

DISCUSSION  
IN DEFENCE OF RAMSEY'S TEST

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**Introduction**

Eugene Mills<sup>1</sup> attacks what I call 'Ramsey's test' for what natural properties (including relations) there are; where by 'natural properties' (or 'properties' for short) I mean the contingent and non-evaluative properties that 'ground the objective resemblances and the causal powers of things'.<sup>2</sup> The test says that 'if we stated all the laws [of nature] there are in a single Ramsey sentence  $\Sigma$ , the properties  $\Sigma$  would quantify over are all the properties there are'.<sup>3</sup>

Mills argues that Ramsey's test 'moves illicitly from talk of *a* Ramsey sentence  $\Sigma$  to talk of *the* Ramsey sentence  $\Sigma$ ', a uniqueness that nothing guarantees and without which it 'yields an outright contradiction'. His argument invokes a corollary of Ramsey's test, that 'if *F* and *G* are natural properties, then  $F \vee G$ ,  $F \& G$ , and  $\sim F$  (among others) are not'.<sup>4</sup> We can see how it does so if we

take two stable isotopes of chlorine,  $^{35}\text{Cl}$  and  $^{37}\text{Cl}$ , which differ physically but not chemically. . . let *F* be the natural property of being  $^{35}\text{Cl}$  and *G* be that of being  $^{37}\text{Cl}$ ,<sup>5</sup>

and let '*H*' abbreviate 'stable chlorine', i.e. ' $F \vee G$ '. Then since a  $\Sigma$  that quantifies over *F* and *G* will not also quantify over  $F \vee G$ , Ramsey's test will not let *H* be a property alongside *F* and *G*. For the same reason, it will not let *G*, i.e.  $H \& \sim F$ , be a property

<sup>1</sup> Eugene Mills, 'Mellor on the Sparseness of Natural Properties', *Ratio* (2013), doi: 10.1111/rati.12040 (to appear in issue 27:3 of 2014).

<sup>2</sup> David Lewis, 'New Work for a Theory of Universals', in his *Papers in Metaphysics and Epistemology* (Cambridge: Cambridge University Press, 1999), p. 47.

<sup>3</sup> D. H. Mellor, 'Properties and Predicates', in *Properties*, ed. D.H. Mellor and Alex Oliver (Oxford: Oxford University Press, 1997), p. 260.

<sup>4</sup> 'Mellor on the Sparseness of Natural Properties', (introduction) p. 350.

<sup>5</sup> D. H. Mellor, 'Nature's Joints: A Realistic Defence of Natural Properties', *Ratio* new series 25 (2012), p. 399.

alongside *F* and *H*. And this, Mills argues, makes the test give contradictory lists of properties. For since 'we could state all the relevant laws using either [*F*' and '*G*', or '*F*' and '*H*', doing so gives us] two corresponding Ramsey sentences:  $\Sigma_1$ , quantifying over *F* and *G* but not *H*, and  $\Sigma_2$ , quantifying over *F* and *H* but not *G*'.<sup>6</sup> Hence the contradiction.

Of the three responses Mills offers me to this, I find the first two as unpromising as he does. I too deny that 'some law capturable using "*F*" and "*G*" isn't capturable using "*F*" and "*H*"'. Nor do I think any condition will 'single out a unique Ramsey sentence from among the multiple ones our theories could or would yield'.<sup>7</sup> But then I need no such condition to rebut Mills' argument, which depends on misreading Ramsey's test. Dispelling that misreading will enable me to show, first, how his argument fails, and then, how a simplicity criterion, the third response Mills offers me, can in fact tell us, in our chlorine case, which of *G* or *H* is a natural property.

### Ramsey's test

Ramsey's test, as I define it, does for properties what 'Quine's test', as I call it, does for particulars. Quine's test says that the particulars which exist are 'those over which our first-order quantifiers must range for every fact to be statable without naming any particular'.<sup>8</sup> And just as, in Quine's test, variables bound by first-order quantifiers replace all singular terms, so, in Ramsey's, variables bound by higher-order quantifiers replace all predicates, not only the theoretical ones Ramsey replaces.<sup>9</sup> That is because where Ramsey's question is semantic – how do theoretical predicates get empirical meaning? – mine is ontological: what properties are there?

Similarly with Quine's test. Where Quine<sup>10</sup> asks about 'ontological commitment' – what particulars do the sentences we take to be true commit us to? – I ask about truthmakers: what particulars

<sup>6</sup> 'Mellor on the Sparseness of Natural Properties', (third page) p. 352.

<sup>7</sup> 'Mellor on the Sparseness of Natural Properties', (third page) p. 353.

<sup>8</sup> D. H. Mellor, *The Facts of Causation* (London: Routledge, 1995), p. 196.

<sup>9</sup> F. P. Ramsey, 'Theories', in his *Philosophical Papers*, ed. D. H. Mellor (Cambridge: Cambridge University Press, 1990), pp. 112–136.

<sup>10</sup> W. v. O. Quine, 'On What There Is', in his *From a Logical Point of View* (Cambridge, Mass.: Harvard University Press, 1953), pp. 1–19.

suffice to make every fact statable? That depends not on the language we use to state facts but on what particulars are available to make such statements true. And that in turn depends, for example, on whether particulars include events as well as things, whether things have temporal parts, whether the world contains spacetime regions and/or points, and whether what exists varies with time. But these are questions for physics and metaphysics, not for semantics.

And as for Quine's test, so for Ramsey's: it is for the natural sciences, not semantics, to tell us what laws of nature, and hence what natural properties, there are. That is why what I, like David Armstrong, mean by a 'law' is not a statement (e.g. a universal generalisation that supports counterfactuals), but whatever (e.g. a Humean regularity) makes that statement true.<sup>11</sup> It is also why different predicates need not correspond to different properties, any more than different singular terms need correspond to different particulars. For just as the different meanings of 'the morning star' and 'the evening star' don't stop the morning star being the evening star, so those of '... is light' and '... is electromagnetic (e-m) radiation' don't stop light being e-m radiation, and not just linked to it by laws of nature. And just as a singular term like 'the present King of France' may fail to pick out any person, so a predicate like '... is at  $-300^{\circ}\text{C}$ ' may fail to pick out any temperature.

Equally, a semantically simple predicate need not, and often does not, correspond to a single property. Take for example

... the particulars to which the predicate '... is red' applies, like red light, red paint, red-hot poker, red filters. These are made to satisfy the predicate '... is red' by quite different properties: red light by its frequency distribution; red paint by its chemical composition; red-hot poker by their temperature; and red filters by their molecular structure. There's no one property that makes the predicate '... is red' apply to all red particulars.<sup>12</sup>

In short, Quine's and Ramsey's tests, rightly read, are ontological, not semantic. And even to ontology their contribution is

<sup>11</sup> David Armstrong, *What is a Law of Nature?* (Cambridge: Cambridge University Press, 1983), p. 8.

<sup>12</sup> 'Nature's Joints', p. 397.

indirect. What the tests tell us directly is not what there is, but how the facts and laws of physics and metaphysics fix what there is. It is those facts, not Quine's test, that make France lack (or have) a King, make things lack (or have) temporal parts, and make our world include (or exclude) future, or past and future, particulars. Similarly, it is the laws of nature, not Ramsey's test, that make light be e-m radiation, and there be no such temperature as  $-300^{\circ}\text{C}$ .

To these facts and laws our tests do add one thing: a denial of mereological inflation. For just as Ramsey's test rules out conjunctive properties like being *Lead&Round*, so Quine's, for the same reason, rules out conjunctive particulars like *Gilbert&Sullivan*.<sup>13</sup> But what the simple particulars and properties are, whose mereological sums our tests rule out, is fixed by the facts and laws of physics and metaphysics. All our tests tell us is how they are fixed. Still, what they tell us even about that can only be true if it is at least consistent. So, in particular, Ramsey's test must not yield the contradictory lists of properties that Mills says it does. And it doesn't, as we shall now see.

### Simplicity

What Ramsey's test, rightly read, says of our chlorine case is that *G* (being  $^{37}\text{Cl}$ ) and *H* (being stable chlorine) cannot both be natural properties. It doesn't say that '*G*' and '*H*' can't both be semantically simple predicates, though they can't. But that follows not from Ramsey's test but from their interdefinability, i.e. from our defining '*H*' as '*For G*', or '*G*' as '*H* and not *F*'. Which we do, i.e. whether we make '*G*' or '*H*' the semantically simple predicate, is up to us. But whether *G* or *H* is a natural property is not up to us, and Ramsey's test doesn't say it is. In particular, it doesn't say that using '*G*' and not '*H*' to state laws of nature makes *G* and not *H* a natural property, nor that using '*H*' and not '*G*' to state them makes *H* and not *G* a natural property. So the fact that the very same laws can be stated either way does not make Ramsey's test entail that *G* and *H* both are, and are not, natural properties.

But if Ramsey's test doesn't yield that contradiction, it also doesn't tell us which of *G* or *H* is a natural property. Nor can it,

<sup>13</sup> 'Nature's Joints', pp. 401–2.

since it makes that depend on which of  $G$  or  $H$  occurs in the laws of nature that it is for the physics and chemistry of chlorine, not for Ramsey's test, to disclose. And to their apparent disclosures I say we can properly apply a simplicity criterion, though not as the criterion of truth or existence that I agree with Mills it cannot be. All we need is the fact that, as Mills admits, 'we do prefer simpler theories to more complex ones, other things being equal'<sup>14</sup>, a preference whose epistemic force is as universally accepted as, I agree with Mills, it is hard to justify.

Take the example, cited earlier, of

... the identity of light with radiation. The undisputed evidence for this is that all light is accompanied by e-m radiation that shares its velocity, is reflected, refracted, and diffracted in the same way, and whose frequency distribution determines its colour. But this fits two theories. One says that light is *not* e-m radiation, merely correlated with it by deterministic laws of nature. To this, the identity theory, that light *is* e-m radiation, is an empirically untestable addition. Yet all physicists accept it for the simple and parsimonious explanation it gives of the correlation it entails.<sup>15</sup>

In other words, what sells us the identity theory of light is its ontological simplicity. We believe it because, where its empirically indistinguishable rival, the correlation theory, postulates two sets of laws and properties, those of light and e-m radiation, it postulates one.

Now apply the same test to our toy theories of chlorine: mine, that the relevant properties are  $F$  (being  $^{35}\text{Cl}$ ) and  $G$  (being  $^{37}\text{Cl}$ ), and Mills', that they are  $F$  and  $H$  (being stable chlorine). To do so, let  $C$  be any of  $^{35}\text{Cl}$ 's and  $^{37}\text{Cl}$ 's shared chemical properties,  $P_F$  any physical property of  $^{35}\text{Cl}$  that  $^{37}\text{Cl}$  lacks, and  $P_G$  any property of  $^{37}\text{Cl}$  that  $^{35}\text{Cl}$  lacks. Then where my theory says the relevant laws are that

all  $F$ s are  $C$  and  $P_F$ , and  
all  $G$ s are  $C$  and  $P_G$ ,

<sup>14</sup> 'Mellor on the Sparseness of Natural Properties', (fourth page) p. 360.

<sup>15</sup> D. H. Mellor, *Mind, Meaning, and Reality* (Oxford: Oxford University Press, 2012), p. 2.

Mills' empirically indistinguishable theory says they are that

- all  $F$ s are  $C$  and  $P_F$ ,
- all  $H$ s are  $C$  and either  $P_F$  or  $P_G$ , and
- all  $H$ s that aren't  $F$  are  $P_G$ .

In short, where my theory postulates two laws for every  $P_F$  and  $P_G$ , Mills' postulates three, two of them more complex than either of mine. That is why the criterion of simplicity which tells us that light is e-m radiation can also tell us that  $G$  is a natural property and  $H$  is not. QED.

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