Can having a property be fully explained in terms of set (or class) membership?

In view of the word "fully" in this question, it will be treated as a straightforward request for an examination of Class Nominalism as an account of properties. The question of whether 'having' a property is the same problem as what a property *is* (think of having children, or money), the issue of what counts as an 'explanation', the matter of whether a 'set' and a 'class' are quite the same thing, and whether it is better to focus on the identity of a class or on the nature of 'membership' – these will be put to one side.

Class Nominalism is the view that being a member of a class is all there is to having a property. Part I will sketch the process by which a thinker might arrive at this conclusion, and Part II will give an assessment.

I

Plato launched the debate with a bold view – that properties (and other general terms) have an abstract mode of existence quite independent of the particulars in which they are found. Properties are among the Forms, which have necessary existence, never change, and give structure and identity to the things in the world when particulars 'partake' of the Forms. The Forms answered the One-over-Many problem (of how different things can clearly be of a single type), and they explained how we communicate successfully in language (because our general terms have fixed and eternal points of reference).

Late in his career Plato (in *Parmenides*) began to spot difficulties with the theory, and Aristotle expounded them more fully. The Forms are hard to individuate without mentioning further Forms (how do you identify the form of 'man'?). Do the Forms of properties have properties of their own, and would that include the original property (how beautiful is the Form of the Beautiful?). How can the Forms be a source of movement and change if they are eternal and unchanging? How can the Forms play any causal role at all in reality? What does it mean to say that particulars 'partake' of the Forms? What use are the Forms? All of these questions remain relevant to the modern debate.

Aristotle retreated from the bold commitments of Plato. Properties (or qualities) are to be found within the particulars that embody them. Since these universal properties cannot exist independently, there will be no uninstantiated universals. Some properties of an object, the ones that make it a member of a particular class of things, are essential to it, whereas others are merely 'accidental'. This would imply the existence of two different sorts of classes: one would contain something like natural kinds, with shared essential properties (e.g. two rose bushes); the other would happen to share a quality (e.g. two tall plants).

The most thorough champion of universals in modern times has been David Armstrong. His motivation for supporting the existence of universal properties is the need for them in a theory of laws of nature, and a belief that real universals offer the only solution to the One-Over-Many problem. He starts from the plethora of universals with which we are faced when any predicate we can come up with suggests the existence of one, and gradually whittles them down to a 'sparse' group, by insisting that predicates must have "ontological correlates" (1980b:164).

However, a thinker who is drifting towards Class Nominalism will not be impressed by any of this. Apart from the difficulties raised by Aristotle, there is a general hostility to any extravagant metaphysic that fills that world with abstractions. The physicalist slogan 'Nothing exists except the postulates of physics' only allows space for particulars. A compromise move was proposed the A.K. Stout, publicised by D.C. Williams, and best expounded by Keith Campbell – that there are only particulars, but some of them are abstract, namely 'tropes'. Thus each property has a location in space and time, and they fall into classes, because a relationship of exact resemblance occurs amongst them. However, tropes have problems. Williams regards tropes as objects buried within other objects (such as a lollipop), but Lowe rightly points out that tropes lack clear identity conditions, so don't seem to qualify as objects. If I add white paint to a tin of white paint (Aristotle's example), do I then have one white trope or two? Lowe asks

whether a ball snug within a plaster case has one spherical trope or two. Since tropes are required to resemble one another, they face Russell's question of what 'resemblance' is; it can't be another trope. And although tropes may (as Campbell claims) solve a number of difficulties about properties, they don't help with the toughest one, which is the explanation of abstract reference. What would the nouns refer to in "pink resembles red more than it does blue" if our ontology contains nothing more than particular instances of those colours?

Meanwhile the nominalists, beginning in the middle ages with Peter Abelard and William of Ockham, had responded more drastically. There are no universals, and only particulars exist. The One-over-Many question must, of course, be addressed, and the answer is usually found in resemblance. This natural phenomenon groups particulars together, and the resulting classes give meaning to general terms.

Nelson Goodman rejected Resemblance Class Nominalism, and pointed to two difficulties. The Companionship Difficulty comes when two classes are coextensive. Defining a class of red squares is no use for distinguishing 'red' from 'square'. Renate and cordate animals are coextensive, yet having heart or kidneys are blatantly different properties. His Imperfect Community Difficulty shows that items might be classed together by resemblance, with no one common property (if A is red, square and sharp; B is red, round and blunt; C is blue, round and sharp, there are resemblances between pairs of particulars, but the resemblances don't run through the whole class, as they need to if the resemblance identifies the property to which the class refers).

Goodman proposed that there was no more to properties than linguistic predication. However, Predicate Nominalism is not a popular view, as it does not provide enough predicates for the multitude of subtle properties we experience with our senses (colours, smells, sounds), it means that predicates won't track natural events (as 'hot' and 'cold' should track changes of temperature), and it provides far too many properties (if a good description of nature is the aim).

This last problem (of superabundant properties) figures large in modern discussion. Are we to accept as properties the references of predicates which are conjunctions ('tall *and* handsome'), disjunctions ('tall *or* handsome'), negations ('*not* tall'), gerrymanderings ('tall and within ten feet of a blue pencil'), implausibilities ('tall and fundamental to physics'), or even category errors ('tall and abstract') and contradictions ('tall and short')?

Willard Quine backed away from the whole issue, by asserting that, given an ontology just of objects and sets, predication must be treated as unanalysable. That is, objects are primitive, and so the predicates or properties cannot be peeled off from them. Armstrong jeered at this as 'Ostrich' nominalism, but supporters of Quine such as Devitt seem happy to live with the label. Quine explains 'universals' as a result of the Humean psychological capacity to spot similarities. Effectively this makes Quine a Class Nominalist, since the classes are imposed on the objects by us, not by nature.

David Lewis has become the recent champion of Class Nominalism, by introducing possibilia into the story. Although renates and cordates are coextensive in the actual world, there are lots of possible worlds where they could come apart, and these must be included in the story, thus making renate and cordate into separate properties. Notoriously, it would appear that the possible classes had better have the same existential status as the actual classes, so Lewis finds himself committed to the reality of possibilia (a view usually greeted with incredulity). Nevertheless, if we say that having a heart and having a kidney are two different properties simply because people can think of the objects bearing them as possibly belonging in two classes, we have a reasonably common sense account of Class Nominalism.

II

However, there is one rather glaring question: *why* might thinking people want to place renates and cordates in two different possible classes, even though in the actual world they get lumped together? Consider four different cases:

Electrons: electrons are putatively identical, but we could place them in two classes, by counting them, and placing the even numbers in one class, and the odds in another;

Fruit: if most humans are asked to place a pile of oranges and bananas into two classes, the normal fruitmongers' distribution is the most likely one;
Geometry: if we create a class of trilateral shapes, we find we have created a class of triangular shapes, and we cannot imagine a situation where they could be separated;
Animals: if we create a class of renates we find that we have also created a class of cordates, though we can imagine weird circumstances where they are separable.

Predicate and Class Nominalists are happy with the electrons forming two classes, if we invent predicates like "is even-numbered", or choose to allocate our electrons in this manner, but this division into classes seems to be neither dictated by any natural fact, nor to reveal anything interesting or useful about electrons. It only indicates the obsessive numerical character of some human beings. You can't, though, stop people from creating classes and attributing properties in this way, and they will sometimes initiate wars and massacres on such a basis.

The division of fruit into yellow curved bananas and spherical orange oranges clearly reflects something real about the world. The division is useful, for culinary and health purposes, and explanatory, of where the two fruits originate. However, in an art school the fruits might be divided differently, on aesthetic grounds, and in the health inspector's office they might be divided on grounds of freshness. In each case, though, the division would be reflecting facts about the fruit, as well as the interests of the classifier.

The geometry example seems to have the interesting characteristic of arriving at an identical set of objects by different routes. We say that being trilateral is not the same property as being triangular, even though the objects all end up in the same set. When we try to imagine the possibilities, no one can see how the two sets could ever come apart (though it is worth noting that it must be specified that a 'figure' is involved; otherwise the two concepts can be pulled apart in situations where some of the lines involved are parallel).

As we have already noted, renates and cordates are inadvertently placed in the same class, but they can come apart in the imagination. But while the whole animal may be both renate and cordate, the property of being cordate has itself got at least one property in reality which being cordate does not, namely that it involves making a thumping noise inside the animal. The renate aspect of the animal is certainly not the same as its cordate aspect. This is what suggests to our imagination that they could, in other circumstances, belong in separate classes.

I think a conclusion is already emerging. People can and will classify things any way they choose, but many such efforts are unreflective of the items being classified, and do not clarify the actual distinctions between objects. It is tempting at this point to seek for 'natural' classes instead of random ones. Anthony Quinton tackled this head-on, by proposing that the idea of a natural class should be taken as primitive. If resemblance is taken as an objective feature of reality (rather than a mere psychological phenomenon), that might give some grounding to the degrees of naturalness, though Quinton says that what counts as natural must partly depend on the interest of observers. While gerrymandered, implausible and impossible predicates would come out as 'unnatural' on those grounds, there doesn't seem to be anything actually unnatural about a class of persons who are tall, handsome, rich and watching the ten o'clock news.

At this point the Gordian Knot of the problem seems to me to be elegantly cut by Sydney Shoemaker: that the distinction between the interesting and the silly properties can be made by reference to their causal role. If we examine the four examples in this light, we see that while the fruits have actual different causal powers, and the renates and cordates have possible different causal powers, there is no known difference in causal powers between electrons, and (in the abstract field of geometry) no conceivable difference in powers between triangular and trilateral figures (in tessellations, for example). Furthermore, if we consider (as Shoemaker suggests) the epistemology of the situation, we find that we can know the difference in fruits by examining them, and we can infer the possible difference of being renate and being cordate by examination, but examination has so far shown no difference between electrons, or between triangular and trilateral figures.

The proposal that we identify the properties that are natural and interesting by means of their causal roles turns out to have ramifications far beyond the ontology of properties, because it ties in with Kripke's proposal that necessities can be known a posteriori. Suddenly scientists are in

the ontological driving seat, and Shoemaker focuses our interest on the essential properties, which give rise to the powers, which enable us to identify (or infer) the underlying properties, and the laws of nature themselves follow from the resulting regular behaviour.

The main question to ask here is whether Shoemaker's proposal has actually solved the problem, and provided an answer to this exam question. The initial answer to the question seems to be a clear 'no'. To rest a theory of properties entirely on class membership gets the situation the wrong way round, and offers nothing remotely resembling a definition or individuation or explanation of properties. Properties can be put into classes, but then absolutely anything can be put into classes. The emphasis on causation also draws attention to the fact that class membership has nothing to do with the causal powers of an individual property, just as one can't become a philosopher merely by joining a philosophy class. Class Nominalism also has the odd and implausible consequence that, since a class gains its identity simply from its members, if one yellow banana ceases to exist, then the property of yellow changes its identity.

If any theory of properties is going to be useful and interesting, it needs to distinguish the natural properties (perhaps in degrees of naturalness) from the highly abstract ones, and the downright silly ones. If causal role won't do that, it is hard to think of anything else that would, since causal relations are at the heart of nature. So the natural and interesting properties are qualities which give rise to events, and we individuate them by their powers (within the limits of scientific discovery), so that a conjunctive property such as 'tall and rich' can be accepted as natural and real, but then needs to be further subdivided, since being rich isn't much help in playing basketball.

The most difficult remaining question is how to explain abstract reference ('pink is more like red that it is like blue'). Every theory finds that perplexing. The best attempt is probably Armstrong's proposal that close resemblance involves an extensive sharing of properties. The causal view seems appropriate there, and we could say that there are a lot of causal powers in common between pink and red, such as arising from similar electro-magnetic wavelengths, and attracting similar insects. To manage all this, the concept of an active causal power will have to be taken as basic and given, but then you have to start somewhere.

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