

Pure Powers and Powerful Qualities

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Those who think that physical properties such as mass and charge are *pure powers* think that such properties are exhausted by the contributions they make to the dispositions of their bearers. This is naturally (but wrongly, I will argue) understood as the claim that the essential natures of pure powers can be exhaustively specified in terms of the disposition-defining counterfactuals they make true. Granting that laws of nature are equivalent to infinite conjunctions of such counterfactuals, it follows that we can specify the essence of, for instance, charge, via the claim that it is the truthmaker for Coulomb's law. Pure powers so conceived are typically contrasted with *powerful qualities*, such as sphericity, with 'pure' in 'pure powers' taken to imply 'non-qualitative'. In this paper I begin by supposing that mass is a pure power in this sense, and argue that sphericity and mass (so conceived) play a symmetrical role in grounding the disposition of a sphere to roll. The essential nature of sphericity, I argue, can be exhaustively specified in terms of its making certain mathematical propositions true of its bearers. But these are the very same propositions to which we appeal in deducing that the sphere is disposed to roll. Since what makes sphericity a quality also makes it powerful, why is it not the case that what makes mass a power also makes it a quality, hence not pure? A natural suggestion is that what makes a pure power pure is that it suffices by itself to make disposition-defining counterfactuals true. Sphericity, one might suggest, does not meet this condition, but mass and charge do. However, Coulomb's law applies only to point charges and uniformly charged spheres (or spherical shells), and it applies to such entities (partially) in virtue of their geometric properties. The role of sphericity in grounding the disposition of a sphere to roll is mirrored in fundamental physics. I conclude that no physical properties suffice by themselves to make laws of nature true – charge is at best a partial truthmaker for Coulomb's law. It follows that charge does not bestow dispositions by itself, but (just as mass combines with sphericity to ground a sphere's disposition to roll) combines with the geometric properties of charge-bearers to ground their mutual attractions and repulsions. I conclude by suggesting that both sphericity and charge can be thought of as exhausted by their (partial) disposition-contributions, despite the fact that both are qualities. Hence, that a property is exhausted by its disposition-contributions does not entail that it is non-qualitative – powers can be both qualitative and pure.