

Direct reference: A route to dualism?

Abstract.

Descriptivist theories of reference consider that cognitively accessible descriptions provide a successful criterion for fixing the reference of expressions. The arguments against the psychological reality of descriptions that are necessary or sufficient for determining reference are often considered decisive. The modal arguments lead in to the notion that what is necessary and sufficient to determine reference are 'real nature' essential properties to be determined by science. These essential properties are not required to be cognitively accessible to speakers; but they determine the nature of the object/s that can be legitimately referred to by way of that expression. While the descriptivists focused on appearances, or qualitative aspects of the phenomena with respect to the appropriate place to look for reference determination; direct reference theorists consider this level to be irrelevant. Putnam, Kripke, Chalmers, and Braddon-Mitchell & Jackson consider that it is metaphysically possible for qualitative properties and 'real nature' properties to vary independently of one another. 'Real nature' properties determine the referents of expressions that denote objects / kinds of stuff in the world, and qualitative properties determine the reference of mental state terms.

Instead of haggling over the primacy of whether 'real nature' essential properties or qualitative essential properties determine the reference of various expressions I will argue that such a stipulated dichotomy between qualitative properties and 'real nature' properties is misguided. It is typically accepted that the properties coincide in the actual world, and I think that if we accept that they may be teased apart in various possible worlds then dualism is an inevitable consequence of our stipulation. We are left with the difficulty of deciding whether the qualitative or the 'real nature' criterion is relevant for various expressions, and we may need to resort to there being two different criteria, or 'senses'. I take the dualistic consequence to be a *reductio ad absurdum* of such a stipulated dichotomy between qualitative and real essences. While the world in itself cannot determine whether qualitative and real essences are essentially connected or not there are advantages to stipulating that they are essentially connected rather than stipulating that they are essentially different. Stipulating that they are essentially connected has the desirable consequence that our inter-subjective experiences of the world are essentially related to, and thus may plausibly be explained by, our scientific accounts of the natural world. When dualism about 'water' and 'heat' are disallowed, we may plausibly avert dualism about the mind as well.

I shall begin with a characterisation of the descriptivist account of reference that was widely accepted preceding the rise of direct reference theories. This is required in order for me to illustrate the difference between the 'qualitative' properties that interested the descriptivists, and the 'real nature' properties that interested the direct reference theorists. We also need to be aware of some of the problems that the descriptivist account faced so that we can ensure that any modifications made to the

direct reference theory does not have it fall victim to the same problems and objections that were ultimately fatal to descriptivism.

1 Descriptivism: The word –world link by way of description

Frege and Russell offered descriptivist accounts of the way in which speakers succeed in referring to objects by using language (in Baillie, 1997 pp.1-69). Frege maintained that speakers have a cognitively accessible description, or sense, that they associate with an expression. Russell held that names, as we usually know them, were equivalent to definite descriptions. These senses or descriptions were thought to provide necessary and jointly sufficient conditions which provide a criterion that a single object may meet. If there happens to be an object in the world that meets the criterion that the description provides then speakers can succeed in referring to that object by way of that expression. The expression actually chosen may be elliptical in that it abbreviates a longer description, and it is in virtue of an object's meeting that longer description that reference is achieved.

Frege required senses to be inter-subjective so that different speakers could pick out the same object by uttering different instances, or tokens of the same expression. Frege considered that the sense of a sentence was part of a 'common store of thoughts which is transmitted from one generation to another' (in Baillie, 1997 p.26). The descriptions that we associate with expressions are passed on to new speakers and it is grasping the sense that enables them to achieve linguistic competence. He maintains that 'the sense of a proper name is grasped by everybody who is sufficiently familiar with the language or totality of designations to which it belongs' (in Baillie, 1997 p.24). On this account one could not succeed in using language to refer unless one grasped the criterion that the referent must fill.

Russell, in reducing proper names to descriptions which themselves are reduced to expressions containing logically proper names may be thought to have altogether missed the point of attempting to construe either description or reference as inter-subjective. Logically proper names were supposed to pick out sense data that the speaker is acquainted with. Because one cannot access another's sense data in principle Russell seems hard pressed to account for language as an inter-subjective, social phenomenon. On Russell's account it is hard to see how there can be shared reference as individuals live in worlds with different objects that are composed of our subjective, idiosyncratic conjunctions of sense data. Russellian analysis does not

seem to help us understand how language can function to secure either an inter-subjective or objective referent. On his account it is hard to see how language, as an essentially social phenomenon, is possible at all¹.

Fregean and Russellian accounts are thought to be similar in that they largely agree on the role that descriptions play with respect to linguistic phenomena. The following three theses are usually considered to characterise the descriptivist view of the role of descriptions.

- (i) *Cognitive Accessibility*; Descriptions are held to be cognitively accessible to the speaker.
- (ii) *Inter-Subjectivity*; For all members of the speech community the same description fixes the significance of a name².
- (iii) *Reference Determining*; Descriptions are necessary and sufficient to determine unique (individuated) reference³.

One might reasonably expect cognitively accessible descriptions to be those that speakers would report when questioned as what they meant. Typically reported descriptions, however, are idiosyncratic and show considerable variation between speakers. Cognitively accessible descriptions thus do not seem to be inter-subjective. Frege concedes that different speakers may associate different

¹ Although this may be averted if one could provide an account of individual sense data as tokens of an inter-subjective type. Russell considered that we could be acquainted with universals and thus have knowledge of them, so perhaps it is unfair to Russell to say that he missed the point of inter-subjectivity.

² Searle may be thought to offer an account of inter-subjectivity that is looser than this with his cluster theory of descriptions which allows for some variation in the descriptions that speakers associate with expressions.

³ I am not sure that either Frege or Russell would accept all elements of the above characterisation. Russell wouldn't seem to require inter-subjectivity, and we will go on to consider an example where Frege allows inter-subjectivity to be breached. A conjunction of these three claims seems to be the standard characterisation of the descriptivist thesis, however. Even if this characterisation is something of a straw man it can still be useful in showing us what *cannot* be required for reference.

descriptions with the same expression and he gives the following example of two different senses that speakers may associate with the name 'Aristotle' (in Baillie, 1997 p24).

(iv) The Pupil of Plato and the teacher of Alexander the Great.

(v) The teacher of Alexander the Great that was born in Stagira.

Frege notes that 'So long as the thing meant remains the same, such variations of sense may be tolerated, although they are to be avoided in the theoretical structure of a demonstrative science and ought not to occur in a perfect language' (in Baillie, 1997 p24). It is hard to see from the above account, though, how there is any assurance that the 'thing meant' remains the same as Alexander may have had many teachers that were born in Stagira. Descriptions like (v) are not generally sufficient to individuate a referent, and it seems that most of the cognitively accessible descriptions that speakers report are like this. Descriptions may also be seen to be unnecessary for reference if we consider the expression 'I wonder who Mary Elizabeth Baxter is?' to refer to Mary Elizabeth Baxter despite the speaker having no associated description. These versions of descriptivism thus do not seem to provide an adequate account of how expressions succeed in denoting objects in the world.

2 Direct reference: An unmediated word – world link

Although some have attempted to modify the descriptivist account (e.g., Searle) many have abandoned the descriptivist paradigm in favour of an alternative initiated by the work of Kripke, (1972) and Putnam, (1975). While Descriptivists maintained that reference was achieved by way of a cognitively accessible sense, meaning, or description; Kripke and Putnam offer us an alternative account. According to the direct reference account some of our expressions are thought to hook on to the world directly in a way that is not mediated by a description. Kripke initially addressed the issue of the reference of proper names of individuals, though he also considers natural kind terms such as 'water' and 'gold'. Putnam independently worked on natural kind terms and he attempted to extend the account to expressions that refer to artefacts. Kaplan, (1989) considered indexical expressions, and introduced an operator allowing some expressions denoting objects to be analysed in a directly

referring way⁴. Much work has been done on attempting to extend the account to plausibly embrace different kinds of expressions. There has also been much debate as to whether an inevitable consequence of direct reference is dualism with respect to mind and body as Kripke takes it to be; or whether this may somehow be averted.

3 Modal contexts and rigid designation

The differences between descriptivism and direct reference are most striking when considering the way in which they handle modal contexts.

- (vi) 'Aristotle could have been born in Greece and become a vase painter rather than turning to philosophy'.

Kripke considers that the intuitive analysis of such an expression would be that the man denoted in the actual world by the expression 'Aristotle' could have done such and such. Kripke thus considers names to function as rigid designators in that they refer to the same individual across possible worlds (Kripke, 1972 pp.4-15). A descriptivist analysis of (vi) however, would produce a different outcome depending on which description we take to be the sense, or which description we take to be deductively implied by the expression. If we consider a conjunction of (iv) and (v) to be the correct analysis of 'Aristotle' then the object referred to must have done those things (or meet that description) as a matter of analytic necessity, and thus (vi) is (implausibly) not only false; but it is false as a matter of logical necessity. Metaphysical possibility would thus seem to be constrained in a highly counter-intuitive analytic, or logical (as opposed to empirical or a-posteriori) way⁵. If (iv) and (v) are taken to be an adequate analysis of 'Aristotle' then, Kripke maintains, the name would serve to pick out whoever happened to do those things in any given counter-factual situation. Descriptions would thus function to pick out different individuals who happen to answer to the description across different possible worlds (Kripke, 1972, pp. 6-7).

⁴ I will consider Kaplan's 'dthat' operator further in the subsequent section on modal contexts.

⁵ We could not alter the description without picking out a different individual with different essential properties. The distinction between logical and metaphysical necessity and possibility is a problem within philosophy of science, however it would seem that there can be no difference between them on the traditional descriptivist account, which some at least find counter-intuitive.

One could talk about 'this essay in front of you now' and consider that it is quite possible that another essay (e.g., the next one in the pile) could have been the one that is in front of you now. The descriptivist account would thus be a suitable analysis if the intended meaning of the expression was something along the lines of 'whichever essay was in front of you at time t '. Kaplan, (1989) considers, though, that we may use a description solely in order to get to a particular individual or thing. We could thus consider that it is possible that 'dthat' essay in front of you now might not have been in front of you now' if, for example it had been sent to someone else. Kaplan's 'dthat' operator thus allows one to rigidify a description.

Kripke considers that an appropriate analysis of names is that they function as rigid designators. If we consider a name in some kind of modal sentence such as a counter-factual conditional then an appropriate analysis is that the name picks out the very individual in the actual world and describes that individual in different (possible) circumstances. Kripke considers that descriptions function as flaccid, or non-rigid designators in that they designate different individuals across different possible worlds as different individuals happen to meet a given description. Since names are rigid and descriptions are non-rigid Kripke concludes that names cannot be equivalent to descriptions.

4 Essential Properties and Metaphysical Possibility and Necessity

Kripke introduces the notions of Metaphysical possibility and necessity as a 'surprising consequence' of direct reference. He maintains that the objects in the actual world that are directly referred to have essential properties that must be retained in order for the object to remain the same object. This has consequences for the counter-factual situations that we can legitimately describe with respect to any given object. There is no possible world in which 'dthat' object can appear without the essential feature required for the objects identity as that object. Kripke considers that science will empirically discover the relevant essential properties⁶. He is thus a scientific essentialist about essential properties, which seems a plausible view on the reference of natural kind terms.

⁶ Mental states are exempt.

He maintains that this notion of necessity is not a matter of analytic or conceptual truth, rather it falls out as a consequence of the way the world is. The objects in the world have 'real nature' essential properties that may or may not be known by us. We do not need to know these properties in order to refer successfully to the objects but the properties do determine what is objectively possible and impossible with regards to those objects. They also serve to show how we can be mistaken in our categorisations when we go by observed features instead of the reference determining 'real nature' ones. Kripke maintains that his scientific essentialism is something of an 'aside' and not a requirement of his thesis. There does need to be something to distinguish between what is and is not metaphysically possible, however, for the notion of metaphysical possibility and necessity to be meaningful. Kripke presupposes a realist metaphysics where:

- (a) Objects in the world have essential properties intrinsically.
- (b) When we refer to these objects (by demonstration) we are referring to their 'real nature' essential properties whether or not we know what these are⁷.
- (c) Part of the scientific enterprise is the discovery and characterisation of these 'real nature' essential properties. Direct reference theorists typically take the relevant essential properties to be those that the 'final science' would endorse.

The arguments against the role of descriptions for reference are often considered decisive, especially when compared to the relative success that the direct reference theory has had while to a large extent by-passing them⁸. What the greater moral of this story is, though, remains controversial. Direct reference theorists typically take

⁷ Salmon, (1981 p.42) considers that some direct reference theorists consider that the proper referent is the essential properties; though others maintain that the referent is the object whose nature is determined by its essential properties.

⁸ Putnam does consider the role of descriptions, or stereotypes (qualitative features) with respect to how we fix reference or categorise in the actual world, and Kripke seems to make a similar concession. Descriptions and qualitative features are still held to be irrelevant, though for determining the essential properties that are relevant to the majority of our expressions, and thus irrelevant with respect to assessing counter-factual situations. I will go on to consider this further.

the moral of the story to extend beyond the fact that cognitively accessible descriptions cannot determine reference. They consider that it demonstrates the irrelevance of qualitative or experiential properties with respect to determining reference altogether⁹.

Searle is often considered an advocate, or defender of the descriptivist approach. He attempted to alter the theory to render it more plausible by maintaining that, instead of providing strict necessary and sufficient conditions for reference, descriptions functioned as cluster concepts (in Lycan, 2000 pp.42-43). Many, or most but not all of the description needs to apply to an object in order for it to be referred to by way of the expression. A certain amount of variation with respect to different speakers associating different descriptive features with an expression could thus be tolerated. Perhaps Searle and others who oppose the direct reference analysis are guided by intuitions that one cannot simply disregard qualitative or experiential properties with respect to reference determination.

5 Qualitative / experiential properties and 'real nature' properties

The deference to 'real nature' properties initially seems plausible because we typically do acknowledge that qualitative features, or appearances can be misleading, and we can be mistaken. Kripke considers a situation that Donnellan, (1966) describes where someone is at a party and asks 'who is the man drinking a Martini?', though it turns out that there was water in the Martini glass, and thus the term 'Martini' was incorrectly applied. Qualitative properties also vary as in the case of natural kinds when we see an object or a substance in new circumstances yet we want to maintain that it is the same object or the same stuff. It is also considered that we need 'real nature' essential properties to fix the reference so that different scientific theories can be about the same object, or the same thing. Presumably the referent does not change as we accumulate experiences with the referent, and we refer to the same substance with the expression 'water' as those who picked out the 'same kind of stuff' in lieu of a scientific theory of it's nature. If we want to say that we are referring to the same kind of stuff, the metaphysical realist considers that we require objectively existing 'real nature' properties to fix or determine the real nature of the referent.

⁹ Mental state terms are exempt.

While Kripke, Putnam, Chalmers, and Braddon-Mitchell & Jackson consider observable properties to be something of a ladder that allow us to ascend to 'real' essences and then may be tossed aside as irrelevant I wish to consider whether this disregard for qualitative properties is a wise move.

Firstly, in Donnellan's example the speaker would, presumably, acknowledge their error if they tasted the 'Martini', or smelt it, or had drunk enough of it. I do not see that this example entails a fault with qualitative properties in general; rather the categorisation error would seem to result from inadequate qualitative information or experience. We sometimes consider that we are mistaken because later experience provides further information that shows us we were in error. We would like to say that we would not have judged or categorised as we did if we had access to that further information at the time of categorisation. One thus does not need to descend to the 'real nature' level of analysis in order to provide an account of how it is possible that we can be mistaken. In the literature qualitative properties seems to have been equated with 'appearances', which are often associated with a superficial glance. Appearances are thought to be deceptive much of the time, and by equating qualitative properties with appearances qualitative properties have been viewed as unreliable and have thus fallen into disrepute by association.

I think that we are wise to consider the role of appearances or qualitative properties with respect to the scientific enterprise itself. It is probably safe to say that most people conceive of science as the enterprise of predicting (and thus explaining) qualitative or experiential features of the world¹⁰. It should be noted that I am using 'qualitative' or 'experiential' in the sense of the kinds of features that interested the descriptivists, the observable or 'watery-stuff' kinds of features. The posited ontology of science consists in entities with theoretical essential features that are defined in such a way that they functionally interact according to laws of nature. This functional interaction produces what we perceive, observe, or experience as the behaviour of

¹⁰ While it remains controversial just what the enterprise of science is, it does seem clear that the mark of a 'good' (or indeed 'bad') theory is whether it can adequately predict and explain phenomena that we encounter in the world. While 'functional laws permit of values which a real parameter could not attain, for instance very high temperatures, as in the ideal gas law: $PV = nRT$ ' (Weinert, 1995); it would seem that its adequacy is assessed by the predictions it makes with respect to phenomena we may observe (within the relevant boundary conditions), and the *explanation* (as part of a greater theory) that can be offered as to *why* we will never observe the phenomena that the law rules out.

middle sized objects. Or what we would observe of these objects if the appropriate boundary conditions were met. This may be seen when one considers that the success or otherwise of scientific theory is judged by its *applications* to the phenomenon we observe. The properties relevant to Newtonian objects would seem to be inertia, mass, velocity etc, and these are defined according to how they interact according to Newton's laws in order to produce the phenomenon that we observe. At this theoretic level of analysis essential properties may thus be described as *functional* properties that get us from a law to a phenomenon. We may likewise consider laws to be a function from essential properties to a phenomenon. Essential properties and laws of nature may thus be seen to be inter-defined.

To clarify the sense in which I am using the notion of 'function' it may be useful to consider a couple of examples of a similar notion of function that I have encountered in the literature. Frege considered concepts to be functions that get us from an object to a truth-value. Concepts are thus defined functionally according to how they interact with other notions such as 'object' and 'truth value'. We can thus consider a concept to be a 'black box' or placeholder where the properties that are essential to its nature are 'black box' properties that determine how it interacts with objects and truth-values. Ramsey sentences use a similar notion of function to show us how we can functionally define mental state terms / mental states so as to avoid circularity. We can treat beliefs as a 'black box' or placeholder that interacts with desires to produce behaviours. We can also treat desires as placeholders that interact with beliefs to produce behaviours. Beliefs and desires thus functionally interact with each other to produce the behaviour that we observe. While this account is clearly insufficient to differentiate beliefs from desires, it seems plausible that they engage in other functional relationships that are different (belief forming mechanisms are different from desire producing mechanisms).

I would say that terms such as 'mass' and 'velocity' are functional terms in the same way. A scientific theory of 'real nature' essential properties has them interacting with the laws of nature in order to produce the phenomena we observe. 'Light' for Einstein was a constant (by definition if you like), whereas this was not explicitly so for Newton. The terms would seem to be defined differently with different essential properties interacting with different laws of nature in order to produce (upon careful observation) slightly different phenomena. While scientific realists may consider that Newton was wrong about the essence of light (and thus 'light' has the same referent in both theories); perhaps the reference is the same in virtue of 'light' being a term for

(very nearly) the same *phenomenon* for both theorists (with respect to the two theories being theories of fairly much the same sets of experiences). If we want to say that Newton was wrong about the essence of light it would seem to me that this is because he could not predict (thus explain) the phenomenon as adequately as scientists *observed* anomalies when they were more thorough with their observations. The role of qualitative properties thus seems to play the same role for scientific investigation as it does for the speaker in the gin / water example. In both cases our judgements are revised in the face of later experience.

Essential properties may thus be best thought of as functional, rather than intrinsic. If an object can be found that does not obey Newton's laws then the object would not be a Newtonian object. Newton would have been wrong about the essential properties and laws of nature *of that phenomenon*. If we are entitled to say that Newton was wrong about laws or essential properties this is in virtue of our *observing* that some objects do not in fact behave as his theory requires¹¹.

I am aware that this characterisation of essential properties may be controversial (especially to scientific realists). I do not have the space here to provide a thorough and sustained argument for it. I introduce it merely to outline an alternative route to enable different theories or accounts to be of the 'same thing'. They refer to the 'same thing' in virtue of accounting for (to a very large extent) the same phenomena, or the same experiences that we encounter. The difficulty of incommensurability, or reference change with every new theory and its postulated objects / substances with essential properties does not require a scientific realist metaphysical system for its solution.

While some consider realism with respect to essential properties and laws of nature to be the only way in which to answer these difficulties I think that we can find a

¹¹ Indeed we have restricted the Newtonian theory as adequate *provided that* certain boundary conditions obtain. Theories with boundary conditions are the ones that explain and predict the phenomena that we observe. It is sometimes considered that the genuine laws (that is to say the *universal* laws) of nature will explain and predict the boundary conditions that the bounded theories presume. These genuine laws thus will not predict and explain phenomena directly. I would think, though that whether they are acceptable or not will have quite a lot to do with their utility in predicting and explaining experience *indirectly*, by way of the bounded (and thus not truly universal) theories or laws of nature which directly explain and predict observed phenomena.

satisfactory answer from the level of observation, appearances, and experience. Different theories can be assessed with respect to the degree of adequacy that they have in the prediction and thus explanation of the behaviour of objects that we observe. The alternative is to posit reference determining essential properties that do not co-vary with our experiences and observations of the world and this has the consequence that they are beyond our grasp in principle.

Kripke (1972, pp.135-137) considers that we initially baptise a sample of water by ostensive definition. The term is then passed on from speaker to speaker in virtue of a causal-historical chain extending back to the baptism ceremony. New speakers succeed in referring to the same kind of stuff (or indeed an individual) in virtue of intending to use the expression to refer to the same thing as the person that they heard the name off. In accepting Kripke's account of a legitimate baptism of a sufficient sample of 'water' the problem becomes the issue of how we determine what is relevant for fixing the reference determining essential properties.

Kripke considers it is the real nature to be determined by science and that the appearances are irrelevant, but he does not give adequate consideration to the way in which scientists 'discover' or 'create' their essential properties in the first place. I propose that what is relevant (once we have a legitimate initial baptism) is that the other instances are always observed to behave the same (in relevant respects) to the initial sample¹². We may consider how scientists actually go about categorising samples of various substances in practice. They make observations of the objects behaviour and they perform experiments and observe the resulting behaviour. If something behaves differently from what would be expected from the sample then this is the evidence that enables them to infer that it cannot have the relevant essential property and thus is a different kind of stuff. This is why science is correctly considered to be an *empirical* endeavour, because it is attempting to explain, describe, and predict the phenomena we encounter.

While the above may be too sketchy to win converts I will consider three cases in which my approach leads to conclusions that are different from the ones typically reached by direct reference theorists. There are practical advantages to accepting the thesis that the 'real nature' level of analysis is determined by how things appear

¹² 'In relevant respects' is a vague notion. I suspect that relevant respects have a lot to do with our purposes but will not pursue this further.

to be, and our posited essential properties and laws of nature which are supposed to predict and explain our observations. If we consider that it is illegitimate to divorce observable properties from 'real nature' properties we may be able to avoid Kripke, Chalmers, and (arguably) Searle's dualism about mind and body. We also do not have to concern ourselves with the arguments as to whether qualitative or real properties are relevant for determining reference, especially for expressions that pre-date science. Before I do this though, I will deal with an objection that qualitative properties entail an unsatisfactory reversion to descriptivism.

Salmon, (1981, pp.22-23) makes a point about the possibility of essential properties being described. He considers that the descriptivist might object that if essential properties can be described then the descriptivist account was a correct analysis all along (though the requirement of cognitive accessibility would have to go). Salmon states that even if 'real nature' essential properties can be described that does not mean that they are essentially descriptions. It is to no cognitive advantage that they can be described and descriptions don't seem to be required in order for speakers to successfully refer. On the typical account of descriptivism [(i), (ii), (iii)] cognitive accessibility is often held to be fairly analytically a major thesis in the descriptivist account. It would indeed seem to be vital as without it (and the implausible cognitive accessibility claim) descriptivism is in danger of collapsing into direct reference.

It seems to me, though, that Salmon's point could equally be made regarding qualitative properties. Although the descriptivists' focus on qualitative properties seems to be run together with their focus on descriptions in the literature, I think that the two notions should be separated out. I don't think that the moral of the failure of descriptivism was its focus on qualitative properties; rather it was due to its focus on the role of descriptions. The direct reference account does seem to be the most plausible account of reference that we have but I think that the role of qualitative properties with respect to reference determination needs to be restored. 'Real essences' may be described in the same way that observable essences can be, but neither are essentially descriptions. Real essences may be known or not known by various speakers, and some observers may make more thorough observations than others but 'real essences' cannot be the reality that we want to capture if they do not essentially predict and explain our observations and experiences of the world.

6 Putnam's 'Twin Earth' and 'water' as essentially H₂O

Putnam, (1975) describes what he takes to be a metaphysically possible world in which there is a substance XYZ that is qualitatively identical to H₂O. He maintains that it is not metaphysically possible that XYZ is water, as the essential property of water is H₂O. The claim that “‘water’ is H₂O” is considered to be provisional in that we have yet to see whether it will be endorsed by the final science. The point, though, is that whatever the final science endorses as the relevant essential property is essential to the substance. I do not take issue with this, I just take issue with the notion that it is metaphysically possible to separate qualitative properties from essential properties the way that Putnam has¹³.

Chalmers, (1996, p.57) considers that we can separate ‘A’ and ‘B’ intensions which seems to be just another way of saying that it is legitimate to separate qualitative properties from ‘real nature’ properties. He maintains that the ‘A’ intensions enable us to fix the referent in the actual world. The ‘A’ intensions, or the qualitative properties of water are that it is watery-stuff. ‘Watery-stuff’ seems to be taken as shorthand for the observable qualitative properties of water; e.g., that it is odourless, colourless, falls from the sky etc. Chalmers maintains that it just happens that in the actual world watery-stuff turned out to be H₂O. Because of the direct reference take on qualitative properties as superficial it turns out that the correlation isn’t perfect, but it is good enough to fix H₂O as the relevant essential property, or the ‘B’ intension of the term ‘water’¹⁴. One might consider that the ‘direct’ route to reference has turned out to be an indirect route to essential properties (they are reached by way of watery-stuff) but it is indeed hard to see how it could be otherwise. Chalmers considers that although watery-stuff and H₂O are correlated fairly often in the actual world (and it is in virtue of this correlation that we were able to identify ‘water’ as H₂O) once we have determined the essential nature of ‘water’ e.g., that it is H₂O then this is what is

¹³ Perhaps Putnam wouldn’t really want to say that earth and twin earth are qualitatively identical. If he does not want to say this then the Twin Earth thought experiment result seems hardly surprising at all. People often mis-categorise when they only have a quick glance. Perhaps intuitions as to the plausibility of Putnam’s result co vary with the degree to which one equates qualitative properties with cognitively accessible descriptions and / or the superficial.

¹⁴ I maintain that if one distinguishes the superficial from the qualitative then the qualitative is correlated perfectly with the real (in the relevant respects). I think that this is as perfect a law as any other to be found within science.

relevant to determining metaphysical possibility. The qualitative properties turned out to be something of a ladder that enabled us to get to the real, and once the real was reached the qualitative then falls out as irrelevant (Chalmers, 1996, pp57-59).

Braddon-Mitchell and Jackson, (1996, p.71) maintain that it is possible that H₂O appear black and tarry and it is possible that watery-stuff be XYZ (as on twin earth). They thus consider that it is metaphysically possible for qualitative and 'real nature' properties to vary independently of one another¹⁵. Kripke and Putnam also both state that it is metaphysically possible for the real nature and qualitative properties to vary independently of one another. One may consider how the scientists know that the substance on twin earth is not water. The only way they could know this is if they observed it to behave differently from water. It is literally inconceivable that something appear exactly the same yet differ in internal structure. This is multiplying entities beyond necessity and the 'real essences' in such a case would be idle and empty, they would do no work¹⁶.

There is a line which we could use to challenge whether the substance on twin earth was water or not. One could consider that our pre-scientific term 'water' should have its reference fixed by the pre-scientific qualitative level of analysis. While I have some sympathy with this approach it once again rests on a difference in kind

¹⁵ They even go so far as to say that this could occur without the scientists even needing to explain why the H₂O appeared black and tarry. This seems to me quite absurd as without a good explanation (as to the breach of boundary conditions) we would have a counter-example to the claim that H₂O is water. While a defence may be that this does not occur in an actual world, but in a counter-factual situation I think we should allow the qualitative and real coincidence in the actual world to dictate metaphysical possibility. Especially considering the way in which these real essences are (and always must be) arrived at.

¹⁶ On Dupre 'Natural Kinds and Biological Taxa', Geoffrey Reid writes: 'Maybe there is also a logical point... Suppose the molecular structure H₂O is both necessary and sufficient to explain the phenomena...Then XYZ cannot be both necessary and sufficient to explain the same phenomena. For the sufficiency of the first denies the necessity of the second. If H₂O will explain the phenomena, then we do not need XYZ to explain the phenomena. XYZ is not (and cannot be) a necessary condition of the phenomena (personal correspondence). If XYZ is always observed to behave the same as H₂O it would seem idle, empty, and pointless to multiply structures beyond necessity. It would seem to me that the scientists would be best to consider that H₂O = XYZ. The difference between H₂O and XYZ must ultimately be detectable from the qualitative or experiential level to be meaningful.'

between qualitative and 'real nature' properties. I think that instead of debating whether qualitative or 'real nature' is primary, indeed instead of allowing them to vary independently across metaphysically possible worlds we are best to see them as lying on the same (empirical) continuum. Chalmers acknowledges that the qualitative and 'real' coincide in the actual world. It seems to be just in thought experiments that are supposed to determine metaphysical possibility that they vary. Is this a discovery about the nature of necessity though, or a stipulation?

If they are found to co-vary in the actual world and it is only in virtue of this correspondence that we ever had a notion of the 'real essence' then why don't we consider that the qualitative properties and 'real nature' properties must co-vary of metaphysical necessity? This acknowledges the way in which science actually does operate to discover (or create) 'real essences'. I cannot think of any reason why we should not stipulate this way. Stipulating in this direction may also lead to a more satisfactory analysis of the following case, which may indicate a way in which we can avoid dualism about the mind.

7 Heat: Qualitative or 'real'?

Kripke acknowledges that there is an ambiguity of reference for the expression 'heat'. He considers that 'what seems hot to me' or the sensation of heat essentially has a qualitative feel and thus has an essentially qualitative referent Kripke, 1972 pp.148-153). He thus treats it as a mental state term as he gives the same analysis to 'pain'¹⁷. He considers that our pre-scientific term 'heat' has a 'real nature' referent as we took heat to be a property of external objects rather than qualitative sensations whereas he goes the other way with mental state terms. The expression 'heat' thus refers (except when it is a-typically used in the first sense) to whatever the 'real nature' of heat turns out to essentially be (provisionally, mean kinetic energy).

¹⁷ It is interesting to consider whether 'pain' can be essentially private for Kripke, or whether he requires a notion of inter-subjective types of experiences in order to avoid private language difficulties. If he requires inter-subjective types (as I think he does) then perhaps the most plausible account of them is that they are functionally defined with private qualia filling something of a 'black box' whose 'essentially private nature' may be just as implausible as 'essentially real nature' reference determining properties when divorced from some notion of inter-subjective appearances / phenomena that are subject to public observation.

Searle takes the opposite reading. He considers that our pre-scientific term 'heat' referred to a sensation and once science came along we changed the meaning of the term, or the criteria for determining what essential properties were relevant. He takes the qualitative reading to be primary and the 'real' reading to be derivative; the result of a change in meaning / referent (Searle, 1992, p.119). He maintains that we have changed our criterion as to where to look for (or what is relevant for) reference determining essential properties. He thus considers it an analytic or stipulative matter as to whether we consider the qualitative or the 'real' to be the relevant place to look for essential properties. The world in itself would not seem to be enough to distinguish which is relevant for the reference of our expressions; stipulation is needed. I think that this is especially true in that qualitative and 'real' properties are found together in the actual world. The distinction between the qualitative and the 'real' may thus be a formal distinction rather than a real one. It is hard to see how formal distinctions determine metaphysical possibility rather than analyticity. We do not need to choose between Searle's deference to qualitative properties and Kripke's deference to 'real' properties if we consider that both criteria are correlated in the actual world and thus perhaps we should more appropriately stipulate that both criteria provide essential properties that determine the nature of the referent.

We seem to be forced to choose between qualitative properties and real nature properties for essential properties that are supposed to fix the referent for various expressions. We could bypass this problem by defining heat as a function of mean kinetic energy producing characteristic sensations in an observer. If there is no observer and we want to specifically talk about the object then we more properly have mean kinetic energy with a power to produce the sensation (if an observer were present). If we just have a hot sensation without the mean kinetic energy then we have a 'heat-sensation' which is a 'heat'-sensation in virtue of someone considering it to be the sort of sensation typically produced by mean kinetic energy. These both seem (to me) to be slight deviations from the more properly both-aspect-inclusive reference determining essential properties of the term 'heat'. They are passable when we speak loosely.

8 The moral of the story

While descriptivists faced insurmountable problems with cognitively accessible descriptions I think that they made no mistake in focusing on observable properties. I might have been a little unfair on direct reference theorists; Putnam might not want to

maintain that Twin Earth is a qualitative duplicate of Earth (with respect to all the experiences that the citizens could encounter on that planet). I presented his case in this light, though, in order to convince the reader that it is metaphysically impossible that Twin Earth be a qualitative duplicate of Earth. My position can be summarised in the following claims:

- (i) Qualitative properties and 'real' properties do not vary independently of one another in the actual world: so long as we distinguish between superficial observation and qualitative experiences / observations.
- (ii) It is a matter of stipulation that the relevant essential properties that determine the referent of our expressions refer to either 'real nature' or qualitative properties or both.
- (iii) I propose that since 'real' and qualitative properties co-vary in the actual world, we should stipulate that they co-vary as a matter of metaphysical necessity.
- (iv) The advantage of this is that science can thus plausibly be construed as informing us of the essential properties of the world in which we inhabit and experience. If the qualitative and 'real' realms vary independently then the 'real' realm is always beyond us in principle. The notion of metaphysic necessity and possibility thus lapses into the notion of epistemic necessity and possibility; in that we could never tell which was which in principle. 'Real nature' essential properties would also be beyond the accessibility of scientists forever; as a matter of stipulated principle.

There are greater issues to do with whether direct reference provides an adequate account of metaphysical necessity or not, but I am running with Kripke's account which does indeed seem to collapse the distinction between logical (thus analytic) and metaphysical possibility and necessity. While some consider this to be acceptable others do not. While it might be possible to supplement the notion of metaphysical necessity where it is relative to a theory and the structure of the theory rules out certain experiences from occurring, I cannot argue this here. A consequence of stipulating that the 'real' and qualitative properties are essentially

connected is that it is not metaphysically possible that two worlds have the same qualitative properties (observed to behave the same as the sample), but different real properties, and vice versa. Twin Earth (as a qualitative duplicate) is not metaphysically possible. This would seem relevant to an analysis of mental state terms as if it is found that mental states = a functional state of ones brain, then this would be metaphysically necessary. If it is metaphysically impossible that a real duplicate not be a qualitative duplicate then Chalmers type Zombie thought experiments would thus be ruled out as metaphysically impossible (if we accept that there are no zombies in the actual world). While I do not have the space to explore this issue further it does point to a way forward from an acceptance of dualism. While it may be objected that I have merely stipulated that zombies are disallowed I think that this stipulation is a better route towards an understanding of our world than stipulating the alternative.

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