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The metaphysics of individuation

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reduction of possible worlds discourse to modal operator discourse in (5) and (6) seems to presuppose that kinds are not mere constructions out of, or reducible to, certain equivalence relations (cf. Salmon, (1981), p.147).

The results obtained so far point to Putnam's emphasis on indexicality as misleading. He consistently emphasizes the 'this' in (5) and (6), creating the impression that the actual paradigm must be rigidly designated. However, since in both cases 'this' appears within the scope of an indexical operator ('actually', 'dthat'), its rigidity is irrelevant to the truth-conditions of (5) and (6), since these will turn only on denotation within the actual world. The only thing which must be rigidly designated is the substance (kind) the paradigm is a sample of (cf. Salmon, (1981) pp.148-152). If, turning to operational definitions, one omits the indexical operator thus:

(7) It is necessarily the case that x is a sample of water iff it is a sample of the colourless, odourless, thirst-quenching liquid in such-and-such lakes and rivers;

then 'water' would designate the general category of colourless, etc., liquid and hence include Putnam's fool's water XYZ. It designates the substance water only if one inserts an indexical operator: '...is a sample of dthat (the colourles, etc., liquid in such-and-such rivers)'. Before I turn briefly to the derivation of aposteriori necessities, it should be noted that the foregoing has proceeded on the assumption of two quasi-essentialistic theses. Firstly, the thesis that every sample/organism is an instance of at most one substance/ species, and secondly, that every substance/species is one wherever it exists. In order to take care of possible substances/species, it would be necessary to assert the necessitations of these theses. Wiggins should have no problem with the former of these theses (cf. SS, pp.201-204). He is not explicitly committed to the second. Whether he can escape such commitments whilst also appropriating Putnam's theory is another matter, judgement upon which I shall postpone until the end of this section.

It has been widely proclaimed , on Putnamian grounds, that truths such as 'Water is H_2O' are aposteriori necessities, i.e., they are metaphysically necessary but conceptually contingent. Putman himself has expressed this claim as follows: "Once we have discovered that water (in the actual world) is H_20, nothing counts as a possible world in which water isn't H_20. In particular if a 'logically possible' statement is one that holds in some 'logically possible world', it isn't logically possible that water isn't H_20. ... In [an epistemic] sense, it is conceivable that water isn't H_20. It is conceivable but it isn't logically possible! Conceivability is no proof of logical possibility." ((1973), p.709). Wiggins would heartily endorse the final sentence (cf. SS, p.216). But there seems to me to be a couple of confusions in this extract which need to be brought into line with Wiggins' position. First of all, what sort of necessity is in question here?

It would seem to be logical necessity, given that it is the negation of its dual which is being asserted of 'Water is H_2O'. There is, however, very little sense in so construing matters. A logical necessity is surely one whose denial can be shown by logic alone to involve contradiction. But I do not contradict myself when I say 'Water is not H_2O'. I think Putnam is wrong to say that the possibility involved here is logical. He surely is not committed to the view that science discovers logical necessities, something which seems to be implied by the above quotation. The fact of the matter is simply that it is logically possible that water is not H_2O. Given the exigency of the notion of logical necessity, the associated species of possibility is radically permissive. It is not that conceivability is no proof of logical possibility, but that the latter is no proof of anything at all. To merely show that some counterfactual supposition is free from contradiction is not to show very much. Wiggins' agreement with Putnam's final quoted sentence is ambiguous; for Wiggins, conceivability is indeed no proof of logical possibility, but only because the former is conditioned and limited by certain 'transcendental' necessities: "... we must not be browbeaten here by the scornful contempt of those who prefer... the lighter work of simply asserting of almost anything they please that they can conceive almost anything at all of it." (SS, p.217). What is conceivable, for a human individuator, will be only a subclass of what is logically possible.[4] It is not to be assumed that 'Q is logically possible' means 'Q is conceptually possible'. A defender of Putnam may object that the Wigginsian has misrepresented Putnam's position; surely the conceivability at issue in each case relates to different domains. Putnam is concerned with the conceivability of this scenario: a community of speakers has certain experiences of such and such a kind which convince them that water is not H_2O. Wiggins is concerned with the inconceivability of individuating say, Julius Caesar, under a sortal incompatible with man. Hidden structure does not come into the Wigginsian picture at this level (although Wiggins does think that certain consequences regarding microstructure are deducible from his theory and endorses the Heraclitean claim that "...hidden structure dominates apparent,..." (SS, p.82)). The one is concerned with what may (conceivably) be discovered, the other with the conditions on de re conceivings of substances. But things are not really that different if Wiggins links conceptual and causal necessity (as he does). For then, since it has been discovered that water (the substance) is H_2O, no one can conceivably individuate any sample of liquid as water if that sample is not H_2O, whether she knows this or not. While 'Water is H_2O' is not a conceptual necessity, this structural property having been discovered, individuating only samples of H_2O as water is. The apparent reconciliation may be put as follows, with Wiggins' embellishments in brackets: "... if there is a hidden structure, then generally it determines what it is to be a member of the natural kind, [and what it is to individuate a member as of that kind, where the constraining influence of hidden structure is not epistemic]... it determines what we can and cannot counterfactually suppose about the natural kind [and about individually individuated members of the relevant kind]." (Putnam, 1975

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[4] For a perceptive critique of Wiggins' reliance on conceivability in metaphysical issues, cf. Forbes (1985), pp.220-224.

a, p.241). However, this is a spurious reconciliation, as the last bracketed claim makes clear. The fundamental disagreement concerning natural kinds between Putnam and Wiggins centres around the claim that individual members essentially fall under the kind in question. Putnam is not committed to this additional claim, only to essential properties for the substance or species as such, i.e., construed as abstract objects. Take the claim 'Tigers are mammals' as a necessary truth. It is not to be concluded from this that individual tigers are essentially mammals. 'Tiger' rigidly denotes the species Felis tigris, so it may be said that having only mammals as members is an essential property of Felis tigris (given 'Necessarily, tigers are mammals'). In order to conclude that if something is a tiger, then it is necessarily a mammal, one needs the additional premiss that if something is a tiger, then it is necessarily a tiger. Putnam does not commit himself to de re necessities for three-dimensional continuants in this way. (cf. Salmon, (1981), p.86). Wiggins certainly commits himself to de re necessities for continuants. He is committed to :

(8) (x) (EF) (t) (Ex at t → N (Fx) at t).

I think that Wiggins is right here, and the following unsavoury problem might show why it is advisable to accept:

(9) (x) (Fx → N (Fx)),

where 'F' is a substance sortal specifying a natural kind. Consider this individual tiger Felix; it is, qua organism, a cellular being. On Putnam's position, this empirically discovered microstructure not only fixes the meaning of 'tiger', it is also an essential property of Felis tigris. But none of this implies that Felix is essentially a tiger. If not, might Felix not exist as a non-cellular being, hence as a non-tiger? How might a case be made for the claim that Felix can exist as a non-cellular being? Well, grant Felix's cellular parts are not essential to him, and things can get started.[5] One does have such intuitions about organic parts, it would seem. The survivor of a heart-transplant is not a different thing. Now simply imagine that synthetic parts are being substituted for Felix's original parts throughout a period of time t1 - tn (surely a real possibility, even if only some synthetic substitute organs are presently available). Since there is no non-arbitrary cut-off point at which to say that Felix does not survive the replacement at that time, the final survivor at tn must be Felix. But Felix existing at tn is composed completely of non-cellular parts. Since 'Necessarily, all tigers are cellular beings' is an aposteriori necessity, Felix cannot be a tiger. So Felix exists as a non-tiger, having once been a tiger. Thus Felix cannot be essentially a tiger. Note that this step-by-

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[5] I am assuming the falsity of mereological essentialism as put forward by Chisholm (1976) in Person and Object. My reasons are similar to those given by Simons in his (1987), Parts.

step procedure did not violate any laws as the supposition about Lot's wife presumably does. It will not do, either, to appeal to a constitutive 'is' here, for that merely strengthens the present case. The foregoing informal argument may be represented as follows. Suppose for the purposes of reductio that Felix is essentially a tiger.[3] This implies Wiggins' de re commitment formulated above (dropping quantification over the sortal because that is part of the original assumption):

(i) (t) (if Felix exists at t, then Felix is necessarily a tiger at t);
Since it is true that:
(ii) Felix exists at tn;
It follows that:
(iii) Felix is a tiger at tn;
But,
(iv) Felix is not a cellular being at tn;
Therefore,
(v) (Ex) (x exists at tn and is a tiger, and is non-cellular).

Given the de dicto necessity 'Tigers are cellular beings', (v) must be false. So either (iii) or (iv) must be, since their conjunction entails (v). The descriptive set-up is such that (iv) is true. So (iii) must be false. Since (ii) is also, on present assumptions, uncontroversial, the rejection of (iii) commits one to denying that Felix is essentially a tiger. Now, the counter-intuitiveness of accepting that Felix, in fact a tiger, could exist without being a tiger, is strong grounds for concluding that individuals are essentially of the kinds that they in fact fall under. The essentialism involved here does not seem to be so outrageous as to offend.

There are however, independent grounds for rejecting the line of thought underlying the Felix argument. The argument presumes that the 'orthodox' answer in puzzles about part-replacement and the individuation of artifacts is correct. Moreover, it assumes that this answer can be transferred, unproblematically, to organisms. The orthodox answer claims that in cases of part-replacement such as that of the Ship of Theseus, it is the ship spatiotemporally continuous with the original one which is identical to the latter. That is, 'two' ships can be strictly identical even if, after a period of replacements spanning the interval from t1 - tn, the ship existing at tn has no parts in common with the ship existing at t1. Independently of whether a rival ship is actually made according to the same plan as the original, one need not accept that the original ship can exchange all its original matter and remain the same (I am not saying it is possible that the ship could be a numerically different entity from the one

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[3] Cf. Carter (1986), 'Mapping Semantic Paths: Is Essentialism Relevant?', p.67. Carter attempts to show that a Putnamian theory of natural kind terms need not accept that Felix is essentially a tiger. I agree, but I claim that there are other reasons to accept the essentiality of kind-membership.

it actually is, cf. SS, p.95). The issues here are complex and difficult. Suffice it to say that a Wigginsian can block the Felix argument without invoking (9) thus: "Some matter may be exchanged, perhaps, provided all replacement of material parts is referred back to the first state of the finished artifact,..." (SS, p.97). This undercuts the basis of an extension of the modal paradoxes to organisms. If one grants, conditionally, that the orthodox answer can be extended to organisms, there still appears to be a disanalogy. Organisms actually do persist through the total replacement of their matter, but then they organize this replacement (not volitionally, of course) themselves. This lawfully determined replacement is given by the principles of activity for organisms of various kinds, and forms the basis of the persistence claims made in spite of cell renewal. Although this presupposition is never explicitly invoked when dealing with one-organ replacement, I think it can plausibly be invoked in the Felix case. Therefore, even if the orthodox answer were correct for artifacts, that would not constitute conclusive grounds to assume it is correct for organisms.

More needs to be said about the higher-order essentialism attributed to Putnam above. On page sixty-seven asserted that a species, Felis tigris, has certain essential properties in order to contrast such a claim with one about the essential properties of continuants in space and time. But what arguments may be offered for this imputation? I shall attempt, following Salmon ((1981), pp.161-192), to reconstruct an argument relating to aposteriori necessities and then show that the argument goes through only on the assumption that natural kinds have essential properties. It needs to be asked, then, what is needed in addition to the ostensive definitions in (5) and (6) in order to generate aposteriori necessities. Donnellan (1973) suggests two pieces of additional information: (a) knowledge of the hidden structure of the actual paradigm; (b) what being an instance of the same kind (substance, species) as something consists in. Take a sample of water, then one needs to know that it has the chemical composition H_20 and, secondly, that being consubstantial with a given (mass) substance consists in having the same chemical composition. The information under (a) is uncontroversially aposteriori, the result of empirical investigation. It is not so clear that (b) is. I shall return to this later. The relevant valid argument, with a conclusion which involves the necessitation of a certain generalization, may be represented as follows:

(i) This (sample) is water;

(ii) This (sample) has the chemical structure H_20;

(iii) Being a sample of the same substance as something consists in having the same chemical structure;

(iv) Therefore, it is necessarily the case that every sample of water has the chemical

structure H_20.

It is clear that (iv) is true only if the substance water has the following essential property: having only samples with the chemical structure H_20. Now, given what was said earlier concerning the lack of dependence of a kind on its actual instances, it might be claimed that properties of the above kind are mere Cambridge properties. However, it still seems to be a genuine conditional property of an uninstantiated kind that if it were to have instances, these would all share a certain common structure. It is unproblematic to extend the argument to species and elements (e.g. gold). Notice, however, that while the argument-form above will generate the conclusion that all tigers are mammals, one needs something more circumscribed than merely the biological class. Being a mammal does not isolate the specific kind of Felix as between whales, dogs and donkeys. Perhaps genetic structure will do. This aspect is one which Salmon pays no attention to (cf. his (1981), p.167). In what follows I shall concentrate on the water-example. It is fairly evident that the important and controversial premiss above is (iii). Is it apriori or the product of discovery? This will be determined, more or less, by whatever is required of (iii) in order to make the above arguement a modally valid one. The details here have been scrupulously worked out by Salmon and I shall not repeat them. Suffice it to say that (iii) should state a necessary condition on crossworld consubstantiality, and as such is a non-trivial essentialist principle. Deleting the possible worlds, it may be expressed as follows:

(iii)* Given any possible chemical structure C and any possible entity z, if it is merely possible that z be a substance and that some sample of z has C, then it is necessary that, if z is a substance, then every sample of z has C. (Salmon, ibid., p.184).

It is far from clear that (iii)* is merely a consequence of empirical discovery. Its truth is established, at least in part, by purely conceptual analysis. I am not, however, saying that the theory of direct reference as such is committed to (iii)*. It is clear, nevertheless, that Putnam is (cf. quotation, p.66). The above serves to substantiate earlier claims about Putnam's commitment to the essential properties of kinds. It also shows something more general, however. I have been concerned throughout with what Wiggins commits himself to by appropriating Putnam's theory. But it is now evident, as intimated earlier, that whatever these commitments are, they will underdetermine Wiggins' specific brand of essentialism. One could be, consistently, an essentialist about kinds construed as abstract objects, and yet not about three-dimensional objects. This is in fact the position most plausibly attributed to Putnam, given his denial that individual members of a kind are essentially of that kind. So, whether or not Wiggins is in fact committed to the higher-order essentialism inherent in the Putnamian programme, such commitment will be an inadequate basis for accepting individual essentialism. This is not to say that Wiggins would want to reject (iii)*, a rejection which is again consistent

with overall acceptance of the theory of direct reference. But if its truth is independent of the latter, one needs independent grounds to accept (iii)*. If this has seemed a tortuous route to a banal conclusion, I beg forgiveness. I must confess that, although it was fairly clear in my mind that Wiggins' essentialism is in his premisses, (and not grafted on via Putnam), I was never certain that the former could not be reduced to an essentialism about abstract objects. That the latter is not a possibility, is now also clear. Be that as it may, Wiggins' use of Putnam still leaves him with Mellor's objection.

Section 3
Universals and Natural Laws

A proper answer here requires a detour through the issues of which universal generalizations are laws and which properties are natural. It will emerge in due course that these two questions are narrowly intertwined in that the discovery of laws involves natural properties and vice versa. Taking the problem of natural properties first, it is important to be clear about what is meant by 'property'. The term is sometimes used to refer to intensional entities, so that properties are monadic concepts (and relations polyadic ones). In this sense, there would be a property horse corresponding to the predicate 'horse' (cf. SS, p.79). It is Wiggins' view that this intensional aspect of individuation is a condition of possibility for singling out tout court, which is extensional in that if one singles out x and x = y, then one singles out y (SS, p.5). That the intensionality carries over from the concept to the individuation follows from the trivial truth that one cannot individuate bare space-occupying matter, plus the claim that concepts are the reference of predicates. Reasons have been given in chapter two to doubt that this trivial truth needs to be cashed out in terms of D(ii); individuation need not presuppose substance sortals. It remains to be seen whether the postulation of intensional entities is a necessasry one for Wiggins' project. On the other hand, 'property' is often used to refer to non-intensional entities, to objective aspects of reality. Following tradition, such properties may be called 'universals'. Note, however, that the claim that there is an objective, mind-independent distinction between non-natural and natural properties does not imply that the latter are universals. Before I address the issue of universals, I shall therefore examine the more general question of the grounds for a non-natural/natural property distinction. In this I follow David Lewis' 'New Work for a Theory of Universals'. ((1983), pp.343-377).

Accept for the moment that quantification proceeds over "Any class of things, be it ever so gerrymandered and miscellaneous..." (op.cit., p.346). Lewis construes any such class as a 'property'. But if properties are so abundant, any two things share infinitely many properties, i.e., they are undiscriminating. What is needed is an elite minority of special properties, the natural ones. These would be the ones grounding resemblances and relevant to causality. Lewis lays it down as a condition on any adequate account of properties that it recognizes

such an objective difference between natural and non-natural properties. To say that the natural ones are universals is, he claims, only one solution. The point, however, is that the function which universals do perform must be performed somehow. What possible reasons are there then, once the need for natural properties is recognized, to also accept the non-natural ones? Perhaps they could serve as semantic values for sentences such as 'Redness is a sign of ripeness', for it is highly counter-intuitive that there are genuine natural properties corresponding to 'ripe' (or to 'grue', 'humble', etc.). Note that Lewis' position here does not go against the one outlined in Chapter two, page thirty-nine. The use of 'property' there was implicitly that of 'universal'. It is simply that Lewisian properties can harmlessly correspond to any predicate whatsoever, if they serve solely as semantic values.

The most convincing argument Lewis gives for believing in natural properties is a consideration of Putnam's so-called 'internalism' (cf. Putnam's (1981), Reason, Truth and History). (He construes the Putnamian conclusion as impossible to accept: "We know in advance that there is something wrong,..." (1984), 'Putnam's Paradox', p.221). I say 'most convincing', because Lewis also claims that natural properties are essential to formulate certain materialist and duplication theses, but one is not as committed to materialism as one is to the Moorean fact of the determinacy of language and reference. Putnam's argument turns on his view that an ideal theory could not be false because reality does not conform to the theory. His fundamental assumption is that "...we interpret our languages or nothing does" ((1980), 'Models and Reality', p.482). If this is correct, any possible constraint on reference is only to be established by stipulation in language itself. That is to say, insofar as theories are highly idealized and rigourous languages, if a saving constraint C (e.g., a causal constraint) is put forward, an account of how it operates will be theoretical, and as such be incorporated into the 'total theory'. Since the ideal theory is the whole of (epistemic) truth, the saving constraint will be true but just more theory. If one takes Putnam's notion of 'intended interpretations' of a theory as any interpretation which satisfies a certain theory, then satisfaction under all such intended interpretations will coincide with (epistemic) truth, i.e., with the ideal theory. Thus an intended interpretation makes C-theory come out true, as well as the rest of total theory. But now, intended interpretations will be so abundant that almost any world (not too impoverished) can satisfy almost any (consistent) theory. Beyond that there are no facts of the matter as to what the world in question is like. It is clear that Putnam's argument goes through if there is only one constraining factor on reference, viz., the intention to refer in such a way as to be right. Given, however, the paradoxicality of such radical indeterminacy of reference, it may be thought that the conclusion refutes the original assumption of no further constraints on reference. Lewis suggests that the saving constraint concerns the referent, not the referrer: "It takes two to make a reference, and we will not find the constraint if we look for it always on the wrong side of the relationship." ((1983), p.371).

If, therefore, reference depends in part on what one does with language, it also depends on the 'eligibility' of the referents. And eligibility will depend on natural properties in that a set in the domain of the world will be an eligible extension of a (monadic) predicate iff its members share a natural property. The notion of eligibility then carries over to the intended interpretations so as to do away with an overabundance of interpretations. Only those that assign eligible extensions to the predicates are eligible interpretations, and hence intended. It is important to see that Lewis here re-establishes a non-epistemic, realist notion of truth. The satisfaction of a theory is no longer guaranteed, even an ideal theory could be false. The important point, for my purposes, is that this realism requires a more traditional realism that recognizes objective sameness and difference. I am intuitively happy with a realist notion of truth, but whether it is feasible or in fact required is something I am not concerned with. Suffice it to say that I take Lewis to be correct in viewing Putnam's line of thought as issuing in paradox, and that its solution requires "...objective inegalitarianism of classifications, in which grue things ... are not all of a kind in the same way that bosons or spheres [are]," ((1984), p.229). In order to take a discriminatory attitude towards properties, one need only take physics at face value. This is indeed a straightforward matter for a physicalist such as Lewis, he gives elite status to fundamental physical properties (e.g., unit charge, mass, quark colour, etc.). Notice that this presupposes that physics goes about its business, in part, by providing an inventory of the natural, elite properties (for a similar view, see Armstrong, (1978)). I do not have any problems with a scientific realism of this sort, primarily because the aposteriori nature of the scientific discoveries tempers the often apriori manner of proceeding in metaphysics (specifically concerning theories of universals, cf. Loux, (1978), Substance and Attribute). The identification of fundamental physical properties as natural properties has the added attraction of rendering plausible a supervenience thesis concerning the determinacy of the world and the microphysical facts. I shall discuss this thesis later.

The proposal that natural properties are a saving constraint on reference calls for two refinements. Firstly, it is more prudent to construe 'naturalness' as a matter of degree rather than as an all-or-nothing- affair. This point was anticipated in Chapter two. Being green is more natural than being grue, yet green is not a fundamental physical property, it is not 'perfectly' natural. Secondly, natural properties set up distinctions not only among properties, but also among spatiotemporal continuants. If one compares Felix to the tiger-shaped, ever-changing hunk of matter that follows him around (i.e., what constitutes him over time), it would appear that the former is a more eligible referent than the latter. Why? Because Felix's boundary is well-demarcated by differences in (highly) natural properties (e.g., density of matter and relative frequency of chemical elements as contrasted with the immediate environment). The dependence might be symmetrical here, or, if not symmetrical, at least mutual. Natural properties lead to well-demarcated substances, and a property belonging exclusively to well-demarcated things is (probably) natural. The latter claim is not unproblematic, however. Only

well-demarcated things are pets, but being a pet is not thereby a natural property. Perhaps natural and intrinsic will do the trick (cf. Chapter two, p.39).

I shall now make the transition to the first of the two questions posed earlier, namely, by virtue of what some generalizations are laws and others purely accidental. Insofar as I think the most plausible line to take is that laws are relations between universals, I briefly show how to combine a theory such as Armstrong's with Lewis' distinction between natural and unnatural properties. For Armstrong, universals are sparse. They do not correspond to every predicate or serve as semantic values. But neither do Lewisian natural properties. So the universals just are the natural properties. They comprise a minimal basis for a complete characterization of the world. One may call those properties whose instances all share one universal perfectly natural. Less than perfectly natural properties correspond to families of related universals (e.g., being metallic should be seen as an imperfectly natural property possessed by, say copper, not in virtue of its instantiating a universal of metallicness). Wiggins could accept this whilst still maintaining that Caesar and Felix have, respectively, the single intensional properties being a man and being a tiger. This does not mean that there is a corresponding natural property in each case. Much confusion in reading Wiggins is avoided by making this distinction. Wiggins can, however, proceed from the intensional level to something stronger by claiming that individuals belong essentially to their actual kinds. This need not be a claim either about the current conceptual scheme or about a single substantival universal (of man-or-tigerhood in the above case) as a truth-ground. It is a claim, rather, about the nomological basis of kind-membership. And insofar as such a nomological basis involves universals, as will soon become evident, essential kind-membership will be seen to turn upon higher-order relations among universals.

The oldest and most well-known argument in favour of universals is the so-called 'One over Many' argument. Given that one continually talks about different things having the same property or quality, being of the same sort or kind, there is a prima facie reason to postulate universals to account for such Moorean facts of apparent sameness of type. The account of sameness in, for instance, two particles being of the same mass, is that one and the same thing (a universal) is wholly present in both particulars. While it is clear that universals do solve the problem at issue, it is not clear that their postulation is compulsory. If the problem is restricted merely to what accounts for apparent sameness of type, a nominalist could simply take such Moorean facts as primitive. It is only by insisting that an account here should consist of an analysis, that such a nominalist response is deemed inadequate. This is indeed an additional condition which Armstrong insists upon ((1978), Vol.I, pp.11-17) by rejecting any unanalyzed predication. Note that this shifts the analysandum from Moorean facts of the above sort to the schema 'a has the property F'. The shift is basic to Armstrong's argument against various forms of nominalism. These are all said to resort to new predicates which cannot be

analyzed with the rest on pain of circularity. Take Class Nominalism, for instance. It employs predications of class membership which cannot, without circularity, be analyzed in terms of such membership. And so on for Resemblance Nominalism, Predicate Nominalism, etc. The argument is also used against rival theories of universals, such as Platonic (Transcendent) Realism, where predications of participation are problematic. Armstrong's relation regress is a powerful instrument, and the main reason for accepting a non-relational realism about universals (no dyadic relation of instantiation is postulated so as to escape Bradley's regress). However, it is possible to argue ad hominem against Armstrong that in this case he himself is guilty of unanalysed predication: "Such identity in nature [one universal in many particulars] is literally inexplicable, in the sense that it cannot be further explained" ((1978), vol.I, p.109). I think it best to shelve the problematic of unanalysed predication, perhaps no primitive predication is to be found. One may, in lieu of a search for the primitive, combine Lewis' argument for natural properties with a critique of a Humean, regularity theory of natural laws to argue that natural properties are best seen as universals (insofar as the latter are required for an adequate account of lawhood).

I cannot examine the extensive literature in this area and will therefore simply list some problems for a regularity theory. I proceed with the assumption that lawhood is not simply a property of statements which is withheld or attributed on purely conventional grounds, for example, Goodman's projectibility of predicates.

On the Humean view, laws are simply cosmic regularities. The following definition, using semantic ascent, serves to pick out the unrestricted regularities (Armstrong, (1983), p.12):

"p is a statement of a law of nature if and only if:

(i) p is universally quantified
(ii) p is true
(iii) p is contingent
(iv) p contains only non-local empirical predicates, apart from logical connectives and quantifiers".

It is clear that these are all non-nomological facts, so that the Humean position may also be construed as the following supervenience thesis for the truth-conditions of laws:

(T) If in w1 and w2 all the non-nomological facts about particulars are the same, then the same laws will be operative in both worlds.

That is to say, laws just are (cosmic) regularities, and the non-nomological fixes the regularities. For a non-Humean about laws, however, cosmic regularities could be accidents; so that distinct

worlds alike in non-nomological aspects (hence alike as far as cosmic regularities go) could differ in the laws holding in each. As far as the Humean view goes, I cite only two problems. There are many others which Armstrong discusses in chapters 2, 3 and 4 of What is a law of nature?. There is, firstly, the problem that purely local uniformities are Humean regularities (sometimes), although no one would want to call these laws of nature. But how can they fail to be if laws just are Humean regularities? Consider the (plural-case) local uniformity that everyone in room x is wearing a hat. In order for there to be a Humean regularity associated with this local uniformity, one only needs an individuating conjunction of general properties for room x. (I ignore the problems associated with such individuations, myriad as they are). Then the people in the room will be all and only those objects which (i) are people; (ii) have the relational property being in room x (the object having such and such individuating properties). Now, the Humean need not be much impressed by this line of argument. Ignoring the problem of a general individuating conjunction of properties, it is clear that being in room x is on Armstrong's own view not a pure, unrestricted universal. Still, it can be instantiated by many things, it is a 'quasi-universal' of sorts. It was only said that things satisfying (i) and (ii) will all wear hats. The actual problem is that this generalization is, surely, accidental. But the Humean has no resources by means of which to distinguish it from non-accidental generalizations. The second problem concerns unrealized physical possibilities. Given the Humean regularity theory, it seems that there cannot be any unrealized physical possibilities. One has, however, evolutionary reasons to think that a whole race of white ravens is more than a logical possibility (if it had inhabited snowy regions, etc.). However, it is a Humean uniformity that no race of ravens is white-feathered. Hence, on this view, it is a law that the possibility is unrealized. It seems highly implausible, however, that a theory of lawhood should in this way prescribe what is and what is not physically possible. Surely that is more of an empirical matter than the Humean theory allows for.

In general, if one has the law that Fs are Gs, as well as the fact that Fa and Ga, what obtains is only the conjunction of two states of affairs (that a is F and that a is G), according to the regularity theory. But that conjunction could also obtain without any nomic connection, it would seem. What makes it a law that Fs are Gs, on the present view, is simply the fact that all other Fs are also Gs. The conjunction is a lawful one in virtue of a relational property it has. If there is reason, however, to disbelieve the regularity theory, one should resist the temptation to analyse laws as (suitable) universally quantified generalizations. For a realist about universals, and about laws as connections between these, one has a case of nomic necessitation only if there is, in the above case, a dyadic relation between the universals F and G. This is the upshot of Armstrong's critique of the regularity theory, one needs universals in order to explain lawhood.

But what exactly is Armstrong's alternative view? It is actually quite simple and straightforward,

for those who can live with it. I can, and I think a close reading of Armstrong's, as well as Tooley's ((1987), pp.37-67), critique of the regularity theory, will show that something like the following is required. Construing the relation of necessitation N as a second-order universal (a dyadic relation), it issues in the second-order state of affairs N(F,G). Apart from the necessity between the universals involved, there is also some (as yet unspecified) sort of necessity between N(F,G) and the first-order regularity $(x)(Fx \rightarrow Gx)$. Notice that the automatic Humean objection concerning the absence of necessary connections between distinct existences is rendered less plausible by the sharing of universals. Construing N(F,G) as itself a universal present in the positive instances of the law, detracts even further from the distinctness between it and the state of affairs Fa & Ga. For the realist about universals then, Humean uniformities are based on non-uniformities, namely, the relation of necessitation between the universals involved in the uniformity. Whether this necessity is taken as logical or physical, it involves taking universals as ontological ground of the necessity. It is to be found, Armstrong suggests (echoing Wiggins at this higher-order level), in "...what it is to be an F and what it is to be a G." ((1983), p.77). Note that the above would be concepts, e.g., the concept unit charge or mass, on Wiggins' position, but not thereby sortal ones, for universals do not have beginnings of existence and persistence conditions in the way that continuants do. Now, it is clear that Armstrong construes the state of affairs N(F,G) as contingent. It is obvious that he must, given firstly, his view that which universals there are is a contingent matter, and secondly, the view that N(F,G) is itself a universal. Utilizing a possible worlds idiom, one could say that F and G can be differently related in different worlds, but not at different times. The reason why the latter is impossible, is simply that a universal is the same in all instantiations, so if one has N(F,G) at one time, one has it at all times. If not, one would have the absurdity of different phases of the same universal (N) being present at different times (cf. Armstrong (1983), p.80-81). Another, independent reason for construing N(F,G) as contingent is related to Armstrong's broadly Aristotelian position and Bradley's regress. If one were to say that N(F,G) holds in all possible worlds (i.e., N (N (F,G)), universals would have to be necessary beings. That is, in order for N(F,G) to have a truth-maker in such a scenario, F would have to exist in every world and bear N to G in every world. Furthermore, in those worlds without particular Fs and Gs, one would also be committed to uninstantiated universals. However, Armstrong regards his Principle of Instantiation, according to which universals are properties or relations of real past, present and future spatiotemporal particulars, as a necessary truth. It is hard to see why it should be a necessary truth, though, unless one also accepts a naturalism limiting existents to one single spatiotemporal frame. But even Platonists could accept that, if they were allowed to split the spatial and temporal dimensions. Be that as it may, surely no Platonist either contradicts herself or displays conceptual confusion by postulating uninstantiated universals as necessary existents?

The Principle of Instantiation, and its fellow the Rejection of Bare Particulars, are best seen

as plausible solutions to Bradley's regress. For if universals are necessary beings which exist even if uninstantiated, they would be Humean substances capable of independent existence. Problems then arise with the connection between these substances and particulars. If F exists independently of its instantiation in a and b, one needs another universal (relation) to link it to a and b, and so on. The regress is escapable only by construing universals as abstract features of states of affairs (the same holds, of course, for the particular, both the "...bare particular and the pure universal are vicious abstractions..." (Armstrong (1983), p.84). This is not to say that one cannot refer to the property of F-ness, it can be non-viciously abstracted from all states of affairs in which some particular has F. If it is objected that this metaphysic implies nothing about the instantiation of higher-order universals (such as the relation of necessitation), the remedy consists in taking N(F,G) as itself a universal. There are, of course, more powerful arguments in favour of universals whose existence transcend those of their instances. Tooley (1987), a latter-day Platonist, argues this line on the basis of purported uninstantiated laws. He considers, for instance, certain laws that would have held, despite being presently uninstantiated, on earth if it had been closer to the sun (laws relating to life forms, for example, which would be absent in this scenario). I cannot consider this position here. Suffice it to say that one should resist the lure of Plato whenever one can get by on less. There is no need to expose oneself to the charge that the means were terrible and the results commonplace. In any case, Tooley offers no independent solution to Bradley's regress, which must surely arise on his position. An additional reason to steer clear of Platonism is purely internal to this essay, namely, that no elucidation of Wigginsian theses should entail commitments he himself would reject. Insofar as Wiggins considers his project as compatible with Aristotelian nominalism (SS, p.8), transcendent universals are out of the question. Now, Aristotle, it seems, was a nominalist in exactly the Armstrongian sense outlined above. Universals are not, for him, other-worldly entities but repeatable features in the world. The Principle of Instantiation accomplishes what the Aristotelian dictum 'Substances are the primary existents' accomplishes.

It was pointed out earlier (p.70) that this form of nominalism in Wiggins is not problematized by his acceptance of Putnam's theory of natural kinds. Wiggins could accept the distinction between those predicates which are extension-involving and those that are not, without thereby committing himself to transworld, abstract entities which could exist without instantiations. Considerations in the present section have shown why and how the acceptance of universals need not compromise his nominalism either. But now, if mass substances and species could exist without samples or members (as Mellor points out), and if this precludes there being transcendent, uninstantiated universals as truth-grounds, what account can be offered of this phenomenon by an Amrstrongian-cum-Wigginsian nominalist? It was pointed out on page fifty-four, Chapter two, that Wiggins is not committed to Essentialist Realism, although he is committed to some sort of individuative essentialism. There might not be universals such as

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