Realistic Metaphysics: an interview with D. H. Mellor

ANNA-SOFIA MAURIN & JOHANNES PERSSON

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There was a time when many philosophers agreed that metaphysics was dead. Anyone acquainted with the works of D. H. Mellor knows that the subject is alive and well. Two young philosophers who are familiar with his work, Anna-Sofia Maurin and Johannes Persson, met him in Cambridge for an interview.

1. Matters and methods of metaphysics

Anna-Sofia Maurin: Terms such as 'metaphysics' and 'ontology' have, throughout history, covered a variety of approaches to what certainly seem to have been quite different topics. Given such a diversity, it would be interesting if you could tell us whether there is some special meaning that you think attach to these words and, consequently, some special condition(s) that you think a philosophical investigation needs to fulfil in order to be properly classified as 'metaphysical' or as 'ontological'?

D. H. Mellor: If you asked Picasso what he meant by 'painting', he wouldn't give you a definition, he'd show you some paintings. If you asked a mathematician what mathematics was, he'd show you some proofs. If you ask me what I mean by metaphysics I will tell you to look at the work I've published under that heading, on the nature of time, of causation, of whether the mind is a computer, the nature of laws, and chance, and so on. Trying to define terms that are rather general and, as you say, have been used in many ways, is much less useful than getting acquainted with what practitioners actually apply those terms to.

'Ontology', to me, has a clearer and narrower meaning, because it concentrates on general questions about what kinds of things exist; whereas, for example, the metaphysical question of whether minds are computers is a question not about what exists, but about how best to classify things – what their nature is – which is not directly a question of ontology. So, metaphysics includes ontology, but ontology is only a part of it.

Johannes Persson: In *Facts of Causation* you say that some philosophers reduce their metaphysics to physics, others to logic and semantics, but that you have another way of doing metaphysics. Could you tell us a little about what this metaphysical method consists in?

DHM: When I say that metaphysics doesn't reduce to physics, I mean that some important questions about the nature of things, and what kinds of things there are, are not studied by physicists, who on the whole take them for granted. For example, they will tell

you what fundamental particles there are, what fields there are, but not what kinds of things particles or fields are. That is, there are very general questions about the natures of things which don't concern the physicist and which are relatively unaffected by the details of physical theory. Those questions fall to metaphysics, which is why, amongst other things, it has to do with the foundations of physics, in the sense of basic assumptions that physicists take for granted. In other words, you can't answer the question 'What kinds of things are there, and what is their nature?' just by looking at lists of fundamental particles or other entities postulated by scientific theories. You must ask more generally 'What makes the descriptions given in a scientific theory true, and what kinds of entities are they talking about?' And that's a meta-physical question rather than just a physical one.

Similarly for logic. Taken in a reasonably narrow sense – as what logic-textbooks are about – logic deals mainly with principles of inference, with what you can safely infer from what on relatively a priori grounds. That doesn't tell you anything about the premises of inferences or, where there's a choice, which are the right principles of inference. So for example, no 'logic' of Newtonian mechanics can tell you whether its premises – e.g. that mass does not increase with velocity – are right. Similarly when there seems to be a choice of logics, for example as between those of Euclidean and other geometries. The choice of which geometry to use can't be settled just by looking at their logics.

So, my objection to these two reductions is that those who advocate them assume either that physics is the only authority on what there is, or that text-book logic sets the only constraints on what follows from what. I say neither of those assumptions is true. And if you ask me to prove it, all I can say is that most of the arguments, assumptions and theories in the book where I make this claim would not occur in books on logic or physics. Right or wrong, they raise issues which such books rarely even address, and certainly don't settle.

ASM: Could one say that the basic difference between metaphysics and the special sciences is one of scope rather than one of subject-matter – that the special sciences are just that, 'special', whereas metaphysics, in dealing with the truly fundamental issues, aims at a wider, or even complete, generality in its theories?

DHM: I don't want to confine metaphysics to something as general as that, because if you try to say something that fits the natures of causation, time, the mind, geometry, logic, law, social science, aesthetics, etc. etc., you'll find that there is very little you can say. But any non-philosophical studies of these subjects will, in practice, have to make some basic assumptions about them, often tacitly. Articulating those assumptions, saying what they mean, what justifies them, and whether they are really right – all that is often neither interesting nor important to that subject's practitioners. But those issues still matter to anyone interested in a subject's foundations, which is where its metaphysics comes in. So there's really not just meta-physics: there is also meta-ethics, meta-sociology, meta-anything. All these meta- questions matter to philosophers of a subject, but they need not matter to those in the field; just as meta-philosophy needn't matter to most philosophers – though of course it does to some.

ASM: You told us earlier that an important and truly metaphysical question is that of 'What makes the descriptions given in a scientific theory true, and what kinds of entities are they talking about?'. Would you say that there could be just one consistent metaphysical theory that could answer all such questions – or do you, in light of what you just told us, rather believe that it would take several such theories – perhaps one for each special science?

DHM: A theory of causation or of time might prescribe one way of describing its subject matter; but even if such a theory is true, it may still not be complete, so we could always add to it. And if we had theories of all such subjects that were both true and complete, why should 'one true theory of everything' be anything more than the conjunction of them? I don't ever expect to see a complete and unified theory of everything, and I don't see any point in aiming for one. What matters is that our theories are completely true, not that they are complete. Maybe there is a complete theory of absolutely everything, though I doubt it; and to be honest I don't much care if there is or not. As long as there is more to be done we're still in business, and I don't see any end to that.

ASM: There is a common-sense belief that scientific (and especially fundamentally physical) descriptions of the world are in some sense 'closer to the truth' or 'more correct' than the corresponding everyday description of that same world. For that reason we say such things as "this table is really atoms and void" (or whatever the table really is). It is also the case that our everyday conceptualisation of the worlds seems less precise and more open to disagreement, and this circumstance together with the apparent preciseness of physics, serves to strengthen the belief in a "privileged physics" (i.e., a physics which, once completely spelled out, will have a structure that 'mirrors' the basic structure of the world). Do you agree that physics is, in this sense, privileged when it comes to providing us with viable information about the basic constituents of the world and of their relations to one another?

DHM: I don't think fundamental physics is an especially privileged authority on what kinds of things there are. What you call 'our everyday conceptual system' contains far more concepts than we really need to produce reasonably full descriptions of almost any subject. And part of the business of all the sciences, it seems to me, is working out the basic concepts needed to describe their subject matters. If that is true of fundamental physics, it is equally true of psychology, of chemistry, biology and sociology, and indeed of the so-called moral sciences. If your metaphor of mirroring the world applies better to the sciences than to ordinary discourse, I think that's because it's part of their job to find ways of describing the world that explain our myriad everyday concepts in terms of fewer better integrated and interrelated concepts. To assume that all our concepts mirror the world would be to assume something like the *Tractatus* mirror-theory of meaning, and I see no reason to buy that.

ASM: Although you deny a simple and straightforward connection between the words and concepts we use (on any level) in describing the world, and that which these words or concepts refer to, or that which serves to make true the sentences in which these words or concepts occur, you still appear to allow for the possibility of drawing metaphysical

conclusions (of what there is) from premises that are based purely on our conceptualisations of the world. The point of contact is provided by the construction of what you call "Ramsey-sentences". Obviously, Ramsey-sentences, therefore, play a central role in the development of your theories. Could you explain to us, what a Ramsey-sentence is, and how it makes the transition from concept to truthmaker possible?

DHM: The original use of Ramsey-sentences was quite different from my use of them. Originally, they were introduced because of a problem in the theory of meaning presented by verificationism. The problem was how predicates like 'has an electronic charge' introduced in scientific theories, but where direct observation can't tell you when they apply, get their meaning. Ramsey's solution was to replace these theoretical predicates with existentially quantified variables, saying for example that 'there is some property – which we shall call 'electronic charge' – such that ...' and then add the rest of the theory. This removes the predicates whose meanings you can't give and turns the theory into a series of ontological claims – 'there are properties such that …'.

     Now, I am not interested in these semantic questions, but I am interested in the question of what properties there are. That is the question I use the Ramsey-sentence idea to answer. To answer that question I take not just theoretical predicates but all predicates in statements of laws of nature. I then imagine conjoining all these law statements – to allow for predicates like 'mass', which occur in many laws – and replacing all the predicates in this conjunction with variables. This gives an imaginary Ramsey sentence which says that 'there are in the world properties that occur in this and that way in laws of nature'. And then I say those are all the factual properties there are – where by factual properties I mean things like mass and charge, not mathematical properties like 'being a prime-number': in other words, all the properties of things in the world that affect how they behave.

     So, for me, this Ramsey-sentence provides an existence criterion, i.e. a claim about what determines what factual properties there are in the world. I think we need such a criterion, because without one it's too easy to postulate properties without having any clear idea of what counts as a property, or what determines whether some property you've postulated really exists.

JP: We have talked about the resemblance and difference between metaphysics and other disciplines of thought. What about interaction? What do you think about the possibilities for metaphysical methods and results to influence the special sciences, logic and semantics? Can a metaphysician have an impact on for instance ecology in a similar way that a student of physics might influence your work on causation and time?

DHM: I think the only way in which any subject should influence another is by producing results which are so well established that you'd better not contradict them, because if you did you'd almost certainly be saying something false. So if I say that I should let my results be constrained by physics, that's only because I think physics is telling me something, not because I don't think metaphysics is. I think therefore that physicists should be just as constrained by metaphysical results, for example that there's no backwards causation, or no cyclical time, which can then be used to rule out solutions of the equations of general relativity in which there is cyclical time or backwards causation.

In short, what we have here is a two-way division of labour, not a one-way dependence of metaphysics on physics or semantics.

To take another example, people in semantics postulate entities, such as properties, for various semantic purposes. It seems to me that before doing that, they should check what reasons there are for thinking there are such entities, as indeed they often do. That is why, for example, many logicians would prefer a logic or a semantics that did without sets, in which, to be honest, I doubt if anyone really believes. Talk about a set of things looks, to the outsider, like a way of using a singular term to talk about a lot of things at once. That is why it would be nice to have a plural logic that would enable semantics to avoid postulating these entities that nobody really believes in.

So my own view is that we should expect influence between subjects, where there is any, to go in all directions. But sometimes there isn't any. In particular, I can't think of any issue in ecology that is metaphysically important enough for it to be influenced by metaphysics. Ecology might of course be influenced by ethics, perhaps because we think we should value a diversity of species, or be concerned with managing the system of the earth so that the human race will continue to survive, since some ethical principles would be needed to justify either of these ecological views. I can't myself see any justification for either of these views. But even that is a claim about ethics, not about metaphysics.

2. On complexity

JP: We should move on perhaps to another illustration, and the one we've chosen is that, unlike some other contemporary metaphysicians you do not accept complex properties. For those who haven't thought about this topic before there are few obvious reasons why properties shouldn't sometimes be complex. True, negative, properties (as being non-green) might strike one as suspect, and also disjunctive ones (as being green or red) might seem a little counter intuitive, but conjunctive and relational ones, on the other hand, seem fairly natural. We say things, or might say things, like: "No. He's not ambitious – He is ambitious and smart", or "Socrates is (has the property of being) Plato's friend". What leads you to deny complex properties, and could you indicate the strength of your reasons not to accept them?

DHM: I have two reasons. One is that admitting complex properties leads to double-counting. Suppose, as you suggest, that we call someone ambitious and smart, and grant for the sake of argument that being ambitious and being smart are simple properties. Then their having those simple properties is quite enough to make what we've said – that they're ambitious and smart – true. Postulating a third property, of being 'ambitious-and-smart' is at best redundant.

My other reason for rejecting complex properties rests on a theory of what properties there are. If there is an independent reason for accepting such a theory, then we can look at it and ask if that theory admits complex properties. And my theory, the Ramsey-sentence theory I mentioned before, does not admit complex properties. Why should it? Who after all believes in individuals that are complex in the relevant sense? For example nobody in their right mind thinks that this room now contains not only Johannes and Anna-Sofia, the two people interviewing me, but also the complex individual Anna-Sofia-and-Johannes. Why then should anyone think that, as well as the properties of being

ambitious and of being smart, there is also the complex property of being ambitious-and-smart? The onus of proof, in other words, is on those who say there are such complex properties, to give us some reason to believe in them. And I can see no such reason, because as far as I can see they do no work, and the best theory of what properties there are doesn't postulate them. That seems to me a good enough reason to reject them.

The alleged property of being Plato's friend raises another double-counting issue. For if we need this property to say what Plato's friends have in common, then we also need the friendship relation to say what Socrates and Plato, and Johannes and Anna-Sofia, have in common. But then, that this relation holds between Socrates and Plato is quite enough to make 'Socrates is Plato's friend' true, and similarly for all other cases of friendship. So again, if to the relation of friendship between Socrates and Plato you add the property of being Plato's friend which you say Socrates has, you are double-counting. And as with complex properties, there is also the theoretical objection, that a Ramsey-sentence theory of what properties there are will not give you any such properties. For the theory would only do that if science had to postulate laws containing relations. But as laws are essentially general, they will only contain general relations like friendship, not the property of being so related to a particular individual like Plato. But then no Ramsey sentence of all laws will ever say that there is such a property as being Plato's friend. So here again we have a redundant property, which the best theory of what properties there are will not postulate. Why then should we believe in it?

JP: But, couldn't you object in the following way. Let us assume that you think that causation is a two-term relation and that, sometimes, only when you have the conjunction you seem to have a causal force to produce something: A cannot cause C, but A&B can. Then if you don't accept conjunctions you have no causation in these cases which looks truly causal. Wouldn't that be a reason to admit complex properties?

DHM: There are two cases here. In one, C has two different causes, A and B. That is no problem, since most things have more than one cause. So the idea here must be that C is caused by the conjunction A&B, as in 'Ian got on because he was ambitious and smart'. I have a two-part answer to that. One is that causation, on my theory of it, is not a relation at all, and so needs no real entities to relate. This is because I think the right way to state this causation has, as in my example, the form 'C because A&B', where 'C', 'A', and 'B' are sentences – 'Ian got on', 'Ian was ambitious' and 'Ian was smart'. Then for this causal sentence to be true, 'C', 'A' and 'B' must all be true: Ian can't have got on because he was ambitious and smart if he didn't get on, or wasn't ambitious or wasn't smart.

But this isn't a relation between Ian's getting on and his being ambitious and smart: it's just that he does get on and is ambitious and smart. Still, that isn't enough, as you can see by swapping 'C' and 'B', since 'Ian was smart because he got on and was ambitious' is false: Ian got on by being smart, not the other way round. So what else, besides the truth of 'C', 'A' and 'B' does it take to make 'C because A&B' true? One good answer is that if Ian hadn't been ambitious, or hadn't been smart, he wouldn't have got on. But that isn't a relation either, since relations entail whatever they relate, and 'If not-A&B then not-C' entails neither C nor A&B. But then, to cause C, A&B needn't be a real entity, merely a reification of the truth of 'A&B'. But this follows automatically from the truth of 'A' and of 'B': nothing else is needed to make 'A&B' true. So this causation needs no

such complex fact as Ian's being ambitious-and-smart, and hence no such complex property as being ambitious-and-smart; and similarly in all other cases. The complexity of much causation is no reason to postulate complex properties.

ASM: So, you deny logical complexity. But, do you also deny other kind(s) of complexity? At one point in *Facts of Causation*, while discussing space-time points (that you describe as a special kind of particular that normally interest us severally), you point out that regions of space-time (i.e., several space-time points) are like conjunctions of space-time points. But then you go on to claim that conjunctions of space-time points (in a sense that seems analogous to the case of conjunctions of properties) do not exist. Only the space-time points that make up the conjunctions do. Now, although denying the existence of the conjunction of space-time points in this case does seem based on an analogy with the case for properties, the conjunctions in the two cases do not seem likewise analogous. Are you in fact denying another kind of complexity in this case?

DHM: The only complexes I'm denying are logical or metaphysical ones. I do not deny that there are physical complexes, meaning physical objects with parts whose relations affect the properties and behaviour of the whole. But these are not logically complex objects, since it's a matter of physics, not logic, that the properties of a human body, say, depend on how its cells are related to each other.

Similarly with space-time. I do think general relativity implies that space-time has a shape, which affects the inertial properties of objects in it, and is itself affected by the amount of matter it contains. This makes me think that space-time is itself an object with spatiotemporal parts. But again, it is for physics, not for logic, to say if we need to postulate space-time as well as the space-time points it contains, just as we may need to postulate this table as well as the pieces of wood – or even the points – which it contains. But to do that is not to make the table a logically, as opposed to a physically, complex object; and similarly with space-time.

So in talking about complex objects, it's important to be clear about what sort of complexity is meant. I am only objecting to conjunctive objects, where conjunction is a logical operation. I have no objection to sticking two objects together to make a third one, with a mass that is the sum of those of its parts. That merely physical conjunction creates a new object which is indeed complex physically, but not logically.

JP: And that holds for objects and for properties?

DHM: Well, I'm not clear what sticking properties together is.

JP: If you take green to be the sticking together of blue and yellow …

DHM: Here's something that might do. There is a theory of simple and compound colours, which is used for example in making colour film, and in theatrical lighting. On this, you can say that yellow light is a compound of red and green light, meaning that if you add red and green light the light you get is yellow. That is a physical fact, which could be put by saying that yellow is not a simple colour but a complex – a conjunction if

you like – of red and green light. If that is an example of a complex property, I have no objection to it, since it is not logically but only physically complex, just as this table is.

JP: What about other entities of metaphysical interest: facts, dispositions, laws …

DHM: Well, to make my point, I had to invent a word which hasn't really caught on, for what I think of as simple or atomic facts, which I called *facta*. And these, which I think are the only real fact-like entities, are not complex or molecular, in the sense of containing other facta, although I think they do contain particulars and properties. But there's a commonplace use of the word 'fact' in which there clearly are complex facts. This is the sense in which facts are taken to correspond to true propositions, which can of course be conjunctions or disjunctions of other propositions. But when you ask what in the world makes such conjunctions or disjunctions true, all you need is something to make true their conjuncts or one of their disjuncts: you never need anything over and above that to make the complex proposition true. That's why I think the 'real' – i.e. the truthmaking – facts, which I call facta, are all atomic.

ASM: Apart from facta (which are singular and serve as truthmakers) you also postulate another kind of "fundamental fact", namely what you call the nomic facta. Could you explain how nomic facta relate to "ordinary" facta, and why you need nomic facta in addition to ordinary ones?

DHM: Once you've made a proposition true, it can entail many complex propositions. Thus whatever makes true a proposition 'P', also makes true 'P or Q', and so on. To go back to your earlier question about dispositions: I say it's a singular atomic factum that one object has a certain mass, but this requires any applied force F that did not alter its mass to accelerate it at a rate proportional to the force in the direction of the force. But that's a generalisation over all forces and all directions. So atomic facta can be truthmakers for generalisations.

So far so good. But it still doesn't enable me to assimilate all laws to this model, because laws have so many forms – with positive, negative and complex antecedents and consequents – that I couldn't see how to specify a form for them.

Since I wrote my book on causation I have, much against my previous inclinations, been tempted by the idea that laws are necessary. For then, not only does fixing all the laws fix all the properties and relations there are, the converse is also true: fixing all the properties and relations fixes all the laws. And if that is so, which I still can't quite believe, the only truthmakers you need are the properties and relations, plus of course the particulars that have them.

I must say I rather like this idea, it's just that I cannot bring myself to believe the consequence of it, namely that laws are, in a sense, necessary, i.e. necessary given the properties and relations that there are. (It doesn't mean that laws are absolutely necessary, because a law could fail to hold by the relevant properties simply not existing.) But that's a bit drastic, since it means that the same properties couldn't occur in even slightly different laws. So if, for example, as special relativity says, an object's mass increases as it accelerates, it couldn't possibly have been the constant that Newton thought it was. So

far I haven't managed to persuade myself that this is true, even though it would greatly simplify my ontology; but I'm working on it. [1]

JP: So in the end this would be a fully dispositionalist view on properties?

DHM: Well, as you may know, I don't think that properties are either dispositional or not, I think they just are. Calling a property dispositional is really a 'transferred epithet', or what Ryle would have called a 'category mistake'. By this I mean that what are really dispositional are not properties but predicates. It is not the property – if any – of being soluble, but the predicate 'is soluble', that is dispositional, because its meaning is given by a conditional: roughly, a thing is soluble in a liquid L to the extent to which it would dissolve if mixed with a given quantity of L But this doesn't tell you anything at all about what property, if any, corresponds to the predicate 'is soluble'.

This is why I don't have a dispositionalist view of properties. I do have that view of all the predicates that correspond to properties, namely, that the only way to introduce any of them is by means of conditionals. That, after all, is implicit in my Ramsey-sentence test for what properties there are. But, if I accepted your formulation of my view, people would then say 'ah, but dispositions need a categorical basis', which they don't, since if they exist at all they are categorical. That's why I'm not going to agree to your way of putting the question.

3. On determinables

JP: I think it was one of your forerunners in Cambridge, W. E. Johnson, who in the 1920s introduced a distinction between determinables and determinates. He said that if we compare different terms, such as 'red' and 'colour', we find that 'colour' characterises an object less determinately than 'red' does. And in addition to this negative characterisation Johnson claimed that determinates such as red emanate from the determinables, that determinates of a common determinable were comparable, while different determinables were not, etc. He even claimed that the phrases 'incomparable' and 'belonging to different determinables' were synonymous. When the distinction is presented in this way, one easily gets a feeling that what we are classifying here are different concepts or predicates rather than properties. Do you think so too, or would you think that the determinate/ determinable distinction reflects a more fundamental structure of the world?

DHM: Yes I do, because the striking thing about any determinable is that the properties that are its determinates are mutually incompatible, i.e. a given object can't have more than one of them at once. That's a very striking fact, which contradicts what we might call the 'Tractatus-view' that properties are independent. But there's no doubt about it. Different temperatures, for example, are different properties, because they have different extensions, precisely because they are incompatible: nothing that is wholly at 0 degrees C can be wholly at 100 degrees C at the same time. And that leaves something to be said about why different temperatures are incompatible.

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1 **DHM:** I've since realised that universal generalisations need no truthmakers, and hence that law statements can lack them even if laws are contingent, which I therefore now think they are: see 'Truthmakers for What?' in my *Mind, Meaning, and Reality*, Oxford: Oxford University Press, 2012.

I doubt if any general explanation can be given of why there are these families of mutually incompatible simple properties. It certainly takes more than logic to explain why temperatures, colours etc. form such families. Still, we do want some way of saying what this phenomenon is, and the twin concepts of determinables and their determinate values provide a good way of saying it.

And then, if you look at the structure of laws you find that they quantify not only over particulars but also over determinates, as in 'for all f and m, any net force f applied to any mass m will accelerate it at f/m', etc. Here 'all f' means not only all particular forces of any given strength f but also all values of f, i.e. all determinates of the determinable force; and similarly for 'all m'. In other words, Newton's laws of motion quantify over all determinate forces, masses and accelerations as well as over all instances of those determinates.

If you now apply to this the Ramsey-sentence view I was advocating anyway, you get not only second-order quantifiers ranging over determinate properties, but third-order ones ranging over determinables: there are determinables (force, mass, etc.) such that ... This makes being a certain determinable (e.g. a temperature) a second-order property, namely a property of certain first-order properties (e.g. 100 degrees C).

This isn't the only possible theory of determinates and determinables, as you know. But it does have the merit of following in a non-arbitrary way from a test for what properties there are, together with a single-sorted logic, i.e. a single domain for all second-order variables to range over. It then says that some members of this domain, namely first-order properties, have the higher-order property of being temperatures, and so on. This is why I think the determinate/determinable distinction applies to properties, i.e. is an ontological distinction, and not a semantic distinction between predicates.

ASM: Could the fact that you accept the existence of non-reducible second-order properties, force you to accept the possibility of an infinite hierarchy of properties of properties, or do you think that this regress could be stopped before it begins?

DHM: Well, although there could be a regress here, I don't think there actually is one, since as far as I know, no two determinables are incompatible with each other. The fact, for example, that something has a colour doesn't stop it from also having a temperature.

ASM: But how, on your theory, are we to decide what is the determinate and what is the determinable in each case? Conceptually there seems to exist quite a few alternatives from which we can choose depending on our perspective or our interests.

DHM: I agree that the distinction is not clear-cut on the conceptual level, but that's just predicates. The real colour determinates are the so-called 'ultimate determinates', i.e. colours whose instances resemble each other exactly in that respect. You can then use different predicates to pick out different sets of these determinates. 'colour' picks out the set of all of them, 'red' picks out one subset, 'green' another, some overlapping, others not. These colour predicates may not pick out precise subsets of colour-determinates, but that's another matter. All that matters here is that, precise or not, these predicates give us no reason to postulate anything other than ultimate colour determinates and the determinable property, of being a colour, which they all share.

Let us have a look at the colour-case. All you need at the level of properties are the ultimate colour determinates and their property of being colours. All other colour terms apply by being disjunctive, since many ultimate determinates count as 'red'. And if you ask why you pick these out, the obvious answer is that they are, or look, similar. It's still just a matter of predicates, not of properties.

Species are more complicated because 'being of the same species' involves relations, e.g. the relation of being able to breed with fertile offspring. The complication here is that, because this relation is not transitive, it doesn't give you an equivalence class of members of the same species. But then this interbreeding test doesn't pick out any property at all. It is just standing in for an explanation in terms of genetic structures, e.g. DNA-structures. And here there will be incompatible properties, based partly on the geometrical incompatibilities of different molecular structures. So here too I see no reason to postulate anything other than first order properties and some properties of those.

4. The future of metaphysics

JP: Moving from recent to future advances, from the methods we use today to the ones we rely on tomorrow. Has metaphysics developed much during your career – and will it go on developing?

DHM: Well, it's developed quite a lot during my career, so by naive induction I expect it to go on developing! The development that has most impressed me has been a clarification of the relation between semantics and metaphysics, and in particular the notion of a truthmaker. This has made much clearer how to get a theory of what there is, or of what kinds of things there are, that is not too closely tied to a semantic analysis of the statements whose truth you are trying to explain.

That seems to me a lot clearer now than it was in the literature of even twenty years ago. For example in my first book about time, I, like everybody else, discussed the 'truth-conditions' of temporal statements. But that is thoroughly ambiguous between metaphysics and semantics, where all you're doing is arguing, for reasons that need having nothing to do with ontology, about which meta-language to use to say when statements in your object language are true or false. Arguing in that way for a tenseless metalanguage only prompts the retort that you can give tensed truth-conditions for tenseless statements as easily as you can give tenseless truth condition for tensed ones. To settle a standoff like that, you have to find some basis for picking a privileged language: for example, that it has the form of second-order predicate calculus, or is the language of a prestige subject like fundamental physics. Either way, it was this choice of language that determined the basis of your ontological claims.

It has now become much clearer, at least to me, that this is what was wrong with a lot of twentieth century metaphysics. The great disease in metaphysics has been a gross exaggeration of the ontological importance of language. And what I have most enjoyed in the philosophy of the last ten or fifteen years has been seeing people recover from this. In particular, distinguishing the notion of a truthmaker from that of truth-conditions has enabled a much clearer view of where semantics starts and where it stops.

Another development is at the level of kinds of entities. Here we are especially indebted to Davidson for making clear why we need to postulate particular events – a

development that has vastly improved the philosophy of causation, action, responsibility and many other related topics. Similarly in the philosophy of time, which McTaggart transformed a century ago with his distinction between the A- and the B-series, which had previously been completely mixed up in discussions on time. And these are by no means the only examples I could give of major developments in metaphysics: they are just the first ones that come to mind.

There is the demise of logical positivism, which was a very respectable demise. What I liked and admired about the logical positivists was that they articulated their doctrines clearly enough to be able to see what was wrong with them. Other philosophical movements have lasted longer because they did not express themselves clearly enough for anybody to be able to tell where they were wrong.

So it's very much to the credit of the logical positivists that they changed their minds. Equally, it's very much to the discredit of some other philosophical movements – which I won't list – that they're still in business because they're so vague and untestable, and largely consist of rhetoric. I hope myself that the revival in the last fifty years or so of the kind of serious work that leads to progress in metaphysics, which you can find in Plato and Aristotle and today in Armstrong and Lewis, continues. The demonstration that this can still go on, and produce good results, I hope will encourage other people to come into the business and go on doing it. But that's up to them.

So even though I don't know where the most important new developments in metaphysics are going to come from, I do think that the rate of profitable change in the last twenty years has been pretty encouraging.

JP: Do you have any guess as to how your interests will develop?

DHM: That's a bit like asking me to list things I will buy next year: I don't know! If I have to guess, I'd say this. I've spent most of the last twenty years doing constructive metaphysics: constructing substantive theories of causation and time and chance. Now I want to stop doing that for the time being, because I don't at present have any ideas on that scale. So I feel I need to return to the sorts of activity from which such ideas come. In particular, I want to spend more time reading the literature, not entirely at random, but responding to ideas as I come across them. In other words, I want to avoid planning what I'm going to work on next as opposed to digesting the ideas of other people and seeing what they suggest to me.

I also want to spend more time developing and selling the work I have already done. In the last few years, since I published most of it, I have had too little time to deal with later developments. In the case of time I did do this, and produced another book. In the case of causation I haven't kept up, and replied to my critics, to the same extent, and I do want to do that. That's not just propaganda - it's how you keep up with a subject, realise what was wrong with your old views on it, try to fix what you can and give up on what you can't. The most recent example, where I have an awful feeling that I shall have to change my mind, which I don't want to, is about the modal status of laws of nature, which I fear may turn out to be necessary: a view I've resisted for decades. So I do expect to go on thinking about that for a while. Apart from that I don't know which ideas that I haven't yet had I am going to have, and I don't think it's very reasonable of you to expect of me to know that!

JP: What about the future importance of metaphysics? You haven't touched on that.

DHM: Well, it's going to go on mattering to me; whether it matters to other people is up to them. I think it would be unfortunate if it didn't, because I do think there is a kind of understanding of the basic nature of the world that can only be attained by doing metaphysics; and if people generally stopped being interested in that I should take a pretty dim view of the people! So I hope there will continue to be some interest in metaphysics.

JP: Could you give us a picture of the metaphysician in a hundred years? Will he or she be, as you are, a philosopher working at a well-known university, or could he or she as well be a biologist or, by all means, a philosopher, employed by a multinational company, or perhaps be an actor with no contacts whatsoever with academic philosophy?

DHM: That's not a very sensible question! I think it's unlikely that places other than universities will want to pay someone to do metaphysics, and even then what they will primarily pay them to do is to teach metaphysics, because some students want to learn it. The metaphysics that you get out of most biologists is not very impressive (and the metaphysics you get out of most physicists is even less so!). This I think is because they don't or won't accept that metaphysics is a discipline in its own right, not just a trivial spin-off from science.

But metaphysics is a serious discipline, as other branches of philosophy are, and one which, for reasons I don't really understand, many bright people can't get their minds round. That is to say, many people, faced with a philosophical question, can only give psychological or sociological or logical or semantic answers to it. Some people just can't do philosophy because they can't get the point of it. I have no idea why not, and I don't think it matters very much.

As to whether most philosophers in future will be in institutions, I really don't know. I suspect so, though there have always been free-lance metaphysicians. Bertrand Russell for most of his career was a case in point, as indeed was Wittgenstein. Metaphysicians have also been employed to do other things, like Ramsey, who was employed as a mathematician. But if you want me to put money on how serious metaphysicians in a hundred years will make their living, and I'm only allowed to put it on one of the options you offered me, I will put it on their being in a university department employed as a philosopher.

JP: Could you, finally, give us D. H. Mellor's short list of important metaphysical problems that will be/has to be successfully dealt with in this century?

DHM: One that I think needs to be settled, and I don't know how, is what consciousness is. Another one, which I think is more likely to be solved soon, is what thought is, i.e. what mental states with content are, and how they are embodied. By this I mean not just what it is for such states to exist, but what it is for them to be mental, and what sorts of mental states there are. I think there's a lot of work still to be done on the metaphysics of the mind, on the nature of consciousness, of agency, and so on.

I also see more work to be done on the relationship between laws, determinism, chance and the various notions of predictability, including issues to do with chaos. Then there is the idea of levels in nature, e.g. the microscopic level. There's a recurring feeling that, in an important sense, the small-scale structure of matter determines what happens on larger scales, rather than the other way around. I'm not sure I believe this, and have argued that even where this is true, it just happens to be true, and is not very important. I'm no longer sure of that, and think we should be able to achieve a better understanding of the relation between size and significance.

Those are just some of the questions I would like answers to, and most of them I don't expect to be able to answer myself, even if I do have another twenty years of philosophy in me. But somebody should.