ABSTRACT

Thomas Reid and the Problem of Secondary Qualities

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Direct Realism is the view that human perception takes physical entities and their mind-independent properties as immediate objects. Although this thesis is supported by common sense, many argue that it can be dismissed on philosophical or quasi-scientific grounds. This essay attempts to defend Direct Realism against one such argument, which I call the "Problem of Secondary Qualities," using the ideas of Scottish Common Sense philosopher Thomas Reid.

The first chapter of this work offers a detailed introduction to the Problem of Secondary Qualities. The Problem of Secondary Qualities arises from the claim that science has shown that physical objects do not possess secondary qualities (color, smell, sound, taste, and heat). This is a problem for Direct Realism because secondary qualities are certainly possessed by at least some perceivable objects. As I present it, the Problem rests on three commitments: (1) that an analysis of secondary quality perceptions should extend to perception in general, (2) that we perceive secondary qualities, and (3) that physical objects do not possess secondary qualities without our perceptions of them. I conclude that Direct Realism requires an account of secondary qualities on which

secondary qualities are perceiver-independent but identifiable with other causally relevant properties.

In Chapter Two, I introduce Thomas Reid's doctrine of primary and secondary qualities, in the context of his theory of perception, as a viable response to the Problem of Secondary Qualities. On Reid's view, secondary qualities are both perceiver-independent and identical to scientific properties, and Reid offers many useful conceptual resources for responding to objections. Most important are Reid's claims that (a) sensation or sense experience is casually related to, but not essential for, perception and that (b) our perceptions of secondary qualities give us very little knowledge concerning their natures.

The final chapter shows how the Reidian theory holds up against four key objections to accounts of secondary qualities on which they may be identified with perceiver-independent, scientific properties. In most cases, the Reidian approach finds solutions without compromising our intuitions or received opinions.

Thomas Reid and the Problem of Secondary Qualities

by

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The initial direction for this dissertation was established by a paper on primary and secondary qualities that I wrote at Baylor in the fall of 2008 for a graduate seminar on Thomas Reid's philosophy of perception. My understanding of Reid's primary-secondary quality distinction came very slowly, over the course of about two years. Much of that process involved lengthy conversations with classmates, especially Matt Douglass. My adviser, Todd Buras, has guided this project since its infancy, and his detailed comments have been invaluable. Outside my department, I have benefited from the thoughts of physicists Angela Douglass, formerly at Baylor, and Punit Ghandi, at the University of California at Berkeley. Also helpful have been responses from participants at conferences hosted by the New Mexico West Texas Philosophical Society, the North Texas Philosophical Association, the British Society for the History of Philosophy, and Baylor's Philosophy Department.

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My wife, Danielle, has been incredibly supportive throughout the writing process, often sacrificing her own ambitions for the sake of mine. The completion of this project is a testament to her patience, generosity, and love.

To my grandfather, William Waugh

An identity statement between names, when true at all, is necessarily true, even though one may not know it *a priori*.

Saul Kripke, *Naming and Necessity*

CHAPTER ONE

Introduction

The problem with which I am concerned, the apparent discrepancy between appearance and reality, meets philosophers, both past and present, at every turn. It is so complex, so widely dispersed through philosophical and scientific literature, that I doubt any single work could address the entire problem. So I confine myself to one tiny corner of the debate, buried deep within the philosophical and historical discussion. That is the conflict between our commonsense perceptual judgments and certain claims among the philosophical and scientific communities concerning the nature of so-called secondary qualities—color, sound, smell, taste, and heat. Many argue that mind-independent, physical objects do not possess these qualities. Instead, they say that secondary qualities are perceiver-dependent relations, subjective experiences, or sensory misrepresentations. This last description construes secondary qualities as epistemically sinister, as if common sense would lead us to believe an entire system of falsehoods. And the view that secondary qualities are misrepresentations forms the basis of a particular challenge to common sense that I call the Problem of Secondary Qualities.[1]

Although which beliefs count as commonsensical is often a matter of controversy, philosophers of all sorts ascribe to common sense the view that the immediate objects of sense perceptions are real, mind-independent, physical objects or qualities of such

[1] D. M. Armstrong, *A Materialist Theory of Mind* (New York: Psychology Press, 1993), 270, uses this name as well.

objects.[2] Philosophers recognize this thesis as Naïve or Common Sense Realism, or, as I prefer, simply Direct Realism. For the sake of brevity, I just use the term *physical* when referring to these objects, because, although some have used it to refer to mind-dependent entities, *physical* usually connotes materiality or embodiment. Moreover, *real* and *mind-independent* are too broad, properly including angels, ghosts, and other spiritual beings.

Another widely recognized common sense position, which often accompanies Direct Realism, is that secondary qualities are perceiver-independent properties of physical objects.[3] Thomas Reid explicitly ascribes such a view to common sense in several instances:

> I resolve, for my own part, always to pay a great regard to the dictates of common sense, and not to depart from them without absolute necessity: and therefore I am apt to think, that there is really something in the rose or lily, which is by the vulgar called *smell*, and which continues to exist when it is not smelled.[4]
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> But though common sense says nothing about the nature of [heat and cold], it plainly dictates the existence of them; and to deny that there can be heat and cold when they are not felt, is an absurdity too gross to merit confutation. For what could be more absurd, than to say, that the thermometer cannot rise or fall, unless some person be present, or that the coast of Guinea would be as cold as Nova Zembla, if it had no inhabitants?[5]
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> The common language of mankind shows evidently, that we ought to distinguish between the colour of a body, which is conceived to be a fixed and permanent

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[2] Lawrence BonJour, "Epistemological Problems of Perception," *The Stanford Encyclopedia of Philosophy* (Spring 2012 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/entries/perception-episprob/>.

[3] The connection between common sense and secondary qualities as possessed by physical objects is well-expressed by Charles Landesman in his treatment of Locke in *Color and Consciousness: An essay in metaphysic*s (Philadelphia: Temple University Press, 1989), 16. Although Landesman is a color skeptic, he characterizes our secondary quality sense experiences as misrepresentations. Early modern thinkers like Galileo, Hobbes, Descartes, and Locke hold similar views. Another description linking the view that secondary qualities are possessed as mind-independent properties of physical bodies to common sense is available in Michael Tye, *Consciousness, Color, and Content* (Cambridge, MA: MIT Press, 2000), 147.

[4] Thomas Reid, *An Inquiry into the Human Mind on the Principles of Common Sense* (hereafter IHM), ed. Derek R. Brookes (University Park, PA: Pennsylvania State University Press, 1997), 2.8/39.

[5] IHM 5.1/54.

> quality in the body, and the appearance of that colour to the eye, which may be varied a thousand ways, by a variation of the light, of the medium, or of the eye itself.[6]

If secondary qualities are not possessed by physical objects, then they are indeed misrepresented by common sense. And, if this is the case, then common sense perception systematically misleads us and Direct Realism is probably false.

Direct Realism has become the mainstream view on sense perception among analytic philosophers in the United States. But this does not mean that its historic problems have been resolved. Rather, the impetus for renewed interest in Direct Realism seems to be its prima facie compatibility with materialist and naturalist theories of the mind. The Problem of Secondary Qualities persists. And its tenacity is manifested in the wave of unsatisfactory accounts of secondary qualities that accompany recent materialist and naturalist theories of mind.

For instance, George Pitcher thinks it possible to make an exception for secondary qualities.[7] He supposed that secondary qualities are perceiver-dependent in a way that other perceivable properties are not. But it is hard to see how he could think this while defending common sense. David Armstrong suggests that the relationship between secondary qualities and the physical properties to which they reduce may be one of 'contingent idenitity.'[8] But the very notion of contingent identity as used in this proposal is horrendously dubious in light of Saul Kripke's conclusion that identity statements

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[6] IHM 6.4/86.

[7] George Pitcher, *A Theory of Perception* (Princeton, NJ: Princeton University Press, 1971), 222.

[8] Armstrong, *A Materialist Theory of the Mind*, 270-290.

involving rigid designators are necessary if true.[9] Fred Dretske and Daniel Dennett, focusing on color, say that colors are whatever properties were evolutionarily advantageous for us to detect by means of our developing color vision in prehistoric times.[10] This approach has the dialectical disadvantage of being immune to both refutation and confirmation by way of scientific investigation, since whether proto-humans were using their color vision for the evolutionarily advantageous detection of any particular property is inaccessible to modern day natural historians. It also has the undesirable implication that our use of color vision for the detection properties other than those involved in the prehistoric development of our color vision is a misapplication of that faculty. If they are right, then most of what we see when we take ourselves to be seeing colors are actually something else, visual false positives. Finally, Michael Tye, whose view is closest to mine, attempts to specify the properties hypothesized in the Dretske-Dennett case as spectral reflectances.[11] This move overcomes my objection that the properties originally detected by proto-humans might be radically different from those we perceive by means of color vision today. However, C. L. Hardin shows that there is no neat and clean way of identifying red or blue or green with any particular spectral reflectance.[12] So Tye's proposal is thwarted by scientific discovery.

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[9] Saul Kripke, *Naming and Necessity* (Cambridge, MA: Harvard University Press, 1980).

[10] Fred Dretske, *Naturalizing the Mind* (Cambridge, MA: MIT Press, 1995), 93; Daniel Dennett, *Consciousness Explained* (New York: Bay Back Books, 1991), 375-383.

[11] Tye, 159-162.

[12] Hardin, "A Spectral Reflectance Doth not a Color Make," *Journal of Philosophy* 100 (2003): 191-202.

I mean to defend Direct Realism against the Problem of Secondary Qualities by defending an *identity* (or, as Tye calls it, a "reductive physicalist")[13] account of secondary qualities whereby we may presume to understand them as perceiver-independent properties of physical objects. This is not an original approach, but, as we shall see, identity accounts face difficult challenges from critics. In making my case, I lean heavily on the work of Thomas Reid, the distinguished father of Scottish Common Sense. Although my first task is defending Direct Realism, this project was born out of an interest in understanding Reid's doctrine of primary and secondary qualities. And I believe that it is through an original interpretation of Reid on this matter that I have grounds for offering a formidable response to the Problem of Secondary Qualities, one that withstands the critics' objections.

My aim in this chapter is to elucidate the Problem of Secondary Qualities, showing why Direct Realists should challenge a widely held opinion among the scientific community and endorse an identity theory of secondary qualities. The second chapter introduces Thomas Reid's account of perception and presents my reading of Reid on primary and secondary qualities. I show how Reid's account of secondary qualities is scientifically plausible. Then, I explain why I think my interpretation is superior to its rivals and highlight some of its important exegetical implications. The final chapter examines four key objections to the identity theory and applies Reid's insights in answering these objections.

[13] Tye, 149.

The Direct Realist Theory of Perception

William Fish defines *sense perception* as "our capacity to perceive the world by means of our sense organs."[14] It is a non-inferential operation of the mind by which one may become aware, or knowledgeable, of something in the external world. Traditional modes of human sense perception include hearing, seeing, smelling, tasting, and touching, which are distinguished from one another both by the mediating sense organ and by subjective sense experience.[15] Just as the eyes employed in seeing, say, an ice cream sundae differ from the tongue which tastes it, so the experience involved in seeing the sundae, although pleasurable, cannot compare to that of tasting it.

There are notable problems with attempts to differentiate these modalities, whether by the correlative objects of perception, the phenomenological aspects of sense experiences, or the bodily organs involved. And these problems make it difficult to know how many and exactly what types of sense modalities there are.[16] Perhaps there are, in principle, an infinite variety of sense modalities, since we do not know what might be the case for angels, extra terrestrials, or future products of evolution. However, the aim of this work concerns human perceptions and their objects. And, for reasons that will become clear in the course of the discussion, I believe that my case is unharmed by

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[14] William Fish, *Philosophy of Perception: A Contemporary Introduction* (New York: Routledge, 2010), 1.

[15] I use the term *sense experience* to indicate the experiential aspect of perceptions, vivid dreams, illusions, and hallucinations rather than the traditional *perceptual experience*. The latter's proper use seems ambiguous to me. Does one have perceptual experiences in illusions or hallucinations? Do they apply to all the senses, or only to sight? Do perceptual experiences necessarily involve any sort of cognitive success in relating one's mind to the external physical world? *Sense experience*, on the other hand, naturally lends itself to perceptions as well as illusions and hallucinations and to all the senses. Because sensory experiences may be had in illusions and hallucinations, they need not involve any sort of successful mind-world connection.

[16] Fish, 149-163, offers a nice summary of the issues involved in discovering the sense modality types.

adopting the customary view, which numbers the senses at five—hearing, sight, smell, taste, and touch.

We have, so far, noted three elements involved in human sense perceptions—organs, sense experiences, and external objects. It is possible for a subject to have a sense experience without organs or objects. But this mental operation is at best a hallucination. Perceptions are essentially intentional—*of* certain objects. If we hear the train whistle, see the locomotive, and smell the burning diesel, then there is a whistle, a locomotive, and diesel. Hallucinations, on the other hand, fail to make subjects aware of objects in the external world, and they constitute a discrepancy between the way things are and the way they seem. Thus, I understand *perception* as a success, or achievement, term, connecting subject to object and mind to world. And, although we often speak of sense experiences and the movements of sense organs as partly constitutive of perceptions, I do not take them to be essential.

The central question of this work concerns the nature of perceivable objects. Direct Realism is a claim about those objects: external physical objects and their qualities are among our immediate objects of sense perception. That is, human subjects perceive external physical objects, and their perceptions of those objects are not mediated by mental or spiritual objects.[17] On this account, objects of sense perception are neither sensations, qualia, sense-data, nor perceiver-dependent relations. Perceptual objects and their qualities exist apart from perceivers and their mental processes. Additionally, in the

[17] This is in contrast to A. D. Smith's definition in *The Problem of Perception* (Cambridge, MA: Harvard University Press, 2002), 8. Smith characterizes Direct Realism as the thesis that all objects of perception are physical. This overlooks the logical possibility of directly perceiving angels, ghosts, and other non-physical beings.

Reidian version of Direct Realism that I defend, the objects of our perceptions normally cause those perceptions by means of our sense organs.

I use the word *cause* loosely because Reid does. Reid, who often expresses frustration at the variety of meanings he finds associated with this term,[18] divides causes into at least two types.[19] *Efficient causes*, he says, essentially involve the agency of a being with the will and power to act. Without choice and deliberation, Reid thinks, there can be no causation of this sort. Moreover, although he uses *cause* in a variety of ways, he thinks its most proper application is in reference to agent causation.[20] *Physical causation*, on the other hand, is a Humean understanding of causation and is an important object of interest for physicists. For Reid, physical causation involves only priority and constant conjunction.[21] It is the sort of causation involved in laws of nature and deductive-nomological explanations. Reid offers the example of gravity, meaning the disposition or law that explains the motions of massive objects.[22] This is also the sense in which Reid applies the word *cause* to qualities of physical objects. Thus, by *cause*, I follow Reid in using it to mean the connection between smoke and fire or, better yet,

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[18] See, for example, Thomas Reid, "Of Power," in *The Philosophy of Thomas Reid*, ed. John Haldane and Stephen Read (Malden, MA: Blackwell Publishing), 14-23.

[19] I follow the analysis of Robert Callergard. See *An Essay on Thomas Reid's Philosophy of Science* (Stockholm: Stockholm University, 2006), 17-21. In addition to the two types of causation I mention here, Callergard mentions *teleological causation* as a distinct concept in Reid.

[20] Thomas Reid, *Essays on the Active Powers of Man* (hereafter EAP) (University Park, PA: Pennsylvania State University Press, 2010), 4.2/203.

[21] See Callergard, 20.

[22] Thomas Reid, *Essays on the Intellectual Powers of Man* (hereafter EIP) (University Park, PA: Pennsylvania State University Press, 2002), 2.6/103.

between past events and memories in virtue of which they are memories rather than imaginings.[23]

In this work, I contrast Direct Realism with Indirect Realism and Idealism. Indirect Realism says that the immediate objects of perception are mental or perceiver-dependent and that these perceptual objects make us aware of physical objects and their qualities only through additional mental operations, usually reasoning. Idealism claims that the objects of perception are mental or otherwise perceiver-dependent and denies that there are any mind-independent entities.

Direct Realism's commitment to the physicality of immediate objects of perception carries certain epistemic risks. Realists, both Direct and Indirect, assert that perception is among the most important ways that we learn about the external world; its epistemic importance extends beyond mere object taking. Through our perceptions we discover characteristics of those objects—sizes, shapes, colors, relative positions, and various other properties. Such discoveries are possible, say Realists, because things are, more or less, as they seem. Of course, things are not always as they seem. We have already mentioned hallucinations, in which there seems to be an object or quality when in fact there is none. And there are also illusions, cases in which real things appear differently from how they are in fact. Like perceptions, illusions involve sense organs, sense experiences, and external objects, but, as in hallucinations, things are not as they seem.

The mental objects of perception, to which many versions of Idealism and Indirect Realism are committed, are virtually invulnerable to illusion and hallucination.

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[23] I borrow this last example from P. F. Strawson, "Perception and its Objects," in *Perception and Identity*, ed. G. F. Macdonald (Ithaca, NY: Cornell University Press, 1979), 52.

These objects are essentially tied to how they seem. Since this type of Idealism denies our cognitive engagement with a physical world beyond the mind, it is free to say that things are always as they appear, perceptually speaking; for, as far as they are concerned, everything is either a perceiver or a perceived object, so there is nothing to be other than it seems. Direct Realism, on the other hand, must say that illusions and hallucinations incline us to adopt false beliefs. Indirect Realists occupy a strange middle ground, where we may be virtually infallible about the immediate, mental objects of perception but subject to error when attempting to reason from those objects to the external world.

General Exposition of the Problem of Secondary Qualities

There are, of course, many ways that Idealists and Indirect Realists attack Direct Realism. Some of the most influential attacks fall into a family of arguments known collectively as the Argument from Illusion. These begin by considering some case in which, the Argument alleges, an object of perception differs from whatever physical entity is naïvely assumed to be the object of perception. When I direct my eyes toward a straight stick in water, for example, what I see is obviously bent, says one version of the Argument. But the stick is not bent; therefore, what I see, at least immediately, must not be identical to the physical stick. Perhaps it is a mental entity. From here, the Argument typically employs what is called a 'spreading' principle to deny Direct Realism altogether. The stick case, the argument continues, is, in crucial respects, qualitatively similar to other perceptions of physical objects, so there is good reason to think that this and all immediate objects of perception are mental, or at least non-physical. Therefore, it concludes, Direct Realism is wrong to say that physical objects are among our immediate objects of perception.

The Problem of Secondary Qualities is a version of the Argument from Illusion. It says that secondary qualities (color, smell, sound, taste, and heat) are possessed by objects of perception, but not by physical entities. That is, it is not the case that secondary qualities are perceiver-independent qualities of physical objects. Therefore, what we perceive immediately when we seem to perceive a secondary quality is not physical, as Direct Realism claims. Moreover, the qualitative similarities between our secondary quality and other sense experiences suggest, that if secondary qualities are not immediately perceivable qualities of physical objects, then, there are no immediate objects of perception that are physical.

Although the early modern natural philosophers understand secondary qualities in general as illusory, their versions of the Problem of Secondary Qualities typically involve only one secondary quality—usually heat, color, or taste. Therefore, for introductory purposes, I turn to a more general argument from our own day, which rests on the convictions of the early moderns. Consider the following passage from Howard Robinson's *Perception*:

> Science has shown that physical objects do not possess secondary qualities intrinsically. As they are clearly possessed by that of which we are aware in perception, that of which we are aware in perception is not the physical object itself. The only plausible way to understand the relation between physical objects and secondary qualities is to think of the objects as possessing dispositions to produce the qualities in us as properties of our sense-data.[24]

In this argument the Indirect Realist (in this case a Sense-Datum Theorist) contrasts his theory's satisfaction of a key desideratum with Direct Realism's failure. Direct Realism, he says, cannot account for the fact that subjects perceive secondary qualities since these

[24] Robinson, *Perception* (New York: Routledge, 2006), 59.

qualities are not perceiver-independent. It will help to understand Robinson's argument in detail, so I will offer my own explicit formulation here.

To begin, I should point out that the argument as written contains a rather cryptic assumption that is elsewhere explicit in Robinson's work—the spreading principle, a statement that generalizes from the illusory case to all instances of perception. Robinson's broadest version of such a principle goes, "There is such a continuity between those cases in which objects appear other than they actually are and cases of veridical perception that the same analysis of perception must apply to both."[25] In defense of such a principle, he asserts,

> There is no absolute distinction between a state of tiredness in which things look slightly less clear and a less tired state, or between accurate vision and very slight short-sightedness; nor probably, is there such a thing as absolutely accurate perception of colour, rather a slight variation between persons. It is, therefore, very implausible to say that some of these cases involve direct apprehension of an external object and in the others of a sense-datum. So the argument generalises easily.[26]

Robinson's point is that the phenomenological and physiological differences between illusions and veridical perceptions are often so small that changing our entire analysis from one case to the other would seem suspiciously ad hoc. It would be strange, for example, if a partially submersed stick caused us to see a sense-datum but not a dry stick, or a round tower ten kilometers away but not ten meters. It is best, he thinks, to assume uniformity in the nature of our perceptions.

We can, for the sake of our particular interest in secondary qualities, alter Robinson's claim so that it applies only to secondary quality perceptions and avoids any

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[25] Robinson, 56-58. The word "continuity" was originally used by C. D. Broad to motivate the spreading principle in "Some elementary reflexions on sense perception," in *Perceiving, Sensing, and Knowing*, ed. Robert J. Swartz (Los Angeles: University of California Press, 1965), 29-48.

[26] Robinson, 57.

mention of sense-data. Since this restriction commits him to less, it only strengthens his case against Direct Realism. The restriction also allows us to focus on the Problem of Secondary Qualities. I suggest the following spreading principle as a first premise, intending it as a corollary to Robinson's just mentioned stronger claim:

1. Secondary Quality Spreading Principle: If there are immediate objects of perception that possess secondary qualities and none of these objects is physical, then there are no immediate objects of perception that are physical.[27]

To this, we add a claim to which Robinson is explicitly committed:

2. Some immediate objects of perception possess secondary qualities.

And he takes it as a deliverance of science that

3. If an object is physical, then it does not possess secondary qualities.

From these, we may deduce that physical objects and their qualities are not objects of perception. We begin with the following sub-proof:

4. Consider some particular object, *a*, which is both an immediate object of perception and a possessor of secondary qualities.

5. *a* possesses secondary qualities. (ConjE 4)[28]

6. If *a* is physical, then *a* does not possess secondary qualities. (UE 3)

7. *a* is not physical. (MT 5, 6)

Our sub-proof shows us that

8. If an immediate object of perception possesses secondary qualities, then it is not physical. (UI 4-7)

Combining this statement with premise 2, we find,

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[27] Robinson sometimes bothers to explicitly state narrower versions of his spreading principle. Robinson, 87-88, for example, offers an Argument from Hallucination which relies on the claim that hallucinations are qualitatively similar to veridical perceptions and so must have qualitatively similar 'sense contents.'

[28] I cite rules of inference and standard argument forms in order to make the validity of the argument apparent. I abbreviate: Conj – conjunction introduction; ConjE – conjunction elimination; UE – universal elimination; MP – modus ponens; MT – modus tollens; UI – universal introduction.

9. Some immediate objects of perception possess secondary qualities, and none of these objects is physical. (Conj 2, 8)

And Robinson's desired conclusion concerning Direct Realism emerges in the next step:

10. There are no immediate objects of perception that are physical. (MP 1, 9)

That is, Direct Realism, the thesis that some immediate objects of perception are physical objects, is false.

In the interest of defending sense-data, Robinson continues by claiming that any perceivable, non-physical thing must be a sense-datum. But we have not used any of Robinson's claims for sense-data in reconstructing his case against Direct Realism, so any complaints we might have about the paradoxical nature of sense-data are an insufficient response. Even if Sense-Datum Theory is implausible, Robinson's argument poses a threat to Direct Realism and to common sense.

The argument is valid. If we are to maintain Direct Realism, then we must undertake the substantive challenge of finding a premise to reject. This is not an easy task, however, as we have good reasons for 1, 2, and 3. Ultimately, my response to the Problem of Secondary Qualities involves a denial of the third premise (hereafter, P3), that physical objects do not possess secondary qualities. This denial is made possible by a identity theory of secondary qualities, where secondary qualities may be specified in terms of perceiver-independent physical properties. But P3 is often taken as a scientific discovery, not open to philosophical criticism. Therefore, before proceeding, I will say why a defense of Direct Realism is best served by arguing for secondary qualities as perceiver-independent properties of physical objects, rather than resisting premise 1 or 2—because premises 1 and 2 are most likely true.

Premise 1: The Spreading Principle

The first premise, the spreading principle, says that if there are immediate objects of perception that possess secondary qualities and none of these is physical, then there are no immediate objects of perception that are physical. I think this principle is correct, but a cursory glance at the Problem of Secondary Qualities as I have presented it may incline one to believe that this is the argument's weak point. The claim seems finicky, overly concerned with secondary qualities in particular, and unmotivated. "So what if I see a sense-datum or a perceiver-dependent relation when I perceive a secondary quality?" one might say. "I don't see what this has to do with my immediate perceptions of lengths, widths, weights, and other obviously perceiver-independent properties of physical objects. Why can't we consider secondary qualities exceptional? Why must we propagate our analysis of secondary quality perceptions to perception generally?"

A Behaviorist Objection to Premise 1

Besides Disjunctivists, the only contemporary philosopher of perception I have found who has explicitly denied the spreading principle is George Pitcher. Unfortunately, Pitcher is a behaviorist, so few will find his solution palatable. Still, he rejects premise 1 by allowing secondary qualities to be perceiver-dependent but refusing to extend this status to other perceivable properties. Concerning secondary qualities, and colors in particular, Pitcher says,

> The way peoples' perceptual apparatus happens to be constructed determines to a much greater degree what colors things are said to be than it does what shapes things are said to be. Colors are in fact largely dependent on the nature of our visual equipment.[29]

[29] Pitcher, 222.

Such a sharp distinction between secondary and other qualities is unusual for a self-proclaimed Direct Realist, but this move is made possible because Pitcher is a behaviorist.

Pitcher says that perceptions are properly caused dispositions to behave in certain ways. My seeing a tree, for example, might be caused by sunlight reflecting off the tree, affecting my eyes in a particular way, and putting me into such-and-such brain state. That brain state, in turn, disposes me to do things like climb the tree, stand in its shade on a hot day, or walk around it rather than into it. Thus, the object of a subject's perception may be discovered and the subject's perceptual knowledge evaluated by considering the subject's behavioral dispositions.

For Pitcher, since perceptions are just dispositions to behave in certain ways, we can know what a subject perceives and whether she has perceived it veridically by how well her behaviors lead her to accomplish certain tasks. For instance, given that the subject sees a circle and wishes to trace it, she might employ a compass. Setting one leg in the circle's center and swinging the other end around, she finds that it conforms to the perimeter quite easily. And we see that the subject perceives the circle veridically because that is the object she attempts to trace and her tracing attempt is successful. On the other hand, if the subject seems to see a circle but actually sees a square, she finds herself unable to trace it with a compass. She sees the square but her behavior fails to reflect the square's non-circularity; the compass consistently fails to follow the shape's perimeter. Her purposes are thwarted by her inappropriate behavioral dispositions. So, according to Pitcher, we find that her perception is non-veridical, an illusion. And this

conclusion is based on the "punishing experiences" our subject undergoes as a result of her misperception.[30]

When it comes to perceptions of color, Pitcher speculates that the relevant behavioral dispositions come in only two types—matching and discriminatory.[31] For a subject to perceive two things as the same color, he claims, is just for that subject to match those things on the basis of apparent color. Likewise, two things look differently colored if and only if the subject sorts them into different color categories. Perhaps there are other behavioral dispositions that attach to color,[32] but Pitcher's point is that secondary quality perceptions, dispositions to match and discriminate, depend on the particulars of the perceiving subject's anatomy in ways that other perceptions do not. If our visual apparatus were adjusted, even slightly, we would have different color matching and discriminatory behaviors. At the same time, we would have every reason to think that our perceptions are veridical, because our altered sorting dispositions would not result in punishing experiences of the sort we saw when the subject mistook the square for a circle. Therefore, says Pitcher, colors are both veridically perceived and dependent on us. And this sets colors, and perhaps all secondary qualities, apart from other perceivable properties such that we are justified in denying the spreading principle (premise 1) and limiting our analysis of secondary quality perceptions to these special cases.

Although Pitcher's attempt to stop the spreading principle is admirable in its cleverness and consistency with his theory, I do not think it is adequate for defending

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[30] Pitcher, 228.

[31] Pitcher, 199-202.

[32] E.g., men are more attracted to women in red. See Andrew Elliot and Daniela Niesta, "Romantic Red: Red enhances men's attraction to women," *Journal of Personality and Social Psychology* 95 (2008): 1150-1164.

commonsense Direct Realism, even if we ignore general objections to behaviorism. First, it is not clear that Pitcher has provided an adequate basis for distinguishing secondary qualities from other properties. Color, he says, is perceiver-dependent because slight anatomical alterations might result in radically different color matching and discriminatory behaviors. Moreover, the absence of punishing experiences in the event of such a change suggests that these new perceptions are as veridical as the old. But compare a quality that is seemingly perceiver-independent, like weight. Slight anatomical alterations might result in radically different weight-related behaviors. For example, if my blood sugar were low and I felt weak, then I would perceive objects as heavier on Pitcher's account. We would know this because I would adopt different behavioral dispositions. I might be disposed to use a wheelbarrow to move something that I would normally carry. This is not likely to generate punishing experiences, so, according to Pitcher, my perception is veridical. Does this mean that weight is a perceiver-dependent quality? Surely not. Likewise, Berkeley suggests that a mite might consider his own foot to be a body of "considerable dimension."[33] And this mite's behaviors are certainly much different than if it were a human-sized creature. But, again, surely Pitcher would not say (as Berkeley does) that magnitude is a perceiver-dependent property.

Either of these examples is sufficient to show that Pitcher's inference from the potential effects of anatomical alterations on behavior to the subject-dependence of perceived qualities is a bad one. The dependence of our behavioral dispositions on our physiological traits does not establish the perceiver dependence of perceived objects or

[33] George Berkeley, *Three Dialogues between Hylas and Philonous* (Indianapolis: Hackett, 1979), 25.

qualities. So Pitcher has failed to say what makes secondary qualities special, and we are left without grounds for stopping the spreading principle at secondary qualities.

Even if a behaviorist theory of perception were able to properly separate secondary qualities from other properties so as to stop the spreading principle, there is reason to think that such a theory is undesirable. For one, it is not clear why such a theory counts as Direct Realism. Direct Realism says that we perceive perceiver-independent qualities of physical objects immediately. And while behaviorism denies the existence, and therefore the perception, of sense-data, it has precious little to say about why behavioral dispositions count as perceptions that take perceiver-independent qualities of physical bodies as immediate objects. Returning to the tree example, my disposition to stand in the tree's shade is the result of a causal chain that begins with the sun's shining and ends with a particular brain state. The tree plays a role in that process, but what reason do we have to make it the immediate perceptual object rather than the sun, the reflected light, my eye, or some earlier brain state? It cannot be that my behavioral dispositions relate especially to the tree, for I am equally responsive to the brain state, my eye, and the sun. Unless Pitcher can say why his theory is a version of Direct Realism, aside from its denial of sense-data, it is hard to see how it could help Direct Realists overcome the Problem of Secondary Qualities, even if it allowed us to reject the first premise of the argument.

A Disjunctivist Objection to Premise 1

Although Disjunctivism has little to say about secondary qualities in particular, its approach to illusion and hallucination may be applied to our problem. Disjunctivism rejects any and all versions of the spreading principle. It says that veridical perceptions,

illusions, and hallucinations have no common essence, despite their phenomenal and (perhaps) causal similarities,[34] so our analysis of one case need not spread to the others. Direct Realist versions of Disjunctivism say that, in cases of veridical perception, the object of our perception is physical and mind-independent, no matter what analysis we give of illusions and hallucinations. To the Problem of Secondary Qualities, then, a Disjunctivist might admit that secondary qualities are possessed by mental (and not physical) entities. But she would also say that other perceivable qualities, such as shape and magnitude, are possessed by physical objects, and we perceive these directly.

All Disjunctivists deny the spreading principle. Many might also reject premise 2, that some immediate objects of perception possess secondary qualities, or premise 3, that physical objects do not possess secondary qualities. However, because we are focusing on premise 1, I will work with a bare-bones Disjunctivism that accepts premises 2 and 3. Of course, since 4 through 9 follow from 2 and 3 alone, this means that this version of Disjunctivism accepts that certain immediately perceivable mental entities are the bearers of secondary qualities. Secondary qualities are properties of mental objects while other non-illusory qualities are properties of physical entities.

How might a defender of premise 1, like Robinson, respond to such a line? We have already seen why Robinson endorses the spreading principle: a "continuity" between illusory and veridical perceptions of physical objects compels us to offer the same analysis for both.[35] Explicitly, he points out both environmental and physiological continuities—between very tired (illusion-conducive) and slightly less tired (mostly

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[34] Matthew Soteriou, "The Disjunctive Theory of Perception," *The Stanford Encyclopedia of Philosophy (Winter 2009 Edition)*, Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/entries/perception-disjunctive/>.

[35] Robinson, 56-58.

veridical) states, accurate vision and slight short-sightedness.[36] This continuity, I think, spells trouble for the Disjunctivist.

Consider the case of seeing the cup on my desk. The Problem of Secondary Qualities says that, when I see the cup, I see something colored. But the cup is not colored. So it posits a non-physical entity, traditionally a sense-datum, as the color-bearing and immediate object of perception. A typical Disjunctivist might avoid speculating about the nature of the immediate perceptual object in the illusory case, but we are considering a bare-bones Disjunctivist who accepts premises 2 and 3. That is, this Disjunctivist agrees that we immediately perceive secondary qualities and that those qualities are not possessed by physical objects. From these, it follows that some immediate objects of perception, namely those that possess secondary qualities, are non-physical.[37] So the bare-bones Disjunctivist agrees that the color I see when I look at my cup is really possessed by some mediating, non-physical object. On the other hand, the Disjunctivist says that this analysis does not extend to perceptions of perceiver-independent qualities. I perceive the cup's intrinsic shape and magnitude directly, with no mediating object. I immediately see the cup's shape and the color of some non-physical object.

While the bare-bones Disjunctivist's position is not incoherent, it is also not intuitive. When I look at my desk, the size and shape that I see are perceiver-independent. Its color, on the other hand, is a property of some non-physical intermediary. When I lift my coffee mug, I simultaneously and immediately perceive the vessel's solidity and the

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[36] Ibid., 57.

[37] Note that the Problem of Secondary Qualities, as I have presented it above, does not use the spreading principle until the inference from 9 to 10. So the bare-bones Disjunctivist is committed to 9.

warmth of some mental entity. When I take a sip, the viscosity I detect is an immediately perceived property of the coffee. But the taste and smell are properties of intervening non-physical objects. If our Disjunctivist is correct, then everywhere we look and feel we perceive immediately a curious mixture of physical and non-physical entities that blend together seamlessly so as to fool our common sense.

Understandably, Robinson finds these stories highly implausible. It does not seem as if a sense-datum suddenly appears in the stick case, nor does there seem to be a great variety of perceivable entity types—mental and physical—floating about, as in the secondary quality case. Instead, there is a phenomenal and causal continuity between veridical and illusory cases. When I look at my desk, its color seems to be a property of the desk in just the way its shape is. I do not seem to be directly seeing two things—a rectangular desk and a white sense-datum. I seem to see a white, rectangular desk. Phenomenally, we find nothing to distinguish the veridical perception from the supposed illusion with regard to mental content.

At the least, our bare-bones Disjunctivism, rejecting the spreading principle while accepting premises 2 and 3, seems to be at a dialectical disadvantage in responding to the Problem of Secondary Qualities. It amounts to positing an immediate perceptual world that is part mental, part physical. And this seems out of step with common sense.

Further Support for Premise 1

On balance, philosophical tradition favors the spreading principle. Early moderns who concede that secondary qualities are illusory also characteristically give up on Direct Realism. David Hume, for example, finding that he cannot comprehend extension, motion, and solidity without color, finally remarks, “After the exclusion of colours,

sounds, heat and cold from the rank of external existences, there remains nothing, which can afford us a just and consistent idea of body."[38] Similarly, Berkeley argues that the concept of a real, physical body deflates into nonsense without the secondary qualities. Consider the following exchange between Hylas and Philonous:

> *Phil.* Again, is it your opinion that colors are at a distance?
>
> *Hyl.* It must be acknowledged, they are only in the mind.
>
> *Phil.* But do not colors appear to the eye as coexisting in the same place with extension and figures?
>
> *Hyl.* They do.
>
> *Phil.* How can you then conclude from sight, that figures exist without, when you acknowledge colors do not: the sensible appearance being the very same with regard to both?
>
> *Hyl.* I know not what to answer.[39]

Secondary qualities co-appear with other physical qualities. We experience them together. It seems that they should stand or fall together. Some say that we cannot even form an idea of an object that possesses the primary qualities without also involving secondary qualities. As Berkeley writes,

> But I desire any one to reflect and try, whether he can by any abstraction of thought, conceive the extension and motion of a body, without all other sensible qualities. For my own part, I see evidently that it is not in my power to frame an idea of a body extended and moved, but I must withal give it some colour or other sensible quality which is acknowledged to exist only in the mind. In short, extension, figure, and motion, abstracted from all other qualities, are inconceivable. Where therefore the other sensible qualities are, there must these be also, to wit, in the mind and no where else.[40]

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[38] David Hume, *Treatise on Human Nature* (New York: Oxford University Press, 2000), 1.4.4.6-10/150-151.

[39] Berkeley, *Three Dialogues*, 38.

[40] Berkeley, *Treatise Concerning the Principles of Human Knowledge,* 1.10/106. Hume's argument in *Treatise*, 1.4.4.8/150 is almost identical.

Berkeley's claim is that we cannot abstract secondary qualities away from the primaries in the Lockean sense of considering a hypothetical object that lacks secondary qualities while possessing primary qualities. That is, we cannot form an idea of an object that has primary qualities but lacks secondaries, as Galileo seems to do when he considers a world without secondary qualities.[41] Even in our imaginations, secondary qualities are necessarily conjoined with primary and other seemingly perceiver-independent physical qualities. This is important because, for Berkeley, conceivability is the mark of possibility.[42] It is inconceivable that a body be extended without also bearing some color or temperature, so, Berkeley thinks, it is impossible that such a body exists. Primary and secondary qualities are inseparable via abstraction. So our analysis of one spreads to the other.

In our own day, Foster treats secondary qualities as merely the tip of the iceberg. Quickly spreading his version of Sense-Datum Theory from secondary qualities to all perceivable objects, he writes,

> This is just the point, already mentioned, about the status of the secondary qualities—that science seems to show that such qualities as colour, sound, flavour, and odour are nothing more, in the physical items themselves, than powers to affect human sense-experience, together with the primary structures on which these powers are grounded. But, importantly, it also extends to the primary structures themselves. For, even in respect of spatial patterning, how things sensibly appear to the ordinary visual and tactual observer is not, except in broad outline, the same as how things turn out in the light of microscopic and sub-microscopic investigation. The conclusion to be drawn seems to be that our perception of the physical world is non-veridical on a global scale, and so almost

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[41] Galileo, *The Assayer*, in *Discoveries and Opinions of Galileo*, trans. Stillman Drake (New York: Anchor Books, 1957), 276-7.

[42] Jonathan Dancy, "Introduction," in George Berkeley, *A Treatise Concerning the Principles of Human Knowledge* (New York: Oxford University Press, 1998), 31.

> entirely beyond the reach of presentationalist [the view that physical objects are present in or partially constitutive of our perceptual experiences] treatment.[43]

The Problem, if allowed to fester, ramifies into full-blown skepticism concerning the external physical world in the twenty-first century as well as in the eighteenth.

This is especially true for secondary qualities, Foster thinks, since secondary qualities occupy so much of our perceptual lives. If these are illusory, then "illusion will be ubiquitous."[44] There is also a phenomenological continuity, or at least a coupling, between secondary and other qualities. Color appears with extension, heat with hardness. Co-experienced qualities, it seems, should receive similar philosophical treatments. So we have even more reason to accept the spreading principle.

Although behaviorism seemed to allow us to respond to the Problem of Secondary Qualities by rejecting premise 1, its promises went unfulfilled. The distinction it attempted to make between secondary and other qualities was unconvincing, and it created additional problems since it is not obviously a species of Direct Realism. Disjunctivism seems implausible, because it asks us to accept radical differences in our analyses of veridical and illusory cases of perception, even when physiological and environmental differences are slight. Moreover, tradition and perceptual continuity between secondary and other qualities give us at least prima facie reason to endorse the spreading principle. Finally, even if we did find good reason to reject premise 1, this commitment might work against us as much as in our favor, because we have already said that common sense understands secondary qualities as perceiver-independent. So even if we denied the spreading principle, the systematic illusoriness of secondary

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[43] John Foster, *The Nature of Perception* (New York: Oxford University Press, 2000), 65.

[44] Foster, 65.

qualities would undermine common sense. And common sense is a primary motive for our endorsing Direct Realism. If we wish to maintain Direct Realism on the basis of common sense, then a rejection of the spreading principle does not help our case. Direct Realism is appealing because it affirms our convictions that things are mostly as they seem. If we defend Direct Realism by admitting that ever-present secondary qualities are not as they seem, then we would be losing ground rather than gaining. So we prefer to keep premise 1.

My aim in this essay is to articulate what I think is the best response to the Problem of Secondary Qualities. I have included this section to say why I do not view premise 1, the spreading principle, as a promising target for our objections. However, my case against the Problem of Secondary Qualities is in no way dependent on the truth of the spreading principle. It may be false. And if one were to find dialectically suitable grounds for rejecting premise 1, I would listen with eager ears. But, as it happens, the best ways of attacking the spreading principle involve either behaviorism or Disjunctivism. And both of these theories seem unlikely as well as controversial. Neither offers a compelling way around premise 1.

Premise 2: The Existence Claim

We are considering which premise from the Problem of Secondary Qualities to reject in order to maintain Direct Realism. Premise 1, the spreading principle, is intuitive and has the support of the philosophical tradition. It would be difficult to mount a case against it. So we move on to the second premise, that some immediate objects of perception possess secondary qualities. This is so obvious that it may not need defending. Our sense experiences themselves testify to this premise. In fact, such qualities seem to

be everywhere. And common sense Direct Realism would like to say that things, for the most part, are as they seem. Even Indirect Realists find this thought appealing. Robinson, for example, motivates his theory with a Phenomenal Principle: "If there sensibly appears to a subject to be something which possesses a particular sensible quality then there is something of which the subject is aware which does possess that quality."[45] Premise 2 would be difficult to deny given its broad appeal. However, I will mention two possible objections—gambits really—before considering how we might challenge premise 3.

The Grand Illusion Objection

First, one might say that secondary qualities do not exist. That is, although immediate objects of perception seem to possess colors, smells, and tastes, they in fact do not. There are no secondary qualities, so they cannot be properties of either mental or physical objects. If there seem to be secondary qualities, then they are a grand illusion. Premise 2, that some immediate objects of perception possess secondary qualities, is false. Moreover, no matter how things seem, this objection insists, Direct Realism is true—physical entities are the immediate objects of our perception.

The objection is right not to commit Direct Realism to the thesis that things are *always* as they seem. Robinson's Phenomenal Principle is too strong, making perceptual beliefs about immediate objects virtually infallible—since immediate objects *must* be as they "sensibly appear." This is one reason that Robinson subscribes to Sense-Datum Theory. Physical objects, he thinks, fail to satisfy the Phenomenal Principle, so there must be mental objects which we perceive immediately and about which our perceptions give us infallible beliefs. However, I contend that Sense-Datum Theory fails to conform

[45] Robinson, 32. Repeated in Fish, 6.

to the Phenomenal Principle since, as I will argue later in this chapter, if sense-data exist, at least some of them appear to be physical. If all immediate objects of perception are sense-data, then lots of them are other than they sensibly appear, since they appear to be external objects. Thus, the Phenomenal Principle is too restrictive for Indirect Realism and Idealism, as well as Direct Realism, since neither physical nor mental objects (if there are such things) are always as they seem.

Michael Huemer suggests a weaker view that although sense experiences are foundational for many justified beliefs, those beliefs are defeasible.[46] Sense experiences give us only prima facie justification, so additional evidence might make it reasonable to reject a perceptual belief. Huemer's Direct Realism acknowledges the existence of illusions but remains optimistic about the veridicality of perception-produced beliefs in general. For example, he concedes that the Müller-Lyer illusion (see Figure 1) is a genuine illusion, but he denies that it undermines the faculty of perception altogether. About that case he says,

> The [center line in Fig. 1] appears to be longer than the [top line in Fig. 1], so other things being equal, you would be reasonable in thinking that the [center] line is longer. However, you can get out a ruler and measure these lines. If you do this, you will find them to be of the same length. At this point it would be reasonable for you to revise the initial belief and conclude that the lines are really of the same length.[47]

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[46] Huemer, *Skepticism and the Veil of Perception* (New York: Rowman & Littlefield, 2001), 98-103.

[47] Huemer, *Skepticism and the Veil of Perception*, 101.

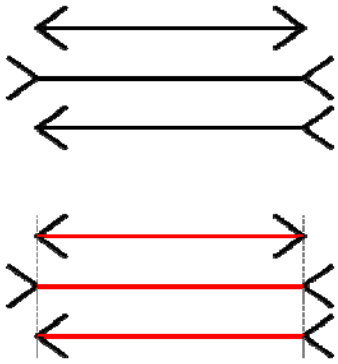

Fig. 1. Müller-Lyer illusion. (Courtesy of Fibonacci, available under a Creative Commons Attribution-Share Alike 3.0 license)

Our beliefs about the relative lengths of these lines are inaccurate so long as our vision provides our only justification. This is why our other epistemic faculties are important. Even if our perceptual abilities are impressive, they can be fooled.

The proposed objection to premise 2, that secondary qualities do not exist either as properties of physical objects or as properties of mental objects, dismisses secondary quality perceptions as cases where our imperfect perceptual faculties suggest something false to us, as in the Müller-Lyer illusion. One line looks longer, but nothing is in fact longer. Likewise, we seem to see secondary qualities. We have secondary quality sense experiences. But, according to his objection, there are no secondary qualities or perceptions of them. We may dream of unicorns, but we do not see them, for there are none to be seen. Perception-based beliefs in secondary qualities are just epistemic misfirings.

This is a dangerous move because, as we have seen, problems in perception tend to ramify. Consider a family of potential spreading principles regarding the justificatory strength of perceptual beliefs. I mean principles of the general form,

> If, on balance, we have good reason to hold that perceptual beliefs of type *x* are systematically false, then, for us, no belief is justified merely on the basis of perception.

Here, *x* stands for some class of perceptual beliefs, like beliefs that I have hands, that certain physical objects possess secondary qualities, or that one line of the Müller-Lyer illusion is longer than the other. Principles of this sort may be more or less plausible, depending on *x*. The generalized formulation prompts us to consider which perceptual scenarios, if illusory or hallucinatory, should cause us to lose our confidence in perception as a viable epistemic faculty.

If we are commonsense Direct Realists, then there will be many spreading principles regarding justification of perceptual beliefs that we cannot accommodate. This is because, according to common sense, perception generally provides us with knowledge of its objects. It does not lead us astray as a matter of course; things are, in most respects, as they seem. However, there are illusions, as the Müller-Lyer case demonstrates. So Direct Realism faces a tradeoff. If we admit that a certain type of perceptual experience is illusory, then we must deny the corresponding spreading principle. That is, if the Müller-Lyer illusion is really an illusion, then we must say that it is not the sort of illusion that causes us to think of perception as epistemically worthless. It is no surprise that our visual and neural systems have limits. The Müller-Lyer case shows that limits are not necessarily debilitating. We admit this case as an illusion and think the corresponding spreading principle false. On the other hand, if a spreading principle is overwhelmingly convincing, then Direct Realists must claim that beliefs of the class relevant to that principle are not systematically false. Consider more critical cases of perceptual beliefs—what if trees were illusory, or people, or physical motion, or the passage of time? These would give us pause to reevaluate perception altogether, because our perceptual beliefs

concerning these things are both ubiquitous and acute. If these are systematically illusory, then all of our perceptual beliefs are unjustified or at least severely undermined. Direct Realism can tolerate the falsity of some perceptual beliefs, but it has its breaking points.

I do not know the exact features of belief classes that make for convincing spreading principles regarding justification. But I contend that secondary qualities are more like trees than Müller-Lyer drawings. We seem to perceive them often and are strongly moved to believe in them. Idealists, Indirect Realists, and Common Sense Direct Realists seem to endorse a spreading principle to the effect that if, on balance, we have good reason to hold that perceptual beliefs in secondary qualities are systematically false, then, for us, no belief is justified merely on the basis of perception. And this means that we cannot treat the existence of secondary qualities as illusory if we are to remain Direct Realists, or Idealists or Indirect Realists for that matter. For these theories all involve veridical perceptions of some sort. It is better to accept premise 2.

The No-Qualities-No-Illusion Objection

We have just entertained the possibility of denying altogether that there are secondary qualities while admitting that we seem to perceive them. But this is not the only way to reject premise 2. Suppose that we deny that there are secondary qualities and also that we seem to perceive them. Is this a plausible means for rejecting premise 2 and so the Problem of Secondary Qualities? Almost certainly not, because such an approach fails to cohere with common sense.

One way to claim both that we do not seem to perceive secondary qualities is eliminative materialism about the mind. Paul Churchland, for example, predicts that a

completed neuroscience will make our traditional 'folk psychology' obsolete.[48] 'Concepts' of desires, beliefs, and perhaps even concepts will give way to a new, scientific understanding of the 'mind.' Churchland suggests that conceptual schemes involving propositional attitudes of the mind will be done away with altogether.[49] And, since perceptions, hallucinations, and illusions involve propositional attitudes, they would be among the eliminated elements of folk psychology. Without such elements, it seems that we would have no grounds for saying either that one perceives secondary qualities or that one even seems to perceive them. Thus, someone like Churchland could deny premise 2 and our supposed evidence for it.

I have offered eliminative materialism as an example of how one might plausibly reject premise 2 by arguing both that there are no secondary qualities and that we do not seem to perceive them. However, the fact that eliminative materialism undermines the notion of perception altogether makes it unhelpful in defending Direct Realism. And its metaphysically revisionary elimination of folk psychology explicitly places it in opposition to common sense. Perhaps there are other ways to deny both the existence of secondary qualities and the claim that we seem to perceive them. I do not know what those would be. But, even so, it seems dialectically advantageous to accept premise 2, if for no reason other than because, as we said near the beginning of this essay, common sense holds that we perceive secondary qualities.

Taking our earlier claims a step further, we see the intuitiveness of premise 2 reflected in our language. Thomas Reid takes widespread linguistic commonalities as

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[48] Paul Churchland, "Eliminative Materialism and the Propositional Attitudes," *Journal of Philosophy* 78 (1981): 67-90.

[49] Churchland, 87.

indications of commonsensicality.[50] But if we do not seem to perceive secondary qualities as possessed by physical objects, then much of our everyday language needs to be reinterpreted. What do we mean when we say things like "the color of the tulip," "the sound of the bell," or "the taste of the apple pie"? We sound like we are attributing secondary qualities to physical objects. And surely, if we make such attributions, it is because it seems to us that physical objects possess them. Or shall we pretend that these phrases are merely colloquial expressions? If so, then they are fantastically widespread and horribly misunderstood.

Further Support for Premise 2

Over two thousand years of philosophical tradition understands secondary qualities as objects of perception, which would be very odd if they did not seem to be so. In Scholastic treatments of perceptual objects, secondary qualities often serve as paradigm cases. Aquinas, Lutrea (the writer of a respected commentary on Aristotle's *De Anima*), Usingen (Martin Luther's teacher at Erfurt), Buridan, and Ockham all treat the secondary qualities as physical, typically using color in thought experiments concerning the proper objects of sense perception—qualities and/or substances.[51] These philosophers understand colors and sounds as rather obvious examples of perceivable qualities. It is unlikely that they are making these claims if they were contrary to how things seem.

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[50] For example, see EIP 1.1/21, which notes that certain operations of the mind are expressed, in every language, by active verbs and so suggests that "the natural judgment of mankind" considers the mind to be active.

[51]Pekka Karkkainen, "Objects of Sense Perception in Late Medieval Erfurtian Nominalism," *Theories of Perception in Medieval and Early Modern Philosophy*, eds. Simo Knuuttila and Pekka Karkkainen (Springer, 2008), 187-202. See also Alfred L. Ivery, "The Ontological Entailments of Averroes' Understanding of Perception," 73-86, in the same volume.

Moreover, the intuition that we seem to see colors, hear sounds, and smell odors is overwhelming. As C. D. Broad puts it, "What I am immediately aware of when I look at a penny stamp is as indubitably red as it is indubitably more or less square."[52] Denying that we seem to perceive secondary qualities flies in the face of common sense even more violently than the view that there are no secondary qualities or seeming perceptions of them.

Curing the Problem of Secondary Qualities by rejecting premise 2 is worse than the disease. We cannot ignore our sense experiences, and admitting those experiences as illusory defeats our purposes as Direct Realists. Moreover, as we have already said, we can gain no ground by rejecting premise 1. We perceive secondary qualities. If they are not properties of physical bodies, then Direct Realism is probably false. If we want to defend Direct Realism, then we should look for a way to challenge premise 3, that physical objects do not possess secondary qualities.

Premise 3: The "Scientific" Postulate

Having seen the complications that would arise from challenging premises 1 and 2, we now turn to the premise that I say Direct Realism should reject. Premise 3 is about the physical world. It says that physical objects do not possess secondary qualities. Robinson justifies it by characterizing it as a scientifically demonstrated fact ("science has shown"), citing Galileo, Descartes, and Locke as authorities.[53]

Galileo offers an early candid rejection of secondary qualities as perceiver-independent. He writes that the sensations we associate with the perception of secondary

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[52] C. D. Broad, "The Theory of Sensa," in *Perceiving, Sensing, and Knowing*, ed. Robert J. Swartz (Los Angeles: University of California Press, 1965), 125.

[53] Robinson, 59-60.

qualities (or as I will say, "secondary quality sensations") *are produced by* "other" and "real" qualities. Tastes, for example, depend on the "various shapes, numbers, and speeds" of the particles that contact the tongue. Smells come about likewise via the nose. Sounds are heard at the "ruffling" of the air. And, although he offers no comment on color, Galileo theorizes that heat sensations originate with tiny moving particles that penetrate our bodies.[54] He is fully aware that we have secondary quality sense experiences. But, Galileo thinks, these experiences, by themselves, are insufficient reasons for believing in secondary qualities as perceiver-independent physical properties, especially if the causes of secondary quality sense experiences are best accounted for by other, obviously perceiver-independent qualities. He concludes, "My mind does not feel compelled to bring them in as necessary accompaniments [to physical substances]."[55]

Galileo offers the following thought experiment to support his view.[56] Consider a possible world with the same physical objects and perceiver-independent qualities as our world, with the exception that in that world secondary qualities are not possessed by physical objects. In that world, says Galileo, our sense experiences are the same as in this world, because the physical causes of our sense experiences are completely accounted for by non-secondary qualities. That is, the possible world where physcial objects do not possess secondary qualities is phenomenologically indistinguishable from this one. Therefore, Galileo reasons, secondary quality sense experiences do not count as evidence for secondary qualities being possessed by physical objects. So we are left with no reason to think that secondary qualities are in fact perceiver-independent.

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[54] Galileo, 276-7.

[55] Galileo, 274.

[56] Galileo, 274.

What makes Galileo think that secondary qualities would make no difference to our phenomenology? He and other early modern natural philosophers are Atomists, Mechanical Philosophers, and neo-Epicureans. Having jettisoned Scholastic "formal causes," they see the universe as consisting of minute atoms, whose interactions are governed solely by collisions and geometric features.[57] Since mechanical interactions account for the whole of physical causation, there is no causal role for secondary qualities. Robert Adams summarizes,

> The only properties of bodies directly involved in such interactions are geometrical properties (size, shape, position), motions (and rest, which is lack of motion), and solidity (the fact that two bodies cannot occupy the same space). These are the qualities that came to be called "primary." The other sensible qualities are assigned no direct causal role in this scheme of explanation.[58]

If secondary qualities play no causal role in the processes that determine our sense experiences, then, even if physical objects do happen to possess secondary qualities, these are not the secondary qualities that we perceive, for we have no causal connection to them. And, therefore, we have no good reason to think that the secondary qualities we perceive are perceiver-independent. Adams again:

> When I see a round, red apple, the geometrical property of roundness that is immediately present to my mind may on this view also be present in the apple, playing a causal role in the effect the apple has on my eye, and ultimately on my mind. But the quality of redness that is immediately present to my mind seems to be entirely different from, and additional to, any geometrical property or motion. As such, if it is present outside the mind, in the apple, it cannot have any effect on my eye, or on any other body, according to the exclusively mechanical theory of explanation.[59]

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[57] See Alan Chalmers, "Atomism from the 17th to the 20th Century," *The Stanford Encyclopedia of Philosophy (Winter 2009 Edition)*, Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/entries/atomism-modern/>.

[58] Robert Adams, "Editor's Introduction," in George Berkeley, *Three Dialogues between Hylas and Philonous* (Indianapolis: Hackett, 1979), xiv.

[59] Adams, xiv-xv.

As Adams tells it, the reasoning of the early moderns leads to the conclusion that if there are physical secondary qualities, then we cannot perceive them, and we have no reason to believe in them. We can only perceive secondary qualities as ideas or properties of sense-data—illusory insofar as they seem to be perceiver-independent.

One might be inclined to ask whether secondary qualities are identified in terms of those properties accepted by seventeenth century Atomists—size, shape, and motion. Then, even if individual atoms lacked secondary qualities, perhaps certain combinations of particles could possess them collectively, as perceiver-independent although possessed by a group. In this work, I pursue a solution along these lines, but the early moderns, like many contemporary thinkers, are against this option. The third chapter explains some of the reasons why the identity option does not find much sympathy among philosophical and scientific communities.

It is worth asking whether today's scientists and philosophers also hold Galileo's view. A cursory glance at the indices of several chemistry and physics textbooks suggests that, with the exception of heat, the traditional secondary qualities are not subjects of interest for contemporary natural scientists, at least not by their traditional names.[60] And it is not difficult to find a few who testify to P3, especially with regard to color. For example, Stanford University biologists Robert Ornstein and Richard Thompson:

> 'Color' as such does not exist in the world; it exists only in the eye and brain of the beholder. Objects reflect many wavelengths of light, but these light waves have no color. Animals developed color vision as a way of telling the difference

[60] One notable exception, Martin S. Silberberg, *Chemistry: The Molecular Nature of Matter and Change*, 2d. ed. (St. Louis, MO: McGraw-Hill, 2000), 1026-7, includes a confusing three-paragraph section titled "What is Color?" The question that forms the title goes largely unanswered, and the language is erratic. Silberberg sometimes claims that colors are properties of things and other times that they are types of light. He sometimes says that an object has a color and other times that it merely appears to have it.

> between various wavelengths of light. The eye converts different ranges of wavelengths into colors, and it does this in a very simple way.[61]

And Leda Cosmides and John Tooby, cofounders of the Center for Evolutionary Psychology at the University of California-Santa Barbara:

> Just as common sense is the faculty that tells us that the world is flat, so too it tells us many other things that are equally unreliable. It tells us, for example that color is out there in the world, an independent property of objects we live among. But scientific investigations have led us, logical step by logical step, to escape our fantastically insistent, inelastic intuitions. As a result, we know now that color is not already out there, an inherent attribute of object. We know this because we sometimes see physically identical objects or spectral arrays as having different colors…. Far from being a physical property of objects, color is a mental property—a useful invention that specialized circuitry computes in our minds and then "projects onto" our percepts of physically colorless objects.[62]

Despite their philosophical clumsiness (e.g., claiming that the contents of eyes and brains do not exist in the world), the gist of these scientists' position is quite accessible. According to them, the physical causes of color experiences are well known, and those causes are not color qualities in physical objects or in the light waves they reflect. Therefore, it only makes sense to speak of colors when considering the visual or neurological physiology of some animal. It seems that colors (and other secondary qualities) are not perceiver-independent. It is also important to notice that Cosmides and Tooby base their claim on the lack of correlation between our sense experiences and perceiver-independent physical properties, which seems to exclude even the identity account of color that I will be proposing in later chapters.

We have said that the third premise seems to be supported by science. Tough-minded analytic philosophers, as a general rule, do not dispute the findings of science

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[61] Robert Ornstein and Richard Thompson, *The Amazing Brain* (Boston: Houghton Mifflin, 1984), 55.

[62] Leda Cosmides and John Tooby, "Forward," in Simon Baron-Cohen, *Mindblindness* (Cambridge, MA: MIT Press, 1995), xi; quoted in Tye, 145.

because philosophers and scientists have the same fundamental goal—understanding human beings and the world they inhabit. Moreover, the systematic and experimental rigor of the natural sciences yields a greater degree of certainty than is typically found in philosophy. We would prefer to accept the apparent findings of science. This sentiment is particularly well expressed by Quine: "Our ontology is determined once we have fixed upon the over-all conceptual scheme which is to accommodate science in the broadest sense."[63] But this is a special case. Rejecting P3 is our best attempt at saving Direct Realism from the Problem of Secondary Qualities. So we would do well to consider the evidence for P3 to see whether Robinson and others are correct in treating it as an invincible result of rigorous scientific investigation and philosophical consideration.

For a formidable contemporary argument for P3, that physical objects do not possess secondary qualities, let's consider Frank Jackson's case. Jackson concerns himself with color in particular, claiming that we should not regard color as possessed by physical objects unless it is a *scientific property*.[64] This last term is a technical one: "A scientific property is a property appealed to by current science in explaining the causal effect of one material thing on another material thing, or a logical consequence of such a property or properties."[65] As examples, he names mass and charge—those qualities involved in physical causation. Notice that on this definition scientific properties include those which may be scientifically identified as combinations of other scientific properties.

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[63] Willard V. Quine, "On What There Is," *Review of Metaphysics* 2 (1948): 36.

[64] Frank Jackson, *Perception: A representative theory* (New York: Cambridge, 1977), 122.

[65] Jackson, 122.

Jackson's argument begins by claiming, "Our reason for believing that material things are colored is (certain of) the perceptual experiences we have."[66] This statement means to highlight the unique role that sense perception plays in the commonsense belief that physical objects are colored. For the sake of being explicit, we can express this point as a conditional, such as,

J1. Unless our sense experiences give us reason to believe that physical objects are colored, we have no reason to think that those objects are in fact colored.[67]

Then, Jackson considers what we know about the physical causes of sense experiences, saying,

> Now it is known in broad outline how a material thing causes the brain events relevant to sensory experience. For those experiences particularly relevant to our perception of colour, the process involves the action of light reflected from the object to the eye. And the role of the object is essentially that of modifying the wave-length composition of the light, and the properties of the object which effect this modification are scientific ones like the texture and the molecular structure of its surface. …we do not yet know the (operative) necessary and sufficient conditions in full detail, but we are far enough along the road to knowing them to be able to predict with fair confidence that they will not require us to invoke properties over and above those countenanced by current science.[68]

In sum, sense experiences are caused by brain events, and scientific properties are sufficient to account for brain events. So Jackson adds two more premises:

J2. When physical objects cause sense experiences in us, the immediate causes of these experiences are certain events in our brains.

J3. The causal effect a physical object has on our brain is, as far as it is concerned, a function solely of its scientific properties.

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[66] Jackson, 122.

[67] I have changed some of Jackson's language to make this argument's vocabulary consistent with the rest of this chapter—e.g., "physical object" has been substituted for "material thing," "sense experience" for "perceptual experience," etc.

[68] Jackson, 124-125.

As we saw in our earlier discussion of Galileo and the early modern mechanists, we intuitively think that perceivable qualities of physical objects should have some causal connection with our sense experiences if those experiences are to count as evidence for the qualities. Moreover, we do not want to attribute secondary qualities to physical objects without good reason—that is, the evidence of sense experiences. But if the evidentiary potency of sense experiences depends on causal connections between our brains and the qualities in question, then sense experiences can only serve as evidence for causally relevant properties. And, as we have already said, causally relevant properties of external objects are scientific properties. Sense experiences can only serve as evidence for scientific properties; otherwise, they offer us no reason for belief. So Jackson says,

J4. If premises J2 and J3 are true, our sense experiences provide no reason to believe that physical objects have non-scientific properties.

That is, unless secondary qualities are causally potent, not even our sense experiences offer us good reasons to believe in them. From here, we affirm the antecedent of J4, which yields,

J5. Our sense experiences provide us no reason to believe that physical objects have non-scientific properties.[69] (J2, J3, J4)

Bivalence tells us that

J6. Either color is a scientific property or a non-scientific property.

J7. If color is a non-scientific property, then our sense experiences provide us no reason to believe that physical objects are colored. (J5, J6)

J8. If color is a non-scientific property, then we have no reason to believe that physical objects are colored. (J1, J7)

J9. Therefore, either color is a scientific property, or we have no reason to believe that physical objects are colored. (J6, J7, J8)

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[69] Jackson omits several inferences from his exposition of this argument. I have filled these in for clarity.

Jackson is an Indirect Realist, so this statement is supposed to narrow down the sort of thing that color might be. What color is depends on its potential as a scientific property—that is, on how we might employ it in scientific explanations. But, Jackson says, it has no potential. Scientific explanations make no appeal to color—"There is not one causal law in which 'is red', 'is blue', and so on appear."[70] While qualities like position and shape help us make scientific predictions, colors do not. Rather than secondary qualities, we use "hypothetical movements of hypothetical parts," which have the causal and predictive powers necessary for scientific theories.[71] Not only is color not mentioned in scientific descriptions of the physical process leading up to human perceptions, it is not even a prospective property for such a description. Jackson concludes,

J10. Color is not a scientific property.

J11. Therefore, we have no reason to believe that material things are colored. (J9, J10)

From here, Jackson pursues sense-datum theory in the same way as Robinson—claiming that perceivers see colored things despite the fact that such things are not physical.

This argument gives us something that Robinson's did not—the reason for the claim that there are no colors in the external world. No physical process resulting in a color perception involves an external color. We doubt our commonsense belief that colors are perceiver-independent. Jackson's argument applies equally well to other secondary qualities.

It would be difficult to reject any of Jackson's J1 through J5. Given what we know of our perceptual-nervous system, the mechanism between external object and

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[70] Jackson, 127.

[71] Broad, "The Theory of Sensa," 126-127.

mind is physical or, as Jackson says, scientific. Therefore, if we intend to say that secondary qualities are possessed by physical objects and that we know about them through perceptions, we must learn to characterize those qualities in such a way that they can engage physical-causal mechanisms. Moreover, they must be causal without overdetermining physical events. This means challenging Jackson's claim that colors are not scientific properties (premise J10) and ultimately P3 of the Problem of Secondary Qualities. As we shall see, I propose to do this by identifying secondary qualities with known causal-scientific properties.

Why Direct Realism?

We have already mentioned Direct Realism's conceptual connection to common sense. This, I think, is sufficient for initially privileging Direct Realism over rival theories of perception. But, before moving on to explain Reid's account of secondary qualities, I will mention a few additional reasons for preferring Direct Realism to Idealism and Indirect Realism. I offer these as a sampling, to show why Direct Realism is worth defending, but a comprehensive case for Direct Realism is beyond the scope of this project.

The central conflict between Direct Realism and the other two theories—Indirect Realism and Idealism—concerns the nature of the immediate objects of perception. Indirect Realism says that physical objects and their qualities are not *direct* or *immediate* objects of perception. Rather, perceptions of physical things are had *in virtue of* perceiving certain mental entities—sense-data or the like. In-virtue-of perceivings are open to both Direct and Indirect Realists. For example, both might say that I see my desk in virtue of seeing the surface of my desk; and I see the surface of my desk in virtue of

seeing the parts of it that are not covered by computer monitors, books, and the usual office clutter. This chain eventually finds its terminus at the immediate object of perception. The point of contention between Direct and Indirect Realists concerns the nature of that terminal object. What sort of thing is it? Direct Realism answers that it is an external, mind-independent, physical object or the qualities of such an object. Indirect Realism says that it is a mental entity; hence the introduction of sense-data, qualia, and sensa as mental objects of perception. Idealism concurs with Indirect Realism that immediate objects of perception are mental entities. But it denies that there are in-virtue-of chains connecting these immediate perceptions to perceptions of mind-independent objects. According to Idealism, everything either perceives or is perceived. Thus, Indirect Realism occupies a conceptual middle ground, incorporating the in-virtue-of relations of Direct Realism and the perceivable mental entities of Idealism.

The Epistemic Gap in Indirect Realism

One significant problem for Indirect Realism is explaining how we could perceive physical objects in virtue of perceiving mental ones. There is no obvious reason why mere mental entities should by themselves count as evidence for mind-independent bodies. The mental entities are not parts of those bodies, or qualities of them. It is not even clear why there would be a causal connection between them. This is an old criticism. George Berkeley writes in *A Treatise Concerning the Principles of Human Knowledge*,

> As for our senses, by them we have the knowledge only of our sensations, ideas, or those things that are immediately perceived by sense, call them what you will: but they do not inform us that things exist without the mind, or unperceived, like to those which are perceived. … But what reason can induce us to believe the existence of bodies without the mind, from what we perceive, since the very

> patrons of matter themselves do not pretend, there is any necessary connexion betwixt them and our ideas?
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> …perhaps it may be thought easier to conceive and explain the manner of their production, by supposing external bodies in their likeness rather than otherwise; and so it might be at least probable there are such things as bodies that excite their ideas in our minds. But neither can this be said; for though we give the materialists their external bodies, they by their own confession are never the nearer knowing how our ideas are produced…. Hence it is evident the production of ideas or sensations in our minds, can be no reason why we should suppose matter or corporeal substances, since it is acknowledged to remain equally inexplicable with, or without this supposition.[72]

In our own day, the same sentiment is echoed by John Foster:

> It seems just obvious that, if the sensible object immediately before his mind is a sense-quale, and if the only other relevant aspect of his current psychological condition is the accompanying experimental interpretation, then the subject's awareness stops at the quale itself and does not make contact with anything external.[73]

According to these Idealists, mental objects of perception leave an evidential gap between the perceiver's mind and the external world.

The failure of mental entities to function as evidence for external objects is among Reid's chief concerns in developing his own theory of perception. Berkeley, Reid says, "hath proved, beyond the possibility of reply, that we cannot by reasoning infer the existence of matter from our sensations."[74] And Reid goes on to give his own reasons why Indirect Realism fails. First, Locke's Indirect Realism, Reid thinks, is manifestly false. Locke explains the veridicality of our perceptions of primary quality perceptions by

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[72] Berkeley, *A Treatise Concerning the Principles of Human Knowledge*, 1.18-19/109.

[73] Foster, 203.

[74] IHM 5.7/70. See also IHM 5.4/61.

a resemblance between those qualities and the *ideas* they cause in us.[75] But Reid, who understands Locke's ideas as sensations, says that this is absurd. He writes,

> When I…compare [primary qualities and sensations] together, it appears to me clear as day-light, that the former are not of kin to the latter, nor resemble them in any one feature. They are as unlike, yea as certainly and manifestly unlike, as pain is to the point of a sword.[76]

The resemblance theory cannot account for our knowledge of the external world, since ideas do not in fact resemble external physical objects and so cannot serve as evidence for them in this respect.

One might think that, even if sensations do not resemble external objects, perhaps they provide knowledge of external entities in virtue of their taking those entities as objects. But Reid finds good reason to reject this line as well. For him, the essential feature of sensations is that they take no objects, other than perhaps themselves.[77] This, Reid thinks, is what distinguishes sensation from other operations of the mind. Pains are pains and pleasures are pleasures if we experience them, no matter what causal or other relations might obtain between them and external objects or mental operations.

Ultimately, Reid does not find any feature of sensations from which one might deduce the existence of external objects. He says, "Our sensations have no resemblance to external objects; nor can we discover, by our reason, any necessary connection between the existence of the former, and that of the latter."[78] And, in another place,

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[75] John Locke, *An Essay Concerning Human Understanding*, ed. by Peter H. Nidditch (New York: Oxford University Press, 1975), 2.8.15/137.

[76] IHM 5.7/68.

[77] EIP 1.1/36. For an argument that sensations are reflexive, taking themselves as objects, see J. Todd Buras, "The Nature of Sensations in Reid," *History of Philosophy Quarterly* 22 (2005): 221-238.

[78] IHM 6.21/176. This point is repeated in a historical discussion in EIP 3.7/289-290.

> And as the feeling [caused by a touching a hard object] hath no similitude to hardness, so neither can our reason perceive the least tie or connection between them; nor will the logician ever be able to show a reason why we should conclude hardness from this feeling, rather than softness, or any other quality whatsoever. But in reality all mankind are led by their constitution to conclude hardness from this feeling.[79]

John Greco has even identified an argument for skepticism in Reid based on this conviction, which Greco calls the "No Good Inference" argument. It says that if we are supposed to learn about the external world by inferring things about it from our ideas or sensations, then we are in trouble, because there is no good inference from sensation to external object. And, if this is the case, then we can have no knowledge of external objects.[80]

Without an adequate explanation of the connection between perceptions of mental entities and perceptions of physical objects, Indirect Realism is highly unsatisfying. Positing mental entities as the immediate objects of perception leads more naturally to Idealism than to Realism. But Idealism faces substantial challenges as well.

Our Natural Aversion to Idealism

One reason for preferring Realism to Idealism (and perhaps other forms of external world skepticism) is its ability to bring harmony to our epistemic faculties. Idealism posits a great struggle in each of us, between commonsense perceptual beliefs and those convictions underlying the rationalization for Idealism.[81] Our sense experiences give us near-unshakable convictions that the things we see, touch, and hear are really

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[79] IHM 5.5/64.

[80] John Greco, "Reid's Reply to the Skeptic," in *The Cambridge Companion to Thomas Reid*, ed. Terence Cuneo and Rene van Woudenberg (New York: Cambridge University Press, 2004), 143.

[81] Again, Landesman's admission that common sense would have us believe that secondary qualities are possessed by physical objects provides a nice illustration of this struggle, even if Landesman is not an idealist. See Landesman, 16.

there in the physical, mind-independent world around us. According to Idealism, our reason leads us elsewhere.

The tension between Idealism and common sense is perhaps most famously illustrated in Samuel Johnson's famous reaction to George Berkeley's Idealism—kicking a stone while shouting, "I refute it thus!"[82] But this anecdote is not as telling as Berkeley's writings themselves. Although Berkeley in one place denies that Idealism conflicts with common sense (he thinks that Idealism is, strictly speaking, commonsensical),[83] he elsewhere acknowledges that we have a naturally tendency to view the objects of our perceptions as mind-independent. He says that, because we perceive things without willing to do so, we assume that those things are mind-independent.[84] Likewise, David Hume, another early modern Idealist, writes,

> Men are carried, by a natural instinct or prepossession, to repose faith in their senses; and that, without any reasoning, or even almost before the use of reason, we always suppose an external universe, which depends not on our perception but would exist, though we and every sensible creature were absent or annihilated.[85]

Berkeley and Hume see our faith in our senses as mistaken and easily undermined, but they also understand our trust in sense perception and our belief in mind-independent, external objects as commonsense and natural. Thus, even for these two, there is a dangerous tension among our epistemic faculties. And, they think, we must favor reason if we are to pursue truth with seriousness.

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[82] James Boswell, *Life of Johnson*, ed. Charles Osgood (1791 & 1794; Project Gutenberg, 2006), http://www.gutenberg.org/cache/epub/1564/pg1564.txt.

[83] Berkeley, *A Treatise Concerning the Principles of Human Knowledge* 1.1/89.

[84] Berkeley, *A Treatise Concerning the Principles of Human Knowledge* 1.56/122.

[85] David Hume, *An Enquiry Concerning Human Understanding* (Indianapolis: Hackett, 1993), 12.1/104.

In Direct Realism, reason aligns with common sense. Perhaps we occasionally form false beliefs on the basis of sense experience. But we also make errors in logic and arithmetic. And, while sometimes we use our reasoning to correct our perceptual beliefs, we also use perceptions to check our reasoning. Even science depends on both. We naturally use reason and perception together, along with memory and other capacities, with considerable success. Besides, there is no obvious reason why reason should be privileged over sense perceptions. As Thomas Reid says in response to the external world skeptic,

> Why, Sir, should I believe the faculty of reason more than that of perception; they came both out of the same shop, and were made by the same artist; and if he puts one piece of false ware into my hands, what should hinder him from putting another?[86]

Direct Realism preserves cognitive harmony, while Idealism introduces a needless tension among the faculties.

For some, G. E. Moore offers a more theoretically palatable argument against external world skepticism. It begins with his famous claims, "Here is a hand. And here is another." Moore then says that because hands are external objects, at least two such objects exist, and, therefore, there is an external world.[87] One might accuse Moore of begging the question. Whether or not there are hands and other external objects is the thing in dispute. If Idealism is true, then there are not hands but hand-ish amalgamations of sense-data or qualia. So it seems as though Moore has missed the point. But Direct

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[86] IHM 6.20/169. This is in sharp contrast to David Hume, who divides the objects of thought into *relations of ideas* and *matters of fact* and then demands that the reader justify the latter in terms of the former. See *An Enquiry Concerning Human Understanding* Section IV.

[87] G. E. Moore, "Proof of an External World," in *Epistemology: An Anthology*, 2d ed., ed. Ernest Sosa and Jaegwon Kim (Malden, MA: Blackwell, 2008).

Realist Michael Huemer offers a more subtle understanding of Moore's argument.[88] According to him, Moore changes the nature of the dispute between Realists and external world skeptics. Although Idealism certainly entails the falsity of "Here is a [mind-independent, physical] hand," the reverse, "Here is a [mind-independent, physical] hand" entails the falsity of Idealism, is true as well. Moore's seeing a mind-independent hand excludes external world skepticism. We may have Idealism or mind-independent hands, but not both. Moore effectively capitalizes on the fact that it is imminently more plausible that he sees a hand than that any particular theory of perception is correct. So, naturally, we reject those theories which deny us our most certain beliefs, Idealism in this case. Idealism is a revisionary metaphysics and should give us sustained successful arguments before demanding that we relinquish views to which we are naturally and deeply committed.

Some have taken Moore's argument even further, saying that certain commonsense beliefs, including our natural perceptual beliefs in external physical objects, are irresistible.[89] Reid's *Inquiry*, for example, is peppered with comments about the irresistibility of many beliefs. He makes the following claims concerning perceptual beliefs in particular:

> [W]e may still inquire, how the rest of mankind, and even the adepts themselves, except in some solitary moments, have got so strong and irresistible a belief, that thought must have a subject, and be the act of some thinking being.[90]
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> If [perceptual beliefs are judgments of nature], as I apprehend [they are], it will be impossible to shake off those opinions, and we must yield to them at last, though

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[88] Michael Huemer, *Skepticism and the Veil of Perception*, 31-45. See also Noah Lemos, *Common Sense: A contemporary defense* (New York: Cambridge University Press, 2010), 85-104.

[89] Much of this discussion follows Lemos, 13-23.

[90] IHM 2.7/36.

> we struggle hard to get rid of them. If we could, by a determined obstinacy, shake off the principles of our nature, this is not to act the philosopher, but the fool or the madman.[91]

Reid finds our belief that we perceive certain physical objects irresistible even in the face of seemingly sound arguments against that view. He goes on,

> Shall we then throw off this [perceptual] belief [that hardness is a quality of external bodies], as having no foundation in reason? Alas! it is not in our power; it triumphs over reason, and laughs at all the arguments of a philosopher. Even the author of the *Treatise of human nature,* though he saw no reason for this belief, but many against it, could hardly conquer it in his speculative and solitary moments; at other times he fairly yielded to it, and confesses that he found himself under a necessity to do so.[92]

In our own day, a similar sentiment is found in P. F. Strawson:

> The grip that commonsense non-reductive realism has on our ordinary thinking…so thoroughly permeates our consciousness that even those who are intellectually convinced of its falsity remain subject to its power.[93]

Even David Hume sees many of our beliefs, including those concerning physical objects, as beyond our control:

> When we believe any thing of *external* existence, or suppose an object to exist a moment after it is no longer perceived, this belief is nothing but a sentiment of the same kind. Our author insists upon several other skeptical topics; and upon the whole concludes, that we assent to our faculties, and employ our reason only *because we cannot help it* [italics mine]. Philosophy would render us entirely *Pyrrhonian*, were not nature too strong for it.[94]

Not only are our common sense beliefs in external objects natural, they may be irresistible.

If we have irresistible beliefs, as described by these writers, then it is difficult to see how Idealism could reasonably demand that we give them up. It would be unfair to

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[91] IHM 2.7/37.

[92] IHM 5.2/58.

[93] Strawson, 53.

[94] Hume, *Treatise on Human Nature* Abstract/414.

hold us responsible for what is beyond our control. As the Kantian puts it, "Ought implies can." And, if we cannot be held responsible for these beliefs, then we are, in a deontological sense, justified in holding them. Reid offers the following example, involving an unintentionally disobedient servant, as evidence that irresistible beliefs are always justified:

> Suppose a servant, through negligence and inattention, mistakes the orders given him by his master, and, from this mistake, does what he was ordered not to do. It is commonly said that culpable ignorance does not excuse a fault: This decision is inaccurate, because it does not shew where the fault lies: The fault was solely in that inattention or negligence, which was the occasion of his mistake: There was no subsequent fault.
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> This becomes evident, when we vary the case so far as to suppose, that he was unavoidably led into the mistake without any fault on his part. His mistake is now invincible, and, in the opinion of all moralists, takes away all blame; yet this new case supposes no change, but in the cause of his mistake. His subsequent conduct was the same in both cases. The fault therefore lay solely in the negligence and inattention which was the cause of his mistake.
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> The axiom, That invincible ignorance takes away all blame, is only a particular case of the general axiom, That there can be no moral obligation to what is impossible; the former is grounded upon the latter, and can have no other foundation.[95]

If our natural belief that we perceive certain physical objects is irresistible, then, if we follow Reid in his analysis of epistemic blame, those beliefs are justified and will always be justified, so long as they remain irresistible.

It seems intuitive that a justified belief that conflicts with a particular theory is a defeater for that theory, even if we are not led to reject the theory entirely. If we have a justified belief that we perceive certain physical objects, and this belief is invincible, then Idealism can never completely cohere with our other cognitive commitments. We will always have defeaters for it, no matter what arguments are brought on its behalf. It seems,

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[95] EAP 4.7/238.

then, that we would do well to do as Reid says and "make a virtue of necessity"[96] by avoiding Idealism, if we can.

Perceptual Mental Entities and the Problems of Perception

One final objection to Idealism and Indirect Realism concerns their motives for positing mental entities as immediate objects of perception. Both of these views use sense-data or other immediately perceivable mental entities[97] in order to solve certain epistemic problems concerning illusion and hallucination. They aim to explain these cognitive failures in terms of veridical perceptions. So they adopt the mental objects of perception because such objects are supposed to be immune to illusion and hallucination.[98] Howard Robinson, for example, posits the existence of sense-data precisely because they are always as they seem.[99] He requires this feature because of his earlier mentioned Phenomenal Principle. So, if I have a hallucination such that I seem to see the surface of my desk, then Robinson accounts for my experience in terms of my

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[96] IHM 5.7/68.

[97] It may be doubted whether all Indirect Realists, especially the early moderns, are also Sense-Datum Theorists. The 'ideas' of Hume and Berkeley seem to function like sense-data, but these two are Idealists. Locke's Indirect Realism uses 'ideas' as mediate objects of perception, but this word also includes "whatever is meant by *Phantasm, Notion, Species*, or whatever it is, which the Mind can be employed about in thinking"—see Locke 1.1.8/47. Insofar as Locke makes his ideas, and especially "phantasms," out to be objects of thought rather than mere mental operations (like sense experiences), I find him most understandable as an early Sense-Datum Theorist.

[98] Michael Huemer, "Sense-Data," *The Stanford Encyclopedia of Philosophy (Winter 2009 Edition)*, Edward N. Zalta (ed.), URL = < http://plato.stanford.edu/entries/sense-data/>. This feature, the sense-datum's being as it seems, is explicitly mentioned by H. H. Price, *Perception*, 2d ed. (London: Methuen, 1950), 3; Robinson, 32; and M. G. F. Martin, "Beyond Dispute: Sense-Data, Intentionality and the Mind-Body Problem," in *History of the Mind-Body Problem*, ed. Tim Crane and Sarah Patterson (London: Routledge, 2000) 218-219. Similarly, A. J. Ayer seems to think that our knowledge of sense-data is infallible. See "Has Austin Refuted the Sense-Datum Theory?" *Synthese* 18 (1967): 129, and *The Foundations of Empirical Knowledge* (London: Macmillan, 1963), 3-11. I believe that Locke attributes a similar epistemic safety to his 'ideas' where he says, "Whoever reflects on what passes in his own Mind, cannot miss it," (Locke 2.9.1/143) and, "For let any Idea be as it will, it can be no other but such as the Mind perceives it to be" (Locke 2.29.5/364).

[99] Robinson, 32.

veridically and immediately perceiving a rectangular, white sense-datum. No matter what the relationship between the sense-datum and the external world, my perception of the mental entity is guaranteed to be accurate. However, I find this doctrine, that mental objects of perception are as they seem, problematic for both Idealists and Indirect Realists.

One way to undermine the Idealist and Indirect Realist positions is to say that the true natures of sensations (if we may consider them mental objects of perception) are not always manifest to us. Keith Lehrer, for example, suggests that one might in fact experience an itch that seemed to be a pain or vice versa.[100] If Lehrer is correct, and we can misperceive mental objects, then they fail to solve the problem for which they were introduced. If immediately perceivable mental entities are supposed to explain the natures of illusion and hallucination in terms of internal veridical perceptions, then we should be infallible in our perceptions of those entities. But if we can mistake a pain for an itch, then we are not infallible and the problems of illusion and hallucination persist.

While Lehrer's pain-itch case is problematic for Indirect Realism and Idealism, I believe that there is another, related problem that is much more extreme. It is that sense-data, if they are indeed direct objects of perception, do not seem like sense-data. Suppose that a naïve perceiver directs her eyes toward my desk. The Sense-Datum Theorist will say that she sees, immediately, a rectangular, white sense-datum. But if we ask her what she sees, she responds, "A rectangular, white table." We might explain to her that we are only concerned with the *immediate* object of her perception (and explain what we mean by 'immediate'), but she still responds, "Such-and-such part of the table," or perhaps

[100] Keith Lehrer, *Knowledge* (New York: Clarendon, 1978), 95-99.

"*This* bit of the surface of such-and-such part of the table." There is a problem here. What our subject perceives immediately seems like a physical object, or part of a physical object. But if she perceives immediately a sense-datum or an idea, then that sense-datum seems to be a physical object. Just as David Hume says, "It seems also evident, that, when men follow this blind and powerful instinct of nature, they always suppose *the very images* [italics mine] to be the external objects."[101] However, sense-data are not external, physical objects. If they exist, they are in fact other than they seem.

Since mental objects of perception are introduced in order to account for hallucinations and illusions in terms of veridical perceptions, this is a huge problem for both Indirect Realism and Idealism, insofar as they subscribe to Robinson's Phenomenal Principle. Mistaking a mental object for physical one is not a minor confusion, as in the pain-itch case, but a major misclassification. Mental objects of perception, if they exist, are not at all as they seem, and therefore they fail to resolve the problems of illusion and hallucination. Their epistemic role in Indirect Realism and Idealism's answer to these problems is self-defeating because mental objects of perception are also illusory.

We would like to salvage Direct Realism from the Problem of Secondary Qualities, because its alternatives face significant challenges as well. Especially troublesome for Indirect Realism is establishing the inferential connection between immediately perceived mental entities and external physical objects and their qualities. If we must choose between Idealism and Direct Realism, then common sense inclines us toward the latter, as do several other reasons. Direct Realism preserves the natural harmony among our epistemic faculties, allows us to continue endorsing our most certain

[101] David Hume, *Enquiry Concerning Human Understanding* 12.1/104.

perceptual beliefs, and does not ask us to reject that which it is not in our power to reject.[102] Both Indirect Realism and Idealism fail to solve perceptual problems with illusions and hallucinations, and they create new problems as well.

Conclusion

Direct Realism is appealing because it harmonizes our understandings of our epistemic faculties, gives us theoretical justification for our commonsense perception-based beliefs, is more intuitive than its skeptical alternatives, and avoids the epistemological and metaphysical problems of Indirect Realism. But we have seen that the Problem of Secondary Qualities presents a serious philosophical challenge to Direct Realism.

The Problem of Secondary Qualities puts our epistemic optimism, perceptual experiences, and scientific findings in conflict with one another. It seems manifest that there are secondary qualities possessed by physical objects. If this seeming is a grand illusion, then common sense is threatened, because our analysis of secondary quality perceptions spills over into perception generally.

The best response for Direct Realism is to challenge the scientifically motivated claim that physical objects do not possess secondary qualities. But this is not an unsubstantiated claim. Scientists and philosophers alike have been telling us for over 400 years that there is no reason to regard secondary qualities as inhabiting the external physical world, especially since we have not found a way to reduce them. They seem causally superfluous and experimentally non-predictive.

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[102] Huemer has given an additional objection concerning Sense-Datum Theory's inability to account for spatial properties, but I will not rehash his argument here. See Huemer, *Skepticism and the Veil of Perception,* 149-174.

My proposal, which is not by any means original, is to say that secondary qualities are scientific properties or, more specifically, that they are identifiable in terms of scientific properties. Therefore, contrary to Jackson, they are implicitly referenced in scientific explanations. If heat, for example, is kinetic energy—minute molecular vibrations and the occasional runaway particle—then, chemistry textbooks can omit the word "heat" and instead discuss "kinetic energy," veiling it with scientific vocabulary. Similarly, I might describe the typing of this essay by detailing the motions of my fingers on the keyboard, without ever saying that I am typing an essay; yet the description would be of my typing this essay. Perhaps we can do the same for colors, smells, and the other secondary qualities. Then, the Problem of Secondary Qualities would disappear, since P3 would be false and secondary qualities could be possessed by physical objects.

Critics of Direct Realism claim that our proposed program to identify secondary qualities with perceiver-independent properties is a dead end. The next chapter will introduce Thomas Reid's theory of perception and his account of primary and secondary qualities, showing how his theory secondary qualities involves their identification with scientific properties. And the final chapter will entertain and answer objections.

CHAPTER TWO

Reid on the Perception of Secondary Qualities

The last chapter introduced the Problem of Secondary Qualities as an important challenge to Direct Realism and to common sense. I argued that, dialectically speaking, the best way for Direct Realism to answer that challenge is by offering a theory of secondary qualities on which they may be possessed by physical objects. Moreover, we said that the theory should treat secondary qualities as causally relevant (*scientific*) properties, but not in a way that commits us to overdeterminism regarding physical causation. In order to do this, I support an account of secondary qualities, based on the thoughts of Thomas Reid, on which secondary qualities are identifiable with other perceiver-independent properties of physical objects. This makes them causally potent and physical without becoming superfluous to our scientific understanding of the world.

This chapter is an exposition of Reid's take on primary and secondary qualities and their place in his philosophy of perception. First, it establishes the conceptual landscape of Reid's theory of perception, including his understanding of the relations among perception, belief, conception, and sense experience. There are three elements of this theory that one must internalize as prerequisites for understanding Reid's primary-secondary distinction: the conceptual nature of perception, the contingent connection between sense experiences and perceptions, and the role of those experiences as natural signs. Second, this chapter presents my interpretation of Reid on primary and secondary qualities. It highlights the scientific nature of secondary qualities according to Reid and shows how this interpretation is supported by both general claims that Reid makes about

the primary-secondary quality distinction and his discussions of secondary quality species. In the course of this discussion, it explains how Reid's theory offers a view of secondary qualities on which they may be identified with scientific properties, thereby answering the Problem of Secondary Qualities. The chapter concludes with responses to several key questions regarding the details and proper application of Reid's primary-secondary distinction in his broader philosophy.

Reid's writings on perception are largely polemical, and radically so. His target is the Way of Ideas, a philosophical tradition that Reid traces from his contemporaries, including David Hume, all the way back to Pythagoras.[1] This tradition, according to Reid, holds that all immediate objects of perception, indeed all immediate objects of thought, fall within the realm of the mental.[2] Hume, Reid thinks, has rightly discovered the tradition's necessary consequences—external world skepticism.[3] Finding this conclusion unacceptable, Reid develops his *Inquiry into the Human Mind on the Principles of Common Sense* as a rejection of and an alternative to the received view. It is to this end that he develops and defends his account of primary and secondary qualities as objects of our sense perceptions, and as properties of physical objects.[4]

Reid's Philosophy of Perception

According to Reid, perception is an operation of the mind by which one becomes aware of external objects. He names three features that collectively distinguish perception

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[1] E.g., Reid EIP 2.7/104-105.

[2] IHM Dedication/4.

[3] IHM Dedication/4-5. See also Reid's letter to Hume, 18 March 1763, in IHM 264-5.

[4] Reid mentions clarifying the primary-secondary quality distinction as his second goal on a list of seven. See IHM Abstract/259.

from other operations, like imagination, memory, and judgment: (1) a conception of the object perceived, (2) an irresistible conviction and belief of its present existence, and (3) a cognitive immediacy regarding the conviction and belief—they do not result from reasoning or argument.[5] For Reid, perception is fundamentally about the deployment of concepts with regard to some object, and it is in virtue of these concepts that perception is intentional.[6] The conception formed in perception is *of* the perceived object, and the perception is *of* its object in virtue of the intentionality of the conception. We can usually express these conceptions in descriptive terms—e.g., "the computer on my desk," "the dog on my porch," or even "that thing left of the tree."

Reid's insistence that belief in the perceived object is essential to one's perceiving it may seem unusual.[7] But conception alone, like imagination or *simple apprehension*, carries no judgment, no conviction, about the existence of any object.[8] So Reid adds belief to distinguish perception from mere imaginings or musings. Judgment or belief is a mental act of affirmation or denial. Unlike conception, it is propositionally expressed if at all.[9] While my conception of my computer might be verbally represented as "the computer on my desk," any adequate expression of my belief in that computer would

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[5] Reid, EIP, 2.5.22-27/96.

[6] Reid's theory seems to rule out perception as a means to 'knowledge by acquaintance,' wherein one gains knowledge with a referential content (i.e., the knowledge is intentional) but without a conceptual or presentational element. See William P. Alston, "Reid on Perception and Conception," in *The Philosophy of Thomas Reid*, eds. Melvin Dalgarno and Eric Matthews (Dordrecht, The Netherlands: Kluwer Academic Publishers, 1989), 36-38; and J. Todd Buras, "Three Grades of Immediate Perception: Thomas Reid's Distinctions," *Philosophy and Phenomenological Research* 76 (2008): 603-632.

[7] Adam Pelser, "Belief in Reid's Theory of Perception," *History of Philosophy Quarterly* 27 (2010): 359-378, argues that, even in Reid's paradigm cases, belief should be replaced with a slightly different cognitive element, which Pelser terms 'construal.'

[8] EIP, 1.1/24-25.

[9] EIP 6.1/406-407.

require a full statement, like "There is a computer on my desk." Reid claims that, in speech, belief always finds its expression via a proposition and that, without belief, there would be no reason for the affirmation or denial of propositions in language.[10]

Belief, Reid claims, is a conceptual simple and so admits of no "logical definition" (ontological explanation).[11] It is, like perceptual conception, an intentional state, but belief admits of degree, depending on the subject's certainty, "from the slightest suspicion to the fullest assurance."[12] Along this sliding scale of assurance, Reid generally places perception at the top, as a bearer of certainty.[13] It, along with other kinds of evidence like memory and reasoning, is "fitted by Nature to produce belief in the human mind, so for them in the highest degree, which we call certainty."[14] Reid offers the example of a distant ship making its way over the horizon:

> In perception we not only have a notion more or less distinct of the object perceived, but also an irresistible conviction and belief in its existence. This is always the case when we are certain that we perceive it. There may be a perception so faint and indistinct, as to leave us in doubt whether we perceive the object or not. Thus, when a star begins to twinkle as the light of the sun withdraws, one may, for a short time, think he sees it without being certain, until the perception acquires some strength and steadiness. When a ship just begins to appear in the utmost verge of the horizon, we may at first be dubious whether we perceive it or not: But when the perception is in any degree clear and steady, there remains no doubt of its reality; and when the reality of the perception is ascertained, the existence of the object perceived can no longer be doubted.[15]

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[10] EIP 2.20/228.

[11] EIP 2.20/227-228

[12] EIP 2.20/228.

[13] In EIP 2.5/98, Reid points out that sense perception, not reason, is the gold standard of evidence in our legal systems.

[14] EIP 2.20/229.

[15] EIP 2.5/97.

Reid's language here is a bit muddled, but the first sentence makes his point clear—until the belief is beyond doubt, it does not count as a perception. The last line is the same. Once the perception is present, all doubts are expelled.[16] Perceptions require not merely beliefs, but irresistible beliefs.

For Reid, as for many contemporary philosophers, "perception" is a success term.[17] There is no perception unless the object and the mental operation connect appropriately. This requires that we expand our understanding of Reid's theory beyond the three earlier-mentioned features of conception, belief, and cognitive immediacy, since by themselves they allow that any immediate (i.e., non-reasoned) conception and belief, including illusory and hallucinatory cases, count as perceptions. An interpreter could easily misread Reid on this issue, since he almost always uses successful cases in examples. When discussing a phantom limb case, Reid even says that the amputee perceives a non-existent toe. However, within the same passage, he qualifies the mental operation as a "seeming" perception.[18] In another place, he explicitly prohibits perceptions of non-existent objects as logical impossibilities.[19]

Ultimately, Reid means to identify perception as a knowledge-generating mental operation apart from other operations, like inference and abstraction. Moreover,

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[16] Pelser, 363, counts this passage of an instance of Reid's entertaining an example of a perception without a belief. The phrase, "perception acquires some strength and steadiness," does lend itself to this interpretation. But this reading seems to undermine Reid's thesis that "the clear and distinct testimony of our senses carries irresistible conviction along with it, to every man in his right judgment" (EIP 2.5/99).

[17] See EIP 2.8/126, where Reid claims as a first principle that what is perceived must exist, and 2.9/136, where perception is treated as a kind of immediate knowledge (and "knowledge" is a success term).

[18] EIP, 2.18/214. Of course, if the amputee sees that the limb is missing and so fails to believe in its existence, this does not merit the status of perception of the limb, although it might count as a perception of a bodily disorder.

[19] EIP, 4.2.17-20/321. Rebecca Copenhaver makes a good case for understanding 'perception' as a success term in Reid's writings in "Thomas Reid's Direct Realism," *Reid Studies* 4, no. 1 (2000): 17-34.

perceptual knowledge is knowledge of particular things and their qualities, not of universals or of imaginary or abstract objects. And both the knowledge-generating and the intentionality of perception distinguish it from mere sense experience.

Before moving on to the features of Reid's theory that underlie his account of secondary qualities, I should add that, while I will be basing my response to the Problem of Secondary Qualities on Reid's thought, I have no intention of confining myself to it. There are problems with Reid's account of perception, most notably the difficulty it faces in dealing with time lags in the causal chains leading up to perceptions.[20] I do, however, find the main tenets of Reid's theory highly plausible. And I do not know of any feature of it that renders it irreparable. So, in the interest of pursuing a solution to the Problem of Secondary Qualities, I will focus on the features of Reid's thought that are most useful and make slight alterations when necessary.

Content of Perception

J. Todd Buras has explained two important ways that perceptions may be said to have contents on Reid's view—presentationally and referentially.[21] Both of these come in virtue of the essential role that conception plays in Reid's theory, not by way of sense experiences. As we already mentioned, conceptions have a descriptive aspect, perhaps best expressed in language although not linguistic entities themselves. And, in cases of

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[20] Reid attempts to distinguish perception from memory with the third-mentioned requirement, "belief in the present existence" of the perceived object. However, today we know that some of the stars we see are millions of light years away, which means that we see them as they were in the prehistoric era. Others, despite their twinkly appearances, burned out or supernovaed long ago. If we have veridical perceptions of these stars, then they are clear counterexamples to Reid's criterion of present existence. We see them, but they are no longer presently existing.

[21] See J. Todd Buras, "The Problem with Thomas Reid's direct realism," in *The Philosophy of Thomas Reid: A Collection of Essays*, eds. John Haldane and Stephen Read, (Malden, MA: Blackwell Pub, 2003), 44-64, esp. 50-51. Buras uses this distinction again in "Three Grades of Immediate Perception;" and "The Function of Sensations in Reid," *Journal of the History of Philosophy* 47 (2009): 329-355.

perception, they also have objects. For Buras, the *presentational content* of a conception (and so a perception) is the way in which a subject comprehends the object of that conception in a descriptive sense. Following Nicolas Wolterstoff, he suggests that we communicate this content in sentences like "The subject perceives of the table that it is hard." The subject brings the perceived object under the concept *hard*. Formally, Buras proposes that the presentational content of a conception might be given by the value of F in a predicative statement of the form 'F*b*', where *b* is the object of the conception.

In Buras's language, the object of conception is its *referential content* —in the previous case of the hard table, the table itself or perhaps the table's hardness. The referential content is the thing to which the presentational content applies. It is the *b* in 'F*b*'.

Some have thought that making conception an essential part of perception creates a problem in accounting for perceptions of ignorant or non-human subjects, or even just those with different background concepts. If concepts are required for perceptions, then how, for example, can a primitive tribesman in Borneo see a typewriter? [22] Certainly not by bringing the typewriter under the concept *typewriter*. N.R. Hanson offers another example:

> Consider two microbiologists. They look at a prepared slide; when asked what they see, they may give different answers. One sees in the cell before him a cluster of foreign matter: it is an artifact, a coagulum resulting from inadequate staining techniques. This clot has no more to do with the cell, *in vivo*, than the scars left on it by the archaeologists spade have to do with the original shape of some Grecian urn. The other biologist identifies the clot as a cell organ, a 'Golgi body'. As for techniques, he argues: "The standard way of detecting a cell organ

[22] I take this example from Smith, 94-121.

> is by fixing and staining. Why single out this one technique as producing artifacts, while others disclose genuine organs?"[23]

The two scientists are aware of the same object but, as Hanson puts it, "see different things," as in a Gestalt case. I think Reid's understanding of perceptual contents, as described by Buras, handles such a case rather well. Both scientists see the cell organ. That is, their perceptions have the same referential contents. But each scientist brings the organ under his own concept. One sees the cell organ *as* a cell organ, the other *as* an artifact. Even though the referential contents are the same, the presentational contents are different.[24] Likewise, the typewriter-viewing tribesman may have the typewriter as the object of his perception, the perception's referential content. But the tribesman will think of the typewriter as the large black object in the middle of that field, and not as a writing device. On Reid's theory, the tribesman and we may have different sorts of perceptions, even though we see the same object under the same conditions, and with comparable perceptual-physiological apparatuses. The difference is in virtue of our presentational contents, not the objects of our perceptions and not our sense experiences.

Contingency, Sensation, and Natural Signs

What is not on Reid's list of essential characteristics of perceptions is as important as what is on the list. The key omission is sense experience itself. Reid does not think that sense experiences (which he calls *sensations*) are essential to perceptions.

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[23] N. R. Hanson, *Patterns of Discovery* (n.p.: Cambridge University Press, 1958), 4.

[24] Fred Dretske's "Perception without Awareness" in *Perceptual Experience*, ed. Tamar Gendler and John Hawthorne (New York: Oxford University Press, 2006), 147-180, opens with a similar problem. Dretske writes,

> Unknown to Sarah, her neighbor, a person she sees every day, is a spy. When she sees him, therefore, she sees him without awareness of either the fact that he is a spy or the fact that she sees a spy. …It isn't only spies. We see Armadillos, galvanometers, cancerous growths, divorcees, and poison ivy without realizing we are seeing any such thing.

(This is one reason that the Time Lag argument is somewhat difficult for Reid. One obvious way to distinguish memories from perceptions is to note the phenomenological differences between the two. But, as Reid defines perception, phenomenological variation is accidental.) Although human perceptions of physical objects are constantly conjoined with sensations,[25] this conjunction is a contingent fact about the human constitution, without bearing on the essence of perception. God might have constructed us so as to experience color-type sensations when perceiving sounds or even textures. Angels and demons may perceive without sensations at all.[26] Nothing obviously connects sensations to conceptions and beliefs in a necessary way, so, Reid thinks, we may safely assume that such connections are divinely granted features of the human constitution.[27]

Reid's distinction between sensation and perception is at the heart of his attack on the Way of Ideas. He thinks that the conflation of these two is what entangles Hume, Berkeley, and their predecessors.[28] The first line of Hume's *Treatise* limits mental operations and their objects to two distinct kinds of "perceptions"—*impressions* and *ideas*.[29] Among Hume's impressions are sensations, passions, and emotions, which makes all these operations out to be species of perception. Reid responds, "I believe, no

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[25] EIP 1.1/37.

[26] Some have thought that Reid believes living, embodied humans do sometimes perceive visible figure without sensations [e.g., see David A. Tebaldi, "Thomas Reid's Refutation of the Argument from Illusion" in *Thomas Reid: Critical Interpretations* (n.p.: University City Science Center, 1976), 25-34, esp. 29-30; and Ryan Nichols, *Thomas Reid's Theory of Perception* (New York: Oxford University Press, 2007), 169.] As we shall see later in this chapter, these are misinterpretations.

[27] This is not to say that sensations are without purpose for Reid. They serve as triggering mechanisms for perceptions. And they are also useful in making us feel (EIP 2.18/210). This second feature, Reid thinks, is a survival-conducive one, so there is a biological and perhaps even evolutionary advantage to experiencing sensations. See Nichols, 150-152.

[28] EIP 1.1/23.

[29] Hume, *Treatise on Human Nature* 1.1.1.1/7.

English writer ever gave the name of a perception to any passion or emotion."[30] For Reid, sensation is not a species of perception but a different kind of mental operation altogether. He explains the semantics of his own position,

> Sensation, and the perception of external objects by the senses, though very different in their nature, have commonly been considered as one and the same thing.…
>
> Thus, *I feel a pain*; *I see a tree*: the first denoteth a sensation, the last a perception. The grammatical analysis of both expressions is the same: for both consist of an active verb and an object. But, if we attend to the things signified by these expressions, we shall find, that in the first, the distinction between the act and the object is not real but grammatical; in the second, the distinction is not only grammatical but real.
>
> The form of the expression, *I feel pain*, might seem to imply, that the feeling is something distinct from the pain felt; yet, in reality, there is no distinction. As *thinking a thought* is an expression which could signify no more than *thinking*, so *feeling a pain* signifies no more than *being pained*. What we have said of pain is applicable to every other mere sensation.[31]

According to Reid, sensations, which I have been calling sense experiences, are neither types nor constituents of sense perceptions. They are different operations altogether. Most importantly, the object of a perception is an external object or quality, whereas the object of a sensation is the sensation itself, if sensations have objects at all. This distinction begins to show us where Reid takes Hume and others to have gone wrong. If Hume took himself to be analyzing perception but was in fact limiting his consideration to sensation, then it is no wonder that he could not find in "perception" any evidence for an external world, or even the means to make such a world an object of thought. He ignored perception altogether.

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[30] EIP 1.1/23.

[31] IHM 6.20/167-168.

What role, then, do sensations play in our perceptions? For Reid, sensations are caused by physical qualities acting, mediately or immediately, on the sense organs. The sensations, in turn, are triggers for the perceptions. Perceptions, in human beings, are what he calls "interpretations of sensations,"[32] which serve as *natural signs* for the objects of perception.[33] To interpret a sensation, according to Reid, one must form a conception of the thing signified by the sign and a corresponding belief. A heat-type sensation, for example, gives us a conception of and belief in an object's heat, which we rightly understand as a physical quality. Another sensation leads us to perceive the physical quality of hardness.[34] Sensations happen to play this role in us, but again only contingently. Reid sees an analogy between sensations as natural signs and our use of words in communication. In the same way that the word "gold" contingently signifies gold metal, sensations stand for qualities.[35] Thus, sensations are causal (in a loose and popular sense).[36] They are mediaries in the perceptual process, but not mediating objects of perception.

One might worry that Reid's theory is indirect, since the causal chain between physical quality and perception is mediated by sensations. But one must not confuse the immediate objects of perception with perception's immediate causal origins. Reid's theory of perception is direct because of its intentional aspect (referential content)—the

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[32] IHM 6.24/190.

[33] IHM 5.3/58-61.

[34] IHM 5.3/58.

[35] This analogy was earlier proposed by Descartes. See *Optics*, in *The Philosophical Writings of Descartes* (New York: Cambridge University Press, 1985), 1:165.

[36] In IHM 5.3/59, Reid says that signs have no efficiency but that "nature hath established a constant conjunction between them and their effects."

perceiver's knowledge is *of* some physical object or its qualities, not *of* the sensation, preceding neurological or physiological events, or anything else.[37] Reid's has both a Direct Realist theory of perception and a natural sign theory of sense experience.

Types of Signs

Sensations are not the only natural signs for Reid. Natural signs, he thinks, come in three distinct types and include mental and physical phenomena of many sorts. He differentiates the types as follows:[38]

> Type-1: The natural connection between sign and thing signified is discovered by experience. These connections are the bases for scientific and technical inquiry—mechanics, astronomy, optics, agriculture, gardening, and medicine.

As paradigm cases, Reid has in mind the constant conjunctions involved in natural laws or deductive-nomological scientific explanations. For example, the consistent orientation of a compass needle is a sign of the relative orientation of the earth's magnetic field. In Newton's second law, mass and acceleration serve as signs for the net force on an object (and perhaps vice versa). Smoke is a natural sign for fire. And the sensation we experience when we smell a rose serves as a natural sign for the perceiver-independent property of the rose that is its smell. In all these cases, we discover the connection between the sign and the thing signified through experience and scientific research. Type-1 signs include some sensations—like those associated with secondary quality perceptions—but not all.

> Type-2: The natural connection between sign and thing signified is discovered by "a natural principle," without reasoning or experience.

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[37] For more on resolving the possible tension between Reid's Direct Realism and his theory of sensations as natural signs, see J. Todd Buras, "The Problem with Reid's Direct Realism," 44-64.

[38] IHM 5.3/58-61.

These include facial expressions and musical pieces insofar as they are used to convey emotions. And the ability to connect type-2 signs to the things signified by them, Reid thinks, forms the basis of artistic taste. The key distinction between these signs and type-1 natural signs concerns the way in which we come to associate them with the things that they signify. Whereas the connections between type-1 signs and the things that they signify are discovered through our own efforts, the association between type-2 signs with the things that they signify is granted by nature. Even an infant, Reid says, can understand an angry countenance. Moreover, he thinks that we could not develop such connections, between type-2 signs and things signified, in any other way. By experience, we could not discover the connection between another person's facial expression and the emotion of anger, for example, because it is impossible for us to experience others' emotions. On the other hand, we can understand the things signified by type-2 signs, say, by experiencing our own emotions. Were we to study the nature of anger merely by looking at angry faces, we would discover precious little.

Type-2 natural signs do not play a significant role in understanding Reid as we address his primary-secondary quality distinction. But the third type does.

> Type-3: The natural connection between sign and thing signified is ingrained in the human constitution. "Though we never before had any notion or conception of the things signified," these signs "conjure it up, by a natural kind of magic."[39]

Type-3 natural signs are all sensations, and nature grants us the ability to properly decipher them. As with type-2 signs, we do not have to discover the connections between type-3 signs and the things that they signify. But type-3 signs have an additional feature that separates them from the type-2 category. Type-3 signs prompt us to conceptualize

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[39] IHM 5.3/60.

the things that they signify as they are in themselves. The one example Reid offers is the sensation involved in perceptions of hardness. The tactile sensation we experience when we perceive the hardness of an object immediately triggers the conception of and belief in the quality as the cohesion of the parts of a body with more or less force, even if we have never before considered such a notion.[40] So not only do we connect the sensation caused by hardness with the quality of hardness, but we also learn something about what hardness is. Moreover, Reid thinks, type-3 signs are the only way to learn about the natures of the things that they signify. Without them we would have access only to the natures of things in our own minds—i.e., mental operations. So we would never form direct conceptions of any of the primary qualities or find reasons to believe in external physical objects.[41]

To summarize, we discover the connections between type-1 natural signs by means of experience and discovery, not by nature. Moreover, the first class of signs does not communicate to us anything about the natures of the things signified. The connections between type-2 natural signs and the things that they signify are given by nature. But our conceptions of the things signified by type-2 signs may be gotten by means other than the signs. Finally, nature gives us the connections between type-3 signs and the things that they signify as well as conceptions of the things signified as they are in themselves. Not all natural signs are sensations, and not all sensations are type-3 natural signs (at least some are type-1). But all type-3 natural signs are sensations.

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[40] IHM 5.4/61.

[41] IHM 5.4/61. The fact that type-3 signs cause non-relative conceptions of the intrinsic properties of physical objects forms the basis for Reid's *experimentum crucis*. See IHM 5.7/70.

Primary and Secondary Qualities

Reid's account of primary and secondary qualities may be understood in at least three ways—in terms of (a) types of natural signs, (b) referential and presentational contents of conceptions, and (c) its opposition to other early modern accounts of the primary-secondary distinction. The last of these is especially useful for interpreting Reid's most explicit description of his own distinction. This passage appears in the *Essays on the Intellectual Powers of Man*:

> There appears to me to be a real foundation for the distinction; and it is this: That our senses give us a direct and distinct notion of the primary qualities and inform us what they are in themselves: But of the secondary qualities, our senses give us only a relative and obscure notion. They inform us only that they are qualities that affect us in a certain manner, that is, produce in us a certain sensation; but as to what they are in themselves, our senses leave us in the dark.[42]

And, shortly thereafter, Reid says again,

> Thus I think it appears, that there is a real foundation for the distinction of primary from secondary qualities; and that they are distinguished by this, that of the primary we have by our senses a direct and distinct notion; but of the secondary only a relative notion, which must, because it is only relative, be obscure; they are conceived only as the unknown causes or occasions of certain sensations with which we are well acquainted.[43]

The early moderns usually reject secondary qualities as perceiver-independent properties of physical objects. Some Indirect Realists make secondary qualities into mental or neurological entities. Others think them relational or otherwise perceiver-dependent. Primary qualities, by contrast, are maintained as both real and mind-independent. On the other hand, Idealists like Berkeley, regard neither primary nor secondary qualities as perceiver-independent, effectively eliminating the primary-secondary distinction altogether. But, in this passage, Reid pursues the other extreme. He maintains the

[42] EIP 2.17/201

[43] EIP 2.17/202.

primary-secondary distinction, contrasting extension, shape, and motion with color, sound, and taste. But he proposes an entirely new basis for that distinction on which both primary and secondary qualities are perceiver-independent. According to Reid, primary and secondary qualities differ in the ways they affect human subjects via the senses. Both types of qualities are mind-independent and possessed by physical objects; both are real. The distinction is entirely relative to the conceptions these qualities bring to our minds in our perceptions of them.

Signs and Conceptions

We can restate Reid's theory in terms of natural signs. Then we see that his primary-secondary quality distinction might be better termed a primary-secondary *sensation* distinction, since the qualities are classified by the sorts of sensations they typically cause—type-1 versus type-3 natural signs. Secondary qualities, when perceived by human subjects, cause sensations that act as type-1 natural signs, signifying the secondary qualities as causes of those sensations but otherwise uninformative. The nature of whatever is signified by these sensations is hidden, at least initially. Primary qualities also cause sensations, but these are type-3 natural signs rather than type-1. Normal human perceivers immediately understand the natures of the primary qualities upon experiencing their corresponding sensations. In fact, as we saw in the last section, Reid holds that type-3 signs are necessary for understanding the nature of anything beyond our own minds.

Buras's referential and presentational contents are also useful in considering Reid's distinction. There is really no difference in the sorts of referential contents involved in perceptions of primary and secondary qualities. Both types of perception are

of mind-independent qualities of physical objects. On the other hand, when we consider the presentational contents of primary and secondary quality perceptions, we detect a severe difference. When a subject perceives a primary quality, the presentational content characterizes it as it is in itself. If we were to put such conceptions into language, we would find ourselves giving a scientific identity of the quality—"Hardness is the firm adhesion of the parts of a body"—or treating it as an easily understood conceptual simple. Secondary qualities, on the other hand, are mysterious. The presentational content of their perceptions bring them under relational concepts, as the causes of such-and-such sensations—"Sound is the cause of sound-type sensations."

Science, Experience, and Original and Acquired Perceptions

The senses, then, give us different types of notions of secondary qualities than of primary qualities. Reid offers several examples that highlight this difference. Consider smelling a rose:

> Suppose a person who never had this sense [smell] before, to receive it all at once and to smell a rose…. He finds himself affected in a new way, he knows not why or from what cause. Like a man that feels some pain or pleasure formerly unknown to him, he is conscious that he is not the cause of it himself; but cannot, from the nature of the thing, determine whether it is caused by body or spirit, by something near, or by something at a distance.[44]

> …a little experience will discover to him, that the nose is the organ of sense, and that the air, or something in the air, is a medium of it. And finding, by farther experience, that when a rose is near, he has a certain sensation; when it is removed, the sensation is gone; he finds a connection in nature betwixt the rose and this sensation. The rose is considered as a cause, occasion, or antecedent, of the sensation; the sensation as an effect or consequent of the presence of the rose.[45]

[44] IHM 2.2/26.

[45] IHM 2.8/39-40.

Reid cuts a sharp distinction between the smell sensation, a mental event, and the smell quality, which is perceiver-independent. We understand the sensation clearly since it is purely phenomenological. But nowhere in the process of smelling the rose does the perceiver discover the nature of the smell quality, the property of the rose that produces this sensation.

The sensation the rose causes is a type-1 sign of a certain quality in the rose. What quality does the sign signify? Whatever causes the sensation. Which quality is that? Long ago, the answer was wholly unknown and still is unknown to young children and certain of the uneducated. But science now allows us a ready answer. As Reid says,

> Natural philosophy [science] informs us, that all animal and vegetable bodies, and probably all or most other bodies, while exposed to the air, are continually sending forth effluvia of vast subtilty…. All the smell of plants, and of other bodies, is caused by these volatile parts, and is smelled wherever they are scattered in the air.[46]

A thorough understanding of the rose's smell comes by way of scientific investigation, not a sensation. Before consulting the scientist or performing an array of experiments ourselves, we have an imperfect understanding of the smell. We consider it by its effect, as the cause of the sensation,[47] not as effluvia of a body. In Buras's language, the presentational content of our perceptual conception is relative, "whatever caused *that* sensation." Eventually, we realize that the cause is some quality of the rose, and this realization allows us an additional conception of the smell as "whatever in the rose caused *that* sensation." The scientist may develop an even more sophisticated conception with presentational content, "the effluvia of *this* rose." All these conceptions have the

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[46] IHM 2.1/25.

[47] EIP 2.17/202.

same referential content—namely, the tiny particles that constitute the rose's smell. But they differ presentationally.

Reid makes a distinction between *original* conceptions, which we have by perception alone, and *acquired* conceptions, which we develop by experience, reason, or science.[48] Smell, taste, hearing, and color, Reid says, "originally give us only certain sensations, and a conviction that these sensations are occasioned by some external object."[49] Our original conception of the rose's smell is indeed relative and obscure. It is relative to a sensation, and its true nature is hidden, even though the smell is an object of perception. We may acquire additional conceptions of the smell, as "whatever in the rose caused *that* sensation" or "the effluvia of *this* rose." But, even if these come to be the conceptions deployed in perceptions of the smell, they will always be acquired products of reason and experience, not the original perception-based notion.

Compare the progression of conceptions we have of the rose's smell to the conception involved in a tactile perception of a primary quality, say, the hardness of a table. Reid claims that we have a sensation, just as when smelling the rose. But the sensation originally triggers an absolute conception of hardness, as the firm adhesion of the parts of the table. He explains,

> There is, no doubt, a sensation by which we perceive a body to be hard or soft. This sensation of hardness may easily be had, by pressing one's hand against the

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[48] EIP 2.21/234-241. Reid's language is dominated by talk of original and acquired *perceptions* rather than, as I prefer to explain him, *conceptions.* I do this out of convenience. Reid uses the terms *original* and *acquired* to explain how our perceptual powers may be improved by acquiring more sophisticated conceptions and use them in perceptions. I am merely interpreting Reid's account of how we acquire more sophisticated conceptions, and I find *conception* language better suited to explaining this.

[49] EIP 2.21/235. Reid treats sight separately from hearing, taste, and smell. But he begins that passage, "By sight, we learn to distinguish objects by their colour, in the same way as by their sound, taste, and smell." So I treat these qualities all-together. Heat or temperature is not in this group because, being an object of touch that is perceived simultaneously with several primary qualities, it is originally understood as a property of a body. See EIP 2.21/236.

> table, and attending to the feeling that ensues, setting aside, as much as possible, all thought of the table and its qualities, of any external thing. But it is one thing to have the sensation, and another to attend to it, and make it a distinct object of reflection.
>
> We are so accustomed to use the sensation as a sign, and to pass immediately to the hardness signified….[50]

The sensation caused by the hardness of the table is a type-3 natural sign. What does the sign signify? The cause of the sensation. Which quality is that? The table's hardness—the firm adherence of its parts. We would be right to think of the table's hardness as "whatever caused that sensation." But such a relative and obscure conception is unnecessary in this case, because type-3 sensations yield direct and distinct conceptions "by a natural kind of magic,"[51] as a matter of common sense.[52] We understand the perceiver-independent nature of the table's hardness immediately. We know what caused the sensation and do not need scientists to explain its nature. Our unlearned, perception-based conception and the scientist's conception have both the same referential and presentational contents regarding the nature of the hardness.

On the other hand, the scientist is indispensible for helping us to understand the cause of the hardness.[53] It is one thing to see that the table's parts adhere firmly, but another to know that this is because the table is made of wood, rather than metal or plastic. The scientist can tell us about the wood, the cell-level features that make this type of wood particularly hard, or perhaps say something about the electrostatic and chemical forces that explain the cell-level features. But, concerning the nature of the hardness, that

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[50] IHM 5.2/55-56. See also EIP 2.17/204 , which reads, "When a primary quality is perceived the sensation immediately leads our thought to the quality signified by it and is itself forgot."

[51] IHM 5.4/60.

[52] IHM 5.4/61.

[53] IHM 5.5/61.

it is the firm adherence of the table's parts, the scientist has no special knowledge or insight.

These examples illustrate the primary-secondary quality distinction in terms of natural signs and the contents of human perception, but they also make clear what Reid means by *direct* and *distinct* in characterizing primary qualities and *relative* and *obscure* in the case of secondary qualities.[54] The notion of a primary quality we gain through perception features that quality's perceiver-independent nature directly, without reference to anything else. On the other hand, our notion of a secondary quality, if acquired in the normal sensory way, involves a reference to the sensation caused by that quality, making the notion relative. As Reid puts it, "A relative notion of a thing, is, strictly speaking, no notion of the thing at all, but only of some relation which it bears to something else."[55] Moreover, the level of understanding involved in a perception-based conception of a primary quality is much higher than that of a secondary quality, distinct (indeed, perfectly so)[56] in comparison to the secondary quality notion's obscurity. This is so because the clarity with which we understand something, when we have a direct conception of it, grants us full knowledge of the thing's nature. With relative conceptions, however, perfect understanding is obscured by the relation that mediates our conception.

We should reiterate an important similarity among primary and secondary qualities: notions of both are formed via the senses, with sensations acting as natural signs that trigger their corresponding notions. In every case, a physical quality affects our sense organs in such a way that we experience a sensation which leads us to conceive of

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[54] EIP 2.17/201-202.

[55] EIP 2.17/201.

[56] See EIP 2.17/201.

and believe in the quality. Primary qualities are immediately understood by means of perception, both directly (in terms of their perceiver-independent natures) and as qualities of bodies. And, because we understand primary qualities directly, we can offer scientific identifications of these qualities. We naturally attribute secondary qualities to physical objects as well, but it takes a great deal more effort to learn their perceiver-independent natures. Our conceptions of them are merely as unknown causes in some external object.[57] Thus, if Reid is correct, then secondary qualities are possessed by physical objects, as common sense suggests. But understanding their natures, giving scientific accounts of them, requires our scientific and experiential efforts.

Three concerns remain in this chapter. First, scholars vary widely in their interpretations of Reid on primary and secondary qualities, and I believe my reading is unique. So I offer an extended defense of my interpretation. In the next two sections, I show that it coheres not only with Reid's general statements about the primary-secondary distinction but also with Reid's discussions of particular primary and secondary quality types—extension, figure, hardness, solidity, color, sound, smell, etc. After that, I give an explicit response to the Problem of Secondary Qualities. Then, returning to the issue of understanding Reid's theory, I address several key interpretive questions: about the nature of the primary-secondary quality distinction, the perceptibility and causal efficacy of dispositions, and the application of the primary-secondary distinction to properties other than those explicitly discussed by Reid.

[57] EIP 2.21/235.

THE Primary Qualities

Unfortunately, Reid nowhere undertakes an encyclopedic account of the primary and secondary qualities, explaining how his primary-secondary distinction applies to each quality type. Instead, the reader is often met with comments like,

> What hath been said of hardness, is so easily applicable, not only to its opposite, softness, but likewise to roughness and smoothness, to figure and motion, that we may be excused from making the application, which would only be a repetition of what hath been said.[58]

And

> The same reasoning [as was just applied to smell] will apply to every secondary quality.[59]

But I believe that Reid is wrong to think that a careful reader can automatically fill in the details concerning the applicability of the primary-secondary distinction to each quality type. If it were as easy as Reid suggests, then someone would have done it. But I know of no attempts to do so. Perhaps Reid's interpreters also regard it as an exercise best left to individual readers. If so, then this too is a mistake. Perhaps it is partially to blame for the wide variety of misreadings of Reid on primary and secondary qualities. We will discuss some of these later in this section. Here, my aim is to do what no one else has bothered to do by accounting for Reid's take on particular species of primary and secondary qualities and our conceptions of them. I will handle these in a case-by-case fashion. Ultimately, we will find, in later sections, that this exercise allows us to settle several key interpretive questions about Reid's primary-secondary distinction and its implications.

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[58] IHM 5.4/62.

[59] EIP 2.17/202.

We will begin with the primary qualities, which Reid names as extension, divisibility, figure, motion, solidity, hardness, softness, and fluidity.[60] In what follows, I identify the various presentational contents that Reid attributes to each of our conceptions of the primary qualities. Where I can, I identify the sensations involved in our original perceptions of them.

Hardness, Softness, and Fluidity

We have already discussed hardness at length. By *hardness* and *softness*, we name particular types of qualities possessed by physical objects. Reid claims that when we perceive the hardness of an object via our sense of touch, we form a *clear* and *distinct* conception of it.[61] That is, there is no obscurity in the presentational content of the conception we form when we contact it in the normal perceptual manner. This is because such a conception is also *direct*, comprehending the object as it is in itself.[62] Reid explicitly identifies the presentational content of that conception as "the cohesion of the parts of a body with more or less force."[63] He later attaches this presentational content to fluidity also.[64] In the next line, Reid points out that this conception does not tell us the causal reason for those parts cohering firmly. Science is charged with investigating this aspect, the causal origin, of the hardness. Science may also discover precise ways to measure and compare the hardnesses of various objects. But there is no call for a

[60] EIP 2.17/201. See also IHM 5.1/54.

[61] IHM 5.4/61, 5.6/63 & 65.

[62] EAP 1.1/9; EIP 2.17/201.

[63] IHM 5.4/61.

[64] See EIP 2.17/201.

scientific inquiry into the nature of the hardness, since its nature as the firm adherence of an object's parts is manifest to us through sense perception.

Reid's exposition of the presentational content of our conception of hardness is enlightening—cohesion with more or less force. What he has given us is a definition, but not just any definition. It is the sort that Reid calls "logical"[65] and that has been called an analytic specification, following the language of Hilary Putnam. It is an explanation of what it is to be hard in terms of its conceptual parts.

As we mentioned in the last chapter, the primary quality of hardness, when perceived via touch, involves a sensation. Reid claims that there is no name for that sensation, but he can form a clear conception of it.[66] He says,

> The notion of hardness in bodies, as well as the belief of it, are got in a similar manner; being, by an original principle of our nature, annexed to that sensation which we have when we feel a hard body. And so naturally and necessarily does the sensation convey the notion and belief of hardness, that hitherto they have been confounded by the most acute inquirers into the principles of human nature, although they appear, upon accurate reflection, not only to be different things, but as unlike as pain is to the point of a sword.[67]

There is a sensation involved in perceiving hardness by touch. And it is different from both the conception of hardness and the quality of hardness. Moreover, our perception-based conception of hardness does not comprehend that quality by any relation it bears to the sensation it causes; it is direct.[68] The sensation makes no appearance in the

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[65] EIP 2.20/227.

[66] IHM 5.4/60-62.

[67] IHM 5.3/60. Reid makes another argument for the existence of this sensation in EIP 2.17/204-205.

[68] EIP 2.17/201.

presentational content of the conception. If it did, we would be "in the dark" about the quality's perceiver-independent nature.[69]

Solidity

Reid gives the presentational content of our notion of solidity: "It excludes other bodies from occupying the same place at the same time."[70] This description is striking because Reid identifies solidity as a disposition. That is, he identifies it by the things that objects with that quality tend to do. Moreover, like Reid's conception of hardness, it is a analysis—direct and distinct. We know exactly what it is.[71] I know of no place where Reid discusses the sensation associated with perceptions of this quality. But his general description of the primary qualities tells us that there is a sensation. However, as one can see from Reid's description, the presentational content in our perception-based notion of solidity does not include a reference to the sensation caused by that quality.[72]

Extension, Figure, Motion, and Divisibility

We have already said that our tactile perception of the primary quality of hardness involves a sensation. It is this sensation, Reid says, that also triggers our conceptions of three different bodily qualities—namely, extension, real (as opposed to visible) figure, and relative (as opposed to absolute) motion:[73]

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[69] EIP 2.17/201.

[70] EIP 2.17/201.

[71] See Elizabeth W. Prior, Robert Pargetter, and Frank Jackson, "Three Theses about Dispositions," *American Philosophical Quarterly* 19 (1982): 251-257.

[72] See also EIP 2.17/202.

[73] Reid says in EIP 2.22/245 that only relative motion is an object of perception. Absolute motion must be inferred.

> Extension, therefore, seems to be a quality suggested to us, by the very same sensations which suggest the other qualities above mentioned. When I grasp a ball in my hand, I perceive it at once hard, figured, and extended. The feeling is very simple, and hath not the least resemblance to any quality of body. Yet it suggests to us three primary qualities perfectly distinct from one another, as well as from the sensation which indicates them.[74]

Thus, there is a single tactile sensation that Reid associates with extension, real figure, and relative motion, and it is the same sensation as that he couples with hardness. We may come to perceive some of these—e.g., extension—through other senses.[75] But our original perceptions apprehend them via touch.

I know of no place where Reid attempts to translate the presentational contents of our conceptions of extension, figure, or motion. By *real figure* Reid means a physical object's shape—a quality perfectly understood even to the blind mathematician, Dr. Saunderson[76]—but "shape" is a synonym for "real figure," not an analysis.

Reid thinks that all motion, whether relative or absolute, presupposes some fixed point.[77] But, again, this falls short of saying what motion is.

Finally, Reid thinks that extension, figure, hardness or softness, roughness or smoothness, and motion or rest are all conceptually linked such that a body cannot have any one without the others.[78] Still, there is no scientific identity here.

It may seem surprising that Reid does not offer a scientific idenity of these qualities. But I believe he does not because he takes them to be conceptual simples. In a

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[74] IHM 5.5/63. He adds motion to this list a few lines later.

[75] IHM 6.2/79 says that we may perceive extension by sight. EIP 2.21/236 says that we learn to perceive three dimensions, tangible figure and magnitude, linear distance, and perhaps other qualities by sight, as acquired perceptions.

[76] IHM 5.6/65.

[77] EIP 2.22/246.

[78] IHM 5.5/62.

place where one would expect Reid to define *belief*, he refuses, saying, "The operation of the mind signified by [the words that indicate belief] is perfectly simple, and of its own kind."[79] I take it that Reid regards belief as not subject to conceptual analysis. Likewise, Reid thinks that he, Dr. Saunderson, and the rest of us have clear and distinct conceptions of extension, figure, motion, and perhaps divisibility,[80] even without logical definitions.[81] We do not lack a definition, but we have no need of a *logical* or *strict and proper* definition, since we understand exactly what these qualities are. They are the properties by which other properties are explained. As Reid puts it, "The distinctness of our notions of them enables us to reason demonstratively about them to a great extent."[82] Although we may note certain conceptual relationships of each quality to the others, there is no reason to break these properties into their conceptual parts. Each is perfectly understood as is.[83]

Reid leaves untreated the sensations involved in perception of divisibility.[84]

THE Secondary Qualities

Reid thinks that each of the primary qualities is readily understood, so there is no hypothesizing about what solidity or extension is. Their natures are manifest in our

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[79] EIP 2.20/227.

[80] Reid does not define divisibility, but it seems obviously to be a disposition to divide into parts in some circumstances.

[81] Divisibility appears on a list with extension, figure, and motion at EIP 2.17/201. Saunderson is mentioned in IHM 5.6/65.

[82] EIP 2.17/203.

[83] This interpretation is strongly suggested by EIP 2.17/201 since Reid offers analytic specifications of other primary qualities immediately after saying, "Every man capable of reflection may easily satisfy himself, that he has a perfectly clear and distinct notion of extension, divisibility, figure, and motion."

[84] EIP 2.19/219ff.

perceptions. However, Reid thinks that secondary qualities are appropriate subjects about which to speculate.[85] In these cases, the scientist may inquire not only into the causes and effects of the qualities but also into their natures. We are encouraged to offer and defend various hypotheses about what the secondary qualities are. So we often entertain more than one proposal when debating about their natures. In what follows, then, we shall note not only what Reid thinks the secondary qualities are but what he thinks they *might* be. That is, we will consider the presentational content of the conception we gain by sense perception alone,[86] but we will also say something about the presentational contents of other conceptions, including inaccurate ones, that have the same referential content.

Smell

We have already said a bit about how we begin to get a scientific understanding of a thing's smell. So we begin again with the case of smelling a rose. According to Reid, the presentational content one derives simply from a sense perception of a smell is not very rich. He considers it in a thought experiment:

> Suppose a person who never had this sense before, to receive it all at once, and to smell a rose; can he perceive any similitude or agreement between the smell and the rose? Or indeed between it and any other object whatsoever? Certainly he cannot. He finds himself affected in a new way, he knows not why or from what cause. Like a man that feels some pain or pleasure formerly unknown to him, he is conscious that he is not the cause of it himself; but cannot from the nature of the thing, determine whether it is caused by body or spirit. It has no similitude to

[85] EIP 2.17/204.

[86] James van Cleve, following Jennifer McKitrick's "Reid's Foundation for the Primary/Secondary Quality Distinction," *The Philosophy of Thomas Reid*, ed. by John Haldane and Stephen Read (Malden, MA: Blackwell, 2003), 65-81, makes an excellent case that Reid's primary-secondary quality distinction concerns only conceptions that are deliverances of unlearned sense perceptions in "Reid on the Real Foundation of the Primary-Secondary Quality Distinction," in *Primary and Secondary Qualities: The Historical and Ongoing Debate*, ed. by Lawrence Nolan (New York: Oxford University Press, 2011), 286-288.

> any thing else, so as to admit of a comparison; and therefore he can conclude nothing from it, unless perhaps that there must be some unknown cause of it.[87]

Our original conception is triggered by a certain sensation, but we have little else to go on. So we are inclined to think of the smell just as the quality that caused the sensation. We might also add that the quality is independent of the smeller's mind, for we know that we did not cause the sensation.[88]

Reid extends his consideration of how we might conceptualize the smell, speculating on the effects that experience, memory, and induction might have on our acquiring more sophisticated conceptions. He continues,

> A little experience will discover to him, that the nose is the organ of this sense, and that the air, or something in the air, is a medium of it. And finding, by farther experience, that when a rose is near, he has a certain sensation; when it is removed, the sensation is gone; he finds a connection in nature betwixt the rose and the sensation. The rose is considered as a cause, occasion, or antecedent, of the sensation; the sensation as an effect or consequence of the presence of the rose.[89]

Experience allows us to add an additional conception of the rose's smell. The presentational content of our new conception is "the quality *in this rose* that causes me to experience *that* sensation." We now have two conceptions of the rose's smell—one from sense perception, the other from sense plus experimentation with the rose. The two conceptions differ only with regard to their presentational contents, not their referential contents, and even then only slightly.

A third conception becomes available though scientific investigation, when we learn that smelly things smell, in part, because they emit tiny particles ("effluvia") into

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[87] IHM 2.2/26. See also EIP 2.21/235.

[88] IHM 2.2/26.

[89] IHM 2.8/39-40.

the air that are taken into one's nose.[90] This scientific discovery affords us a conception that possesses yet another presentational content, "some power, quality, or virtue, in the rose, or in effluvia proceeding from it, which hath a permanent existence, independent of the mind, and which, by the constitution of nature, produces the sensation in us."[91] Although we have not yet found a conception with a presentational content that constitutes a scientific identity, we are much closer than when we started.[92]

There is certainly nothing about the smell sensation alone or the presentational content of the initial conception that determines a right-thinking person to adopt this third or even the second conception of the rose's smell. According to Reid, scientific investigation could have led us, epistemically speaking, to conclude that the smell was caused by something spiritual rather than physical.[93] He mentions a theory of smell on which bodies have a soul that "flies about in the air in quest of a proper receptacle."[94] He considers vibrations as a plausible explanation of smell.[95] For all we know by sense alone, the cause of our sensation might be one of these things. The third conception is theoretical and *a posteriori*, a well-evidenced hypothesis that aims to comprehend the true nature of the smell.

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[90] IHM 2.1/25.

[91] IHM 2.9/43.

[92] Reid seems inconsistent on whether he regards effluvia as the smell itself or merely the smell's medium. I imagine that, if pressed, he would endorse the latter. Compare IHM 5.1/25 lines 32-35, IHM 5.4/61 and EIP 2.17/204 to IHM 6.21/174.

[93] IHM 2.2/26.

[94] IHM 2.1/25.

[95] IHM 5.2/57.

Taste

Reid does not consider a detailed case of tasting, as he does with smelling. But the fact that he identifies it as a secondary quality tells us what he thinks is the presentational content of a taster's initial conception of some taste—"the cause of *that* taste sensation." With experience, we soon discover that the sensation is occasioned by placing some object in our mouth or on our tongue. So we can acquire a second, more experienced conception of the taste with a presentational content that takes this into account, akin to our second conception of the smell in the last section.

As in the case of smell, Reid does not offer a analysis of taste. But he does include a few notes that might lend themselves to the development of more scientific conceptions of taste. He says, for example, that the quality has something to do with an object's being soluble in saliva.[96] He also notes a correlation between taste and smell, as good smelling things are likely to be good tasting. From these discoveries, we might develop other more scientific conceptions, but we should continue to look for an explanation by which we might understand taste perfectly.

Sound

Sound, being a secondary quality, grants by means of sense perception a conception with the presentational content, "the cause of *that* aural sensation." Of course, we learn to associate variations in sensations with differences in the natures and relative locations of sounding objects.[97] These indicate that the perceiver naturally acquires

[96] IHM 3/46.

[97] IHM 4.1/49-50.

additional conceptions of sounds by means of everyday experiences, as in the previous cases—for example, "the sound of *that* bell."

Also like the previous cases, we can develop more sophisticated conceptions of sound by way of scientific discovery. Reid says that scientists have discovered a medium involved in our perceptions of sounds. He explains,

> To make a perfect tone, a great many undulations of elastic air are required, which must all be of equal duration and extent, and follow one another with perfect regularity; and each undulation must be made up of the advance and recoil of innumerable particles of elastic air, whose motions are all uniform in direction, force, and time.[98]

Just as effluvia serve as a medium for smells and saliva for tastes, vibrating air enables us to hear sounds.[99]

Unlike smell and taste, Reid thinks that a direct and distinct conception, and thereby an accurate scientific identification, is available for sound. The vibrations of the air communicate the relevant quality of the sounding body. The body's vibration is the quality that causes the vibrations in the air. Thus, the thing's sound *is* its vibration.[100] This identification is further evidenced elsewhere in Reid's writing. For example, he compares the vibration of a bell to the sensation it causes precisely to show that qualities do not resemble sensations.[101] Moreover, Reid paints the relation of hardness to the presentational content, "firm adhesion of the parts of a body," as analogous to the relation between sound and the presentational content, "vibration in the sounding body."[102] He

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[98] IHM 4.1/49.

[99] IHM 6.21/174.

[100] EIP 2.17/204, and again at 2.17/209.

[101] EIP 2.17/203.

[102] EIP 2.17/209.

takes the presentational content of his conception of sound to be direct and distinct in exactly the way his conception of hardness is. These two conceptions are equally revealing the perceiver-independent natures of their respective qualities. This conception has a type of presentational content found in conceptions formed by sense perceptions of primary qualities—scientifically identified understandings of the quality's perceiver-independent nature.

The parallel between hardness as the cohesion of a thing's parts and sound as a thing's vibration is especially telling. Sound can be understood as directly and distinctly as hardness. However, acquiring our conception of sound as a vibration requires significant intellectual work, whereas the full understanding of hardness comes automatically via sense perception.

Heat and Cold

According to Reid, our original, perception-based conception of heat is like that of smell, taste, and sound. It has a presentational content of the form, "the cause of *that* sensation," the one had when a subject touches a hot object. Further conceptions begin to flesh out the details of heat as a quality of physical objects. Reid reiterates that common sense insists on treating it, even though its perceiver-independent nature is unknown, as mind-independent. As we noted twice above, Reid says about heat, "For what could be more absurd, than to say, that the thermometer cannot rise or fall, unless some person be present, or that the coast of Guinea would be as cold as Nova Zembla, if it had no

inhabitants?"[103] That is, the conception of heat that one develops through everyday experience incorporates mind-independence as part of its presentational content.

Reid is in the dark about the perceiver-independent nature of smells and tastes and fully informed about sounds, but heat is a middle ground. Reid does not give a definite analysis of heat, but he has a few guesses. He writes in a time when the phlogiston theory of heat, although fatally wounded by Mikhail Lomonosov, is still dominant (until after Antoine Lavoisier's 1783 "Reflections on Phlogiston"). No doubt, he means to contrast that theory with his own suggestion, "a certain vibration of the parts of the heated body."[104] Furthermore, Reid raises questions about heat's relation to cold—whether the two are contrary qualities or one is the privation of the other.[105] He expects one of these options to become incorporated into the scientist's conception of heat. But, for him, actually adopting one view or the other would be too hasty. Logical definitions of these qualities, and thus direct and distinct conceptions, come only with further investigation.

Color

As with other secondary qualities, Reid is keen to distinguish colors from the sensations caused by those colors, which he terms *appearances*. Again, Reid holds that the connection between color appearance and color is merely contingent:

> Although there is no resemblance, nor, as far as we know, any necessary connection, between that quality in a body which we call its *colour*, and the appearance which that colour makes to the eye….[106]

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[103] IHM 5.1/54.

[104] IHM 5.1/55.

[105] IHM 5.1/55.

[106] IHM 6.7/95.

But our sense of sight originally allows us only a conception of color as the cause of the appearance and perhaps possessed by a body.[107]

Our studies of smell, taste, sound, and heat suggest that, on Reid's theory, a normal perceiver will develop a multiplicity of color conceptions, all of which have the same referential content (a color) but differing presentational contents. According to Reid, some of those conceptions gained by experience involve a presentational content that takes proper viewing conditions into account—"a certain power or virtue in bodies, that in fair day-light exhibits to the eye an appearance, which is very familiar to us, although it hath no name."[108] Note that this content also includes the usual placement of the quality in a physical body. The conception accompanies the perceiver's realization that light serves as the medium by which color makes its causal impression on the eye.[109]

Reid includes a modest proposal for an analysis of color: "the disposition of bodies to reflect a particular kind of light."[110] But his analysis goes no further. He offers no species into which we might sort these particular kinds of light. However, it is telling that this is the only secondary quality that Reid identifies as a disposition. So Reid has the beginnings of a identity conception of color as a disposition perhaps as a spectral reflectance.

I contend that, on Reid's view, the distinction between primary and secondary qualities is single faceted and perceiver-dependent—Jennifer McKitrick characterizes it

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[107] See EIP 2.2.21/236.

[108] IHM 6.5/57.

[109] Reid treats light as a medium of this sort in IHM 6.21/174.

[110] EIP 2.17/204.

as "epistemic."[111] The conceptions we form of primary qualities solely on the basis of unlearned sense perceptions are direct and distinct.[112] That is, by sense perception alone, we can understand the what-it-is of primary qualities. Sometimes these direct and distinct conceptions allow us to scientifically identify the quality, as in the cases of hardness and solidity. Other times, our understandings are conceptually simple but nonetheless fully understood, as in extension and figure. Our original sense perceptions of secondary qualities, on the other hand, involve indirect and obscure conceptions.[113] In particular, we conceive of secondary qualities as causes of the sense experiences that they happen to cause in us. This is because the sensations by which we learn about secondary qualities are type-1 natural signs, which means that we must learn the connection between the sign and the thing signified through other means. Original perceptions do not inform us about the what-it-is of the quality. They merely tell us how the quality relates to our sensations—whatever is causing *that* sensation. Such a conception is relative and obscure because its presentational content references our sensation, rather than addressing the quality's perceiver-independent nature.

Through everyday experience and scientific investigation, we may gain additional, more informative conceptions of secondary qualities. But we cannot acquire these from sense alone. Moreover, Reid's primary-secondary distinction is fundamentally about a commonality among primary and secondary qualities—they are perceiver-independent qualities of bodies, just as our common sense suggests. Primary and

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[111] McKitrick, "Reid's Foundation for the Primary/Secondary Quality Distinction," 73.

[112] EIP 2.17/201.

[113] EIP 2.17/201.

secondary qualities are, metaphysically speaking, equally real. He writes in a letter to Lord Kames (Henry Home),

> What is in the Sugar then. Not the Sensation but what causes the Sensation in us. The word Taste is applied both to the Sensation and to the Quality in the body tasted, & most frequently by the Vulgar to the last. Therefore if we will use common Words in their common Acceptation, which I think Philosophers ought to do, we both speak properly and think justly when we say that Color Sound and Taste are in the external Objects.[114]

According to Reid, secondary qualities are perceiver-independent properties of physical objects. In this respect, they are indistinguishable from primary qualities. The true demarcation between quality types concerns only the way in which we understand them, not the essential natures of the qualities.

Answering the Problem of Secondary Qualities

In the previous chapter, we saw that in order to adequately answer the Problem of Secondary Qualities, it would be dialectically desirable to attack the Problem's third premise (P3). P3 says that if an object is physical, then it does not possess secondary qualities. Robinson characterizes this claim as a deliverance of science, citing Galileo, Descartes, and Locke as authorities. And we found P3 repeated by contemporary scientists. In spite of our high regard for science and our strong desire to accommodate its best theories, we were not content to accept P3 without a stronger argument. So we examined Frank Jackson's case for that premise and found that it rests on a hypothesis regarding the causal potency of secondary qualities. *Scientific properties*, Jackson claims, fully account for the causal connections between physical properties and our sense organs. So sense experiences give us no reason to posit the existence of non-scientific

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[114] Thomas Reid, *The Correspondence of Thomas Reid*, ed. Paul Wood (University Park, PA: Pennsylvania State University Press, 2002), 20 December 1778, 61/115.

properties in physical objects, because anything in addition to scientific properties would be causally superfluous. And this is a problem for secondary qualities, says Jackson, because secondary qualities are not scientific—i.e., they make no appearance in our current scientific theories. Sense experiences do not count as evidence for the possession of secondary qualities by physical objects. And, without the evidence of sense, we are left without reason to think that physical objects possess secondary qualities at all.

Rejecting Premise 3

In the first chapter, I said that I would argue against P3 by challenging Jackson's claim that secondary qualities are not scientific and therefore not causally potent. Here, I suggest that secondary qualities are in fact scientific but may seem not to be because they are not readily understood in scientific terms. Jackson is right that the language of science does not mention secondary qualities by their traditional names, and the concepts by which we originally grasp secondary qualities are not scientific concepts. But these facts about secondary quality names and concepts do not demonstrate anything about the natures of secondary qualities themselves, only something about the way we normally think and talk about them. I contend that, even if traditional secondary quality vocabulary words do not appear in scientific explanations, it may be the case that scientific theories make reference to secondary qualities. This would be the case, for example, if secondary qualities were identical to scientific properties or combinations of scientific properties.

Just as Robinson regards P3 as a discovery of science, Reid takes the falsity of P3 as a scientific and commonsensical finding. That is, both Reid and Robinson regard the question of whether physical objects possess secondary qualities as an empirical one. And both believe that the question has been answered. But they arrive at different

conclusions. On Reid's account, secondary qualities are identical with perceiver-independent, causally potent properties of physical objects.

According to Reid, we initially understand secondary qualities by way of their accidental features—their tendencies to cause certain sense experiences in us. Our original, perception-based conceptions of secondary qualities have obscure and relative presentational contents, like "the cause of *that* sensation." We may have a conviction that the sensation was caused by some external object,[115] since we know that we did not cause it.[116] But, by our original conception, we cannot identify the external object as either body or spirit.[117] Initially, we only know the secondary quality as the cause of a sensation, not as a property of a physical object.[118] Again, this matter is empirical for Reid, just as it is for Robinson.

As we have outlined the Problem of Secondary Qualities, the conclusion that secondary qualities are not perceiver-independent properties of physical objects is based on two claims from Jackson: first, that properties of physical objects, if we are to perceive and believe in them, must be causally potent and, therefore, scientific; and, second, that secondary qualities are not scientific, because scientific theories do not mention them. Reid reaches the opposite conclusion almost as quickly. A little experience with smell allows anyone with common sense to discover the following:

> [T]he nose is the organ of this sense, and that the air, or something in the air, is a medium of it. And finding, by farther experience, that when a rose is near, he has

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[115] EIP 2.21/235.

[116] IHM 2.2/26.

[117] IHM 2.2/26.

[118] EIP 2.21/236 suggests that we may identify heat as a property of a body via our original perceptions.

> a certain sensation; when it is removed, then sensation is gone; he finds a connection in nature betwixt the rose and this sensation. The rose is considered a cause, occasion, or antecedent, of the sensation.[119]

For Reid, it is a matter of common sense that secondary qualities are possessed by physical objects. And we make this discovery by recognizing that our sensations are constantly conjoined to physical bodies, like roses and noses. We may not understand the natures of secondary qualities, but, according to Reid, we do know that they are causally potent properties of certain physical objects.

Our original conceptions of secondary qualities inform us only that secondary qualities are causally potent. Experience then locates secondary qualities in physical objects. Discovering anything else about them requires more extensive study. According to Jackson, we have conducted further study of the causal connections between our sense organs and the external world, and we have found that there is no need to posit the existence of properties beyond those employed by contemporary science.[120] If both of these claims are correct, then secondary qualities must be identical to scientific properties or combinations of scientific properties.

Jackson claims that secondary qualities are not scientific because their traditional names—"red," "yellow," "sweet," "concert A"—do not appear in our contemporary scientific descriptions of the world. But Reid would find Jackson's dismissal entirely too hasty. If we know anything about secondary qualities, it is that they are scientific, since only scientific properties are causal. But, given only that secondary qualities are causal properties of physical objects, it remains a matter for empirical investigation to say what

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[119] IHM 2.8/41. Reid tells a similar story about sound in IHM 4.1/50.

[120] Jackson, *Perception*, 124-125.

kinds of secondary qualities there are and how they may be identified with scientific properties.

On Reid's account, secondary qualities are not mentioned in scientific theories by their traditional names because those names are attached to our original, relative and obscure conceptions. We may tell blue from scarlet, he says, only by the differences in the sensations that they cause.[121] Relative and obscure conceptions are not well-suited to scientific reasoning. Reid remarks,

> The primary qualities are the object of the mathematical sciences; and the distinctness of our notions of them enables us to reason demonstratively about them to a great extent. Their various modifications are precisely defined in the imagination, and thereby capable of being compared, and their relations determined with precision and certainty.[122]

In science, we try to use conceptions and vocabulary that are clear and distinct, not obscure. Our original conceptions of secondary qualities fall short of this requirement, even if secondary qualities are scientific properties. If we wish to think and speak of secondary qualities in a scientific way, then we must acquire clear and distinct conceptions of the natures of those qualities.

Reid's account of secondary qualities charges the scientist with the task of developing distinct conceptions of secondary qualities. Perception is relatively uninformative, so Reid trusts science to pick up where perception leaves off. He calls for scientists to investigate the natures of those qualities,[123] and, as we have seen, he believes that scientists have made significant progress in doing so. Initially, all we know of secondary qualities is their causal effect on our sense experiences. But this is merely an

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[121] IHM 6.5/86-87.

[122] EIP 2.17/203.

[123] EIP 2.17/204.

accidental feature. If we wish to reason clearly about secondary qualities, then we need to know their natures or what is essential to them. Our aim in studying secondary qualities is to develop more sophisticated, scientific conceptions of them. That is, ultimately, we mean to make *a posterori* identifications of secondary qualities, the causes of certain sense experiences, with their natures. And it is the scientist's task, not the philosopher's, to make these discoveries.

Reid gives us good reason to think that Jackson is wrong to say that secondary qualities are not scientific properties. They are scientific, but each secondary quality is not *yet* fully understood in scientific terms (except for sound, which is a vibration of a body). And, if this is so, then Jackson is wrong that secondary qualities are non-causal and that our sense experiences fail to provide evidence for their existence. Instead, sense experiences give us reason to believe in causal secondary qualities, and the discovery that secondary quality sensations are caused by scientific properties informs us that secondary qualities are scientific. If secondary qualities are scientific properties, then they are possessed by physical objects and P3 is false. Without this premise, the Problem of Secondary Qualities gives us no reason to think that Direct Realism is false or that common sense has failed us.

Reid and Kripke on A Posteriori *Identity*

Reid claims that secondary qualities are scientific, causal properties of physical bodies, even if we do not know precisely which secondary quality is identical to which scientific property. He charges scientists with the task of making such identifications on the basis of empirical investigation. *A posteriori* identification, of the sort demanded by Reid, is a familiar exercise in contemporary analytic philosophy, thanks to writers like

Saul Kripke and Hilary Putnam.[124] Although I do not mean to draw a historical connection where there is none, noting a few similarities between Reid and these thinkers may help us consider Reid's proposal in light of recent scholarship.

Reid says that we identify secondary qualities by the sensations that they cause in us. For example, Reid says of heat,

> The sensations of heat and cold are perfectly known; for they neither are, nor can be, any thing else than what we feel them to be; but the qualities in bodies which we call *heat* and *cold*, are unknown. They are only conceived by us, as unknown causes or occasions of the sensations to which we give the same names.[125]

We experience a sensation and conceive of (and believe in) some quality that is the cause of the sensation. Heat is a secondary quality, so our conception of that quality has the sensation's cause as its referential content and "the cause of *this* sensation" as its presentational content. And it is the referential content of this conception that we name "heat."

As we have seen, Reid does not take the causing of particular sensations to be essential features of secondary qualities. Heat may exist without causing sensations.[126] And each secondary quality might have caused sensations other than the ones they in fact cause: "No man can give a reason, why the vibration of a body [i.e., heat] might not have given the sensation of smelling, and the effluvia of bodies affected our hearing."[127] Thus, heat sensations are merely our way of identifying the heat quality, not essential features

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[124] Hilary Putnam, "Meaning and Reference," *Journal of Philosophy* 70 (1973): 699-711.

[125] IHM 5.1/54. Compare IHM 2.8/39 and EIP 2.17, where Reid argues that "smell" and "heat" are names for qualities of bodies, despite the fact that we do not know their natures.

[126] IHM 5.1/54.

[127] IHM 5.2/57.

of the nature of heat. And the name, "heat," picks out the quality that causes heat sensations, but it is not an abbreviation for "that which causes heat sensations."

According to Kripke, humankind was for a long time in a similar situation with regard to gold. We identified gold by certain identifying marks, like its yellow color.[128] And to this metal, we gave the name "gold." But yellowness is not an essential property of gold. It is conceivable, says Kripke, that we discover gold to be not yellow but blue.[129] And it is possible for there to be other non-gold metals with most or all of gold's identifying marks—e.g., fool's gold.[130] Yellowness and other identifying marks are our ways of picking out gold, but they do not tell us the nature of gold. The name "gold" is not an abbreviation for "yellow metal," nor is being yellow metal part of what it means to be gold.[131]

According to Kripke, if we wish to understand the nature or essential properties of gold, it seems that we need to investigate it beyond its yellowness. What properties of gold make it gold? For the purposes of the example, Kripke suggests having the atomic number of 79. It seems that anything with atomic number 79 is gold and that gold is anything with atomic number 79.[132] It is part of the nature of gold to have atomic number 79. And our coming to understand that gold as the element with atomic number 79 represents a successful *a posteriori* identification of gold with its nature.

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[128] Kripke, 119.

[129] Kripke, 118.

[130] Kripke, 119.

[131] Kripke, 117.

[132] Kripke, 123-125.

Conveniently for us, the secondary quality of heat is another of Kripke's paradigm cases. For Kripke, the word "heat" picks out a property by way of the sensations that it causes, but it is not an abbreviation for "the cause of heat sensations."[133] As for Reid, the fact that heat causes heat sensations is true but not necessary. There are some worlds in which heat causes no sensations at all and others where heat sensations are caused by effluvia and evil demons. We fix the referent of "heat" by one of heat's accidental identifying features. If we wish to know what it is or what it is like essentially, then we must study it empirically. Kripke writes,

> We've discovered eventually that this phenomenon [that causes heat sensations] is in fact molecular motion. When we have discovered this, we've discovered an identification which gives us an essential property of this phenomenon. We have discovered a phenomenon which in all possible worlds will be molecular motion—which could not have failed to be molecular motion, because that's what the phenomenon *is*. On the other hand, the property by which we identify it originally, that of producing such and such a sensation in us, is not a necessary property but a contingent one.[134]

Fixing the referent of "heat" by way of our sensations tells us almost nothing about what heat is. Causing sensations is a poor identifying property compared to what scientists have discovered by investigating the nature of heat. Once we know what heat *is*, then we may understand that heat is molecular motion or caloric or phlogiston or whatever describes the essential characteristics of the heat. Kripke goes on,

> In general, science attempts, by investigating basic structural traits, to find the nature, and thus the essence (in the philosophical sense) of the kind. The case of natural phenomena is similar; such theoretical identifications as 'heat is molecular motion' are *necessary*, though not *a priori*. The type of property identity used in science seems to be associated with *necessity*, not with a prioricity, or analyticity:

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[133] Kripke, 130-136.

[134] Kripke, 133.

> For all bodies *x* and *y*, *x* is hotter than *y* if and only if *x* has higher mean molecular kinetic enerty than *y*.[135]

For Kripke, the task of science is to discover the nature, and hence the essential features, of things that are otherwise known only in a relative or contingent way. It is a contingent fact that heat causes heat sensations in us. We use that fact to fix the reference for "heat." Then, we apply our scientific-experimental methods and theoretical genius to the task of understanding its nature, its essential features.[136]

Empirical study is also Reid's prescription for discovering the essential features or perceiver-independent natures of secondary qualities. Although we know to what our concept of heat refers—the cause of our heat sensations—we do not, by our original perception-based conception, know what heat is in itself. Such a study, Reid thinks, is a task for scientists: "It is the business of philosophers to investigate, by proper experiments and induction, what heat and cold are in bodies."[137] In Putnam's language, Reid means to analytically specify heat, to say or understand *what it is to be* heat.[138] We are searching for a conception by which to understand the quality *distinctly* and *clearly*.[139] Is heat a chemical element or, as we think today, "a certain vibration of the parts of a body?"

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[135] Kripke, 138.

[136] Putnam describes the scientist's task as discovering the *analytical specification* of the heat or water or other subject of interest. See Putnam, 708.

[137] IHM 5.1/55. See also EIP 2.17/204, where Reid remarks, "Very curious discoveries have been made of the nature of heat, and an ample field of discovery in [the secondary qualities] still remains."

[138] Putnam, 708.

[139] Reid often uses these words together. For example, in IHM see 5.4/61, 5.5/65, 5.6/67, 5.8/76, 6.9/105, and 7/209. There is even an instance (6.12/130) where Reid uses these words to describe an image on one's retina rather than a conception or notion.

For Reid, the correct answers to these questions provide us with *direct* conceptions of heat because they consider heat as it is in itself, without reference to its causal or other relations. But these answers are also obvious instances of *a posteriori* identifications. Nothing about heat or its identifying marks *a priori* necessitates its being a certain vibration of the parts of a body. But once we realize that the object of our conception with presentational content "the cause of heat sensations" is the same as the object of our conception with presentational content "a certain vibration of the parts of a body," this discovery is best expressed by an identification. We say, "Heat is a certain vibration of the parts of a body." And this is precisely the sort of *a posteriori* identification that we find in Kripke: "Heat is the motion of molecules."[140]

We may be confident that Reid is calling for empirical identifications because, as we have seen, he considers several cases in which attempts to identify the nature some quality fail. If identification of a quality with its nature were an *a priori* matter, then these failings would be either impossible or incredibly rare. Reid mentions, for example, some chemists who conceive of smell as a *spiritus rector*, "a kind of soul" that "flies about in the air in quest of a proper receptacle."[141] Of course, Reid himself does not endorse such a theory. But these chemists have an inaccurate conception of smell, which just means that they have a conception with smell as its referential content and "soul that flies about in the air" as its presentational content. The presentational content is inaccurate, yet the referential content makes it clear that the smell is the object of the conception. Again, Reid mentions a theory of heat on which heat is "a particular element diffused through

[140] Kripke, 129.

[141] IHM 2.1/25.

nature and accumulated in the heated body."[142] A misguided scientist, then, might wrongly identify heat as a particular element. And this would be a failure in empirical research and speculation, not a misunderstanding of the word "heat."

Secondary qualities are not automatically understood in scientific terms. But they are scientific properties nonetheless. Reid's theory gives us an explanation for why this might be and challenges scientists to identify secondary qualities scientifically, as they are in themselves. There are several objections to identity theories of secondary qualities. We will address these in the next chapter. In the remainder of this chapter, we will address a few controversial questions among interpreters of Reid regarding the proper understanding of the primary-secondary quality distinction.

Epistemic or Metaphysical?

It is not unusual for Reid interpreters to construe Reid's talk of *relative* secondary quality conceptions as a doctrine about the essential natures of the qualities themselves, positing a metaphysical distinction where there is none. They suggest that primary qualities are intrinsic qualities of bodies whereas secondary qualities are mere relational "powers to produce certain characteristic sensations in us in normal circumstances."[143] For example, James van Cleve holds that secondary qualities are dispositions. And, he argues, "If secondary qualities are dispositions, they will differ metaphysically from primary qualities—they will be relational or extrinsic properties…whereas primary

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[142] IHM 5.1/55.

[143] Gideon Yaffe and Ryan Nichols, "Thomas Reid," in *The Stanford Encyclopedia of Philosophy*, ed. by E. N. Zalta, URL = < http://plato.stanford.edu/entries/reid/>.

qualities are intrinsic."[144] Thus, in addition to whatever distinction arises as a result of our original conceptions of perceivable qualities, van Cleve understands Reid as positing a metaphysical distinction between primary and secondary qualities. Others see Reid's description of secondary qualities as "that which occasions such a sensation"[145] and his use of the words *power*[146] and *virtue*,[147] as evidence for the metaphysical distinction.[148] However, I will argue that these interpreters have misunderstood Reid on this issue. His distinction is purely conceptual.

Van Cleve's earlier mentioned statement suggests two ways in which one might attempt to understand Reid's primary-secondary quality distinction as metaphysical. First, one might hold that secondary qualities are dispositions or powers while primary qualities are categorical. That is, secondary qualities are abilities or tendencies that are most clearly understood in terms of a stimulus condition and a manifestation. *Fragility*, for example, is the disposition of an object to shatter when struck. *Solubility* is the disposition of an object to dissolve in water. Primary qualities, on the other hand, are categorical, like being round or being made of plastic. Understanding them does not require qualifications concerning stimulus conditions or their manifestations. They are absolute in a way that dispositional qualities are not. Second, one might take secondary

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[144] James van Cleve, "Reid on the Real foundation of the Primary-Secondary Quality Distinction," 280.

[145] EIP 2.17/204 and IHM 6.4/86. See James van Cleve's "Reid's Theory of Perception," in *The Cambridge Companion to Thomas Reid*, 110-111, and "Reid on the Real Foundation of the Primary-Secondary Quality Distinction," 281.

[146] See the titles of sections 2.8 and 2.9 in IHM 2.8-9/38 & 40.

[147] IHM 6.5/87.

[148] See Jennifer McKitrick, "Reid's Foundation for the Primary/Secondary Quality Distinction," 74; and Nicholas Wolterstorff, *Thomas Reid and the Story of Epistemology* (New York: Cambridge University Press, 2001), 112-113. Neither of these authors endorses the view that Reid's secondary qualities are extrinsic dispositions. They merely take Reid's vocabulary as evidence for that reading.

qualities as extrinsic or relative, whereas primary qualities are intrinsic. A thing has intrinsic properties in virtue of the way it is in itself. But extrinsic properties are those concerning the way a thing interacts with the world. One paradigm case of this intrinsic-extrinsic distinction is that between mass, which depends only on the quantity of matter composing an object, and weight, which is the gravitational pull on a massive object due to another body. If I took a trip to the moon, my weight would change, because the moon's gravitational pull is much less than Earth's, but my mass would be unaffected. This second misinterpretation views secondary qualities as extrinsic, due to their supposed dependence on perceivers, and primary qualities as intrinsic.

Van Cleve's statement construes the dispositional-categorical distinction as congruent with the intrinsic-extrinsic. This is a reasonable assumption, especially since Jennifer McKitrick's impressive argument against the notion of intrinsic dispositions.[149] If she is right, then all dispositions are necessarily extrinsic and, I presume, all categorical properties are intrinsic. (This, of course, does not mean that all extrinsic properties are dispositions or that all intrinsic properties are categorical. The property of being a sibling, for example, is extrinsic but not dispositional.) However, McKitrick's claim opposes a longstanding tradition that accepts the possibility that some dispositions are in fact intrinsic.[150]

Perhaps the disposition-categorical question is the same as the intrinsic-extrinsic question, as van Cleve assumes. But it is not necessary for us to take a stand on the

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[149] Jennifer McKitrick, "A Case for Extrinsic Dispositions," *Australasian Journal of Philosophy* 81 (2003): 155-174.

[150] This tradition includes David M. Armstrong, *Belief, Truth and Knowledge* (Cambridge: Cambridge University Press, 1973); J. L. Mackie, "Dispositions, Grounds and Causes," *Synthese* 34 (1977): 361-370; David Lewis, "Finkish Dispositions," *The Philosophical Quarterly* 47 (1997): 143-158; and P. Menzies, "Critical Notices of *Nature's Metaphysics* by Alexander Bird," *Analysis* 69 (2009): 769-778.

possibility of intrinsic dispositions in order to resolve the question of how to understand Reid's distinction. Whether a quality is dispositional or categorical, intrinsic or extrinsic, does not affect whether that quality is primary or secondary. Therefore, rather than resolving the dispute over the possibility of intrinsic dispositions, I will handle the dispositional-categorical question as distinct from the intrinsic-extrinsic. At worst, I will be making the same point twice.

Dispositions and Categorical Properties

Reid does not mean to posit a metaphysical distinction between primary and secondary qualities on which all secondary qualities are identified as dispositions and all primary qualities are understood as categorical. No passage in Reid compels us to think that he does. And such a distinction clearly conflicts with his assessments of particular primary and secondary quality types.

As we saw earlier, some interpreters take Reid's vocabulary—*power* and *virtue*—as evidence that he understands secondary qualities as dispositions. But the jump from *power* and *virtue* to *disposition* is unwarranted. When Reid uses these words, in IHM 2.8 and 2.9, he is speaking of one particular secondary quality—the smell of a particular rose. In the scenario he is imagining, a perceiver is smelling the rose for the first time, and Reid is trying to trace the development of the perceiver's conceptions of the smell, the cause of a certain sensation. He attaches the words *power* and *virtue* (as well as *cause*) to the smell because our hypothetical smeller would have trouble finding better ways to describe it, not because smell is a disposition.

Even if we often use the words *power* and *disposition* as synonyms, we have good reason to think that Reid does not. In fact, he is willing to use *power* in opposition to the word *tendency*, which is more clearly tied to *disposition*:

> *Magnetism* signifies both the tendency of the iron towards the magnet, and the power of the magnet to produce that tendency…. The same thing may be said of *gravitation*, which sometimes signifies the tendency of bodies towards the earth, sometimes the attractive power of the earth, which we conceive as the cause of that tendency.[151]

In Reid's vocabulary, *power* does not necessarily indicate a tendency or a disposition. In fact, it may even stand for the categorical causal base of a disposition. Moreover, this passage appears in the same section of Reid's *Inquiry* as the instances of *power* and *virtue* that are taken by others as evidence for secondary qualities as dispositions. If these words were to indicate anything about whether secondary qualities are, for Reid, dispositions or categorical, they would signify the latter, for that reading would be consistent with the rest of the section.

I do not mean to say that all secondary qualities are categorical. As we mentioned earlier, Reid explicitly identifies color as a disposition to reflect certain kinds of light.[152] If this is the case, then at least some secondary qualities are dispositions. On the other hand, we have also seen that sound and heat are types of vibration, which are not dispositions. When we hear the sound of a bell, we hear it actually vibrating, not merely its disposition to vibrate at a certain frequency. And an un-rung bell has no sound, even if it has a resonant frequency—a tendency to vibrate a certain way if rung. Heat, likewise, is a molecular vibration, not merely a disposition to vibrate. These properties are

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[151] IHM 2.9/41-42.

[152] EIP 2.17/204.

categorical, not dispositional. Thus, secondary qualities include both dispositional (e.g., color) and categorical (e.g., heat) species.

Attempts to read Reid's primary-secondary distinction as dispositional-categorical also face difficulty with regard to the primary qualities. Along with categorical primary qualities, like figure and extension, there are dispositional ones—solidity and divisibility. Solidity is a disposition to exclude other objects from the solid object's space.[153] Divisibility is, as the suffix *–ility* suggests, a disposition as well. It is the disposition to divide in some circumstances. So the primary qualities, like the secondary qualities, include both dispositional and categorical properties. Given what Reid says about each of the subspecies we examined above, it is impossible to understand him as saying that secondary qualities are all dispositions and primaries are all categorical properties.

Intrinsic and Extrinsic Properties

Another attempt to impose a metaphysical distinction on Reid's doctrine of primary and secondary qualities claims that primary qualities are intrinsic to the objects that possess them while secondary qualities are extrinsic. In particular, it says, secondary qualities are extrinsic because they are relational—dependent on or constituted by a relation their objects have to our sense experiences. For example, Gideon Yaffe and Ryan Nichols write,

> Colors, sounds, tastes and smells are relational properties of objects…. [They] are powers to produce certain characteristic sensations in us in normal conditions; to ascribe such a quality to an object is not to perceive any intrinsic quality of the

[153] EIP 2.17/201.

> object, but is, rather, to perceive that the object bears a certain relation to something else: namely, ourselves.[154]

As Yaffe and Nichols read Reid, secondary qualities are possessed by physical objects, but they are also dependent on perceivers. This means that secondary qualities are extrinsic relations. By contrast, these authors think, primary qualities are intrinsic.

Based on our study of Reid, we may agree that relations play a role in Reid's account of secondary qualities, but Yaffe and Nichols seem to speak too loosely. If we consider the key passages in Reid, as well as his comments concerning the various species of primary and secondary qualities, we will find that Yaffe and Nichols' interpretation does not hold up. The intrinsic-extrinsic property distinction does not correspond to Reid's division between primary and secondary qualities. Moreover, Reid does not consider either primary or secondary qualities to be, by nature, sensation-relative.

Although Yaffe and Nichols do not cite a passage in support of their view, our conflicting understandings of Reid may come from varying readings of Reid's official definitions of primary and secondary qualities. We have seen them before, but I include them here for convenience. They are:

> There appears to me to be a real foundation for the distinction; and it is this: That our senses give us a direct and a distinct notion of the primary qualities, and inform us what they are in themselves: But of the secondary qualities, our senses give us only a relative and obscure notion. They inform us only, that they are qualities that affect us in a certain manner, that is, produce in us a certain sensation; but as to what they are in themselves, our senses leave us in the dark.[155]

> Thus I think it appears, that there is a real foundation for the distinction of primary from secondary qualities; and that they are distinguished by this, that of the primary we have by our senses a direct and distinct notion; but of the

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[154] Yaffe and Nichols.

[155] EIP 2.17/201. Also cited above.

> secondary only a relative notion, which must, because it is only relative, be obscure; they are conceived only as the unknown causes or occasions of certain sensations with which we are well acquainted.[156]

Secondary qualities are those for which our sense perceptions give us conceptions with presentational contents relative to some sensation which the quality causes. As I have interpreted him, Reid means this description[157] to function as an analysis of what it is to be a secondary quality. I would formalize the definition as follows:

$$\Box\forall x(Secqual(x) \leftrightarrow \exists y\exists z\big(Sensation(y)\wedge Origconcept(z)\wedge Refcontent(x,z)\wedge Prescontent(y,z)\big))$$

That is, by definition, a quality, *x*, is secondary if and only if there is some sensation, *y*, and some original conception, *z*, such that *x* is the referential content of *z* and *y* features in the presentational content of *z*. Secondary qualities are secondary in virtue of the role that sensations play in our original conceptions of them. But this is not an essential feature of any particular quality. It is simply a necessary condition for that quality's being secondary. I am a sibling, and a same-parents relation to another person is necessary for my being a sibling. But being a sibling is not one of my essential properties. Likewise, we originally perceive heat by means of sensation-relative conceptions. But being originally perceived by means of sensation-relative conceptions is not an essential feature of heat.

Alternative interpretations understand Reid as saying something more like this (using "∃!" to mean "exactly one"):

$$\forall x(Secqual(x) \leftrightarrow \exists!\, y(Sensation(y)\wedge\Box\forall w(Causes(w,y) \leftrightarrow w = x)))$$

For each secondary quality, *x*, there is some unique sensation, *y*, and, by definition, whatever thing, *w*, causes *y*, just is *x*. This second definition takes Reid's statements to be

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[156] EIP 2.17/202. Also cited above.

[157] EIP 2.17/201.

about the natures of the secondary quality subspecies—what makes heat what it is, sound what it is, color what it is, etc. Heat, being a secondary quality, is heat in virtue of its causing heat sensations. On this reading, sensation-relative conceptions are essential to a proper understanding of secondary qualities, because secondary qualities themselves are sensation-relative. They are secondary qualities in virtue of their being essentially tied to the sensations that they cause, which makes them both sensation-relative and extrinsic.

On my interpretation, sensation-relative original conceptions of a quality are necessary for its being secondary. On the alternative reading, each secondary quality is essentially related to certain sensations. I believe that my reading is superior because, unlike the alternative reading, it (a) acknowledges Reid's claims that secondary qualities are only accidentally linked to the sensations that they cause, (b) makes sense of Reid's desire for scientists to investigate the natures of secondary qualities, and (c) is consistent with the fact that Reid never identifies any perceivable quality as sensation-relative.

If secondary qualities are essentially linked to the sensations that they cause, then it is impossible that heat could have been signified by anything other than heat sensations or sound by anything other than sound sensations. But we have good reason to think that they might have been. Just as the links between Kripkean names and their referents are obviously contingent, according to Reid, so are those between natural signs and the things that they signify. Reid makes this point quite evident, saying that we can imagine much different correlations between sensations and qualities:

> No man can give a reason, why the vibration of a body might not have given the sensation of smelling, and the effluvia of bodies affected our hearing, if it had so pleased our Maker. In like manner, no man can give a reason, why the sensations

> of smell, or taste, or sound, might not have indicated hardness, as well as that sensation, which, by our constitution, does indicate it.[158]

Reid suggests that the correlations between sensations and qualities are contingent not only for secondary qualities but also for primaries. Sound sensations do not necessarily indicate sounds; they might have signified hardness. And if this is possible, then sound is not merely whatever causes sound sensations. My understanding of Reid can accommodate this claim, but its rival cannot, because for it sensations are essentially linked to secondary qualities.

A second reason for preferring my reading is that it allows for discoveries about the natures of secondary qualities, which Reid endorses.[159] Above, we saw how Reid expects our conceptions of secondary qualities to multiply with experience and scientific study, becoming ever more clear and accurate. My reading of Reid is open to that. For example, our original conceptions of heat have presentational content "the cause of *that* heat sensation." But, without substantial theorizing and experimentation, we do not know that the cause of *that* sensation is in fact molecular motion. For all the original conception tells us, it might be caloric, phlogiston, or the Greek element of fire. But if the alternative interpretation is correct, then heat is the extrinsic property of having a tendency to cause heat sensations. And, if this is the case, then we know the nature of heat by our original conception. There is no reason to investigate its nature, although perhaps we might try to discover its cause.

If we consider the alternative reading carefully, we see that it makes Reid's definition of secondary qualities into a functional one. Each secondary quality is what it

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[158] IHM 5.2/57.

[159] EIP 2.17/204.

is because of the sensations it causes. The implications of this are quite strange. If the sensation of heat is caused by molecular motion in our world and by the heat-sensation-inducing actions of a rose's effluvia in another possible world, then the second reading asserts that these two things—molecular motion and the effluvia—are of the same kind or essentially the same quality. We would be unable to develop unified accounts of secondary quality types, because these qualities would be world-relative. At best, we could have disjunctive accounts—"heat is molecular motion or effluvia or a disposition to reflect certain kinds of light or the firm adhesion of a thing's parts and so on." Defining secondary qualities in this manner would be like identifying a play with its title. If *Hamlet* just is whatever play bears that title, then *Hamlet* in our world would still be a tragedy about the revenge of a young prince. But, in another possible world, it might be a comedy about a small town in Canada, or an opera starring a small Caribbean fish. It seems unlikely that Reid would charge scientists with the investigation of such gerrymandered properties.

Finally, in his analyses of the various secondary qualities, Reid never specifies any secondary quality as sensation- or otherwise perceiver-relative. As we have seen, for Reid, sound and heat are types of vibrations,[160] and smell has something to do with tiny particles.[161] But these properties are independent of anyone's perception of them. They are even intrinsic. One might think that color is a sensation-relative extrinsic property, because Reid explicitly identifies it as a disposition.[162] However, color is not specified as a disposition to cause sensations but to reflect certain kinds of light. This may make it

[160] EIP 2.17/209, IHM 5.1/55.

[161] IHM 2.9/43.

[162] See also IHM 6.5/57.

extrinsic, but it does not make color sensation-relative. So even it fails to fit the interpretation on which Reid views all secondary qualities as extrinsic and dependent on perceptual experiences.

Ultimately, the alternative reading of Reid's official definition of the primary-secondary quality distinction, on which secondary qualities are sensation-relative, creates more problems than it solves. First, if secondary qualities were relative to sensations, then they would be essentially tied to the sensations that they cause. But Reid seems to deny this. Second, if secondary qualities were extrinsic and relational, then there would be no reason to investigate their natures. But Reid advocates such an investigation and even reports on its progress. Finally, the alternative reading ignores what Reid has to say about the various species of secondary qualities, particularly the fact that he does not identify any of them as sensation-relative, nor does he offer any other grounds for positing a metaphysical distinction between primary and secondary qualities.

Intrinsic and Extrinsic Properties Again

Despite the textual evidence against the metaphysical intrinsic-extrinsic distinction, some think that other passages in Reid's writing show that he considers secondary qualities extrinsic and sensation-relative, in contrast to the intrinsic natures of the primary qualities. Foremost among these, van Cleve makes his case from this passage, which appears in the same section as Reid's official definition of primary and secondary qualities:

> We may see why the sensations belonging to secondary qualities are an object of our attention, while those which belong to the primary are not.
>
> The first are not only signs of the object perceived, but they bear a capital part in the notion we form of it. We conceive it only as that which occasions such a sensation, and therefore cannot reflect upon it without thinking of the sensation which it occasions: We have no other mark whereby to distinguish it. The thought

> of a secondary quality, therefore, always carries us back to the sensation which it produces. We give the same name to both, and are apt to confound them together.[163]

According to van Cleve, Reid's description of sensations as 'capital parts' of our notions of secondary qualities commits him to the claim that it impossible for us to understand secondary qualities apart from sensations. That is, we cannot conceive of secondary qualities without conceiving of the sensations that they cause. To this claim, van Cleve adds, as an obvious fact, that we can conceive of things like molecular motion or the vibration of a thing's parts without conceiving of sensations. So these supposed identifications of secondary qualities, like vibrations of bodies or molecular motion, have a property that Reid's secondary qualities lack—namely, the ability to be conceived without reference to a sensation. Molecular motion has the ability to be conceived without reference to a sensation, but heat does not. Therefore, by Leibniz's Law, van Cleve concludes that heat is not identical to molecular motion, or to anything independent of perceivers and their sensations.

Van Cleve's argument is valid. If (a) it is impossible for us to conceive of heat without conceiving of heat sensations and (b) we can conceive of molecular motion without conceiving of heat sensations, then we must conclude that (c) heat is not molecular motion. It also seems right that (b) is obviously true; we can conceive of molecular motion without conceiving of heat sensations. So, if we are to disagree with van Cleve's understanding of Reid, without accusing him of inconsistency, we must say

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[163] Van Cleve, "Reid's Theory of Perception," 110-111, and "Reid on the Real Foundation of the Primary-Secondary Quality Distinction," 281-282. For the passage in Reid, see EIP 2.17/204. I have included a few more sentences than van Cleve in order to give the reader a better understanding of the context of these lines. This will be important in my counter-interpretation below.

that (a) is drawn from a misinterpretation. And to do this, we need a new reading of the 'capital part' passage.

The passage makes clear that Reid regards certain conceptions of secondary qualities as sensation-relative. That is, the presentational contents of our notions of at least some secondary qualities include references to sensations. But should anything in this passage lead us to think that all conceptions (or all possible conceptions) of secondary qualities must include presentational contents that are sensation-relative? I do not see why it would. Reid's language here refers to a single secondary quality conception, not to all conceptions. That is, "[sensations] bear a capital part in *the* [italics mine] notion we form of [a secondary quality],"[164] considers only one notion or conception—namely, the one we form by means of unlearned perceptions. It says that this original conception is essentially sensation-relative. But nothing in this sentence prevents us from forming additional conceptions of secondary qualities with presentational contents that make no reference to sensations at all.

Three sentences later, Reid says, "The thought of a secondary quality, therefore, always carries us back to the sensation."[165] Although it is not part of van Cleve's analysis, this line, I think, is the best evidence from the 'capital part' passage for his claim that Reidian secondary quality conceptions must be sensation-relative. The word *always* might suggest to some that Reid's intended scope is universal. However, it is still not clear that he means to say that all thoughts about secondary qualities involve thoughts of sensations.

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[164] EIP 2.17/204.

[165] EIP 2.17/204.

My proposal is that we consider Reid as referring to all our thoughts of secondary qualities that employ perception-based conceptions of those qualities. That is, Reid seems to mean that original conceptions of secondary qualities necessarily involve thoughts of sensations. As the introductory lines of this passage (quoted in full above) show, Reid is explaining why we typically notice secondary quality sensations but not primary quality sensations. His answer is that our original, perception-based conceptions of secondary qualities relate those qualities to the sensations that they cause, but not so for our conceptions of primary qualities. The presentational contents of original conceptions of secondary qualities infect our thoughts with conceptions of sensations. And this is *always* and necessarily true, so long as we consider them by means of original conceptions. Our perception-based conceptions of primary qualities, by contrast, are not sensation-relative. So we do not necessarily think about sensations when considering those qualities by our original conceptions. Therefore, Reid says, it is difficult to attend to primary quality sensations, unless they are pleasant or painful.[166] Understanding Reid's use of *always* as restricted to original conceptions of secondary qualities seems to preserve his explanation of why we do not notice primary quality sensations and so does no violence to the passage.

There is no reason to count this sentence or the one van Cleve cites as definitive evidence for the premise that, according to Reid, we cannot conceive of secondary qualities without conceiving of sensations. So nothing in the 'capital part' passage conclusively demonstrates that thoughts about secondary qualities necessarily involve thoughts about sensations. Is there any reason to think that Reid would not endorse this

[166] EIP 2.17/204-205.

claim, that he would reject the first premise of the argument van Cleve attributes to him? I believe that there is.

First, on the same page as the 'capital part' statement, Reid identifies a variety of secondary qualities without making reference to sensations:

> The nature of secondary qualities is a proper subject of philosophical disquisition; and in this philosophy has made some progress. It has been discovered, that the sensation of smell is occasioned by the effluvia of bodies; that of sound by their vibration. The disposition of bodies to reflect a particular kind of light occasions the sensations of colour. Very cautious discoveries of the nature of heat, and an ample field of discovery in these subjects remains.[167]

Here, Reid is outlining our understandings of various secondary qualities' natures. He identifies them with effluvia of bodies, vibrations, and spectral reflections. As I have already said, none of these things is sensation-relative. So, standing van Cleve's argument on its head, we can offer the following counter-argument: (a*) sound is the vibration of a body; (b*) the vibration of a body may be conceived without conceiving of sound sensations; therefore, (c*) it is possible for us to conceive of sound without conceiving of sound sensations. Reid's endorsement of (a*) in this passage is much more explicit than his supposed claim that it is impossible for us to conceive of a secondary quality without conceiving of secondary quality sensations in the 'capital part' text. So it is reasonable for us to conclude that Reid does not understand secondary qualities as sensation-relative by nature.

A second reason to avoid the claim that we cannot conceive of secondary qualities except in a sensation-relative manner is that we obviously can. I have a conception of heat with presentational content "the quality Reid mentions on pages 54 and 55 of the *Inquiry*." I have another with presentational content "the quality of a particular lawn

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[167] EIP 2.17/204.

mower muffler that caused a burn on my left hand." Neither of these conceptions of heat is sensation-relative. The first is relative to a page in a book, and the second is relative to an event. I could have these conceptions of heat, even if I lacked the ability to perceive heat by means of heat sensations. I would just think of heat as Reid's topic on pages 54 and 55 of the *Inquiry* or the cause of my injury. So it is possible to conceive of secondary qualities without conceiving of sensations. And, if Reid thinks that secondary quality conceptions must be sensation-relative, then he is clearly wrong.

As we observed in previous sections, Reid's distinction between primary and secondary qualities depends on the presentational contents of conceptions we form of primary and secondary qualities by means of perception. Perception-based conceptions of secondary qualities comprehend those qualities by way of sensations that they cause. But there is no reason to suppose from this that secondary qualities themselves are dependent on the sensations they cause. The fact that we can form a relative conception of a thing does not make the thing itself relative. In fact, we may form relative conceptions of nearly anything. I have a conception of extension, for example, with presentational content "the topic of Reid's discussion on pages 62-67 of the *Inquiry*." But this does not make extension a relative or extrinsic quality. Likewise, the fact that our original conceptions of secondary qualities are sensation-relative does not mean that secondary qualities are. Rather secondary qualities, like the vibration of a bell and the molecular motion of a cup of coffee, are what they are no matter our sensations.

There is no reason to posit a metaphysical distinction in Reid's theory of primary and secondary qualities in addition to the conceptual one I defend above. A dispositional-categorical distinction will not work, because some secondary qualities are categorical

and some primary qualities are dispositions. An intrinsic-extrinsic distinction, where secondary qualities are relative to the sensations that they cause, will not work, because the causal connections between secondary qualities and their sensations are accidental and because such a view makes the scientific investigation of secondary qualities futile. Finally, the fact that our original conceptions of secondary qualities are relative to sensations does not mean that there is any feature of those qualities, like being relative to sensations, that necessitates our thinking of them by means of sensation-relative conceptions. For Reid, there is no metaphysical distinction between primary and secondary qualities. The distinction is epistemic or conception-based, and therefore it is a feature of us, not of the primary and secondary qualities themselves.

Conceptual, Phenomenological, or Both?

Some have claimed to find a perceiver-relative primary-secondary quality distinction in Reid, besides the conceptual one I have expounded. They claim a distinction based on the phenomenology of our primary and secondary quality perceptions. One version of the phenomenological distinction says that our perceptions of primary and secondary qualities differ with regard to our awareness of their accompanying sensations. It says that, according to Reid, in our perceptions of primary qualities, we are unaware of our sensations, but we notice them for secondary qualities. A more radical interpretation says that we may not even have sensations when we perceive primary qualities, and this separates them from secondary qualities, which are always accompanied by sense experiences. Both of these readings, I think, misunderstand Reid's text.

The Radical Phenomenological Distinction

The more radical interpretation is based on Reid's characterization of primary quality perceptions as *direct* and *immediate*. Ryan Nichols, for example, seems to take these words to indicate something about how we get our primary quality conceptions, not their presentational contents:

> While directness concerns the *formation* of our concepts of qualities, Reid also argues that the *contents* of our conceptions of primary and secondary qualities differ in crucial respects. This marks the second means by which Reid draws his distinction.[168]

Nichols says that, by these words, Reid means to explain something about how primary quality conceptions are formed—without causal cognitive mediation. That is, there is no distinct psychological event preceding the perception, and perhaps no sensation in particular. Nichols offers the formal description,

> P's notion of quality Q is a notion of a primary quality only if P apprehends Q, and no intermediary is necessarily apprehended *in the process* [italics mine].[169]

Somehow, when perceiving primary qualities, Nichols thinks, our minds address the quality without pausing to consider, or perhaps even to experience, sensations. Moreover, this interpretation argues, Reid expressly says of visible figure (the quality of a body represented by the two dimensional shape presented in one's visual field) that it lacks a corresponding sensation.[170]

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[168] Nichols, 167.

[169] Nichols, 167.

[170] Nichols,169. There is a nice exchange on this issue between Gideon Yaffe and Lorne Falkenstein and Giovanni Grandi in *The Journal of Scottish Philosophy* 1 (2003). See Yaffe, "Reid on the Perception of Visible Figure," 103–115; Falkenstein and Grandi, "The Role of Material Impressions in Reid's Theory of Vision: A Critique of Gideon Yaffe's 'Reid on the Perception of the Visible Figure,'" 117-133; and Yaffe, "The Office of an Introspectible Sensation: A Reply to Falkenstein and Grandi," 135-140. The relevant passage in Reid is IHM 6.8/101.

But Nichols' reading mistakenly takes *direct* and *immediate* as causal or chronological, meaning that there is no psychological event before the conception in the process of perceiving the quality. The first of these terms appears in Reid's official description of the primary-secondary distinction:

> There appears to be a real foundation for the distinction; and it is this—that our senses give us a direct and distinct notion of the primary qualities. … But of the secondary qualities, our senses give us only a relative and obscure notion.[171]

Nichols takes *direct* in this passage to describe the formation of a conception. But *direct*, as explained earlier, indicates the type of presentational content in a conception—making no reference to the sensation or to anything outside the nature of the quality. One understands the quality directly, rather than by way of causal relations to other events or entities. Using *direct* to modify the way in which perceptions are caused does not even fit the text grammatically. Reid's use is adjectival—"our senses give us a direct and distinct notion," modifying "notion." If Reid meant to say that we form conceptions in a causally or chronologically direct way, he should have used *direct* adverbially—as in, "our senses directly give us."

Immediate, on the other hand, does indicate something about the way that notions are formed in perception, but not in a way that helps the radical interpretation. The term appears in the earlier-mentioned 'capital part' passage, about why we do not typically attend to primary quality sensations. There, Reid says, "When a primary quality is perceived, the sensation immediately leads our thought to the quality signified by it, and is itself forgot."[172] *Immediate* here indicates that our conception of the quality is not the product of reason or any other conception-yielding operation other than the perception

[171] EIP 2.17/201; Nichols, 166.

[172] EIP 2.17/204; Nichols, 166.

itself.[173] His point is that, because we do not reason from sensations to qualities and because sensations do not feature in the presentational contents our original conceptions of primary qualities, we have no opportunity to consider the sensations that primary qualities cause. So, even though our original conceptions of primary qualities are formed by sensations that trigger them, we have no occasion to pause and consider those sensations. We form our conception of hardness when we experience sensations caused by the hardness of some object, but the conception we form of the hardness has the presentational content "the firm adherence of the parts of a body." We do not consider the hardness in terms of the sensation it causes. So our conception is formed in the same way as an original conception of a secondary quality. A quality causes a sensation that triggers a conception and belief in the quality. But, in a perception-based conception of a primary quality, the presentational content does not usually offer the perceiver an occasion to consider the triggering sensation. It causes the perceiver to immediately consider the quality as it is in itself.

Reid's comments on visible figure are not much help to the radical interpretation either. First, even if one primary quality were perceivable without sensations, this would uniquely distinguish that quality from *all* other qualities, whether primary or secondary. It would not differentiate primary qualities from secondary qualities, except insofar as this odd quality is among the primaries. Second, Reid neither says nor implies that visible figure is a primary quality. One interpreter assigns it to the primary qualities on the basis of its mind-independence.[174] But, for Reid, both primary and secondary qualities are

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[173] Reid insists that perception takes place without reasoning. E.g., see IHM 6.20/172.

[174] Nichols, 117.

mind-independent, as is apparent in the earlier reference to the taste of sugar in Reid's letter to Lord Kames.[175] Third, Reid does not say that visible figure is perceivable without sensations. He merely says that there is no characteristic sensation associated with it. It is consistent with Reid's text that visible figure is perceived in virtue of a wide variety of sense experience types—visual and tactile.[176] There is no reason to construe Reid's comments concerning visible figure as the basis for a phenomenological primary-secondary quality distinction.

The Milder Phenomenological Distinction

The milder phenomenological distinction says that we are not aware of primary quality sensations, but we do notice sensations caused by secondary qualities. In this vein, Keith Lehrer remarks,

> The distinction that Reid has drawn is, in fact, both phenomenologically and conceptually based. As he insists, in the case of primary qualities, we hardly notice the character of the sensation but immediately take the sensation as the sign of the quality.[177]

Pitson, after considering the conceptual distinction, also writes,

> Another [contrast between primary and secondary qualities] is at the level of the *sensations* or experiences involved, …. The sensations which belong to the secondary qualities are in general objects of attention, but those which belong to the primary qualities are not. This makes it possible for the sensations involved to form part of the very conception of secondary qualities. In the case of primary qualities, sensation leads immediately to the thought of the quality signified and we have no occasion to attend to it.[178]

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[175] Reid, *Correspondence*, 20 December 1778, 61/115; cited in Nichols, 166.

[176] IHM 6.7/96.

[177] Keith Lehrer, "Reid On Primary and Secondary Qualities," *The Monist* 61 (1978): 189.

[178] Tony Pitson, "Reid On Primary and Secondary Qualities," *Reid Studies* 2 (2001): 20.

It is not clear to me how seriously Pitson takes the phenomenological distinction since he qualifies his statement with "in general." But, since he marks it alongside the conceptual distinction, I shall treat him as if he understands Reid as offering a phenomenological basis for the primary-secondary distinction.

Both of these interpreters support their positions with this passage, which we treated in the last section concerning its use of *immediate*:

> But having a clear and distinct conception of primary qualities, we have no need when we think of them to recal their sensations. When a primary quality is perceived, the sensation immediately leads our thought to the quality signified by it, and is itself forgot. We have no occasion afterwards to reflect upon it; and so we come to be as little acquainted with it, as if we had never felt it. This is the case with the sensations of all primary qualities, when they are not so painful or pleasant as to draw our attention.[179]

In accordance with Pitson and Lehrer's remarks, Reid's words do suggest a way in which our sensations differ with regard to each quality type. But adding this point into Reid's account of *the* distinction between primary and secondary qualities is misguided.

As we have seen, in this passage, Reid is offering an error theory for how other philosophers have missed the fact that primary quality sensations (type-3 natural signs) do not resemble external objects. His answer is that they did not direct their *attention* to these sensations because there is no need to do so—their significance is perfectly understood. *Attention*, for Reid, is the operation of the mind by which we form distinct notions of things or discover their properties.[180] It is the means by which we learn about things. Attention is a somewhat voluntary operation, but we have a habit of directing our attention to primary qualities rather than to the sensations that they cause. Just as there is usually no need for an able reader to study the spelling of a word or the font in which it is

[179] EIP 2.17/204.

[180] EAP 2.3/60.

written, so the sensations that are signs of primary qualities communicate to us so readily, we habitually ignore them, attending only to their meanings. However, Reid believes that this habit can be broken.[181]

The passage does not indicate that the phenomenological difference is what makes primary qualities primary or secondary qualities secondary. It merely mentions a contingent fact about our cognitive tendencies. We might distinguish primary qualities from secondary in other contingent ways, perhaps by noting that primary qualities are those addressed first in this chapter or used most in scientific explanations. This distinction would be accurate, but it would not be *the* distinction. The fact that we tend to attend to secondary quality sensations and not to primary quality sensations is an interesting observation about human behavior, nothing more. The supposed phenomenological distinction is only a habit explained by the conceptual distinction.

Another problem with the milder interpretation is that, if it is taken too strictly, it generates an inconsistency in Reid's text. A strict interpretation would say that we never attend to primary quality sensations and always to secondary quality sensations. But there are clear counterexamples to this thesis. For example, one may perceive the secondary quality of color without attending to its accompanying sensation. Reid explains,

> In [visually] feeling a coloured body, the sensation is indifferent, and draws no attention. The quality in the body, which we call its colour, is the only object of attention; and therefore we speak of it, as if it were perceived, and not felt.
>
> There are some sensations, which, though they are very often felt, are never attended to, nor reflected upon. We have no conception of them; and therefore, in language, there is neither any name for them, nor any form of speech that supposes their existence. *Such are the sensations of colour, and of all*

[181] IHM Abstract/258-259, quoted in full below.

> *primary qualities* [italics mine]; and therefore those qualities are said to be perceived, but not to be felt.[182]

Thus, color stands as a glaring counterexample to the idea that secondary qualities might be impossible to perceive without attending to their corresponding visual sensations and to the mild version of the phenomenological distinction between perceptions of quality types.

Why No Phenomenological Distinction?

It is essential to Reid's case against the Way of Ideas that there not be a necessary phenomenological distinction between primary and secondary quality perceptions. He builds his case on the contention that our conceptions of primary qualities are triggered by sensations that do not resemble or necessarily correlate with the qualities that they signify. In order to make such a case, Reid must attend to his primary quality sensations. He acknowledges that this task as difficult.[183] But if our inattention to primary quality sensations were anything more than a habit, Reid would have no way to discover the natures of primary quality sensations and to understand that they do not resemble primary qualities. Without this information, Reid's natural sign theory could not extend to the primary qualities, and he could not account for the role of sensations in his general account of perception.

But sensations that prompt perceptions of primary qualities are the very thing that Reid believes himself to have studied. He claims,

> Let a man press his hand against a hard body, and let him attend to the sensation he feels, excluding from his thought every thing external, even the body that is the cause of his feeling. This abstraction indeed is difficult, and seems to have been

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[182] EIP 2.18/212. Pitson, 20-21, acknowledges this point.

[183] EIP 2.17/204-205.

> little, if at all, practised: But it is not impossible, and it is evidently the only way to understand the nature of the sensation. A due attention to this sensation will satisfy him, that it is no more like hardness in a body, than the sensation of sound is like vibration in the sounding body.[184]

And again, in an abstract of the *Inquiry* he sends to Rev. Dr. Blair, Reid claims to have broken the habit of ignoring primary quality sensations and offers an explanation of how he accomplished this:

> It is extremely difficult to attend to the sensations that are neither pleasant nor painfull, such as those we have when we feel a body hard or soft, rough or smooth of this or that figure. …
>
> I flatter myself that by much pains and practice I have overcome this difficulty in some degree. When I present an Object to any of my Senses in order to attend to the impression that is made upon the mind, I endeavour to withdraw my thoughts from every thing external, to turn them inward and consider purely what I feel. I suppose every external existence annihilated, every impression and thought I ever had before quite obliterated, and that I begin a new Scene of Existence with this single Impression. What is it like? To what is it like? I view it narrowly on every side and resist every thought that would divert my Attention untill I be well acquainted with it, and able to make it an object of thought.
>
> When I had acquired the power of thus attending to my Sensations [when perceiving primary qualities], I was soon perswaded that I had never made them objects of thought before & that those Sensations which I had felt every day, perhaps every hour of my life, had notwithstanding been as much unknown to me as if I had never felt them, because I had never given any attention to them.[185]

While our habits of attending to secondary quality sensations and ignoring primary quality sensations are strong, they are not invulnerable. The human constitution does not irresistibly draw our minds to one sensation type and away from the other. This phenomenological distinction between primary and secondary qualities is flimsy and therefore not suited to being a second basis for the division between quality types.

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[184] EIP 2.17/209. See also IHM 5.4/60-61.

[185] In IHM, pg. 259.

Reid cannot think that the primary and secondary quality distinction is essentially characterized by a difference in phenomenology since he believes he has overcome that difference. Moreover, as we shall see in the next chapter, Reid's response to the Way of Ideas depends on a perceiver's ability to form two conceptions, one of the primary quality and another of the sensation that accompanies the perception of that quality. This, again, would be impossible if we *never* became aware of primary quality sensations.

Positing a phenomenological difference between primary and secondary quality perceptions in Reid's account only creates needless complications. Reid's entire primary-secondary division is clearly explained on the basis of presentational contents of original conceptions. The presentational contents of our original conceptions of primary qualities consider those qualities as they are in themselves. We conceive of hardness by means of a conception with presentational content "the firm adherence of the parts of a body." On the other hand, the presentational contents of our original conceptions of secondary qualities consider them in relation to our sensations, not by their natures. For this reason, we tend to pay more attention to secondary quality sensations and to ignore primary quality sensations. But this is an accident, not part of the primary-secondary distinction itself.

Both Dispositional and Causal?

Jennifer McKitrick points out another potential problem with Reid's account of primary and secondary qualities and points her reader toward the solution.[186] Reid explicitly identifies certain perceivable qualities—solidity, divisibility, and color—as dispositions. But each of these qualities is also a cause of some sensation. So, on Reid's

[186] McKitrick, "Reid's Primary/Secondary Quality Distinction," 487.

account, dispositions must be causally potent. But Prior, Pargetter, and Jackson have argued forcefully that dispositions are, strictly speaking, non-causal.[187] This is why a disposition requires a 'causal base,' some categorical explanation for its potency. The relevant *causal* quality of a glass, when we speak of its fragility, is not its disposition to shatter when suddenly struck. Rather the cause of its breaking has something to do with its molecular structure and other microphysical features, features that *do* things. These form a causal base upon which the disposition supervenes. Thus, a critic of Reid may argue, if color, hardness, and solidity are causes of certain sensations, they must be causally potent. And the best candidates for causal potency are not dispositions but their causal bases. At this point, one might be tempted to reject Reid's theory altogether, unless he can give some account of how divisibility, solidity, and color could cause sensations or anything else for that matter.

The solution to which McKitrick points is Reid's use of a somewhat different notion of the word *cause* than the one assumed by Prior, Pargetter, and Jackson, a notion that Reid calls a "*cause* in the popular sense."[188] Consider Reid's account of the causal connection between a smell of the rose and the sensation it occasions:

> This [rose that occasions the sensation], when found, we call the cause of it; not in a strict and philosophical sense, as if the feeling were really effected or produced by that cause, but in a popular sense: for the mind is satisfied, if there is a constant conjunction between them; and such causes are in reality nothing else but laws of nature.[189]

This gives Reid a roughly Humean account of causation when it comes to the natural world—constant conjunction. And he favors deductive-nomological explanations in

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[187] Prior, Pargetter, and Jackson, 251-57.

[188] McKirtrick, "Reid's Primary/Secondary Quality Distinction," 487.

[189] IHM 2.9/40.

science.[190] Reid even considers laws of nature, like the universal disposition of massive objects to undergo gravitational attraction, as true causes.[191] If this is the case, then there is no problem with attaching the term *cause* to dispositional qualities, since dispositions are constantly conjoined in causal chains. There is a natural law, for instance, that relates a thing's disposition to reflect certain kinds of light to color sensations in perceivers. Likewise, the disposition of parts to adhere with a greater or lesser degree of firmness is coupled with our perception of that disposition and a certain sensation. Reid is using *cause* in a broad, natural-law-oriented sense, so this potential problem with his account is diffused.

Other Qualities?

Our survey of primary and secondary qualities has examined Reid's views on our conceptions of, at most, thirteen quality types. But this is hardly exhaustive of the properties of objects in the physical world. So how do we integrate these into Reid's taxonomy?

Reid offers a broad overview of his nomenclature:

> Were I therefore to make a division of the qualities of bodies as they appear to the senses, I would divide them into those that are *manifest*, and those that are *occult*. The manifest qualities are those which Mr. Locke calls *primary*; such as extension, figure, divisibility, motion, hardness, softness, fluidity….
>
> The second class consists of occult qualities, which may be subdivided into various kinds; as *first*, the secondary qualities; *secondly*, the disorders we feel in our own bodies; and, *thirdly*, all the qualities which we call powers of bodies, whether mechanical, chemical, medical, animal or vegetable; or if there be any

[190] Callergard, 88-90.

[191] EIP 2.6/103.

> other powers not comprehended under these heads. Of all these the existence is manifest to sense, but the nature is occult; …[192]

The primary qualities, Reid thinks, are extensionally equivalent to the manifest. But secondary qualities make up only one species of occult quality. These, as we have seen repeatedly, are qualities of bodies that we originally conceive by means of the sensations that they cause. Disorders in our own bodies, Reid says, make up a second, similar class of qualities. Like secondary qualities, we understand these by means of sensations that they cause. But unlike secondary qualities, disorders that we perceive are possessed by our own bodies, not by other objects. Finally, powers of bodies constitute a third class of perceivable occult qualities. Of these, we have relative conceptions, but not relative to our sensations. We understand these qualities by means of the other effects that they have. As Reid puts it, "The effect is manifest, but the cause is latent to sense."[193]A particular sedative, for example, manifestly causes sleep, but, without researching it scientifically, we do not understand what it is in itself.

According to Reid, the members of the occult qualities are proper subjects of scientific inquiry. We have yet to discover their natures. These categories, like the primary and secondary categories, are relative to conceptions gained by way of our senses. I do not know how Reid intends to handle those qualities we understand through mathematical relations of the primary qualities. Where do, say, acceleration or torque fit in his scheme? I imagine that, to include all of them, Reid would have to expand the scope of his taxonomy beyond readily perceivable qualities.

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[192] EIP 2.19/217.

[193] EIP 2.17/216.

Some interpreters have incorrectly assigned properties to primary and secondary quality categories that do not meet Reid's criteria. Visible figure has already been mentioned.[194] One commentator places gravity among the secondary qualities.[195] But Reid mentions gravity in order to explain the difference between a direct notion and a relative notion.[196] If by *gravity* we employ a conception with presentational content "the tendency of bodies towards the earth," then the quality is not occult. It is a tendency or disposition, and we have a direct and distinct conception of it.[197] On the other hand, if *gravity* is used to mean the causal base of the disposition, as it sometimes is, then we do not understand it as it is in itself. It is an occult quality, a power of bodies. Our conception has a presentational content like "whatever causes bodies to tend toward the earth." But what is that? Is it curved spacetime, an exchange of subatomic particles, minute vibrating strings, or something completely different? We cannot be sure at this time. For our purposes, it is important to note that regardless of which notion of gravity is used, gravity is not a secondary quality. When *gravity* means a tendency, our notion is direct and distinct and, therefore, not occult at all. When *gravity* is used to indicate the cause of the tendency, it is an occult quality. But this gravity is indicates a power of a body or of the universe, because we conceive of it in terms of its mechanical effects. To be a secondary quality, the presentational content of our conception would have to make reference to our sensations.

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[194] Categorizing visible figure is beyond the scope of this paper. It will suffice to say that Reid does not assign visible figure to a particular sense, so it appears that one could come to a conception of it by a variety of means. See IHM 6.7.

[195] Nichols, 171.

[196] EIP 2.17/201-202.

[197] EIP 2.17/201-202.

The same interpreter also labels the inebriating quality of wine a secondary quality.[198] He claims that this is so because his "notion of the microphysical nature of alcohol is not direct and clear since it is based on the testimony of chemists."[199] But there is no reason why the testimony of chemists should cause a conception to fail in directness or clarity. It has already been shown that Reid's use of *direct* has nothing to do with the way in which a notion is formed but how the mind understands the quality—not by way of anything other than the quality itself. It indicates that the conception is non-relative. The inebriating quality of wine is another power of body, a chemical or medical power, not a secondary quality.

Conclusion

This chapter has shown that Reid's distinction between primary and secondary qualities rests entirely on the presentational contents of the conceptions we form of those qualities by means of sense perception, and it has eliminated alternative readings that wrongly ascribe ontological or phenomenological aspects to that distinction. The only important difference is this: perceptions originally give us direct and distinct conceptions of primary qualities but only relative and obscure conceptions of secondary qualities. And, for our purposes, the key similarity is that both primary and secondary qualities are possessed by physical objects, even if some of these qualities are identifiable with other properties.

Reid's theory of secondary qualities does exactly what it must for us to reject premise 3 from Robinson's original argument. There, Robinson denied that secondary

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[198] EIP 181.

[199] EIP 181–2.

qualities are possessed by physical objects. Jackson defended Robinson's view by arguing that secondary qualities do not feature in contemporary scientific theories—they are not scientific properties—which are sufficient to account for the causal origins of our sense experiences. And, since sense experiences would be the same whether physical objects possess secondary qualities or not, those experiences do not count as evidence for the possession of secondary qualities by physical objects. This gives us good reason to think that the secondary qualities that we perceive are not possessed by physical objects. And, therefore, we also have good reason to think that all of the things that we perceive are non-physical objects and that Direct Realism is false.

Reid's theory gives us grounds for rejecting this line of argument by responding to Jackson. It might be the case that secondary qualities are in fact scientific properties, even if they do not appear in contemporary scientific theories, at least not by their traditional names. Perhaps secondary qualities are identical with scientific properties, but we fail to recognize them as such. Reid makes this scenario plausible by separating sense experience and perception, as essentially independent but contingently linked operations of the mind. Sense experiences, he says, serve as *natural signs* for secondary qualities, but they themselves are not secondary qualities. In particular, secondary quality sense experiences are type-1 natural signs, which means that nature does not automatically convey to us anything about the natures of the things signified. That is, in our original perceptions of secondary qualities, the conceptions by which we apprehend those qualities are relative and obscure. We learn that secondary qualities cause certain sense experiences, but, without experience and rigorous scientific study, we do not understand what those qualities are in themselves.

This is significant because, as far as we are aware by original perceptions alone, secondary qualities could be (epistemically speaking) anything—vibrations of bodies, elements diffused throughout nature, *spiritus rectors* that fly about the air, effluvia, or something entirely different. All we know is that secondary qualities cause these sense experiences. In other words, our original perceptions of secondary qualities leave us open to speculating about the natures of those qualities. And if we find scientific or other convincing reasons to think that the causes of our sense experiences must be scientific properties, then we also have good reason to think that secondary qualities are scientific properties. But it is still up to us to discover their various species and the means by which they affect our sense organs.

All this may make secondary qualities sound more like primary qualities. Metaphysically speaking, that is true. Secondary qualities on Reid's theory are causally potent, physical, real properties of bodies, just like the primaries. However, according to Reid, the primary qualities differ from the secondary qualities, because we have no need to scientifically investigate the natures of the primary qualities. They are originally perceived by means of type-3 natural signs, so we immediately and automatically understand what they are. We have direct and distinct notions of them. This is why they are the objects of the mathematical sciences.[200] It's not that scientists should investigate or study their natures. It's that our original conceptions of primary qualities provide us the conceptual vocabulary for understanding things in the physical world. And so, as we make discoveries about the natures of secondary and other qualities, we will naturally come to understand them by means of primary quality conceptions—heat is the vibration

[200] EIP 2.17/203.

of a thing's minute parts, sound the vibration of an entire body, color a disposition to reflect certain kinds of light. Primary qualities enjoy a privileged conceptual status; when we offer an identification of a secondary quality, it is usually in terms of primary quality concepts. But the primary qualities themselves are no more causal or scientific than the secondaries.

The identity of secondary qualities and scientific properties means that secondary qualities are not causally superfluous. Understanding them as possessed by physical objects does not mean that we are positing an overdetermined causal process from physical object to sense organ to sense experience. Rather, it means that the scientific properties that cause our secondary quality sense experiences *are* secondary qualities. And Jackson is wrong to say that secondary qualities do not feature in our scientific theories. They do, but their appearances are covert. It is the scientist's task to discover and explain where and how secondary qualities fit into the scientific image of the world. And this means that Robinson's claim, that secondary qualities are not possessed by physical objects, is also false. If the scientific properties that cause our sense experiences are possessed by physical objects, then so are secondary qualities.

In the next chapter, I will entertain and respond to objections. For this, two features of Reid's account are especially important. First, sensations are contingent accompaniments to perceptions, not parts of the perceptions themselves. Second, perceptual conceptions of secondary qualities are relative and obscure. They do not commit us to very much concerning the natures of the secondary qualities, just to their existence and to their causal efficacy. Most of the objections that have been brought

against the identity theory of secondary qualities rashly assume that one of these points is false.

CHAPTER THREE

Objections and Replies

In the first chapter, we introduced the Problem of Secondary Qualities and the threat that it poses to Direct Realism. We saw that our best approach to answering the problem involves a rejection of its third premise (P3)—that physical objects do not possess secondary qualities. This, however, meant that we needed an account of secondary qualities that allows them to be possessed by physical objects without being non-scientific. We considered that secondary qualities might be identified in terms of scientific qualities, and we fleshed out such an account in Reid's theory of secondary qualities. This theory says that secondary qualities happen to cause our secondary quality sensations but are best understood in terms of other perceiver-independent properties of physical objects. Developing this understanding, however, is the prevue of scientific investigation, since by perception alone we understand secondary qualities only as unknown causes of our sense experiences.

Although Reid's theory allows us to reject P3, and thereby the Problem of Secondary Qualities, many have thought it impossible to specify secondary qualities in scientific terms. They think that Reid's program is a dead end. This chapter details the four objections to identifying secondary qualities with scientific properties that I find to be the most formidable and offers replies to each. None of these objections is specifically directed against Reid, perhaps because his account of primary and secondary qualities has been widely misunderstood. But answering them is important because they purport to

demonstrate the futility of any program to identify secondary qualities with scientific properties.

The first and most important objection involves the lack of correlation between secondary quality sense experiences and known scientific properties. It says that since scientific property types cannot be shown to neatly correspond with sense experience types, we cannot identify secondary qualities with scientific properties. The second says that the identity theory of secondary qualities cannot fulfill a necessary requirement—*a priori* connections between explanans and explanandum. That is, it claims, secondary qualities cannot be identified in terms of scientific properties, because there are no *a priori* connections between secondary qualities as we perceive them and the scientific properties by which we mean to specify those qualities. The third deals with the role of phenomenology in our knowledge of secondary qualities. It says that our sense experiences are essential features for understanding the natures of secondary qualities, but not so for scientific properties. And, since therefore secondary qualities have a feature that scientific properties lack, Leibniz's Law compels us to reject the possibility of their identification. The last objection, which is based on the early modern resemblance theory of perception, says that secondary quality ideas do not resemble perceiver-independent qualities of physical objects, as they must to be perceiver-independent. While my replies to the first three objections are my own thoughts and applications of Reid's theory, my treatment of the final objection is more exegetical, analyzing the role that Reid's doctrine of primary and secondary qualities plays in his attack on the Way of Ideas.

Non-Correspondence

According to John Locke, the traditional authority on the primary-secondary quality distinction, the effects of secondary qualities are wholly explained by the operations of the primary.[1] This is perfectly compatible with Reid's identity theory. However, Locke only hesitantly ascribes secondary qualities to physical objects, regarding them as "nothing in the objects themselves."[2] His other characterizations include "powers barely," "mere powers," and "imputed" powers.[3] Why does Locke, in these passages, regard these properties as unreal? Because qualities of physical objects and secondary quality sense experiences do not exhibit strong correlation or, as Descartes calls it, "exact correspondence."[4] Locke offers several examples of secondary quality sense experiences changing without variation in certain perceiver-independent physical qualities—looking at colored objects in the light and in the dark, tasting crushed and uncrushed almonds, and placing hands of different temperatures into a lukewarm bowl of water.[5] This lack of correlation between perceiver-independent property and sense experience type underlies the most prolific and important objection to the identity theory of secondary qualities.

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[1] Locke 2.8.14/137, 4.3.11/544. This view has also been taken by Bertrand Russell, *The Problems of Philosophy* (n.p.: Valde Books, 2009), 2; A. J. Ayer, *Central Questions of Philosophy* (London: Weindenfeld and Nicolson, 1973), 83; and Colin McGinn, *The Subjective View* (Oxford: Clarendon Press, 1983), 5. For explicitly Lockean versions, see J. Bennett, *Locke, Berkeley, Hume* (Oxford: Clarendon Press, 1971), 104; Gareth Evans, "Things without the mind," in *Philosophical Subjects* (Oxford: Clarendon Press, 1980), 98; and J. L. Mackie, *Problems from Locke* (Oxford: Clarendon Press, 1976), 21ff.

[2] Locke 2.8.10/135, 2.8.14/137.

[3] Locke 2.8.24/141, 2.8.22/140,

[4] See Descartes, *Principles of Philosophy*, in *The Philosophical Writings of Descartes* (New York: Cambridge University Press, 1985), 1.70/1:218.

[5] Locke 2.8/139.

The many versions of the non-correspondence objection depend on the fact that there is no single-valued function from sense experience types to perceiver-independent quality types or vice versa. That is, we cannot say that, given such-and-such type of sense experience, we have perceived such-and-such type of physical quality. Nor can we say that, given such-and-such species of physical quality, we will have such-and-such sort of sense experience. Since we pick out secondary qualities by the sense experiences they cause, this seems to make it impossible to get a fix on the supposed physical quality to be scientifically identified. To better illustrate Locke's point, I detail five cases in which attempts to discover such correlations have failed.

All five cases are variations on one theme—there is no single-valued function from perceiver-independent physical property to sense experience, and none from sense experience to property. Four demonstrate non-correspondence in the first direction, from property to sense experience. They make it apparent that one physical property may cause many different sense experiences. The fifth, the case of metamerism, demonstrates non-correspondence the other way. One sense experience may be caused by many physical properties. I respond that this non-correspondence, regardless of direction, does not warrant the rejection of the identity theory of secondary qualities. Those who have argued in this manner have assumed either (a) that sensations are essential constituents of perceptions or (b) that secondary quality perceptions commit us to more than they in fact do.

Others have tried to solve the non-correspondence objection in other ways. Michael Huemer, for example, when faced with the a lack of correspondence between color sensations and scientific physical properties (like spectral reflectance) offers a

promissory note, that we will find a correspondence once we learn to think of the scientific properties in the relevant categories. That is, we have not discovered that there is no correlation between secondary qualities and scientific properties.[6] Another approach has been to standardize viewing conditions, so that there is an appropriate sense experience linked to each secondary quality. These standard viewing conditions may be specified in a number of ways. Tye merely mentions "normal viewing conditions" for colors, which seem to include certain contrast effects, viewing distances, lighting conditions, and so on.[7] Dretske indexes veridical perceptions of secondary qualities to certain features of our evolutionary history.[8] Finally, some have considered that secondary qualities might be relative, although not to perceivers. Tye, for example, considering the effects of background contrasts on our sense experiences, entertains and then rejects an account of color on which colors are relationally dependent on one another.[9] On this theory, we would see, by means of our secondary quality perceptions, relations between perceiver-independent, scientific properties of physical objects, even if we did not see the perceiver-independent properties themselves. In the following sections, I will consider these alternative theories only insofar as they highlight the difficulty of answering the objections presented here. My aim in this section is to present a Reidian response to these objections, not to discount other responses.

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[6] Huemer, *Skepticism and the Veil of Ignorance*, 140-145.

[7] Tye, 150-165.

[8] Dretske, *Naturalizing the Mind*, 93.

[9] Tye, 152-153.

Property to Sense Experience: An Introduction

The first four versions of the non-correspondence objection share a similar pattern. They consider a scenario in which two veridical perceptions of one object seem to be taking place. Then, they claim that the perceived properties would be mutually exclusive if they were intrinsic to a single object. So, they conclude, the perceived properties must not be perceiver-independent, identified qualities of physical objects. The objection runs as follows. The first premise is tautologically true, since it considers only veridical cases.

0.1. For any property, X, if an object is veridically perceived as possessing property X, then the object possesses X.

Considering the perception of some particular object, the second and third premises affirm the antecedent of a conditional derived from premise 0.1:

0.2. Object *o* is veridically perceived as possessing property A.

0.3. Object *o* is veridically perceived as possessing property B.

Premises 0.2 and 0.3, combined with 0.1, yield that the object *o* does in fact possess both A and B. But this becomes a problem because, in the non-correspondence objection, the particular A and B are chosen such that they are mutually exclusive unless they are dependent on perceivers. That is, while the following statement is not true for just any A and B, the objector selects A and B such that

0.4. Any object, *x*, may possesses both property A and property B only if A and B are perceiver-dependent properties.

For example, the objector may choose for A and B the properties of large and small. An ant may veridically perceive a certain mouse as large, while an elephant views it as quite small. However, it seems that the same object could not be both large and small unless its largeness and smallness were relational. The mouse's largeness is in relation to or

dependent on the size of the ant. Its smallness, likewise, depends on the elephant. If this works for secondary qualities, however, it spells trouble for our Reidian solution to the Problem of Secondary Qualities. If A and B are perceiver-dependent, then they and properties like them must not be identical to scientific properties in the way that Reid's theory of secondary qualities suggests.

This argument form is valid. But, in each of the four cases we examine, we will find that Reid's theory of perception allows us to contest premise 0.2, premise 0.3, or both. This is because, in each case, the non-correspondence objection names the allegedly perceived properties in these premises (properties A and B) with dubious specificity. On Reid's account of secondary quality perception, the presentational contents of unlearned perceptual conceptions are relative to sensations and vague with regard to the natures of the qualities perceived. But the objection attempts to delineate properties A and B as if a subject's perceiving them necessarily resulted in that subject's acquiring a detailed knowledge of their natures. That is, the objection offers premises 0.2 and 0.3 in a way that tacitly commits one to a perceiver's having conceptions with different presentational contents from those in Reid's analysis. Thus, the non-correspondence objection, as presented in these cases, is not a fair test of Reid's theory and may be safely dismissed. Moreover, in each case, the unwarranted commitment seems to be the result of confusion between perceptions and sense experiences. So, by distinguishing sensations from perceptions, we may explain not only why the objection fails but also why one may have been fooled into thinking that it works.

The Water Bowl

As an example, consider the heat-related first case of the lukewarm water bowl. Although this scenario appears first in Locke,[10] Berkeley offers the most celebrated articulation in his *Three Dialogues*:

> Phil. Those bodies, therefore, upon whose application to our own, we perceive a moderate degree of heat, must be concluded to have a moderate degree of heat or warmth in them; and those, upon whose application we feel a like degree of cold, must be thought to have cold in them.
>
> Hyl. They must.
>
> Phil. Can any doctrine be true that necessarily leads a man into an absurdity?
>
> Hyl. Without doubt it cannot.
>
> Phil. Is it not an absurdity to think that the same thing should be at the same time both cold and warm?
>
> Hyl. It is.
>
> Phil. Suppose now one of your hands hot, and the other cold, and that they are both at once put into the same vessel of water, in an intermediate state; will not the water seem cold to one hand, and warm to the other?
>
> Hyl. It will.
>
> Phil. Ought we not therefore, by your principles, to conclude it is really both cold and warm at the same time, that is, according to your own concession, to believe an absurdity?
>
> Hyl. I confess it seems so.[11]

Berkeley seems to have found a case in which we simultaneously perceive contrary properties—warm and cold—in a single physical object. Unless our perceptual faculties are frightfully prone to error, both perceptions are veridical. Berkeley's reasoning fits the general pattern of the non-correspondence objection along the following lines:

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[10] Locke 2.8.21/139.

[11] George Berkeley, *Three Dialogues*, 14-15.

1.1. If we perceive the water as being warm (cold), then the water is warm (cold).

1.2. We perceive the water as being warm.

1.3. We perceive the water as being cold.

Premises 1.2 and 1.3, combined with 1.1, yield that the water is in fact both warm and cold. But this becomes a problem because warm and cold are contraries, mutually exclusive—that is, unless they are dependent on perceivers. Maybe a bowl of water can be warm to one's left hand and simultaneously cold to one's right, but it cannot be absolutely both warm and cold. So it seems highly plausible that

1.4. If the water is both warm and cold, then the properties of warm and cold are perceiver-dependent.

From here, we may infer

1.5. The water is warm. (1.1, 1.2)

1.6. The water is cold. (1.1, 1.3)

1.7. The water is both warm and cold. (1.5, 1.6)

1.8. Therefore, the properties of warm and cold are perceiver-dependent. (1.4, 1.7)

According to this version of the non-correspondence argument, we must conclude that warm and cold are perceiver-dependent and, therefore, not identified in the manner we propose.

Because of his place in history, the water bowl case is the only version of the non-correspondence argument to which Reid responds or can respond directly. Reid rejects premises 1.2 and 1.3 because, as we have said, they illustrate an all-too-common confusion between sensation and perception. Ironically, Reid sees the water bowl scenario as an occasion for noticing this distinction. He says,

> *Heat* signifies a sensation, and *cold* a contrary one. But *heat* likewise signifies a quality or state of bodies, which hath no contrary, but different degrees. When a man feels the same water hot to one had, and cold to the other, this gives

> him occasion to distinguish between the feeling, and the heat of the body; and although he knows that the sensations are contrary, he does not imagine that the body can have contrary qualities at the same time.[12]

According to Reid, we do not for a moment suspect that the water has contrary qualities, as premise 1.7 suggests. Although we experience two sensation types, we form only one belief about the perceiver-independent heat of the water. There are no contradictions or attributions of contrary qualities. Rather, the heat of the water is represented by two somewhat different sense experiences.

On Reid's account of secondary quality perceptions, the presentational content of an unlearned perceptual conception of heat is "whatever caused *that* sensation." So, although we might say that we perceive a quality causing a warm sensation and one causing a cold sensation, questions concerning the natures of these causes are still open. Reid would not tolerate premises 1.2 and 1.3. Not only do they say something about the existence and causal features of the perceived qualities, but they commit us to a particularly detailed conception of the qualities' measures—*warm* or *cold*—as well as to a perfect correlation between those measures and our sense experiences. Such commitments are simply not present in untrained perceptions. Understanding heat in terms of degrees and investigating potential correlations between those degrees and our sense experiences are tasks that require extensive experience and perhaps scientific methodology. We may experience a warm-type sensation upon touching the water, but this does not mean that we perceive warmth in the water.

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[12] IHM 2.9/42. There are passages in which Reid seems to endorse a sensation-quality correlation (e.g., IHM 4.1/49). If this is the case, then perhaps Reid is inconsistent on this point. Regardless of Reid's actual opinion, I suggest that we adopt a version of his theory without requiring exact correspondences between sensation and quality types.

Reid's response to the water bowl case highlights an important exegetical point. Namely, Reid's description of secondary qualities as unknown causes of known sensations is not intended as an endorsement of any correlation between sense experience types and physical property types. It is worth taking a moment to explain this, for the sake of clarity, before returning to non-correlation examples.

When Reid defines secondary qualities as unknown causes of known sensations, we are tempted, but mistaken, to understand him as follows:

> We do not, by perception alone, know what causes our various sensations. But we can assign names to the secondary quality types based on those sensations. For example, objects that cause hot-type sensations we shall call "hot," sounds that cause concert-pitch-A-type sensations we shall call "concert pitch A," and spectral reflectances that cause green-type sensations we shall call "green." Thus, our secondary quality sensations inform us what type of secondary qualities we see—hot, concert pitch A, or green—even if the perceiver-independent natures of those qualities are hidden in perception. Eventually, science may discover that hotness is a high average kinetic energy among molecules, A is 440 Hz vibration, and a green is such-and-such spectral reflectance.

If this interpretation were correct, then Reid would not be able to reject 1.2 or 1.3, since our experiencing warm- and cold-type sensations would mean that we had felt the heat properties as *warm* and *cold*. But Reid does not take this line. Rather, he claims that, despite our contrary sensations and the dissimilar states of our hands, we rightly perceive only one quality in the water. But Reid does not deny that we experience two different sensations. If he is consistent at all, then Reid cannot think that we, even as a matter of common sense, posit or assume an invertible function from sensation types to secondary quality types, as this misinterpretation suggests. I do not presume to offer a comprehensive argument for an alternative reading of Reid here. But the following understanding seems highly plausible, given the 'invertible function' interpretation's inability to account for Reid's handling of the water bowl case.

I suggest that we understand Reid as saying that objects of perception are particular qualities, not genera of qualities. So the presentational contents of our original conceptions are ways of conceiving particular qualities, not ways of conceiving every member of whatever genera or natural kinds to which those qualities belong. Original perceptions of secondary qualities, in which a subject is given a presentational content like "the cause of *that* sensation," are to be distinguished from conceptions with presentational content "the kind of thing that causes *that* kind of sensation." Given the first presentational content, it is hard to see how the subject could claim to have learned anything about members of a genus besides the particular object of her perception. She cannot even say that the cause of *that* sensation is similar to the cause of *that* other sensation, which is similar to the first. It is natural to think that like causes will have like effects.[13] And Reid acknowledges that we have a "strong desire to find out connections in things,"[14] and so we are prone to speculate about seeming causal patterns. But such conjectures are not deliverances of our perceptual faculties. Rather they are inductions or educated guesses, products of reason and our eagerness to discover causal connections.

In his definitions of secondary qualities, Reid does not mention sensation *types* or secondary quality *types.* He merely says, "[Secondary qualities] are conceived only as the unknown causes or occasions of certain sensations with which we are well acquainted."[15] Moreover, concerning universals, Reid is a nominalist and perhaps a trope theorist[16]

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[13] Hume, *An Enquiry Concerning Human Understanding* 7.2/49-53.

[14] IHM 5.9/41.

[15] EIP 2.17/202.

[16] One relevant passage in Reid is EIP 4.2/323, and another is quoted below. Although Reid notes that we use terms pertaining to universals, *general words*, to express things about the attributes of subjects

(although I do not think that we need to adopt trope theory in order to endorse his account of perception). It is not heat in general or the Platonic form of heat that we perceive upon placing our hands into the water bowl, but rather the heat of *this* water. And so the conception we develop is of *this* particular heat of *this* particular water, and it commits us to nothing about whether *this* water's heat is by nature similar to *that* fire's heat. To discover similarities, we must compare the two qualities as they are in themselves, and for that we must know something more about them.

We can find some evidence for this interpretation in a thought experiment Reid uses to show that conceptions of primary qualities are not formed by considering or combining sensations. It begins by considering a person, with only the sense of touch, whose body is secured and immovable, and who has lost all his conceptions of physical qualities. We then give him certain sensations and consider his conceptual responses. About him, Reid says,

> Suppose him first to be pricked with a pin; this will, no doubt, give a smart sensation: he feels pain; but what can he infer from it? Nothing surely with regard to the existence or figure of the pin. He can infer nothing from this species of pain, which he may not as well infer from the gout or sciatica. Common sense may lead him to think that this pain has a cause; but whether this cause is body or

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(EIP 5.1/356), Reid clearly distinguishes between the individual attribute of a subject (e.g., a quality of a body) and its generalization:

> To this I answer, that the whiteness of this sheet is one thing, whiteness is another; the conceptions signified by these two forms of speech are as different as the expressions: The first signifies an individual quality really existing, and is not a general conception, though it be an abstract one: The second signifies a general conception, which implies no existence, but may be predicated of everything that is white, and in the same sense. On this account, if one should say that the whiteness of this sheet is the whiteness of another sheet, every man perceives this to be absurd; but when he says both sheets are white, this is true and perfectly understood. (EIP 5.3/367)

Reid is recognized as a trope theorist in Stephen Laurence and Eric Margolis, "Abstraction and the Origin of General Ideas," *Philosophers' Imprint* (forthcoming); and Keith Lehrer and Joseph Tolliver, "Tropes and Truth," in *Philosophical Papers Dedicated to Kevin Mulligan*, ed. Anne Reboul, Genéve, URL = <http://www.philosophie.ch/kevin/festschrift/>.

> spirit, extended or unextended, figured or not figured, he cannot possibly, from any principles he is supposed to have, form the least conjecture.[17]

This case is like an original perception of a secondary quality, because the sensation itself communicates nothing about the nature of its cause—not even whether it is a body or spirit. The subject only conceives of the pin as the cause of the pain sensation, just as we originally only conceive of secondary qualities as causes of their respective sensations.

Suppose that we subject the man in Reid's experiment to another sharp pain—a bee sting perhaps. The man in Reid's experiment might conjecture that both pains were caused by objects of the same sort, supposing like causes of like effects. But nothing, in either the pained man's sensations or in his commonsense conceptions of the pin and bee (as causes of the pains), forces him to think that the two pains have the same cause.

Likewise, our original conception of a rose's smell is just "the cause of *that* sensation." If we were to experience the smell of the rose for the first time on Monday and then to have a similar experience caused by the same rose on Tuesday, we would form two conceptions—one with presentational content "the cause of the Monday sensation" and the other with presentational content "the smell of the Tuesday sensation." Nothing about the smell sensations or these conceptions lets us deduce that the two causes have a common causal origin in the rose. In fact, they do not even link the sensations to the rose. Our inductive reasoning and our desire to find causal patterns may lead us to conjecture that the two sensations, being very similar, probably have similar causes. But this is not a deliverance of perception.

How might this 'particular quality' interpretation account for our ability to detect correlations among sensations and perceivable qualities? In the case of primary qualities,

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[17] IHM 5.6/65.

the answer is relatively straightforward. Since our original conceptions of primary qualities are products of type-3 natural signs, we understand what primary qualities are in themselves. And so we may notice that the hardness of the desk is the firm adhesion of its parts and that the hardness of the mug is the firm adhesion of its parts. So the desk and the mug have a noticeable similarity: their parts adhere firmly. However, our reason for thinking that the hardness of one is like the hardness of the other has nothing to do with their causing similar sensations. If we accurately conceive of the qualities as they are in themselves, then the sensations they cause do not matter in our recognition of the qualities' similarity. We think them similar because we understand what they are and can tell that they are in fact similar by comparing their natures.

Secondary qualities are more difficult. Since the natures of secondary qualities are not given in original perceptions, we cannot immediately tell whether two similar sensations have similar causes or not. If such correlations exist, they are discovered through everyday experiences, science, and other empirical investigations. Reid describes the process by which we come to understand the cause of certain smell sensations as a particular rose:

> The smell of a rose is a certain affection or felling of the mind; and as it is not constant, but comes and goes, we want to know when and where we may expect it, and are uneasy till we find something, which being present, brings this feeling along with it, and being removed, removes it. This, when found, we call the cause of it.[18]

In this story, we experience a number of similar sensations, so we naturally consider the possibility that they have a common cause. A little experience informs us that the sensations occur when a certain rose is near and cease when the rose is far. So we rightly

[18] IHM 2.9/40.

conclude, on the basis of induction and experiment, that the sensations are caused by some quality in the rose. But, once again, this is not a perception-based belief. Nothing in our original conceptions of the quality tells us that the sensations have a common cause or even similar causes.

We have said that similarities among primary qualities are discovered by comparing their natures, not by comparing the sensations that trigger our perceptions of those qualities. But we might also point out that, because the same primary quality can cause multiple sensations, there is no such correlation between sensation types and primary qualities. We detect a certain desk's hardness by applying pressure to it with, say, our hand. This causes a certain sensation in us, which triggers our conception of the desk's hardness. But the amount of pressure we apply, and therefore the sensation that we experience, may vary greatly depending on our health, physical strength, and other factors. Yet our perceptions do not incline us to believe that the desk grows softer on days when we are feeling fit and in good health, harder on days when we are sick and sore. The relationship between our sensations and our conceptions is much more complex. One quality may cause a variety of sensations. There is no invertible function from one type to the other.

In the case of secondary qualities, it seems even more obvious that one quality may cause a variety of sensations. A bowl of lukewarm water causes warm sensations in some situations, cold sensations in others. A single color, likewise, seems not to change, although it may cause a variety of sensations. If we find a flower while on a walk in the sunlight, we may pluck it and bring it with us back into the artificial lighting of our home. The sensations caused by the flower change a bit, but nothing about this inclines us to

think that the flower has changed color.[19] In this respect, the views that a single quality may cause a variety of sensations and that one sensation may be caused by a variety of qualities concur with common sense, despite any inclination we may have to ascribe common causes to common effects.

For Reid, identifying particular qualities as members of natural kinds and developing taxonomies of secondary qualities are non-perceptual, speculative projects. There is no reason to think that a single quality may not be the cause of multiple sensations or, as we will see, that multiple qualities may not cause a single sensation. If there are correlations between sensation and quality types, then these must be discovered through experience, induction, and experimentation. And we need not presume that, if sensation-quality patterns are discovered, they are simple or as we initially hypothesize. It is reasonable for us to attempt to learn some pattern, but we have little reason to assume that our first conjecture will be the correct one.

PTC

Whereas the water bowl experiment concerns itself with multiple sense experiences in the same subject, Jonathan Bennett considers variations across perceivers. He offers the taste of Phenol-thio-urea (PTC) as a counterexample to the thesis that secondary qualities are identifiable with other inherent qualities.[20] The taste of PTC, he claims, depends not only on the substance's inherent qualities, but also on which perceiver we consider. About 75% of the population finds PTC bitter, but it is tasteless to

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[19] This phenomenon is called 'color constancy.' See Tye, 147-148.

[20] Jonathan Bennett, "Substance, Reality, and Primary Qualities," *American Philosophical Quarterly* 2 (1965): 1-17.

the other 25%.[21] We could easily imagine possible worlds in which the entirety of the population finds PTC bitter and others in which we all think it is tasteless. We might even be able to create such worlds with surgery or selective breeding. Bennett believes that this possibility gives us grounds for understanding the bitterness of PTC, and secondary qualities generally, as a perceiver-dependent property.

Following the earlier-described form of the non-correspondence objection, I understand Bennett as follows:

2.1. If any large group perceives PTC as bitter (tasteless), then PTC is bitter (tasteless).

2.2. A large group perceives PTC as bitter.

2.3. A large group perceives PTC as tasteless.

Premises 2.2 and 2.3, combined with 2.1, yield that the PTC is both tasteless and bitter. But this becomes a problem because bitterness and tastelessness are mutually exclusive, unless they are dependent on perceivers. Maybe PTC is bitter to one perceiver and simultaneously tasteless to another, but it cannot be absolutely both bitter and tasteless. So it seems highly plausible that

2.4. If PTC is both bitter and tasteless, then the taste of PTC is perceiver-dependent.

Following the same reasoning as in the water bowl case, we infer that the taste of PTC is relative. So Bennett bids us conclude that bitter and tasteless are not perceiver-independent. And this suggests that these qualities are perceiver-dependent.

As in the water bowl case, this argument exhibits confusion between sensation and perception. Premises 2.2 and 2.3—which say that certain groups perceive PTC differently—are not warranted. That 75% of the population finds PTC bitter almost

[21] For a historical perspective on this phenomenon, see Stephen Wooding's "Phenylthiocarbamide: A 75-Year Adventure in Genetics and Natural Selection," *Genetics* 172 (2006): 2015-2023.

certainly means that 75% of the population experiences bitter-type sensations upon touching their tongues to the substance. Some property in the PTC, its taste, causes some sensation in them. They develop a conception of the taste with presentational content "the cause of *that* sensation," or even "the cause of *that* bitter-type sensation." Such a conception makes reference to a bitter sensation, but the sensation is not the conception deployed in this perception, nor is it a conception at all. *Bitterness* is not a distinct quality that this group conceives. Rather they conceive of an obscure quality by comprehending a relation that the quality bears to their bitter-type sensations. These perceivers do not perceive what causes bitter sensations generally. As we have noted, one quality may cause an array of sensations, and one sensation may have multiple causes. They perceive the particular qualities that are causing particular bitter-type sensations in them.

It will not do to handle the 25% group like the previous one. If we tried, we would say that this group perceives the quality in the PTC that causes tasteless-type sensations as "the quality that caused *that* tasteless sensation." But, I think, there is no such thing as a tasteless sensation. However, we may still reject premise 2.3. That 25% of the population finds PTC tasteless means that this group experiences no taste sensation upon touching a sample to their tongues. And without a sensation to trigger a conception and belief, it is difficult to see why this group should count as perceiving a taste. We can say that 25% of the population does not perceive the taste of PTC. Rather, they are somehow impaired. This would involve positing a widespread perceptual incapacity, something akin to colorblindness. But this is not a problem. A quality's failing to be perceived by large numbers of perceivers does not threaten its existence. And, if perceiving the quality

is not terribly important for our survival, it is not surprising that evolution would distribute it sparingly or not at all.

Bennett's treatment of sense experiences (and the absence of sense experiences) as perceptions makes his argument unsound in the same way as Berkeley's water bowl objection. These non-correspondence scenarios are not a problem for Reid's identity theory.

Bees and Pigeons

The next case expands on the previous two, dealing with dissimilarities in sense experiences across species. Bees, pigeons, and some fish almost certainly have different sense experiences from us, if they have them at all, since their eye-brain physiology differs from ours. Even if we could identify an exact correspondence between sensation and quality types in humans, the correspondence would stop with us. Some have suggested that this cross-species variation makes color species-relative and therefore perceiver-dependent and non-physical.[22] However, we shall see that this inference is unwarranted, for some of the same reasons as in the previous cases.

Scientists characterize the human visual apparatus as "trichromatic," after the three-color model of perception described in the Young-Helmholtz theory. Our eyes process information from incoming light in three relatively narrow wavelength bands. The high-frequency band is most responsive to 430 nm light waves (blue), the middle band to 530 nm waves (green), and the low to 560 nm (red).[23] Because of this, any color

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[22] Although he believes colors to be mind-independent, Keith Allen has a nice outline of the problem in his "Inter-Species Variation in Colour Perception" *Philosophical Studies* (2009): 197-220.

[23] This information is available in any textbook on neuroscience or color technology. I used Roy S. Berns, Fred W. Billmeyer, and Max Saltzman, *Billmeyer and Saltzman's Principles of Color Technology*,

sense experience can be duplicated in a properly calibrated eye merely by mixing the proper ratio of intensities of these three particular frequencies of light (which makes Technicolor—a filtering technique that allows film viewers to experience a full range of color sensations—possible). The brain processes these signals by comparing the stimulation levels of various cone types. Resulting signals represent three features of their stimulation: the overall excitement (how bright things are), the difference between the low and middle frequency cones (red vs. green), and the difference between the two lower bands together and the high frequency cones (yellow vs. blue).

The problem this creates for color realists who wish to correlate sensations with color properties is that everything in the last few sentences applies only to human beings and a few other species. Other animals, like bony fish, pigeons, and finches, have an additional type of cone that is sensitive to ultraviolet light around 370 nm.[24] This gives them a more discriminating visual apparatus and no doubt a very different array of sense experiences from that of humans. Bees are among those animals sensitive to light in the ultraviolet range, which helps them spot not only bee-appropriate flowers but also the parts of those flowers that contain nectar. A daffodil looks uniformly yellow to me, but, if viewing the flower under ultraviolet light tells us anything about the bee's sense experiences, the bee sees bright flowers with dark centers and bright spots at the nectar

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3d ed. (New York: John Wiley & Sons, 2000); and Mark F. Bear, Barry W. Connors, and Michael A. Paridiso, *Neuroscience: Exploring the Brain*, 3d ed. (New York: Lippincott Williams & Wilkins, 2007), Chapter 9.

[24] N. S. Hart, J. C. Partridge, A. T. D. Bennett, and I. C. Cuthill, "Visual pigments, cone oil droplets and ocular media in four species of estrildid finch," *Journal of Comparative Physiology A* 186 (2000): 681-694.

locations. These spots reflect both ultraviolet and yellow light, which, scientists suppose, combine to make "bee's purple," which is invisible to humans.[25]

From this information, we may construct an argument along the same lines as the previous two:

3.1. If a human (bee) veridically perceives the daffodil as yellow (bee's purple), then it is yellow (bee's purple).

I use 'veridically perceives' here to reflect the arguments of the previous sections. One might think that, given the cognitive complexity we have associated with perception, bees may not have perceptual abilities. If this is a problem, we can substitute some other factive cognitive state—perhaps Dretske's simple seeing, which involves an acquiring of information.[26]

3.2. A human veridically perceives the daffodil as yellow.

3.3. A bee veridically perceives the daffodil as bee's purple.

It seems that yellow and bee's purple are mutually exclusive, unless they are dependent on perceivers. Maybe the daffodil is yellow to us and simultaneously bee's purple to the bee, but it cannot be absolutely both yellow and bee's purple. So it seems highly plausible that

3.4. If the daffodil is both yellow and bee's purple, then the color of daffodil is perceiver-dependent.

As in the previous arguments, we infer that the daffodil's color is perceiver-dependent. So yellow and bee's purple are not perceiver-independent, and color qualities (and

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[25] Peter H. Raven, Ray F. Evert, and Susan E. Eichhorn's *Biology of Plants*, 6th ed. (New York: W. H. Freeman and Company, 1999), 532-533, contains a helpful photograph of some angiosperms under ultraviolet light, giving us some idea of the contrasts a bee must notice as it approaches the flower—light petals, dark center, and bright "honey guides" near the nectar. By contrast, to us the same flower looks uniformly yellow under regular sunlight.

[26] Fred Dretske, "Simple Seeing," in *Perception, Knowledge and Belief* (New York: Cambridge University Press, 2000), 97-112.

secondary qualities in general) are perceiver-dependent and therefore not identical to scientific properties.

If we continue our previous pattern, we will object to premise 3.2, premise 3.3, or both. Our initial inclination may be to protect the reliability and integrity of human perception, perhaps by claiming that human beings have a corner on the color market. Birds and bees are misled by their sense perceptions, but not us. This means accepting 3.2 and rejecting 3.3. This move, however, is unwarranted. Our visual apparatus is *less* discriminatory than those of birds and bees. They can see what we cannot, and it serves them well. If anyone is misled, it is we humans.

A better attack on 3.2 and 3.3 challenges the notions of *yellow* and *bee's purple* as quality types. They, again, suggest confusion concerning sensations and perceptions. Although we may have yellow-type sensations, and these may prompt us to conceive of and believe in a quality that causes them, the presentational content of our conception is "whatever quality caused *that* yellow sensation." It does not sort the yellow sensation's cause into some correlative color category—red, yellow, or blue. I have no idea what a bee's conceptual life is like. But suppose that it forms a perceptual conception of the daffodil's color as "whatever quality caused *that* bee's-purple sensation." Then we may think that there is a quality in the daffodil that causes yellow sensations in us and one that causes bee's purple sensations in a bee. Perhaps these are the same quality, perhaps not. Regardless, these perceptions give us no reason to think that color is perceiver-dependent. If the daffodil has two colors, then one is perceivable by humans and the other by bees. If so, then premise 3.4 is false since it assumes that the daffodil may have only one color.

And, if it has only one color, then that color causes yellow sense experiences in humans and bee's-purple sense experiences in bees. In this case, premises 3.2 and 3.3 are false.

Viewing Conditions

My reply to the birds and bees case may cause one to wonder exactly what color daffodils are. How can we specify the color of a thing that causes two different sense experiences? Can we still call these flowers yellow? Sadly, this is not an easy question. It is best answered by considering the last version of the non-correspondence objection to the identity theory of secondary qualities, the viewing conditions case.

The viewing conditions case appears in C. L. Hardin's "A Spectral Reflectance Doth not a Color Make."[27] He claims that we cannot reduce colors to perceiver-independent physical qualities by way of sense experience types because spectral reflectances, the best candidates for color explanantia, do not exhibit a one-to-one correlation with sense experiences, even if we consider "normal" viewing conditions. A single object may exhibit very different color properties if viewed under different conditions. This may come as no surprise since our sense organs require proper conditions to function well; the requirement for a suitable environment is expected. But Hardin's objection does not involve unsuitable viewing conditions. None of the situations Hardin considers is suspicious or even unusual.

The first of Hardin's concerns is adaptation.[28] The eye changes its calibration to compensate for light that is especially intense for any particular cone type. Too much red light makes the eye less sensitive to red and more sensitive to green. Greens viewed

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[27] Hardin, "A Spectral Reflectance Doth not a Color Make," 191-202.

[28] Hardin, 193.

against red backgrounds appear more intense than against other colors and vice versa. Moreover, normal sense experiences had by a subject looking at an 560 nm-reflective object in broad daylight are different from those experienced in dim artificial light, even if that light is incandescent (which, like daylight, has a good saturation across the visible spectrum). If a paper causes a subject to have a magenta sense experience in daylight, a quick transition into artificial light may result in a yellow-red sensation, which fades into unique red as the eye recalibrates.[29]

I understand Hardin as arguing along the lines of previous objections:

4.1. If we veridically perceive the object as magenta (unique red), then the object is magenta (unique red).

4.2. We veridically perceive the object as magenta.

4.3. We veridically perceive the object as unique red.

4.4. If the object is both magenta and unique red, then its color is perceiver-dependent.

And, as before, these yield the conclusion that the object's color is perceiver-dependent.

Once again, we would like to object to premise 4.2, 4.3, or both. One might propose a standard background and lighting condition for all color evaluations—black and bright sunlight for example. This would allow one to dismiss either 4.2 or 4.3 on the grounds that it did not occur under standard conditions for color evaluation and is not veridical. But this will not work, according to Hardin, because our perceptual abilities are not so limited, because perceptual abilities in fact function correctly in a variety of environments. For example, we have a strong ability to identify an object as the same color, despite differences in conditions and even sense experiences. A red tomato looks red in daylight, in incandescent light, by candle light, etc. This is known as "color

[29] Hardin, 193.

constancy." And it suggests that imposing strict standards for lighting conditions is unnecessary.

Moreover, Hardin claims that color constancy depends on environmental concerns—i.e., contrasts in a subject's field of vision. We have already seen that if one views the tomato against a green background, it appears redder than it would against other backgrounds. One might suggest that we always evaluate colors against perfectly dark backgrounds or backgrounds of the same spectral reflectance as the object. But if we do, then objects lose their color constancy.[30] Our sense experiences depend not only on lighting conditions but also phenomenological features of adjacent objects. So, even if we wished to stipulate standard viewing conditions, it seems impossible to choose a non-arbitrary background against which we might evaluate a thing's true color. Hardin makes it clear that an exact one-to-one correlation between sense experience and perceiver-independent quality is impossible.

In the case of the water bowl, I suggested that the same quality might cause different sensations in the same subject at the same time. In answer to the last objection, we argued that a single physical quality, a color, might cause different experience types in different perceivers or different biological species. We can take a similar approach to the problem of viewing conditions. A single quality may cause multiple sensations, depending on the conditions in which it is sensed. Hardin's argument inappropriately attempts to correlate color sensations with perceivable color properties. It is perfectly plausible that the same physical quality might cause one sensation on one occasion and a different sensation on another. An object may possess a quality that causes magenta

[30] Hardin, 195.

sensations in some circumstances and causes unique red sensations in other circumstances. So we are not conceiving of the property as red or magenta, as the objection states, but as causing red or magenta sense experiences. That is, the presentational contents of our perceptual conceptions are "the cause of *that* red-type sensation" and "the cause of *that* magenta-type sensation," not "the red color" or "the magenta color." So we may reject 4.2 and 4.3. At one time, we see a quality that causes a magenta-type sensation. At a second time, we see a quality that causes a unique-red-type sensation. And this may very well be the same quality, for, as we have said, the same quality may cause multiple sensations.

What we are saying about secondary qualities is not radical. Indeed, primary qualities also cause a wide variety of sensations. Reid considers the case of viewing a book:

> Every one who is acquainted with the rules of perspective, knows that the appearance of the figure of the book must vary in every different position: yet if you ask a man that has no notion of perspective, whether the figure of it does not appear to his eye to be the same in all its different positions? he can with a good conscience affirm, that it does. He hath learned to make allowance for the variety of visible figure arising from the difference of position, and to draw the proper conclusion from it.[31]

Not only does the book's shape cause a variety of sense experiences, but also we are so adept at interpreting these sense experiences that all of them are taken to indicate the book's one and only, categorical shape. Primary qualities cause multiple sensations, and this poses no problem for our understanding them as perceiver-independent properties of physical objects. Surely then, we should not accept the fact that each secondary quality may cause a variety of sense experiences as evidence for their perceiver-dependence. Just

[31] IHM 6.3/83-84.

as a perceiver-independent taste and a perceiver-independent temperature each can cause a variety of sensations, so can a perceiver-independent color.

Some will find this a curious response, since it offers no perceptual method for determining the actual color of a perceived object. How can we say what color the object is—magenta or red? (Is the daffodil yellow or bee's purple?) As G. J. Warnock says,

> Consider a simple case of…seeing a quality, for example seeing the colour of Lloyd George's tie. It is clear that one could not rightly say that one saw the colour of his tie, if one did not get to know at the same time what colour it was.[32]

Surely, one might claim, perception tells us what colors things are if we see those colors at all.

In answer, I return to Reid's account of the type of presentational content available in a sensory conception of a secondary quality. In the case of the red-type sensation, our senses lead us to conceive of some quality, which we conceptualize as the cause of the sensation. In the magenta case, we consider the cause of the magenta-type sensation, which happens to be the same quality. What we do not find in these presentational contents is any claim about the natural kinds which these qualities might instantiate. And we should not expect to find one, so long as we are confined to the deliverances of sense perception. That is why Reid says that the secondary qualities are proper subjects for scientific investigation; our perceptual notions of them are obscure. Therefore, we take issue with Warnock's claim.

Reid, who writes without the advantages of nineteenth and twentieth century color science, suggests that an approach like Warnock's confuses colors with color appearances—i.e., qualities with sensations. About color types, Reid says,

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[32] G. J. Warnock, "Seeing," in *Perceiving, Sensing, and Knowing*, ed. Robert J. Swartz (Los Angeles: University of Los Angeles Press, 1965), 59-60.

> When we think or speak of any particular colour, however simple the notion may seem to be, which is presented to the imagination, it is really in some sort compounded. It involves an unknown cause, and a known effect. The name of *colour* belongs indeed to the cause only, and not to the effect. But as the cause is unknown, we can form no distinct conception of it, but by its relation to the known effect. And therefore both go together in the imagination, and are so closely united, that they are mistaken for one simple object of thought.[33]

That is, Reid thinks, since color perceptions offer us no information about their natures, it is not unusual for us to inflate the association between color and sensation. But we do not understand what colors are in themselves by perception alone. Therefore, we have no grounds on which to organize colors, no way to build a taxonomy, except by the sensations that they cause. Reid continues by noting examples,

> When I would conceive those colours of bodies which we call *scarlet* and *blue*; if I conceived them only as unknown qualities, I could perceive no distinction between the one and the other. I must therefore, for the sake of distinction, join to each of them in my imagination some effect or some relation that is peculiar. And the most obvious distinction is, the appearance which one and the other makes to the eye.[34]

If it were not for variations in sensations, we would have no way to sort color qualities whatsoever—unless we learn something about their natures. Our names for supposed color types, like "blue" or "scarlet," are not based on anything about the qualities as they are in themselves. And this fact makes our traditional color categories somewhat dubious. Perhaps they do not accurately reflect variations in the natures of the colors themselves. As Reid puts it,

> [T]he appearance is, in the imagination, so closely united with the quality called *a scarlet-colour*, that they are apt to be mistaken for one and the same thing,

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[33] IHM 6.5/86.

[34] IHM 6.5/86-87.

> although they are in reality so different and so unlike, that one is an idea in the mind, the other is a quality of body.[35]

We may conjecture that the natures of colors correlate with our color sensations. But, in reality, color sensations are not color qualities, nor are they similar to color qualities. So there is a strong possibility that our conjecture is wrong.[36]

How can it be that we see Lloyd George's tie without knowing what color the tie is? Color distinctions are not given to us in original perceptions of colors, apart from distinctions among the sensations that the colors effect. So, while seeing the color of the tie may allow us to say what sensation the tie causes, our attempts to specify the tie's color as green or blue are merely guesses. These names are elements of a hypothetical color taxonomy based on the sensations the colors cause, not the perceiver-independent natures of the colors. We perceive the color of a certain object as that which causes a magenta sensation at one time and that which causes a unique red sensation at another. There is no reason to think that the same quality could not cause both. The viewing conditions objection mistakes sensation types for color types.

Sense Experience to Property: Metamerism

As we have seen, some of the most formidable objections to the identity theory of secondary qualities are those derived from failed attempts to find exact correspondences between sense experiences and perceiver-independent qualities of physical objects. The situation is compounded in the case of colors. Not only is there no function from

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[35] IHM 6.5/87.

[36] Perhaps we find the same point in Descartes, *Meditations* in *The Philosophical Writings of Descartes* (New York: Cambridge University Press, 1985), AT7.81/2:56-57, where he discusses our inclination toward ill-considered judgments, including the belief that "when a body is white or green, the selfsame whiteness or greenness which I perceive through my senses is present in the body."

perceiver-independent quality type to sense experience type. But there is also no function from sense experience type to perceiver-independent quality type, even given "normal viewing conditions." The problem is that two objects may exhibit the same color appearance in the same conditions, even though they have very different perceiver-independent properties. That is, whereas the last section considered colors that each cause multiple sensations, here we see that a single sensation may be caused by a variety of colors. This phenomenon, known as *metamerism*, is an inevitable consequence of our trichromatic vision. And, again, Hardin finds this a reason to reject colors as perceiver-independent properties of physical objects and, thus, the identity account of secondary qualities.[37]

The problem arises because the cones in our eyes come only in three types, each of which is sensitive to a relatively narrow band of light. But the information carried along the optic nerve (and hence to the brain-mind) consists of only two color signals (plus a light-dark signal): one that represents the difference in the stimulation of the green and the red cones and another that communicates the difference between the blue cones and the sum of the others.[38]

I will present a case involving a yellow-type appearance for the sake of simplicity in our discussion, but nearly any color sensation would work. Suppose that, under typical daytime lighting conditions, we look at an object A that reflects only 540 nm light. It has a bright yellow appearance since our red and green cones are about equally stimulated and the blues hardly at all. Now consider another object B that reflects equal amounts of

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[37] C. L. Hardin, *Color for Philosophers: Unweaving the Rainbow* (Indianapolis: Hackett, 1988), 45-51 and 67-75.

[38] Berns, Billmeyer, and Saltzman.

530 and 560 nm light. Again, the green and red cones are equally stimulated, and the blue cones are left out. Assuming that we have about the same concentration of green and red cones, this object will also appear bright yellow. In bright daylight and other white lights, the two objects will have indistinguishable color appearances. They have different perceiver-independent properties—spectral reflectances and the micro-physical bases of those reflectances—but cause the same type of sense experience. And, again, this is true not only of the yellow appearance, but no matter which color appearance we consider. Thus, it seems that a thing's color is not identical to its spectral reflectance, for color appearance types do not correspond to (and therefore cannot be identical with) spectral reflectance types.

The metamerism objection to secondary qualities as perceiver-independent properties of physical objects goes like this. First, it says that what is true of colors generally is also true for each species of color. I will use yellow as an example.

5.1. If colors are perceiver-independent properties of physical objects, then yellow is a perceiver-independent property of physical objects.

Given that yellow is in fact a species of color, this statement is analytically true. Next, the objection considers two or more objects that, because of our sense experiences, we take to possess the relevant color species. It says that if the color of these objects is perceiver-independent, then the objects must share some perceiver-independent property, like a spectral reflectance distribution. So consider objects A and B, which both appear yellow.

5.2. If yellow is a perceiver-independent property of physical objects, then objects A and B have microphysical surface structures or spectral reflectances of the same natural kind.

Finally, the metamerism objection asserts that there is no perceiver-independent property shared by the objects. We have looked for it, and we have found nothing.[39]

5.3. It is not the case that objects A and B have microphysical surface structures or spectral reflectances of the same natural kind.

From these we infer,

5.4. It is not the case that yellow is a perceiver-independent property of physical objects. (5.2, 5.3)

5.5. It is not the case the colors are perceiver-independent properties of physical objects. (5.1, 5.4)

Once again, if color is perceiver-dependent, then our identity theory fails, since other versions of this objection may be formulated for other secondary qualities.

In answering the metamerism objection, one might be tempted to target premise 5.3, that objects A and B do not share a perceiver-independent property. For example, one might try considering spectral reflectances in terms of averages or coarse grained categories, offering a weaker understanding of "of the same natural kind." But these efforts are to no avail. Averages do not take into account the way that the cones and optic nerve handle the information transmitted to the brain. Even in the above example, the average wavelength reflected by the second object ((530nm + 560 nm)/2 = 545 nm) is not the same as that reflected by the first (540 nm). Coarse grained or disjunctive color properties, once they are adapted to fit the data, are so convoluted that one begins to question how they could ever count as natural kinds. There are a potentially infinite number of dissimilar wavelength combinations that cause yellow sense experiences. By way of analogy, J. J. C. Smart compares course grained and disjunctive understandings of color species to *snarkhood*, which, he stipulates, is the property of being a tomato or

[39] Austen Clark, *A Theory of Sentience* (New York: Oxford University Press, 2000), 213, reports that there are at least eight physical properties that go into determining an object's color appearance.

rainbow or bulldozer or archbishop.[40] This approach makes color kinds too ad hoc, too contrived.

Michael Huemer rejects 5.3 by offering a promissory note, that one day we may discover the perceiver-independent property that links A and B as members of a natural kind.[41] We may lack good theories of what it means to be red, blue, or yellow, he thinks, but this does not mean that we cannot eventually find one.

Holding out for perceiver-independent commonalities seems explanatorily redundant, not to mention a long shot. The theory of trichromatic vision already gives an explanation for why we experience the same color appearances in response to the same physical properties. We can explain why A and B cause similar sense experiences in us in terms of certain physiology-relative properties. That is, we have the full causal-scientific account of how and why objects with radically varied perceiver-independent properties cause the same sense experience. And that account says that the reason for metamerism is because of the physiology of our eyes and optic nerves. But Huemer seems to think that we will find some non-physiological commonality among metamers, some additional explanation for why different qualities cause similar sensations. This response seems to multiply metaphysical properties beyond necessity. What we know is sufficient to explain metamerism. We should not expect to find a additional explanation.

Fred Dretske tries a rejection of 5.2—that if yellow is perceiver-independent, then A and B have the same microphysical structure or spectral reflectance. He hypothesizes that metamerism is the result of our employing color vision outside of its proper

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[40] J. J. C. Smart, "On Some Criticisms of a Physicalist Theory of Colors," in *Readings on Color, Vol. 1*, ed. Alex Byrne and David R. Hilbert (Cambridge, MA: MIT Press, 1997), 1-10.

[41] Huemer, *Skepticism and the Veil of Ignorance*, 140-145.

context.[42] That is, although we seem to perceive objects A and B as yellow, one or both of them are not in fact yellow. Yellow, Dretske thinks, is the property our yellow-perceiving ability is designed to detect—whatever property the detection of which gave proto-humans the relevant evolutionary advantage.[43] In this case, if A has the property that our yellow-perceiving ability is meant to detect, then A is yellow and B is not. And if B is not yellow, then 5.2 is false.

There are at least two undesirable features in Dretske's proposal. The first is that it leaves us with too many questions about object B. Object B causes yellow-type sense experiences, color-type experiences, but, according to Dretske, object B is not yellow. So is it another color? If so, which one would it be? Or is B somehow colorless, or unperceivable? Exactly what is our epistemic status with regard to this object's color? These questions are confusing, but probably not insurmountable. A second undesirable feature is that it makes the vast majority of our color perceptions illusory. Dretske's solution makes each color appearance into a detector for finding some evolutionarily advantageous property. If our yellow-sensing ability is meant to detect bananas, for example, then my yellow-type sense experiences are supposed to alert me to the presence of bananas. But, if this is the case, then my banana detector is ridiculously oversensitive. It responds to sunflowers, pedestrian crossing signs, and my rubber ducky just as well as to bananas. And, if Dretske is correct, then each of these responses is an illusion, because having a yellow-type sense experience is the appropriate cognitive response to bananas, not sunflowers. Every time I see my raincoat my senses try to dupe me into thinking that

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[42] Dretske, *Naturalizing the Mind*, 88-93.

[43] Dretske credits D. R. Hilbert with the same view. See D. R. Hilbert, "What is color vision?" *Philosophical Studies* 68 (1992): 362.

it is a banana. As we said in the first chapter, Direct Realism can tolerate some illusions, perhaps even as many as Dretske effectively suggests. But we would rather not have them.

The Reidian theory of perception offers another possibility—denying 5.1. Premise 5.1 says that if colors are perceiver-independent properties of physical objects, then yellow is a perceiver-independent property of physical objects. According to Reid, our common sense tells us that colors are perceiver-independent, but our perceptions of objects A and B do not tell us that they are yellow or even possesses the same property.[44] Assuming that they are confuses sensations with perceptions. By perception alone, the presentational content of my conception of object A is "whatever quality caused *that* yellow sensation." And the presentational content of my conception of B is "whatever quality caused *that other* yellow sensation." Nothing in these conceptions necessitates that A and B possess the same yellow-sensation-causing quality. Perhaps we hypothesize that the quality in A is very much like quality B, since like effects often indicate like causes, but this is only a conjecture, not a deliverance of our perceptions. If it is erroneous, then it is the fault of our intellectual hastiness, our social conventions, or our inductive reason, not our perceptions. As far as perceptions are concerned, it may be that yellow is not a natural kind of perceiver-independent property. Perhaps *yellow* is merely a type of sensation, and it may be caused by more than one kind of property.

On Reid's theory of perception, it is quite possible for a natural sign or sensation to be caused by multiple properties. This is even true for primary qualities when perceived by acquired perceptions. Consider again Reid's example of viewing a book's

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[44] See IHM 6.5/86-87 and commentary in the previous section.

size and shape. The book's visible figure and magnitude serve as signs (although they are not sensations) for its intrinsic figure and magnitude.[45] That is, the two-dimensional projection from the book to the location of one's eye leads our minds to consider the book's intrinsic dimensions.[46] About our perceptions of the book's magnitude, Reid says,

> Whether I view [the book] at the distance of one foot or of ten feet, it seems to be about seven inches long, five broad, and one thick. I can judge of these dimensions very nearly by the eye, and I judge them to be the same at both distances. But yet it is certain, that at the distance of one foot, its visible length and breadth is about ten times as great as at the distance of ten feet; and consequently its surface is about a hundred times as great.[47]

So many visible figures and magnitudes represent the book's one intrinsic size and shape. But Reid's claim about the visible dimensions of the book from a distance of one foot suggests that the reverse may also be the case. Many intrinsic sizes and shapes may be represented by a singular type of visible figure. At an arm's length, my edition of Reid's *Inquiry* has the same visible dimensions as Robert Swartz's *Perceiving, Sensing, and Knowing* when viewed from a location ten inches nearer. And Swartz's book, when viewed at an arm's length, has a visible height roughly equivalent to the hospital across the street, when viewed from my office. Thus, this single visible height serves as a natural sign for real heights of seven inches and nine stories. Likewise, it seems that a single sensation might stand for multiple qualities.

Another way to construe this solution is by way of Reid's trope theory. Color qualities are objects of perception—causes of our sensations. But to be causal and to be particular objects of perception, they must be tropes, not generalizations, genera, or

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[45] IHM 6.7/97.

[46] For Reid's discussion on the nature of visible figure see IHM 6.2/79-82, 6.7/95-98, 6.9/103-112.

[47] IHM 6.4/84.

categories. As Reid puts it, “The whiteness of this sheet is one thing, whiteness is another.”[48] So members of a class are different from the class itself. Reid goes on, “[The whiteness of this sheet] signifies an individual quality really existing…. [Whiteness] signifies a general conception which implies no existence.”[49] For Reid, qualities are particular features of particular entities, not categories into which those entities fall. It is these particular qualities that exist and are causally potent.

Since, for Reid, the objects of perception are causal, they must be particular qualities of particular entities. Even if yellowness is appropriately predicated of both objects A and B, it is not yellowness in general that we see. It is the particular color of A, which is a quality of A and not of B, and the particular color of B, which is a quality of B and not of A. These particular qualities are causal, and they are the objects of our perceptions.

The color of a perceived object is whatever particular property accounts for the particular color sensation we have when we look at it. In these cases, it seems clear that the relevant causal properties are, as Reid puts it, “the disposition of bodies to reflect a particular kind of light.”[50] The color of object A is its disposition to reflect 540 nm light. The color of object B is its disposition to reflect both 530 and 560 nm light at the same time. Each of these dispositions is constantly conjoined to our yellow-type sensations, and so causes them in the ‘vague and popular’ sense.[51]

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[48] IHM 5.3/367.

[49] IHM 5.3/367.

[50] EIP 2.17/204.

[51] IHM 2.9/40.

Yellow, on the other hand, is an attempted generalization. It is not a particular quality of any particular entity. It is not possessed by any object, and Reid even says that such generalizations do not exist.[52] Without existing and being possessed by particular bodies, it is clear that yellowness in general cannot be involved in causation. And, since qualities that are objects of perception become objects of perception by causing certain sensations in us, it is clear that *yellow* in general is not an object of perception. It is not *yellow* that we see when we look at objects A and B, but rather the colors of A and B, which both happen to cause yellow-type sensations in us. Colors are causal, possessed by physical entities, and objects of our perceptions. *Yellow* in general is not, and, therefore, it is not a color. The colors of A and B are their respective spectral reflectances. *Yellow* is a conjecture about whether those colors might belong to some natural kind.

The drawback to the Reidian solution is that it makes yellow neither a color nor a natural kind of color. The same goes for red, blue, green, and perhaps everything in between. Our standard color species are mistakes, erroneous speculative conclusions, and hasty generalizations. We assume that, because two particular qualities cause similar sensations in us, they must be of the same natural kind. This is not a deliverance of perception but an inductive misstep. We perceive the color of the daffodil and notice that it occasions a sensation similar to that caused by the rain slicker. Our assuming that this similarity marks some perceiver-independent commonality is not unreasonable, but it is epistemically hazardous, like judging a book by its cover. As Descartes says,

[52] IHM 2.9/40.

> There are, however, many other things which I may appear to have been taught by nature, but which in reality I acquired not from nature but from habit of making ill-considered judgments.[53]

In the case of traditional color categories, we judge wrongly. Our sensation-based color categories—red, green, and yellow—do not correspond to perceiver-independent qualities of physical objects, the objects of our perceptions.[54]

This conclusion is not as surprising as it may seem. Inaccurate generalizations are quite common in human thought. I am not shocked to learn that my plastic rain slicker differs in nature from a daffodil, even if I call them both "yellow." Without scientific knowledge of the causes of my sensations, such mistakes are practically inevitable, given that I speculate on the nature of colors or try to group them at all.

Consider some parallel examples. First, suppose that my two-year-old decides to organize my library. Unable to read and having little knowledge of philosophy, theology, science, or literature, she looks for ways to group the books without regard to subject. So she puts Plato's *Five Dialogues* next to Marcus Aurelius's *Meditations* and Augustine's *On Free Choice of the Will*, since my Hackett paperbacks all have similar covers. Little green Loeb editions of Homer, Xenophon, and Plato wind up together—not bad. But Plato's *Complete Works*, a larger book with a cloth cover, gets shelved next to H. W. Hanson's *History of Art* and a German dictionary. She puts Penguin editions of Nietzsche and Machiavelli side-by-side, perhaps with an Anchor Books edition of Martin Luther—a little jumbled. And pandemonium erupts when she groups Ernest Sosa's *A Virtue Epistemology* and Robert Baden-Powell's *Scouting for Boys*. She has done her best to

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[53] Descartes, *Meditations*, AT 7.82/56.

[54] This discovery would no doubt come as a surprise to Reid, who names scarlet, green, and blue as color species (see EIP 1.1/19). But Reid also points out, in the same passage, that nothing in our color sensations tells us what is different (or the same) about the species themselves.

bring order, but no highly educated person would make these groupings. She has made honest mistakes but mistakes nonetheless.

We find another example in the field of biology. The now-extinct Tasmanian wolf (*Thylacinus cynocephalus*; see figure 2) looks much like the gray wolf (*Canis lupis*; see figure 3).

Fig. 2. Tasmanian wolf (Courtesy of Benjamin A. Shepherd)

Fig. 3. Gray Wolf (Photo by Santiago Atienza. Cropped by Zaqarbal, available under a Creative Commons Attribution-Share Alike 2.0 license)

If one were classifying animals by natural kinds, one might be inclined to put these two animals in the same family.[55] Each has large pointed ears at the top of the head, binocular vision, a long narrow face, strong shoulders, hock in the hind leg, long tail, and coarse fur. The most prominent differences, size and fur pattern, seem insignificant for purposes of biological classification. However, despite appearances, these species are not closely related.

Kripke has explained to us that basic taxonomies of biological species are an empirical and scientific matter. A biologist, he says, denies that whales are fish, contrary to the opinion of the layman.[56] This is not because the biologist attaches a different meaning to the word "fish." It is simply that the biologist has discovered that whales are mammals. Likewise, despite all appearances, the Tasmanian wolf is a marsupial, whereas the gray wolf is placental. Genetically, the Tasmanian wolf has more in common with koalas than canines, and the gray wolf shares a common ancestor with weasels and housecats before we find any links to its Australian lookalike. Their common physical features are best explained by parallel evolution, not genetic relations. Our inclination to lump these "wolves" together is an error in induction. Again, we generalize too hastily.

I have said that our names for supposed color species in fact fail to identify natural kinds of colors. Some will find this a very high price to pay for a solution to the Problem of Secondary Qualities. "Yellow must be a color if anything is," they will think. But there is good reason to doubt this sentiment. Psychologists comparing the color

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[55] In fact, scientists wrongly categorized the Tasmanian wolf as an opossum, in the order Didelphimorphia, in 1808. Its rightful order according to the Linnaean taxonomy is Dasyuromorphia, the same as koalas and kangaroos. See Robert Paddle, *The Last Tasmanian Tiger: The History and Extinction of the Thylacine* (New York: Cambridge University Press, 2002), 2-8.

[56] Kripke, 138.

vocabularies of English, Berinmo (of Papua, New Guinea), and Himba (of Southern Africa) have found that color vocabulary and taxonomies differ greatly among cultures.[57] This suggests that our color categories are culturally and linguistically defined, not naturally inherent in perception. Moreover, it means that dogmatic adherence to the traditional Western color taxonomy is ethnocentric, unwarrantedly treating non-Westerners as if they have a perceptual impairment. It would be desirable to release our hold on it and reject 5.1.

Reidian Secondary Qualities among Contemporary Color Theories

In light of contemporary color science, we find that Reid's theory of secondary qualities leads us to a curious combination of claims regarding the natures of colors. First, our traditional names for color types—"red," "yellow," "green," and "blue"— fail to pick out natural kinds. These traditional categories are merely conventional and do not necessarily reflect anything about the perceiver-independent natures of colors. And the reason that our traditional categories fail to reflect the natures of colors is because, second, colors are objects of perception, but their natures and proper classifications as members of natural kinds are not among their originally perceived features. That is, we can see a thing's color, which is probably identical to its spectral reflectance, but our visual organs do not take in enough information for us to determine, merely by looking, what color the thing is. Third, as we have been arguing from the beginning, colors are possessed by physical objects. Together, these claims constitute an unusual, and perhaps unique, theory of color. So before addressing the next objection to identity theories of

[57] Debi Roberson, Jules Davidoff, Ian Davies, and Laura Shapiro, "Color categories: Evidence for the cultural relativity hypothesis," *Cognitive Psychology* 50 (2005): 378-411.

secondary qualities, I will try to place our Reidian theory among contemporary philosophies of color.

C. L. Hardin,[58] Jonathan Cohen,[59] and Barry Maund[60] concur with our Reidian theory of color that traditional color categories fail to pick out natural kinds of qualities in the physical world. But, contrary to Reid, these philosophers do not take colors to be possessed by physical objects; they are color Eliminativists. I will focus on Maund since his attacks on so-called Color Realism are meant to target Reid explicitly.

Maund's case is straightforward. He says first that, if colors are anything at all, then colors are whatever our "ordinary colour names name: *red, dark red, blue, light blue, yellow, orange,* and so on."[61] The view that colors are perceiver-independent properties of physical objects, then amounts to something like

> *Color Realism (1)*: There are certain properties, that our colour terms 'red', 'blue', 'yellow', 'purple', etc., name; and there are certain physical objects, such that, at least on certain occasions, it is true that some of these are red; some are blue, etc.[62]

For Maund, in order to say that colors are possessed by physical objects, one must also say that each of the traditional Western color categories names some natural kind. From here, Maund continues by arguing that no physical property does all the things that we normally take these "colors" to do. Specifically, no perceiver-independent physical properties (a) correlate with given color categories, like yellow, blue, red, etc.; (b) play a

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[58] Hardin, *Color for Philosophers*.

[59] Jonathan Cohen, *The Red and the Real* (New York: Oxford University Press, 2009).

[60] Barry Maund, "Colour Eliminativism," in *Primary and Secondary Qualities: The Historical and Ongoing Debate*, ed. by Lawrence Nolan (New York: Oxford University Press, 2011), 362-385.

[61] Maund, "Colour Eliminativism," 366.

[62] Maund, "Colour Eliminativism," 364.

causal role in our perceptions; and (c) stand in structural relationships of similarity and difference that reflect similarities and differences with which our traditional color categories are laden.[63] Thus, he concludes, there are no perceiver-independent color qualities in the external world.

Maund supposes that Reid falls prey to his argument because Reid identifies colors as causes of certain sensations.[64] According to Maund, this means that there must be some property, red, that is the cause of red-type sensations, some property, blue, that is the cause of blue-type sensations, etc. But, in fact, we have learned from Reid that, although we conventionally arrange our color sensations into these categories, there is no reason to assume that this arrangement reflects a deep understanding of the natural differences among color types. Knowledge of the natures of colors, including their natural kinds, does not come by way of sense perception alone. For Reid, if colors are anything at all, then they are the objects of color perceptions. If these do not fit neatly into the categories *red*, *dark red*, and *blue*, then perhaps we need to revise our categories. But this is no reason to give up on common sense color perception.

Mark Johnston agrees with our Reidian theory that original perceptions of colors do not reveal their natures to us. But, despite this, he thinks we know what kind of colors there are. And this leads Johnston to endorse a dispositional account of color. As Maund begins by putting supposed colors into categories, so Johnston initiates his argument by analyzing a list of "core beliefs" about a supposed color species, "canary yellow."[65] He

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[63] Maund, "Colour Eliminativism," 367.

[64] Maund, "Colour Eliminativism," 367.

[65] Mark Johnston, "How to Speak of the Colors," in *Readings on Color, Vol. 1*, ed. Alex Byrne and David R. Hilbert (Cambridge, MA: MIT Press, 1997), 137-138.

defends the thesis that canary yellow is the disposition of a thing to look canary yellow. This account of canary yellow and by extension all colors, Johnston thinks, best maintains the core beliefs, even if imperfectly. Among Johnston's core beliefs are (a) the belief that canary yellow is a color species and some objects are canary yellow and (b) the belief that the intrinsic nature of canary yellow is revealed by a standard visual experience as of a canary yellow thing.[66] Curiously, in the course of his argument, Johnston suggests that we reject (b) in the interest of preserving the other core beliefs, including (a).[67] That is, he suggests that we know that canary yellow is a distinct and unified color genus, despite the fact that we know nothing (or very little) about its nature through perception alone. The best way to do this, thinks Johnston, is to accept his perceiver-dependent dispositional theory.

Two things in Johnston's argument may strike the Reidian as surprising. First, as we saw in the first chapter, common sense seems committed to the thesis that colors are perceiver-independent qualities of physical objects. Yet this conviction makes no appearance among Johnston's core beliefs. No wonder it is so easy for him to adopt a perceiver-dependent dispositional account. Second, Johnston is keenly interested in defending our perceptual abilities to recognize various tokens of canary yellow, and other supposed colors, as belonging to a unique and abstract color type. Yet he denies that we can discern the nature of canary yellow through our sense perceptions.[68] But how we can commit to any particular color taxonomy without comprehending the natures of the properties we are classifying? If we have only a subject-relative understanding of colors,

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[66] Johnston, 138.

[67] Johnston, 164-166.

[68] Johnston, 166.

then we seem bound to organize them according to their relations to us, not by their perceiver-independent natures. Whether canary yellow is a color is a question for science, not a core belief.

Much nearer the Reidian theory is Alex Byrne and David Hilbert, who, like Reid, write in favor of Color Physicalism, the view that colors are perceiver-independent properties of physical objects.[69] They suggest identifying colors with the spectral *productances*, which are very much like our proposed spectral reflectances.[70] Byrne and Hilbert respond to certain objections—metamers, bees and pigeons—in roughly the same way that we have responded on Reid's behalf. They make a sharp distinction between color appearances and colors themselves. And they even suggest that color sensations may not correlate precisely with physical colors. In response to the problem of metamerism, for example, they say, "[A] model that classified reflectances on the basis of color *appearance* would not necessarily be classifying them on the basis of *color*."[71] That is, color sensations are distinct from colors themselves, and there is no *a priori* reason to expect any particular correspondence between them.

However, in the same article, Byrne and Hilbert consider that there are discrepancies in perceivers' identifications of particular objects as unique green, a

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[69] Alex Byrne and David R. Hilbert, "Color Realism and Color Science," *Behavioral and Brain Sciences* 26 (2003): 1-44.

[70] Productance, like reflectance, is expressed by a function relating wavelength to intensity. But in reflectance, the light source is distinct from the colored object. Productance considers only the light given off by the object, no matter its origin. The identification of colors with productance may be superior to the reflectance theory I endorse, because it allows one to specify the colors of translucent objects and light sources in addition to opaque reflective objects. If such a theory turns out to be a better account of color, no matter, for such a theory is just as compatible with the Reidian account of colors as reflectances.

[71] Byrne and Hilbert, 11.

traditional color category.[72] To this, they consider two possible responses. First, they note that we may follow the Eliminativists in saying that colors are perceiver-dependent or otherwise nonphysical. Second, they suggest, we may conjecture that either or both perceivers are wrong. Byrne and Hilbert say that whether a particular object is unique green is a matter of fact, just like a thermometer's reading 70 or 71. But, if the thermometer is difficult to read, it would not be surprising to find someone who thought the thermometer said 70 when in fact it registers 71 or vice versa. Likewise, say Byrne and Hilbert, it is not a problem for color physicalism if one or more perceivers mistakenly identifies an object as unique green. So disagreements and slight perceptual impairments should not cause us to think that color Physicalism is false. We are fallible, but that does not affect the truth about what colors are.

Byrne and Hilbert agree with Reid that the natures of colors are not apparent merely from sensations or original sense perceptions. They also take colors to be perceiver-independent properties of physical objects. What is surprising about Byrne and Hilbert's position is their response to the discrepancies about unique green. Given their claim that color appearances are not necessarily reflective of color types, there is little reason why they should need to specify any color as unique green or red or blue.

In the past decade, the philosophy of color has grown into a vast and complex field.[73] I will not pretend that I am familiar with every theory. But, to my knowledge, there are no contemporary philosophical accounts of color that advocate the rejection of

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[72] Byrne and Hilbert, 16-17.

[73] Barry Maund, "Color," *The Stanford Encyclopedia of Philosophy (Spring 2012 Edition)*, Edward N. Zalta (ed.), URL = < http://plato.stanford.edu/entries/color/>, lists about fifty significant works on color that have been published since the year 2000.

traditional color categories without rejecting colors as well.[74] Every proposal is explicated in terms of red, canary yellow, or unique green. And extrapolating to other supposed color species is left as an exercise for the reader. There are Physicalist accounts of color on which colors are perceiver-independent properties of physical objects. And some of these agree with our Reidian theory about the revelatory limitations of our sense perceptions of colors. But, even then, they are not inclined to dispense with our traditional color categories, despite the fact that they are products of social conventions, not of commonsense.

In this section, we have explored five ways in which hypothetical correlations between secondary quality sense experiences and physical qualities fail. There is no invertible function from sense experience to perceiver-independent physical property or vice versa, no exact correlation between quality and sense experience. However, this is no reason to think that secondary qualities, the causes of our secondary quality sense experiences, are not perceiver-independent properties of physical objects. It merely means that the understanding of them that we develop via perception alone is obscure and relative, which is exactly what the Reidian theory predicts. So long as we maintain a clear distinction between sensation and perception and realize that the presentational contents of secondary quality perceptual conceptions are vague, the non-correlation objection is no threat. Instead, the causal relationships between sense experiences and physical properties become subjects of scientific wonder.

[74] Similarly, Maund, "Color," calls attention to Reid's characterization of colors as *unknown* modifications of bodies, but he does not find it repeated among contemporary philosophers.

A Priori *Sufficiency*

As in the preceding case, the next two objections confuse sense experiences with perceivable properties. Our aim has been to offer an account of secondary qualities whereupon they may be counted as perceiver-independent physical properties without their being causally superfluous. To this effect, we have put forward a theory on which secondary qualities are identifiable with other perceiver-independent properties. But some, including Howard Robinson, say that our proposal is impossible because no candidate for a scientific explanation is *a priori* sufficient for "phenomenal" secondary qualities.[75] Perhaps his criticism is best understood by comparing our attempts at identifying secondary qualities with scientific properties to other scientific explanations.

Consider a paradigm case of scientific identification. The phases of matter—solid, liquid, and gas—may be specified as microphysical properties relating to chemical bonding. Firm bonds create the rigid structures of solids, whereas weak or non-existent bonds cause substances to behave as liquids or gases. One reason that such an explanation is plausible is that, given its truth, we may deduce the phases of matter. That is, the explanans entails the explanandum, for it is impossible that the molecules of a substance bind rigidly without its being a solid, and likewise for other bonding strengths and phases. As Robinson puts it, the explanans of chemical bonding strength is "*a priori* sufficient" for the explanantia of the material phases.[76] He explains,

> If the molecules bind in a certain way the object just cannot, for example, behave as a liquid. This is not an empirical truth, for if the molecules are binding tightly,

[75] Robinson, 62-63.

[76] Robinson, 63.

> that *means* that they don't move easily relative to each other, which *entails* that the object is not flowing.[77]

A solid is an object with certain dispositional properties: it does not flow, and it has some certain elasticity, plasticity, tensile strength, shear strength, etc. If we consider an object held together by strong electrochemical bonds, we see that it exhibits the same mechanical properties. That is, given that an object is composed of molecules with strong electrochemical bonds, it cannot help but exhibit the same macrophysical dispositions and other properties as solids.

Robinson's point is an epistemic one. In considering possible candidates for theories to explain solidity, we might consider the presence of some Greek element like earth or very tiny fairies that draw the parts of the solid object together. If the fairies were strong enough, then their pull would be *a priori* sufficient for at least some of the solid object's mechanical powers. The coolness and dryness of the earth would explain the solid object's lack of flow. Only after extensive experimentation or taking additional considerations, like simplicity, into account, do we come to favor the electrochemical theory over these.

To bolster Robinson's case, we may consider proposals for explanations that fail to meet the *a priori* sufficiency requirement. Suppose that we were looking for an explanation for the solidity of some object and someone suggested that electrochemical repulsion was present among the object's molecules, or that the Greek element of water permeated the object, or that a giant squid was hiding behind a Volkswagen in Wisconsin. We would reject these out of hand, because they are insufficient to account for the mechanical powers of solid objects. Electrochemical repulsion among an object's

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[77] Robinson, 63.

microphysical parts, it seems, would explain an object's falling apart or its sublimating, but not its tensile strength. Water would explain an object's flowing, but not its elasticity. And the squid seems to have no bearing whatever on the nature of the object's solidity. *A priori* sufficiency seems to be a precondition for any *a posterori* identity of the sort we are proposing.

According to Robinson, however, secondary qualities fail this requirement. While it is inconceivable that large numbers of atoms be tightly bound by electrostatics without forming solid objects, there is not the same *a priori* connection between an object's microstructure or spectral reflectance and its "phenomenal secondary qualities."[78] According to Robinson, the explanandum is not deducible or entailed by any of the explanantia we might propose. There is no apparent reason why fast-moving molecules should cause us to perceive heat, why 440 Hz vibrations should cause us to perceive concert A, or why 540 nm light should cause us to perceive yellow. When it comes to secondary qualities, Robinson thinks that identity makes no sense.

Robinson's criticisms amount to an objection along the following lines:

6.1. If an identity of a secondary qualities with perceiver-independent physical properties is successful, then perceiver-independent physical properties are *a priori* sufficient for the manifest features those qualities.

6.2. If perceiver-independent physical properties are *a priori* sufficient for the manifest features of secondary qualities, then they entail the phenomenal aspects of those qualities.

6.3. Perceiver-independent physical properties do not entail phenomenal aspects of secondary qualities.

6.4. Therefore, perceiver-independent physical properties are not *a priori* sufficient for secondary qualities. (6.2, 6.3)

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[78] Robinson, 63.

6.5. Therefore, the identity of secondary qualities with perceiver-independent physical properties is not successful. (6.1, 6.4)

This argument is valid. Although 6.1 is controversial,[79] it seems right, and it is suggestive of a similar requirement that Reid imposes on potential explanations. Following Isaac Newton, he says, "When men pretend to account for any of the operations of nature, the causes assigned by them ought…to be sufficient to produce the effect."[80] In fact, Reid uses this principle in a manner similar to Robinson's argument to dismiss the materialist theory of the mind:

> …matter and motion, however subtilly divided and reasoned upon, yield nothing more than matter and motion still.
>
> It would, therefore, be unreasonable to require that [Dr. Hartley's] theory of vibrations should, in the proper sense, account for our sensations. It would, indeed, be ridiculous in any man to pretend that thought of any kind must necessarily result from motion, or that vibrations in the nerves must necessarily produce thought, any more than the vibrations of a pendulum.[81]

Nothing about physical vibrations would entail anything about the operations of our minds, so, Reid thinks, it would be "ridiculous" to posit a theory that purports to explain the nature of thought by physical movements. Out of charity, then, Reid ascribes to David Harley the view that physical movements are causally linked to certain operations of the mind. But even this theory, Reid thinks, fails the sufficiency test. For example, vibrations seem insufficient for explaining the wide variety of sense experiences we have:

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[79] Key contributions to this debate include Ned Block and Robert Stalnaker's "Conceptual Analysis, Dualism and the Explanatory Gap," *Philosophical Review* 108 (1999): 1-46; and David Chalmers and Frank Jackson's reply, "Conceptual Analysis and Reductive Explanation," *Philosophical Review* 110 (2001): 315-61. I, like Robinson, Chalmers, and Jackson, tend to favor the need for an *a priori* connection. But if Block and Stalnaker are correct that such a connection is not necessary, then we merely have one more reason for thinking that Robinson's objection fails.

[80] EIP 2.3/80. This requirement is repeated at EIP 2.6/102.

[81] EIP 2.3/84.

> I know two qualities of vibrations in a uniform elastic medium, and I know no more. They may be quick or slow in various degrees, and they may be strong or weak in various degrees; but I cannot find any division of our sensations that will make them tally with those divisions of vibrations.[82]

Sensations, he says, vary by degree as well as by mode. Vibrations, on the other hand, vary in only two respects. Unless vibrations can exhibit at least as much variety as sensations, Reid does not see how vibrations alone could causally explain our sense experiences. If this is Hartley's theory, we may rule it out without subjecting it to scientific inquiry. Vibrations of the nervous system are, by themselves, not a potential candidate for explaining the causes of sensations.

There is good reason to think that Reid concurs with something like 6.3 as well. He does not think that one can deduce sensations from physical properties. Concerning the rose-smelling case, Reid discusses possible inductions from a secondary quality sensation to its cause, saying, "[The sensation] has no similitude to any thing else, so as to admit of a comparison; and therefore he can conclude nothing from it, unless perhaps that there must be some unknown cause of it."[83] There is nothing about small particles entering a nose that necessitates a smell sense experience, or about 440 Hz vibrations that entail a concert-A experience. Robinson seems to be correct in saying that there is no *a priori* connection between secondary quality phenomenology and the perceiver-independent properties of physical objects.

Premises 6.2 and 6.3, however, should draw our suspicions with its use of the phrase, "phenomenological aspects of secondary qualities." As we have said repeatedly, the secondary quality, which we take to be a perceiver-independent property of a physical

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[82] EIP 2.3/85.

[83] EIP 2.17/209.

body, is not the same as a sense experience. Nor are our perceptions of secondary qualities identical to sense experiences. But Robinson's characterization, "phenomenal secondary qualities," suggests that secondary qualities are, in some sense, essentially tied to those sense experiences. He means that our explanation must entail that certain secondary qualities involve particular sense experiences. If so, then we may reject this requirement, since we think that the causal connection is a contingent one.

It may be important to note that our identification program fulfills the *a priori* requirement in other respects, because the conceptions of secondary qualities that we obtain through sense perceptions are not the only conceptions of them that we are likely to form. Recall, for example, the progression of conceptions one might acquire of the smell of a rose. The presentational content of the conception had by unlearned sense perception characterizes the smell merely as the unknown cause of a certain sensation. A more experienced, but still commonsense, conception posits a causal chain from the smelly object to the air to one's nose.[84] A third, more theoretical conception of the smell relates it to tiny airborne particles released from the object and taken in through the nose. Eventually, we hope to discover the perceiver-independent nature of the smell by developing another, more scientific conception.

Notice for a moment the third conception, the one that considers the smell as tiny particles inhaled through the nose. I submit that there is an *a priori* connection between it and the second conception, which merely links the smelly object and the nose. If a theoretician proposed a third conception on which particles were issuing from somewhere besides the smelly object—say, from one's own head or the moon—then it would offend

[84] IHM 2.8/39.

the second conception, which explicitly locates the smell in the smelly object. Likewise, in light of the second conception, no third conception could specify very large, wider-than-a-nostril-sized carriers of the smell—how would they enter the nose? On the other hand, tiny particles inhaled via the nostrils do *a priori* necessitate something about a causal chain from smelly object to air to nose. So there is an *a priori* connection between the third, speculative conception and the second. Even when it comes to secondary qualities, some hypotheses may be ruled out on *a priori* grounds.

We see the same sort of connection when we consider the nature of heat. Our senses alone only inform us that there is some quality causing *this* heat sensation. Again, on Reid's theory, there is nothing that necessitates *this* quality's causing *this* sensation. But, in fact, it does cause it. Our knowing that heat is rapid molecular motion does not tell us why heat causes the sensations it does. But experience can give us additional conceptions of heat as possessed by some physical object; transferable via radiation, conduction, or convection; and capable of initiating chemical reactions, etc. However we attempt to account for the nature of heat, then, the proposed explanation must possess an *a priori* connection to these commonsense characteristics. The caloric, phlogiston, and molecular motion theories of heat all offer such connections. Caloric, for example, is supposed to be self-repellant, so it will flow from warmer bodies into cooler ones. And this feature is *a priori* sufficient for explaining heat conduction. That is, if heat is an element with a disposition to self-repel, then we expect it to behave in the same manner as heat, spreading from warmer objects to cooler. Molecular motion, likewise, is supposed to spread as excited molecules impart kinetic energy to adjacent molecules, which would also lead to conduction. But if one were to suggest that heat is effluvia

entering one's nose or pink leprechauns guarding their gold, we would dismiss these proposals because they do not account for the conductive features of heat.

We have seen that Robinson is right about there being no *a priori* connection from theoretical conceptions of secondary qualities to our sense experiences. But this is only true because our sensory conceptions carry so little information. Once we develop further commonsense conceptions, through experience and scientific investigation, we discover that there are *a priori* connections between explantia and explananda of the sort that Robinson demands. Reid's theory allows us to consider secondary qualities apart from the sensations they cause.

Knowledge and Phenomenology

Some object to the identity theory on the basis of our perceptual knowledge of secondary qualities. But these objections also seem to exhibit confusion between secondary qualities and the sensations that they cause. For example, Bertrand Russell claims that true knowledge of secondary qualities is essentially first-hand, but knowledge of perceiver-independent physical properties is not. Thus, he thinks, secondary qualities are perceiver-dependent.

Considering light (which we have not been treating as a secondary quality) as an example, Russell explains,

> It is sometimes said that "light *is* a form of wave-motion", but this is misleading, for the light which we immediately see, which we know directly by means of our senses, is *not* a form of wave-motion, but something quite different—something which we all know if we are not blind, though we cannot describe it so as to convey our knowledge to a man who is blind. A wave-motion, on the contrary, could quite well be described to a blind man, since he can acquire a knowledge of space by the sense of touch; and he can experience a wave-motion by a sea voyage almost as well as we can. But this, which a blind man can understand, is not what we mean by *light*, we mean by *light* just that which a blind man can never understand, and which we can never describe to him.

> When it is said that light *is* waves, what is really meant is that waves are the physical cause of our sensations of light.[85]

Russell drives a conceptual wedge between secondary qualities and perceiver-independent physical properties on the basis of human understanding. He thinks that a blind person cannot understand what *we* mean by "light," since he has never experienced light for himself. Hearing the scientist's story about the wave motions of photons, Russell thinks, only gives the blind man an understanding of light's causes, not its nature. If the blind man suddenly received sight, he would learn something about light that he did not know before—namely, what light is in itself. I interpret Russell as making the following argument. First, he claims, by taking a sea-voyage, a blind person can understand waves, so

7.1.Waves may be understood by a blind person.

However, the sea-going blind person cannot see light, and so cannot acquire perceptual knowledge of it. Thus,

7.2.Light cannot be understood by a blind person.

From here, we may apply Leibniz's Law, noting that waves have a property that light lacks—i.e., the ability to be understood by the blind. Thus,

7.3.Light is not identical to waves.

The argument is valid, and we could construct parallel arguments for our secondary qualities. Premise 7.1 is obviously true, since there are perceptually impaired scientists and mathematicians. 7.4 seems correct, perhaps even tautological. Since scientific identity is a kind of identity, whoever properly understands the specification properly understands the thing specified. If one properly grasps H_2O, then one grasps water.

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[85] Bertrand Russell, 12-13. Russell, 16, also dismisses colors as qualities of physical objects on the basis of their supposed superfluousness.

Premise 7.2 is supported by the testimony of several highly-regarded philosophers. In addition to Russell, the seventeenth century philosopher Pierre Gassendi holds that secondary qualities depend not only on combinations and interactions of atoms and their qualities, but on those atoms cooperating with our senses.[86] Likewise, C. D. Broad claims that secondary qualities' appearances are essential to their perceiver-independent natures.[87] And John Foster writes that secondary qualities essentially feature in the content of experience in a way unlike the primary qualities.[88] These writers see secondary qualities as essentially tied to sense experiences.

We, however, may deny 7.2 on the basis of two by-now-familiar Reidian doctrines—that sensation and perception are distinct and that the presentational contents of secondary quality perceptions do not say anything about the natures of secondary qualities. The knowledge objection claims that the normal perceiver understands the secondary quality's nature in virtue of having perceived it. On Reid's account, that is not so, for, although the normal perceiver has a conception of the quality, the presentational content of that conception is "the cause of *this* sensation." It does not inform the perceiver of the quality's nature. The normal perceiver and the perception-impaired subject are both, at least initially, ignorant of the quality's nature. The impaired subject, failing to have the relevant sense experience, does not have any conception by means of perception. But the normal perceiver might inform him of her perception, allowing the impaired subject to form a non-perceptual conception of the quality—perhaps one with

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[86] Saul Fisher, "Pierre Gassendi," *The Stanford Encyclopedia of Philosophy (Winter 2009 Edition)*, Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/win2009/entries/gassendi/>.

[87] Broad, "The Theory of Sensa," 126-127.

[88] Foster, 131-132.

presentational content, "whatever *she* perceived." This is a weak understanding indeed, but an understanding nonetheless. Through scientific investigation, the normal perceiver and the impaired person may come to a new conception of the quality, one that permits both of them to understand its nature better. But neither has an advantage over the other in conceptualizing the quality scientifically, because the scientific conception has nothing to do with the subject's sense experiences.

In Reid's work, we find a similar case in his analysis of visible figure. Visible figure, Reid thinks, may be perfectly understood by a blind person and the blind mathematician Dr. Saunderson in particular. Reid writes,

> We may venture to affirm, that a man born blind, if he were instructed in mathematics, would be able to determine the visible figure of a body, when its real figure, distance, and position, are given. Dr. Saunderson understood the projection of the sphere, and perspective. Now, I require no more knowledge in a blind man, in order to his being able to determine the visible figure of bodies, than that he can project the outline of a given body, upon the surface of a hollow sphere, whose centre is in the eye.[89]
>
> There is nothing surely to hinder a blind man from conceiving the position of the several parts of a body with regard to the eye, any more than from conceiving their situation with regard to one another; and therefore I conclude, that a blind man may attain a distinct conception of the visible figure of bodies.[90]

Since visible figure may be specified in terms of real figure, distance, position, and projection, these are the only notions required for a distinct conception of this quality. It is not essentially linked to the means by which it is perceived or even to its being perceived at all. The blind person can understand its nature.

At the same time, Reid may agree with Russell and the others that there is something that the perceptually impaired person does not understand regarding normal

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[89] IHM 6.7/95.

[90] IHM 6.7/96.

human perceptions of secondary and certain other qualities, like visible figure. Most obviously, the sighted person experiences sensations that the blind person does not. Plus, according to Reid, there are conceptual distinctions between the blind and sighted person. First, the blind person does not associate visible figure with color, but a sighted perceiver hardly ever perceives visible figure without color. Reid says that color and visible figure for most of us are so closely linked that we have difficulty disjoining them in our imaginations.[91] Moreover, the blind person learns about visible figure by reasoning from mathematical principles; whereas, the sighted person "has it presented to his eye at once, without any labour, without any kind of reasoning, by a kind of inspiration."[92] Finally, while the blind person considers a thing's visible figure only by making inferences based on its real figure and relative distance and position, the sighted person uses visible figure as a natural sign for real figure.[93] But these differences, which concern the blind and sighted subjects' mental operations, do not bear on Reid's identification of visible figure with the projection of a thing's real figure. The identity holds.

Likewise, we may reject 7.2 while acknowledging that there may be a variety of conceptual and otherwise cognitive distinctions between perceptually impaired and perceptually able subjects. Premise 7.2 is false, however, because secondary quality sensations do not feature in conceptions of secondary qualities' perceiver-independent natures. Secondary qualities are not essentially tied to sense experiences, so understanding a secondary quality's nature does not require any particular sense

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[91] IHM 6.7/97.

[92] IHM 6.7/97.

[93] IHM 6.7/97-98.

experience. Reid's theory grants us a framework for identifying secondary qualities with the physical causes of our sensations, not the sensations themselves, as Russell does.

Resemblance

I engage this final objection to the identity theory of secondary qualities, the resemblance objection, primarily because of its historical importance. The resemblance objection is based on two commitments for which we have relatively little sympathy. The first is the atomic or corpuscular theory of matter, which in the 17th and 18th centuries was rapidly replacing its Scholastic predecessors. The second is the view that immediate objects of perception are mental. That is, the resemblance objection assumes the falsity of Direct Realism and the truth of either Indirect Realism or Idealism. In the context of our discussion, such a starting point is question begging. But the resemblance objection is the most prominent argument for the perceiver dependence of secondary qualities from Reid's day and one with which he is deeply concerned, because of its conceptual links to the so-called Way of Ideas. This objection merits our attention in our efforts to understand Reid, even if we do not find it philosophically convincing. In what follows, I attempt to reconstruct the resemblance objection in accordance with Reid's analysis of the Way of Ideas and to highlight the features of his doctrine of primary and secondary qualities that bear on his response to the objection.

According to Reid, adherents of the Way of Ideas include Platonists, Aristotelians, Epicureans, Cartesians, and Lockeans.[94] Reid is convinced that the Way of

[94] Reid cites Antony Arnauld, a follower of Descartes, as a possible dissenter from the 'common theory of ideas.' But Arnauld's book was rare, and he, according to Reid, went to great lengths to reconcile his rejection of the Way of Ideas with the writings of Descartes and others. Otherwise, Reid believes himself to be unique. See EIP 2.13/165-170.

Ideas is responsible for the external world skepticism of Berkeley and Hume.[95] Among Scholastics, the resemblance theory manifests itself in terms of physical causation by contagion of forms.[96] Just as they explain heat transfer by saying that one warm body produces a form of warmness in another, so in perception, a red object transmits a *sensible form* of redness to our eyes, and on to our minds. The phenomenological experience, they say, is of the same form as the physical quality. This allows medieval philosophers to explain the intentionality and epistemic accuracy of perceptions by way of phenomenology (sensations): the sensible form that is impressed on the mind resembles the object of perception in virtue of their sharing a formal cause. And this resemblance is what makes the resulting idea (sensible form) both literally informative and *of* the object.

According to Reid, early moderns take the immediate objects of all thought to be mental entities, called *ideas* or *images*, following the Scholastic model of sensible forms.[97] In veridical perceptions (or conceptions) of external objects, the subject perceives an idea that resembles the external object. Descartes describes resemblance as analogous to the resemblance between an engraving and the thing of which it is an engraving.[98] A circular object, for example, may be represented an ellipse, but not a square. Although the circle and ellipse are not the same shape, one resembles the other well enough for perception by resemblance. For these philosophers, as for the

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[95] For a more detailed account of Reid on the restrictions imposed by the Way of Ideas, see John Greco, "Reid's Critique of Berkeley and Hume: What's the Big Idea?' *Philosophy and Phenomenological Research* 40 (1995): 279-296. In Reid's work, see EIP 1.1/31, 2.8/112, and 2.9/132.

[96] EIP 2.8/112-115.

[97] EIP 2.8/115-116.

[98] Descartes, *Optics* 1:165.

Scholastics, the accuracy and intentionality of our perceptions, as well as any later thoughts we might have about the object of perception, are dependent on the resemblance between object and idea (sensation).

Whether one thinks that there is a resemblance between one's sensations and the properties of physical objects partly depends on what sorts of properties one takes physical objects to have. As we saw in the first chapter, many early moderns understand the physical world in as being composed of tiny particles with size, shape, position, and motion as perceiver-independent properties.[99] These may combine to form objects with certain complex qualities like hardness and solidity. But it seems that no combination of size, shape, and position could ever form a quality that resembles our ideas (i.e., Cartesian images or Reidian sensations) of secondary qualities, like color and sound.

I understand the resemblance objection as deriving from the Way of Ideas and early modern atomism as follows.[100] The first premise reflects the Way of Ideas' commitment to mental entities (ideas or sensations) as immediate objects of thought.

8.1. For any object of thought, *x*, if *x* is a perceiver-independent property of a physical object, then *x* resembles some idea (sensation), *y*.

The second premise deals with the nature of the external, physical world. Although it is not exclusive to atomism, it is certainly a corollary of that thesis. It says that scientific, perceiver-independent properties of the 17th and 18th centuries do not include anything that resembles our secondary quality sensations.

8.2. There are no perceiver-independent properties of physical bodies that resemble our ideas (sensations) of secondary qualities.

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[99] Adams, xiv.

[100] I follow Greco's interpretation of Reid's understanding of Berkeley in "Reid's Critique of Berkeley and Hume: What's the Big Idea?" 287. But whereas Greco focuses on Berkeley and Reid's response to external world skepticism generally, I restrict my scope to secondary qualities.

8.3. If secondary qualities are perceiver-independent properties of physical objects, then those qualities resemble our ideas of secondary qualities. (8.1)

8.4. Secondary qualities are not perceiver-independent properties of physical objects. (8.2, 8.3)

This argument is valid, and, if 8.4 is true, then the identity theory is false. Reid believes that premise 8.2 is commonsensical. But, overall, Reid finds this case unconvincing. According to him, although philosopher after philosopher defends 8.2, premise 8.1 is a mere assumption from the Way of Ideas. In addition to yielding the unlikely conclusion, 8.4, Reid thinks, premise 8.1 is clearly false, since primary qualities are counterexamples.

Reid's accusation, that his immediate predecessors reach 8.4 without defending 8.1, seems apt. Galileo, Descartes, and Locke all have passages in which they move immediately from the claim that secondary quality sensations or properties resembling them are not possessed by physical objects to the conclusion that we mistakenly attribute secondary qualities to physical objects as perceiver-independent properties. Moreover, these writers treat premise 8.2, that no perceiver-independent properties of physical objects resemble our sensations of secondary qualities, as if it were the locus of disagreement between common sense and their theories of secondary qualities.

For example, although it does not mention resemblance explicitly, Galileo's *The Assayer* contains a thought experiment to show that sensations may be distinct in kind from perceiver-independent physical properties. Galileo asks us to consider what it is like to have one's hand tickled with a feather. The feather is moved about on one's skin, and one has a certain phenomenological experience—a tickling sensation. The sensation, Galileo argues, is something distinct from any physical feature of the feather or the

hand—"This titillation belongs entirely to us and not to the feather."[101] Then, he applies the distinction to secondary qualities explicitly, saying, "I believe that no more solid an existence belongs to many qualities which we have come to attribute to physical bodies—tastes, odors, colors, and many more."[102] By thinking of secondary qualities as possessed by physical objects, he says, we have mistakenly attributed our secondary quality sensations to those objects: "Many sensations which are supposed to be qualities residing in external object have no real existence save in us, and outside ourselves are mere names."[103] For Galileo, secondary qualities cannot be identical to physical properties, because physical objects cannot possess our secondary quality sensations. The pages that contain this argument, however, do not say why physical objects would have to possess sensations in order to possess secondary qualities. So Galileo seems to take 8.1 as given and 8.2 as a discovery that overturns our common sense understanding of secondary qualities.

Descartes says a bit more about non-resemblance. He claims that just as words do not resemble the objects to which they refer, secondary quality ideas do not resemble their causes.[104] Even primary qualities, according to Descartes, do not resemble their corresponding sensations in every respect.[105] This leads him to conclude, like Galileo, that secondary qualities are really just sensations posing as qualities.[106] He asks us to

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[101] Galileo, 275.

[102] Galileo, 275.

[103] Galileo, 277.

[104] Descartes, *Optics*, 1:165-167.

[105] Descartes, *Optics*, 1:165-167.

[106] Descartes, *Principles of Philosophy* 1.71/1:219.

consider a secondary quality—like color—as a sensation. There is no problem understanding it. It is *clear* and *distinct*. But, as a quality of a physical body, this color idea makes about as much sense as pain would. One cannot meaningfully ascribe it to a non-sentient object. Other qualities, like shape and motion, we clearly understand as properties of physical objects. Thus, Descartes, like Galileo, holds that secondary qualities are perceiver-dependent, because secondary quality sensations differ in kind from perceiver-independent physical properties. And, like Galileo, Descartes seems to take for granted in these passages that resemblance or likeness in kind between secondary quality sensations and secondary qualities is required for us to perceive them.

Locke is even more explicit about resemblance between idea and quality. He extends Descartes' claims, proposing a primary-secondary quality division based on the resemblance of physical qualities to ideas. He writes,

> The ideas of primary Qualities of Bodies, are Resemblances of them, and their Patterns do really exist in the Bodies themselves; but the Ideas, produced in us by these Secondary Qualities, have no resemblance of them at all. There is nothing like our Ideas, existing in the Bodies themselves.[107]

Primary qualities, according to Locke, are somehow like the sensations that they cause. Secondary qualities are not. This is why Locke characterizes secondary qualities as "nothing but powers" and "powers barely."[108] He acknowledges that secondary quality sensations are caused by external, perceiver-independent properties. But he is unwilling to say that these causal properties just are the secondary qualities, since, he thinks, nothing about them resembles the objects of our secondary quality ideas. Locke offers some examples involving heat:

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[107] Locke 2.8.15/137.

[108] Locke 2.8.24/141.

> [Secondary] Qualities are commonly thought to be the same in those Bodies, that those Ideas are in us, the one the perfect resemblance of the other, as they are in a Mirror; and it would by most Men be judged very extravagant, if one should say otherwise. And yet he, that will consider, that the same Fire, that at one distance produces in us the Sensation of Warmth, does at a nearer approach, produce in us the far different Sensation of Pain, ought to bethink himself, what Reason he has to say, That his Idea of Warmth, which was produced in him by the Fire, is actually in the Fire; and his Idea of Pain, which the Fire produced in him the same way, is not in the Fire.[109]

Just like Galileo and Descartes, Locke believes that one who seriously attributes warmth to fire mistakenly ascribes a secondary quality sensation to a physical object. Another passage:

> Though receiving the Idea of Heat, or Light, from the Sun, we are apt to think, 'tis a Perception and Resemblance of such a Quality in the Sun: yet when we see Wax, or a fair Face, receive change of Colour from the Sun, we cannot imagine, that to be the Reception or Resemblance of any thing in the Sun, because we find not those different Colours in the Sun it self.[110]

For Locke, color, smell, and sound ideas exist primarily in our minds, as immediate objects of our perceptions. But these ideas do not resemble anything mind-external. Thus, he concludes, we should not say that secondary qualities, which are only ideas in our minds, are possessed by physical objects, although physical objects may possess "bare powers" that cause the secondary quality sensations. Once again, we find a move directly from the premise that secondary quality sensations do not resemble physical properties to the conclusion that secondary qualities are not possessed by—and therefore are not identical to—perceiver-independent properties of physical objects.

In each of these thinkers, the claim that secondary qualities are possessed by physical objects is considered equivalent to the claim that physical objects possess something resembling secondary quality sensations or, even more radical, that physical

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[109] Locke 2.8.16/137.

[110] Locke 2.9.25/142.

objects possess *our* sensations. Perhaps Galileo holds the latter view. If so, we find his sentiment repeated by Hume, who says that we follow a "blind and powerful instinct of nature" in believing that sensory images are external objects.[111] On the other hand, Hume says that such an opinion is "destroyed by the slightest philosophy," because in fact our minds can only engage mental images.[112] So Hume also sees premise 8.2, that there are no perceiver-independent properties of physical bodies that resemble our sensations of secondary qualities, as unnatural. And he takes premise 8.1, that our thoughts of perceiver-independent properties of physical objects involve resemblances between sensations and those properties, as given.

Reid concurs with all of these writers that premise 8.2 is true. But, contrary to them, he thinks, every right-thinking person assents to 8.2. It is not a grand discovery that physical properties are not like sensations. If we did not believe 8.2 and instead thought that physical objects possessed properties that resembled (or were identical to) secondary quality sensations, it seems that, in everyday thought and speech, we would fail to clearly distinguish secondary qualities from the sensations that they cause. But commonsense non-philosophers do not seem confused when they apply secondary quality names to physical objects or to sense experiences. They make a consistent distinction between sense experiences and physical objects. Nothing seems amiss in saying, "The baby feels warm, but according to the thermometer she isn't running a fever." In fact, Galileo's tickling example capitalizes on just this point—i.e., that we do not confuse sensations

[111] Hume, *Enquiry Concerning the Human Understanding* 12.1/104.

[112] Hume, *Enquiry Concerning the Human Understanding* 12.1/104.

with physical properties. Reid defends 8.2 as the commonsense view with regard to secondary qualities:

> The vulgar are commonly charged by philosophers, with the absurdity of imagining the smell in the rose to be something like to the sensation of smelling: but I think, unjustly; for they neither give the same epithets to both, nor do they reason in the same manner from them. We say, This body smells sweet, that stinks; but we do not say, This mind smells sweet and that stinks. Therefore smell in the rose, and the sensation which it causes, are not conceived, even by the vulgar, to be things of the same kind, altho' they have the same name.[113]

Reid is seconded by contemporary writers.[114] Moreover, our language favors secondary qualities as real and possessed by physical objects, clearly distinguishing them from sensations. For example, sensations disappear when no longer felt, but secondary qualities—colors, smells, and sounds—do not. The Way of Ideas, by treating 8.2 as unexpected, predicts confusion where we find none. But common sense finds nothing scandalous in premise 8.2.

Reid finds premise 8.1 to be false. This premise says that the immediate objects of all thought, including conception and perception, are mental entities. These entities Reid takes to be sensations. Perceiver-independent objects and properties may be mediate objects of thought only by resembling immediate objects of thought. As Reid understands it, the Way of Ideas says that a conception of a sensation counts as a conception of a physical object in virtue of the sensation's resembling some property of the object. For us to think about a physical object, then, two sub-relations must hold—the conception's

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[113] IHM, 2.9/42.

[114] E.g., Strawson, 48, 50; Wilfred Sellars' main contributions to this point are "Empiricism and the Philosophy of Mind," in *Science, Perception and Reality* (Atascadero, CA: Ridgeview Publishing Co., 1991), 127-196, and the three-part "Foundations for a Metaphysics of Pure Process," *The Monist* (1981): 3-90.

being of the sensation and the sensation's resembling that object.[115] Without a resemblance between sensation and external object, one's thoughts are limited to sensations. And, if a resemblance relation holds between external object and sensation, then thoughts about the sensation are also indirectly about the object.

Reid argues that we may conceive of primary qualities, which are perceiver-independent properties of physical objects, even though primary qualities are not the same as and do not resemble our sensations. Conceptions of primary quality sensations are not conceptions of primary qualities, and conceptions of primary qualities are not conceptions of primary quality sensations. Reid's argument against 8.1 is the crux (*experimentum crucis*) of his *Inquiry*. He states his challenge,

> Extension, figure, motion, may, any one, or all of them, be taken for the subject of this experiment. Either they are ideas of sensation, or they are not. If any one of them can be shown to be an idea of sensation, or to have the least resemblance to any sensation, I lay my hand upon my mouth, and give up all pretence to reconcile reason to common sense in this matter, and must suffer the ideal scepticism to triumph. But if, on the other hand, they are not ideas of sensation, nor like to any sensation, then the ideal system is a rope of sand, and all the labored arguments of the sceptical philosophy against a material world, and against the existence of every thing but impressions and ideas, proceed upon a false hypothesis.[116]

All Reid needs to reject premise 8.1 is one case where an idea (conception) of a perceiver-independent property is not an idea of a sensation. He names three—extension, figure, and motion. And, if his analysis of primary quality perceptions is correct, he could add three more—hardness, solidity, and divisibility. These, Reid says, should settle the matter.

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[115] See also IHM 5.8/73.

[116] IHM 5.7/70.

Reid comes to see primary qualities as counterexamples to 8.1 by following in the footsteps of the other philosophers we have mentioned. Reid agrees with Galileo, Descartes, and Locke that perceiver-independent, physical properties do not resemble our secondary quality sensations. But Reid is willing to go even further. Following Berkeley, Reid holds that no physical property resembles any sensation, nor could it.[117] If 8.1 is true, then, Reid thinks, it is impossible for us to perceive or even think about external physical objects. Nothing in the physical world satisfies the resemblance requirement. Moreover, if 8.1 is true, then all of our supposed conceptions of perceiver-independent properties are really conceptions of sensations.

The problem for premise 8.1, however, is that our conceptions of perceiver-independent properties are *not* conceptions of sensations. Most obviously, this is not the case for our conceptions of primary qualities and the sensations that they cause. Reid first argues that sensations accompany perceptions of primary qualities, just as they do secondary qualities.[118] As we mentioned in the previous chapter, the difference in our primary and secondary quality sensations arises from their roles as natural signs. Primary quality sensations are type-3 natural signs that trigger direct and distinct conceptions, whereas secondary quality sensations are type-1 signs that initially give us only relative and obscure conceptions. Reid admits that it is difficult to attend to primary quality sensations,[119] but, once we overcome the difficulty, he asks us to compare (a) a conception of a primary quality to (b) a conception of the sensation caused by the quality.

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[117] Berkeley, *Three Dialogues*, 79; IHM 5.8/75.

[118] IHM 5.5/63-4.

[119] IHM 5.2/56-57.

Are these conceptions in fact the same? Do they take the same objects? Reid asserts that they are manifestly distinct.

Reid's clearest treatment of this experiment deals with our conception of hardness and our conception of the sensation caused by our touching a hard object.[120] Again, the Way of Ideas says that these are the same conception. But is this in fact the case? It seems that the answer is no. To make the point more vividly, Reid considers an extreme case: "If a man runs his head with violence against a pillar, I appeal to him, whether the pain he feels resembles the hardness of the stone; or if he can conceive any thing like what he feels to be in an inanimate piece of matter."[121] The one who runs his head into a pillar certainly has a sensation—pain—and a little introspection gives him a conception that has the pain as its referential content. But the referential content of the man's conception of the pillar's hardness is of the firm cohesion of the pillar's parts if it is a conception of anything, not of a pain.[122] The man forms two distinct conceptions, one of the pain sensation, a mental operation, and another of the pillar's hardness, a perceiver-independent quality of a physical object. His thought of the pillar is not mediated by ideas. The Way of Ideas and premise 8.1 are false.

For good measure, Reid makes similar assertions concerning our conceptions of other primary qualities, finally remarking,

> But let us, as becomes philosophers, lay aside authority; we need not surely consult Aristotle or Locke, to know whether pain be like the point of a sword. I have as clear a conception of extension, hardness, and motion, as I have of the

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[120] IHM 5.2/55.

[121] IHM 5.2/56.

[122] See IHM 5.4/61.

> point of a sword; and, with some pains and practice, I can form as clear a notion of the other sensations of touch, as I have of pain.[123]

We seem perfectly able to accurately conceive perceiver-independent properties of objects, even when they bear no resemblance to sensations. In all these cases, we are able to think about perceiver-independent properties without thinking about sensations.

The Way of Ideas cannot cope with conceptions that are not, first and foremost, *of* sensations. It says that conceptions of primary qualities are the same conceptions as our conceptions of primary quality sensations. But this is not true. We have conceptions for each of the primary qualities *and,* if we attend to them, conceptions for each of the sensations that they cause. As Reid announces in triumph, "The very conception of [primary qualities] is irreconcilable to the principles of all our philosophic systems of understanding."[124] And again, "The very existence of our conceptions of extension, figure, and motion, since they are neither ideas of sensation nor reflection, overturns the whole ideal system."[125]

Primary qualities as we conceive them do not resemble the sensations that trigger our conceptions of them. So Reid finds a reason to dismiss premise 8.1. Without the general rule that external properties must resemble sensations, the Way of Ideas gives us no compelling reason to say that secondary qualities, if they are perceiver-independent, must resemble sensations. Perhaps, as we have said, they cause sensations, and we may conceive of them as sensation-causing but otherwise unknown properties of physical objects. If so, we can maintain our identity theory of secondary qualities.

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[123] IHM 5.7/69.

[124] IHM 5.7/67.

[125] IHM 5.7/69.

Final Notes on Objections

We have found the identity theory of secondary qualities defensible against four formidable objections: non-correspondence, *a priori* sufficiency, knowledge, and resemblance. All of these arguments either wrongly conflate sense experiences with perceptions or fail to acknowledge the obscure and relative nature of unlearned secondary quality perceptual conceptions. On the other hand, the only sacrifice we were forced to make was acknowledging that some of our traditional color and other secondary quality categories do not reflect natural kinds. Contrary to what we may have supposed, "red," "blue," and "green" are not names for natural kinds, because they do not pick out single unified properties of physical bodies. This was not a problem, however, since our insistence on traditional color categories turns out to be unnecessarily ethnocentric. Giving it up is a small price for maintaining Common Sense and Direct Realism.

All this is not to say that there can be no correlations between secondary qualities and the sensations that they cause. Heat sensations certainly depend on the temperature of the tactilely perceived object, even if they also depend on the object's heat capacity and the physiological features of the perceiver's skin. Cain Todd's *Philosophy of Wine* offers an argument for the objectivity of certain gustatory properties of wine on the basis of correlations between taste sensations and chemical features of the wine.[126] Perhaps "elegant," "overripe," and "charming" pick out natural kinds of properties intrinsic to the wine, despite the fact that wine tasters conceive of these properties in sensation-relative ways. And Byrne and Hilbert propose a method by which a scientifically sophisticated perceiver might be able to relate her sense experiences to the spectral reflectances of

[126] Cain Todd, *The Philosophy of Wine: A Case of Truth, Beauty and Intoxication* (Ithaca, NY: McGill-Queen's University Press, 2010).

visible objects.[127] If she has the right background beliefs about her own sensations, her own physiology, and the physics of light, she might be able to infer something about the relative stimulations of her retinal cones from her sense experiences and, from there, something more about the kinds of light that may have caused those stimulations. So perhaps she could develop the capacity to discover something about the perceiver-independent nature of a thing's color by looking at it. Reid's theory of secondary qualities draws our interest to these theories, because it is our scientific task to discover the connections between type-1 natural signs (sensations) and their causes. But, on Reid's theory, the outcomes of such investigations have no bearing on whether any particular secondary quality is perceiver-independent or possessed by physical objects. If our secondary quality sensations arise because of the stimulation of our sense organs by scientific properties, then secondary qualities are scientific properties, no matter the type-type correspondences among sensations and perceiver-independent qualities.

We have answered each objection to Reid's identity theory of secondary qualities individually. It may also help to note that, as a group, these objections to the identity theory have an internal inconsistency that gives us even more reason to think them unsuccessful. The non-correspondence objection conflicts with the other three. The *a priori* sufficiency, knowledge, and resemblance arguments are all non-scientific or even *a priori* objections to the identity theory. They say that such a theory is not even conceivable. But the non-correspondence objection is based on supposed scientific findings concerning the relations of our sense experiences and perceiver-independent properties of physical objects. So why would scientists investigate an inconceivable

[127] Byrne and Hilbert, 14.

hypothesis? If science has discovered that secondary qualities are not identifiable with scientific properties, then the theory is conceivable. On the other hand, if the theory is inconceivable, then the scientific findings are pointless. Thus, if one wished to object to our identity theory, one may attempt to do so on the basis of the non-correspondence objection or another, but not both.[128] So these objections were dubious even before we considered them individually

Conclusion

Direct Realism is a theory of perception worth defending. Its commonsense appeal and epistemic optimism affirm our importance as morally responsible beings, preserve our confidence in scientific investigation, and satisfy our intuitions about our own experiences of the world. We have seen that, although the Problem of Secondary Qualities presents a formidable obstacle to our acceptance of Direct Realism, there are Direct Realist accounts of perception and theories of secondary qualities, like Thomas Reid's, that can overcome this obstacle.

The Problem of Secondary Qualities infers the falsity of Direct Realism from three premises: (1) a spreading principle, that our analysis of secondary qualities should extend to perception generally; (2) an empirical claim, that secondary qualities are among the objects of our perception; and (3) a supposed scientific discovery, that physical objects do not possess secondary qualities. From these, it concludes that no perceivable qualities are possessed by physical objects, which means that Direct Realism is false.

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[128] This point is also in P. M. S. Hacker, *Appearance and Reality* (Oxford: Basil Blackwell, 1989), 141.

All three premises from the Problem of Secondary Qualities are prima facie plausible. But, while premises 1 and 2 hold up against a wide range of criticisms, premise 3 is somewhat weaker. It rests on a poorly defended hypothesis about whether secondary qualities are physically causal. They are not, it is supposed, because scientific properties account for the whole of physical causation, particularly between the objects of our perceptions and our sense organs.

But scientists and philosophers who say that physical objects do not possess secondary qualities because they are non-causal have spoken too soon. Even if we admit that causal-scientific properties account for the entirety of the causal story when it comes to the stimulation of our sense organs, this does not make secondary qualities non-scientific. On the contrary, secondary qualities can be perceiver-independent, causal, and identified in terms of known scientific properties.

One way to make these *a posterori* identifications is on the basis of Thomas Reid's theory of secondary qualities. According to Reid, secondary qualities are perceiver-independent objects of our perceptions. But our original conceptions of them are relative and obscure. We do not understand the natures of secondary qualities merely by perceiving them. Rather, we grasp them in terms of their relations to our sense experiences, which are natural signs for the qualities that cause them. The epistemic difficulty with these signs, as opposed to certain other natural signs, is that it is up to us to decipher the connections between the signs and the things that they signify. If a certain sensation signifies the smell of a rose, then we must learn this through experience and scientific investigation. And, through these investigative exercises, we may reasonably hope to gain an understanding of each secondary quality as it is in itself.

There are several strong objections to theories of secondary qualities that propose identifications between secondary qualities and perceiver-independent properties of physical objects. Most of these deal with the difficulty of finding invertible functions from secondary quality sensations to their physical causes and vice versa. Reid's theory of secondary qualities handles such objections by making a sharp distinction between sensations and physical properties, as well as by emphasizing the epistemic limitations of our original perceptions of secondary qualities. Sensations are not identical to secondary qualities, and, since our original conceptions of secondary qualities do not tell us that there must be an invertible function from sensation type to quality type, we have no reason to think that we will find such a function, outside of our own wishful thinking. We are open to investigation.

One strange consequence of the Reidian response to the correlation objections is the discovery that traditional color categories do not accurately reflect perceiver-independent color types. This does not mean that objects are not colored or that we cannot see their colors. It merely means that "red," "green," and "blue" do not reflect anything about the natures of color species, as one might have assumed. And, while one might be taken aback by this finding initially, it turns out to be a very small concession.

Other objections bar the identification between secondary qualities and scientific properties for *a priori* reasons. Scientific qualities cannot explain the phenomenological effects of secondary qualities, so they cannot be identified with them. Scientific qualities can be known by the perceptually impaired but secondary qualities cannot, so the first cannot be identified as the second. These objections, however, confuse sense experiences with their causes, which are the secondary qualities. To understand the nature of

secondary qualities, we do not need to know why they cause the particular sensations that they do. And, while we affirm that the perceptually impaired may lack a certain sensation-relative understanding of secondary qualities, we deny that this in any way inhibits them from understanding their natures.

Finally, the early modern objection to the identity theory of secondary qualities, based on the Way of Ideas demanded that our conceptions of external objects be mediated by sensations that resemble the external objects. But the Way of Ideas asks too much. If the resemblance theory were correct, then our conceptions of primary qualities would be of properties that resemble certain sensations. And they clearly are not. The point of a sword is nothing like the pain that it causes, nor is our conception of the sword identical to our conception of the pain.

Reid's theory of secondary qualities gives us a highly plausible, dialectically defensible response to the Problem of Secondary Qualities.

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