are instantiated in foreign countries but uninstantiated here. Likewise, if I am right that ours is but one of many possible worlds, there is no special problem about universals that are instantiated in other worlds but uninstantiated in actuality. Forrest and Armstrong, disbelieving as they do in the other worlds, face the question whether they ought to believe in universals that might have been instantiated but happen not to be. For me there is no such question: whatever might have been, *is*.)

We might hope to extract an argument against uninstantiated universals from Armstrong's doctrine that universals are abstractions from their instances. Perhaps we might argue that an abstraction cannot exist if there is nothing whence it is abstracted: this instance or that may be dispensable, since the universal is wholly present in each one, but it is nonsense to say that it is an abstraction from its instances if it has no instances. But again I do not know what we can mean by 'abstraction' that would meet the needs of the argument. If abstracted universals were equivalence classes or verbal fictions, then indeed they could not exist without particulars to be abstracted from; but if so, we have no genuine universals at all. We would do better to mean that universals are nonspatiotemporal parts of their particular instances, and the abstraction of them is just mereological subtraction. But if 'abstraction' means that, it supports no argument against uninstantiated universals. Every hand is part of a human body, suitably integrated with the rest of it. It can be 'abstracted' from the body, so to speak, by mereological subtraction of the rest of the body. But a hand that is in fact part of a body might have existed on its own, or at any rate a duplicate or counterpart of it might have existed on its own; and something that is intrinsically just like the hands that are parts of bodies might exist without being part of a body. And why couldn't the same be true of nonspatiotemporal parts? The argument against uninstantiated universals requires that if something is an abstraction, then it is so *essentially* and couldn't exist without being so. But if abstractions are just parts of things (or, nonspatiotemporal parts of things) then it seems that if something is an abstraction, it is so contingently. We would need some independent argument against uninstantiated universals to establish that they were abstractions essentially.

A universal is wholly present wherever it is instantiated, and present nowhere else. Therefore an uninstantiated universal is present nowhere. But that is not a strong reason to deny its existence. It is an open question whether everything that exists has some sort of spatiotemporal location. The empty set, and the pure sets generally, are supposed to be unlocated; if so, maybe that is bad news for the pure sets, or maybe it is bad news instead for the thesis that everything is located.

(I myself would deny that unlocated things are part of this possible world, or any other; but that is irrelevant, since I do not claim that everything there is must be part of some or another world. The pure sets might perhaps be a counterexample.)

I would raise a different objection against uninstantiated universals.[22] Wherefore are they *universals* at all? When we are told what it means to be a universal, we are told, mainly, that universals are wholly present repeatedly, as nonspatiotemporal parts of things at different times and places; and also we are told that this repetition of universals makes for similarity. But uninstantiated universals satisfy no part of this description. Far from being wholly present repeatedly, and thereby making similarities, they are not present anywhere.

(To a lesser extent, my complaint applies also against universals with only one instance. There is no repetition, and no similarity or duplication made by such repetition. But the one-instanced universal is at least wholly present as a nonspatiotemporal part of something.)

I thought I knew what universals were—but if there are some of them that go against all I have been told about their distinctive behaviour, we'd better begin again!

I know the answer, of course. An uninstantiated (or one-instanced) universal is supposed to deserve the name because it *might* be instantiated many times over. It *might* be wholly present repeatedly, and thereby make similarities. It *might* do what universals distinctively do, even if in fact it happens not to.

This means that the definition of a universal is modal. A universal is something that satisfies a certain *de re* modal condition; it has a certain potentiality, whether or not this is realised. So far, so good. But what makes it so that one thing has the potentiality for repeated presence and another thing lacks it, when in fact neither thing is repeatedly present? Is that just a brute modal fact? I would hope not. For the most part, things have their potentialities in virtue of their nonmodal characteristics.

(I would explain that as follows: something might satisfy a condition iff it has a counterpart that does; it is resemblance that makes counterparts; and it is the intrinsic and extrinsic characteristics of two things that make resemblance between them. But I suppose that many who would not care to explain *de re* modality in that way would nevertheless agree that things have their potentialities in virtue of the nonmodal characteristics they actually have.)

If brute potentialities are to be rejected, then the modal answer is a halfway house. It rests on some better answer, in terms of the nonmodal characteristics that universals actually have. Then we might as well give the better answer directly. It should be as follows. There are the universals that are repeatedly present; and there are the uninstantiated universals that are not repeatedly present, indeed are present nowhere. But these are all things of one and the same kind. The universals that exhibit the distinctive behaviour of their kind, and those that don't but might have done, are united by a common nature.

[22] The argument that follows is due in large part to Mark Johnston.

That is the reason why the latter deserve the name of universals; and it is also the nonmodal fact in virtue of which the latter might have behaved as the former do.

But what does 'of a kind' mean here? Usually, in a theory of universals, things of a kind are supposed to share a universal. So is it that the uninstantiated universals share a second-order universal of *universalhood* with the instantiated ones? That would be an unwelcome complication at best, and leads straightway to a Third Man regress. Or must we have recourse to some primitive notion of sameness of kind—a sort of similarity—which is not to be explained in terms of shared universals? I myself have no great objection to primitive similarity, if it is offered as an *alternative* to a theory of universals. But what are universals for, if not to afford an account of similarity? To buy into universals, and yet appeal to a primitive similarity between the uninstantiated and the instantiated ones, is to buy a dog and do the barking yourself.

If we are dealing with simples, I see no other way to explain how the instantiated and the uninstantiated ones are of a kind. Therefore I think it is quite unsatisfactory to believe in uninstantiated simple universals. There is no good way to say what makes them be universals at all.

But if we are dealing with structural universals, we may be better off. We may have new ways to say how the uninstantiated and the instantiated ones are of a kind. Certainly that is so on the linguistic conception: we can say that they are constructed alike, in accordance with the same syntactic rules, out of the same vocabulary of simples. The linguistic conception is thus entitled to uninstantiated structural universals if, but only if, they are built out of instantiated simples.

Likewise for the pictorial conception. It is unintelligible how structural universals could be composed mereologically out of simpler universals; but try to imagine, nevertheless, that somehow they are. Then why not say that uninstantiated and instantiated structural universals are of a kind, because they are composed in the same (mysterious) way out of simpler universals? Eventually we must descend to instantiated universals, perhaps simples or perhaps just simpler structural universals. (The latter alternative covers the case of infinite complexity, which the linguistic conception can't handle.) Provided we reach instantiated universals sooner or later, it seems that we do not get any extra problem when our more complex structural universals are uninstantiated.

But the linguistic conception, or the pictorial conception if somehow it could be made to work, would not meet the whole of Forrest's need for uninstantiated structural universals to serve as ersatz possible worlds. It is possible, I take it, that there might be simple natural properties different from any that are instantiated within our world. To cover this 'outer sphere' of possibility, it is not enough to have uninstantiated structural universals that are set-theoretically constructed, or mereologically composed, out of simpler instantiated universals.[23] If he is to cover the full range of possibilities, Forrest

[23] On inner and outer spheres of possibility, see D. M. Armstrong, 'Metaphysics and Supervenience', *Critica* 14 (1982) pp. 3-17.

needs uninstantiated simples as well; and nothing we can build up out of thisworldly ingredients will help him there.

Only the magical conception could help. It is so far sunk in brute modality that some more wouldn't make matters worse. Let the magician be hanged for a sheep: let him accept uninstantiated structural universals and uninstantiated simples as well, saying that it is yet another brute modal fact that these might have been repeatedly present, and that is why they deserve the name of universals. This position, if only its brute modality were intelligible, would best meet the needs of Forrest's project.[24]

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Received November 1984

[24] In writing this paper, I have been much helped by discussion with D. M. Armstrong, John Bigelow, Peter Forrest, and Mark Johnston.