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## THE REALITY OF QUALIA

**ABSTRACT.** This paper argues for the reality of qualia as aspects of phenomenal experience. The argument focuses on color vision and develops a dispositionalist, subjectivist account of what it is for an object to be colored. I consider objections to dispositionalism on epistemological, metaphysical, and ‘ordinary’ grounds. I distinguish my representative realism from sense-data theories and from recent ‘representational’ or ‘intentional’ theories, and I argue that there is no good reason to adopt a physicalist stance that denies the reality of qualia as phenomenally available intentional contents in Brentano’s original sense of ‘intentionality’.

### 1. INTRODUCTION: QUALIA REALISM AND COLOR ONTOLOGY

I am a qualia realist. I believe that specifically phenomenal qualia are present in perception. Thus, when we see a yellow lemon in good light, we typically see that it is yellow by experiencing a yellow quale. We can experience (an instance of) the same yellow quale in the absence of the lemon, or of any yellow object. In my view, not only is the experience of the lemon’s quality real – something many will grant – but the experienced quale is real, in the sense that it exists as perceiver-dependent phenomenal content.

I am a qualia realist because I think this position permits the best account of visual perception, for both spatial and color perception – although in this paper I focus on color, and, more specifically, on surface color. We experience surface color in experiencing colored objects, and we experience such objects as if color were simply a property of the surface, on a par with its shape. I think that qualia realism gives the best account of what it is to see surfaces that are colored. Thus, qualia realism is, in my view, part of an account of quality realism about the colored surfaces of object. We see the colors of objects in virtue of having visual experience that contains phenomenal color as a subject-dependent phenomenal content.<sup>1</sup>

Philosophers have been concerned with the status of color from early days. Among the Greeks, the question arose of whether material objects are really colored or color arises only with human or animal perception. Aristotle thought that color is a real quality, and that, during perception, the 'form' of that color is transmitted from the object to the soul. Democritus is said to have held that the atoms that compose things aren't really colored, but that color arises as a merely subjective effect of atoms on perceivers. Philosophical reflections on color properties and color experience intensified during the early modern period, when Descartes and Locke (among others) developed a distinction between primary and secondary qualities. Discussion has again intensified in recent years, raising issues in metaphysics, epistemology, and philosophy of mind.

Visual scientists, who sometimes were philosophers as well, have also investigated color and color perception from the early days of visual theory. They have discovered many things about color, and continue to do so. The scientific book on color and color perception is not closed. To my mind, that means the philosophical book should remain open as well.

I have claimed qualia realism gives the best account of what it is to see colored objects, which implies that it is part of the best philosophical account of what color is. The main accounts of color ontology currently fall into three general types: objectivism, subjectivism, and dispositionalism (Hatfield, 2003a). *Objectivists* argue that color is a mind-independent property of objects. They say that, when we perceive a colored object veridically, we perceive a physical property that the object possesses independently of all perception or experience of it (ours or any other). They identify this physical property with the object's color. Currently, the most popular form of objectivism is called 'representationalism', according to which the phenomenal content of color experience is nothing but the representation of a physical property (Dretske, 1995; Tye, 1995, 2000, 2003); visually representing a physical color property *just is* a phenomenal experience, which contains no subjectively supplied content. *Subjectivists* argue that color is not a property of objects, but an internal state of the perceiver: color reduces to the subjective content of a perceiver's experience. By contrast with objectivists, they think that the notion of color has legitimate reference only to visual experience, and they deny that objects are really colored. In their view, color experience is a kind of standing illusion, although a useful one (Hardin, 1988). *Dispositionalists* also define color in relation to color experience, but that definition allows a notion of 'object color'

that ascribes a color property to the surfaces of objects in virtue of the relation between objects and the color experiences they produce. They argue that color, considered as a property of objects, consists in a relational disposition, or its causal basis;<sup>2</sup> it is a property that surfaces (and light sources) have of causing perceivers to have experiences that exhibit various phenomenal characters (Johnston, 1992; Peacocke, 1984). For dispositionalists, color as a phenomenal feature of experience is conceptually primary; they then use experienced color to define the related notion of color as a property attributed to objects (Hatfield, 1992, 2003a).

My arguments focus primarily on the objectivists and the dispositionalists, and favor dispositionalism. If a convincing version of either of these positions were established, that would remove the motivation for retreating to a purely subjectivist account. In focusing on color properties and color experience, I leave aside (for the most part) questions of color categories or color concepts. In the primary instance, we presumably categorize colors of objects in accordance with how the objects look. Along with the authors I discuss, I assume that objects can look a certain way as regards color independently of whether we have the concept of that color, or have any concept of color at all.<sup>3</sup> At the same time, I don't believe that my specific arguments for dispositionalism depend on this assumption; that is, I believe that someone who held a different view about the relation between color concepts and the phenomenal experience of color could adapt and use my arguments.

## 2. PHYSICS AND BIOLOGY OF COLOR

In my view, any account of color as a property of objects should relate that property to color perception and color experience in some way. This relation need not necessarily be dispositionalist; it may simply be explanatory, so long as the account of color as a property of objects gives, or is working toward, an explanation of color perception. This desideratum is widely shared by philosophers and color scientists, although there may be some who would not endorse it. I think of those philosophers and scientists as having changed the topic (to a purely physical discussion of light and wavelengths, perhaps), and I am not addressing them here.

My aim is to articulate a conception of colors in objects as dispositions of objects to cause color experiences in perceivers. Consequently, to understand what color is as a property of an object

(or of an object's surface) requires that we understand object surfaces, illuminants, eyes, brains, and color experiences. One doesn't need to reflect on or understand any of these things in order to have color perceptions or to classify things by their colors. But in order to understand what color is in objects, and how it is involved in color perception, we must consider these factors.

From the perspective of the physics and biology of color properties, it is interesting to consider color perception as a capacity that has evolved in sighted animals. Not all animals are sensitive to color, that is, not all of them can distinguish between the total amount of light energy (in the visible spectrum) that they receive at a given location in their eyes, and the distribution of that energy across the visible spectrum (Jacobs, 1981, ch. 2). Only animals possessing eyes that are differentially sensitive to wavelengths can discriminate color (or colored surfaces).<sup>4</sup> Among color-sensitive animals, some are called 'dichromats' because their retinas possess only two types of light-sensitive cones, which means that they can discriminate fewer color qualities (say, blue and yellow, plus gradations) than can other animals, the 'trichromats', whose retinas contain three types of light-sensitive cones that allow them to discriminate more color qualities in objects (say, blue, yellow, green, and red, plus gradations).

Among mammals, humans and some other primates are trichromats. The three types of cones in their retinas are maximally sensitive to light in the short-, middle-, and long-wavelength regions of the visible spectrum, and these three types are therefore called S, M, and L cones. Primate trichromacy evolved from short- and long-wavelength dichromacy some tens of millions of years ago, when the long-wavelength cones separated into middle- and long-wavelength types, thus yielding three types in all (Goldsmith, 1990). This development permitted greater discrimination among surfaces that reflect light predominantly from the middle- and long-wavelength portions of the spectrum (such as green leaves and yellow or red fruit).

Color and color perception have their basis in the physical properties of the world and in the biological and psychological capacities of organisms that are sensitive to color, not all of which are sensitive in the same way. The fact of biological diversity by itself suggests relativity between organisms and colors, but I won't rest my case for dispositionalism there.

The case for dispositionalism arises from a scientific analysis of the causal basis of color perception, starting with the 'new science' of the 17th century. The genesis of dispositionalism as a theory can best be understood against the background of the theory that it supplanted.

The standard view had been that color is a 'real property' in the Aristotelian sense. This meant that in the surfaces of things there is a property, color, which is transmitted to the mind 'without its matter' during perception (Simmons, 1994). On this view, the mind receives a copy or instance of the color property that inheres in the surfaces of things. Once transmitted into the brain (according to medieval Aristotelian accounts), this instance expresses itself as a color experience (Hatfield, 1998).

Aristotle's physics of color was a plausible account of the facts as known, but it was wrong. Early modern philosophers and scientists picked away at the Aristotelian view that things contain different 'forms' that account for their effects, ultimately replacing it with a view that there are a few basic physical properties that account for all the physical effects of things (on each other, and on perceivers). According to the mechanical philosophy of the 17th century, these properties were (primarily) size, shape, and motion. Color as a 'real quality' was banished from a world of particles in motion; color as a property in objects was reconceived as a physical disposition to affect light in such a way as to cause sensations of color (phenomenal experiences) in perceivers. In this way, physical colors came to be denominated in relation to color sensations or color experiences.

Dispositionalism was enshrined in the distinction between primary and secondary qualities, according to which color in objects is a secondary quality. Contrary to some common (and recently repeated) misconceptions, secondary qualities as Locke construed them are not 'in the mind'; rather, they are physical properties of objects (properties consisting in configurations of the primary qualities such as size, shape, and motion) that have the 'power' to cause specific types of color sensations in perceivers (Locke, 1690, II.viii.10–13). For an object to possess color as a secondary quality is for it to possess a power to cause the sensation or experience of color in perceivers (Ayers, 1991, vol. 1, ch. 23).

Newton subsequently reconceived the basic physical properties of things in terms of mass, force, and their distribution. Light was reconceived as consisting of rays (analyzed as either particles or waves, and more recently regarded as having aspects of both) with differing refractive properties that correlate with the color of the light. Newton's discovery of the refractive properties of lights of different colors did not by itself yield an adequate theory of color vision. Modern theories of color vision arose in the nineteenth century, with the discovery of the three types of color receptors mentioned above. Color vision arises because the nervous system compares the

responses from the three cone types, thereby allowing the visual system to respond differentially to stimuli that reflect differing wavelengths of light into the eyes.

From a biological and psychological perspective, sensory systems allow organisms to navigate their environment and to discriminate and detect what's in it. In this functional context, we can distinguish the environment and its properties from the ways that perceiving organisms represent them (without yet deciding whether some sensory properties are defined relationally and dispositionally). We may then ask both *what* gets represented in perception and *how* it gets represented. The features of objects that are represented by human vision include spatial properties and colors.

Let us consider various answers to the question of what color experience represents in the environment. Subjectivists maintain that color experience has no representational content, or else has only an illusory one. Objectivists say that the phenomenal content of color perception is nothing but the representation of a physical property: the bare (visual) representation of the physical surface property by itself constitutes phenomenally experienced red or yellow. (If one experiences an illusory color, then one's color experience mistakenly presents it as being the case that a certain physical property is present when it isn't; the mistaken representation of the physical property creates the phenomenal experience of the illusory color.) By contrast, dispositionalists ascribe phenomenal red or yellow to perceptual experience as an intrinsic feature of experience itself, and they hold that perceivers are so constituted that light stimuli of various kinds cause various kinds of color experiences. Although dispositionalists may speak of phenomenal color as representing the surface properties of an object, they (unlike representationalist objectivists) do not think that the phenomenal content of color experience is reducible to the bare representation of a physical property.

In thinking about what color experience represents, it is useful to ask what color perception might be good for. We've seen that color perception allows perceivers to respond to more than the lightness and darkness of objects. Further, because objects look different, colorwise, organisms are better able to tell them apart visually. The physical basis for the objects' looking different as regards color (when seen under the same viewing conditions) is that they reflect light differently.

The comparative amount of light of various wavelengths that a surface reflects is called its 'spectral reflectance distribution' (SRD). An SRD describes the percentage of light reflected by the surface of

an object for each wavelength in the visible spectrum. Perfect reflectance would be 100%, complete absorption by the surface would yield 0%. Natural surfaces typically reflect varied percentages of light in the visible spectrum from any given point of the surface. The peaks and valleys, the shape of the SRD, determine what color a surface region is perceived to have under a given illumination and with other conditions held constant. Generally speaking, a surface that predominantly reflects light of short wavelengths will appear blue, while one that mainly reflects long wavelengths will appear red. However, the relation between SRDs and color perception is complex, as I will discuss in greater detail.

The color properties of surfaces depend on their SRDs. Objectivists and dispositionalists disagree over whether color amounts only to the SRD (or to a grouping of SRDs, perhaps along with relations to SRDs of neighboring surfaces), or whether color must be analyzed relationally and dispositionally. Representationalist objectivists hold that colors in objects just are their SRDs, and that color experience is constituted simply by representing an SRD (Hilbert, 1987) or a grouping of SRDs (Dretske, 1995, pp. 88–93; Tye, 1995, pp. 146–147). Objectivists often put this point by saying that color experience is ‘transparent’ (Tye, 2000, pp. 45–51). To them, this means that there is no mediating subjective element of experience that constitutes phenomenal color. Rather, the physical property, present to the mind representationally, constitutes the phenomenal color (Dretske, 1995, pp. 88–93).

The dispositionalist posits phenomenal reds and yellows as subjective features of experience that the SRDs of object surfaces cause in accordance with the laws of color perception. Dispositionalists may even think that these phenomenal colors represent, in some way or other, a surface property of objects. But such representation is not transparent in the relevant sense. Some dispositionalists hold that phenomenal color (nontransparently) represents its physical basis in things (Peacocke, 1984). I prefer a version of dispositionalism according to which phenomenal color stands as a sign for an unanalyzed surface property (as discussed below). In either case, dispositionalists are committed to there being a relation between two distinct things: a phenomenal color and a surface property. They think that the phenomenal color is causally correlated with physical surface properties, and that it represents or signifies the surface properties of things, without transparently making those properties present in consciousness so as to constitute phenomenal color.<sup>5</sup>



Objectivists and dispositionalists agree that color experience permits us to discriminate physical objects with different SRDs. Without yet trying to settle whether to take a ‘transparency’ or a ‘sign’ view of this representational relation, we can ask what kinds of discriminations color vision makes possible. By studying how color vision helps various species, scientific work in animal color vision has suggested that the capacity for discriminating the surface colors of objects serves the following functions (Jacobs, 1993, pp. 456–457):

- (1) to provide contrast not based on achromatic brightness or lightness;
- (2) to aid in the detection of small objects in a dappled environment, where lightness cues are largely masked (e.g., fruit in trees);
- (3) to aid in segregating objects that are partly occluded (e.g., fruit seen through leaves);
- (4) to identify objects by perceiving their color stably across varying conditions of illumination (requiring something approaching color constancy).

I have already discussed (1). In (2), the chromatic contrast mentioned in (1) enhances the salience of small objects (red or yellow fruit) in a field of differing color surrounding them (green leaves). In (3), chromatic unity (having a single hue: red, yellow) permits a surface to be seen as continuous even though, from a specific locus, only parts of it are seen (intervening objects occlude some parts of the surface). Finally, in (4), the hues that are stably perceived in specific objects or kinds of object permit those objects to be identified or reidentified by color.

The literature on comparative color vision, and on the evolution of trichromacy in primates, stresses functions (1)–(3). Genetic analysis suggests that mammalian color vision evolved through selection on naturally occurring variation in the middle-wavelength-sensitive (M) cones. The short-wavelength cone is thought to have been stable, but the M cone is believed to have exhibited variations that in time became the M and L types of cone (Goldsmith, 1990). Trichromatic color vision of this sort would allow better discrimination of yellow, red, and orange objects found among green leaves. This ‘fruit detection’ hypothesis has long been favored in explaining the development of trichromacy (Jacobs, 1993, p. 457). It supposes that evolution opportunistically took advantage of the fact that if the visual system compares the outputs of the M and L cone variants, some objects become easier to discriminate on the basis of color.



According to this point of view, objects ‘gained’ new colors when trichromacy evolved and the visual system came to partition the chromatic appearances of surfaces in more finely grained ways. Fruit and leaves now appeared chromatically more distinct and hence were easier to discriminate than before. On this view, the function of color experience is to represent surfaces in distinctive ways so as to enhance their discriminability and perhaps to aid in the identification of object kinds. Any such account assumes that perceived colors correlate with the reflective properties of objects, even if evolution acts opportunistically to change some of those correlations (by adding new ones). However, it remains to be seen whether such accounts must regard color experiences as specifically representing physical reflective properties such as SRDs.

### 3. COLOR AS A PSYCHOBIOLOGICAL PROPERTY OF OBJECTS

With this primer in place, my reasons for preferring dispositionalism can be stated briefly, in terms of comparative advantages. Objectivists seek a single physical property to be identified with the color of an object. This property then constitutes the content of color-perceptual representations of surfaces. As objectivists, they must seek a mind-independent property. I don’t believe that they have or will find any good candidates for a categorical (or intrinsic) physical property that is the color of a thing; the only properties that are good candidates for object color must be defined relationally with reference to visual experience.

The best contemporary reason for this conclusion is the phenomenon of metamerism. For natural vision systems, such as the human perceptual system, each SRD does not yield a unique color perception (under a given illuminant). Rather, many SRDs, even those whose graphs exhibit widely divergent shapes, may yield the same perceived color: they are ‘metamers’ of one another (see Hatfield, 1992). Although ‘metamerism’ means etymologically ‘sameness of parts’, here it means ‘sameness of color response’ to physically distinct SRDs. The SRDs that group metamERICALLY do not constitute a *physical kind* independent of color vision; there is no strictly physical property or principle that relates them. From the fact that we (normal perceivers) perceive objects having physically distinct SRDs as instances of the same surface color, I conclude that the quest for a single mind-independent color-property fails.

Objectivists of course know about metamerism, but they don't agree with my conclusion. One response (Tye, 2000, pp. 160–161) is that the metamERICALLY matching SRDs together form a disjunctive physical property, which is the mind-independent property that the visual system detects in color perception. The problem with this proposal is that metamers are perceiver relative. They are defined relative to their (subjective, phenomenally characterized) effects on perceivers.

The objectivist representationalist Michael Tye (2000) seeks to address this problem by adopting a physicalist dispositionalism, one that defines object colors by their tendencies to affect other physical objects. He proposes to define object colors through their effects on the S, M, and L cones. A red object is one that, *ceteris paribus*, causes a certain pattern of activation across the three types of cone; metamERICALLY matching red objects would all cause the same pattern of activation in the S, M, and L cones. This renders surface colors as dispositions, but the reference to cone types ostensibly is a way of defining these dispositions as existing independently of minds. Hence, Tye holds out hope for a reductive physicalist dispositionalism (2000, pp. 149–150).

While it is true that we can define surface colors relative to the physical effects of incoming light on the three cone types, we cannot do so without appealing to color experience. We can isolate the pattern of cone firing that signals (to the theorist) the presence of a red object only by noting that this pattern of cone firing causes a red-experience. That is, we can isolate the pattern only by appealing to phenomenal or psychological facts. The 'disjunctive properties' that the objectivist tries to use as a physical basis for reduction have no interest or significance from a purely physical point of view. Such properties can be defined only in relation to the responses of color perceivers: they are not mind-independent.<sup>6</sup> Hence, Tye's position fails as a version of objectivism.

Another objectivist response is to say that each SRD is actually a distinct color, and that the human visual system is simply incapable of resolving all the colors there are. So, if two SRDs produce exactly the same perception of green, this just shows that the normal human visual system is blind to some colors (Hilbert, 1987). For a committed physicalist, such talk of illusion or misrepresentation makes some sense. However, from a biological and psychological perspective, it is problematic, if we accept that the function that colors serve is to enable us to tell things apart. In fact, from such a viewpoint it presumably is better not to discriminate each SRD, since that would

create too vastly a variegated color world. That objects are grouped into a small number of hue ranges, rather than each SRD producing a distinct hue, presumably makes our color world more useful and manageable. Further, since SRDs are grouped relative to the color experience that they produce, it is not objectionable for disposition-*alists* to define the physical color-property as an arbitrary disjunction (from a physicist's point of view). The groupings of SRDs are conceived as driven evolutionarily by enhanced discriminability for objects (and not by the search for a chromatic partition of object surfaces that coincides with a physically precise description of the surfaces' reflective properties).

Since physicalism does not otherwise have much going for it (as I will observe below), I take it that the comparative advantage goes to the biological and psychological perspective. Color perception is, after all, an evolved psychological capacity of biological systems.

There is, however, a variant of the 'one SRD per color' position that seeks biological plausibility. If we assume that in ecologically pristine environments there is only one naturally occurring SRD per hue or shade, then we could define that as the 'real' physical color (Dretske, 1995, pp. 89–93). Suppose that tomato red has only one SRD, strawberry red another, geranium red another, and so on. By hypothesis, there would be no natural metamers; metamERICALLY matching SRDs, if artificially produced, would yield color experiences deemed to misrepresent, for they would yield a color experience that, according to nature, should signal the presence of a specific biological kind.

This conjecture is interesting (see Hatfield, 1992), but problematic. It has not been established that, in the ecological circumstances in which trichromacy evolved, there were unique SRDs for each distinguishable shade of red and green. In this regard, there needs to be more sampling of extant SRDs in natural environments. Moreover, even if a one-to-one correspondence provided the original selective pressure (in the fruit-detection scenario), that does not entail that primate populations have maintained color vision because distinct hues signal distinct biological kinds. The general enhancement of discriminability across various chromatic circumstances (including naturally occurring metamers in non-fruit domains) might well be responsible for the maintenance of trichromacy. More significantly, there are important challenges to the one-SRD/one-shade hypothesis. All pieces of ripe fruit of a given kind do not have the same SRD: they vary in appearance. So there is no single SRD to signal each type of fruit. Moreover, because color constancy is not perfect and natural

lighting conditions vary, a given SRD does not always produce a unique shade, and may under some conditions appear the same shade as does another SRD under slightly different illumination. Color vision does not achieve the presumed goal of recovering unique SRDs, nor is it apparent that that is or should be its goal.

If there is no well-conceived physical property that can on its own serve to partition colors as properties of objects, what is the basis for color properties? I maintain that color properties should be classed relative to color perception or color experience. This means that theories of color as an object property must begin (conceptually) with color experience. Given that there is no way to reduce the phenomenal content of color experience to a representational content that transparently presents a distal property,<sup>7</sup> both the existence and character of the object quality must depend on the experience itself. By saying that the object quality depends on experience, I mean that the phenomenal characters of color qualia are features of how colored objects appear to us, of the experience, that is, by which we see colored objects. I also mean that we should construe the qualitative character of color experience as developing out of the subject's capacities for phenomenally presenting objects.

We might think of it this way. Mammalian visual perception presents the spatial properties of things. It is initially specialized for presenting surfaces phenomenally to perceivers. It presents surfaces as spatial structures, and also as colored. If there were no chromatic color perception, all surfaces would appear with shades of grey, from black to white.<sup>8</sup> But, with the development of color vision, surfaces came to be presented with one or another phenomenal color. Because of the spatial structure of experience, these colors are presented as being properties of the surfaces. There is no need to 'refer' or 'project' the color experience outwardly. Evolutionarily, color experiences are a kind of phenomenal infusion into pre-existing perceptual presentations of surfaces. The phenomenal character of this infusion is not generated by its representational content (as in objectivist representationalism). Rather, we may imagine that mutation generates it, and that its etiology lies in the capacities of neural structures to generate phenomenal characters.

From a phenomenological point of view, and from the standpoint of ordinary experience, objects are presented as if color were a simple categorical property of the surface. That is the manifest representational content of color experiences: they present objects as having a (categorical) color property. The content of the color experience makes no further comment on the color property in the object. Color

experience simply presents the object surface as having a distinctive character. Beyond the implication that, with conditions held constant, surfaces that look different chromatically are different in some way, color qualia of themselves don't contain further content about the properties of surfaces.

As theorists, we can now seek a further characterization of the relation between phenomenal color and the physical object-surface. The phenomenal color presents the object surface under a minimal characterization, compared to the physicist's description of the surface.<sup>9</sup> The capacities of the brain for presenting phenomenal character do not arise from conceptually sophisticated physical descriptions such as are embodied in color experience according to the representationalist. From the present theoretical point of view, color experiences are blank signs for the color properties of objects. They contain the content that a thing has a color property of a specific kind (yellow, red, etc.), but they do not provide any further details. We, as theorists, can correlate the signs with their causal conditions under a physical description and we can determine that the color property in objects is a disposition to produce color experience. However, evolution established those correlations in the visual system through the trial and error of natural selection. It did not build into color experiences the content that they result from dispositional properties.

Phenomenal colors are aspects of our experience under which we experience surfaces, and they are arbitrary signs by which we distinguish surfaces. Such signs represent things that in fact have causally relevant physical properties (SRDs or disjunctions of SRDs), but they are not representations of physical properties as such: they do not carry in their representational content a specification of the SRDs that cause them. They serve to group surfaces according to their effects on perceivers, and so as to enhance the discriminability of objects. They present the surfaces of objects *in accordance with* the distinctive dispositional bases objects have for producing color experiences, but we need not construe them as *representing* the specific physical properties that constitute a particular dispositional basis. Color qualia, as signs, simply present the object as having a color property of a kind that differs from other color properties.<sup>10</sup>

Accordingly, phenomenal colors are arbitrary signs for the properties of surfaces. Neither we nor our visual systems – nor the visual systems of our trichromatic primate ancestors – need to know this or to be able to reflect on this in order for it to be the case. Indeed, as previously noted, objects are presented phenomenally as if color were

a simple property of a surface. Evolution need not have built into color experiences the content that they are produced by dispositional (relationally defined) properties of objects for it to be the case that they are so produced. It is as theorists, not as bare perceivers that we discern that the dispositional account provides the best color ontology.

On this view, things are red, blue, green, and yellow because they produce red-, blue-, green-, and yellow-experiences in normal perceivers under standard conditions.<sup>11</sup> I thus disagree with the third major position, subjectivism, by maintaining that we can use the dispositional basis for things to produce such color experiences to define color as a property of objects.

Subjectivists reject dispositionalism largely because they don't think that the notions of normal perceivers and *standard conditions* can be made good. They base their argument on the variability among perceivers who are classed as 'normal' trichromats, and on the variability of even the same perceiver to the same SRD under conditions that would all be classed as 'standard'. They reason that such variability is inconsistent with construing relationally grouped SRDs, or metamers, as instances of a dispositional color property in objects (Hardin, 1988).

The subjectivists are right about the variability, but I don't accept their conclusion. Their argument tacitly relies on an assumption about what kind of property a color property would be if it were actually a property of objects: that the relevant property would be the disposition to unvaryingly produce a determinate shade or hue. Thus, on their interpretation of dispositionalism, for a given SRD to be an instance of yellow a perceiver would always have to see it (under standard conditions) not merely as in the yellow range, and not merely as some determinate shade of yellow (because phenomenal color shades are determinate), but as the same determinate shade each time. Subjectivists attribute to the dispositionalist the view that colors in objects are dispositions to produce the experience of particular determinate shades of color (rather than, say, a range of shades).

Many dispositionalists make this assumption, but they needn't and shouldn't. The functions of color vision (as I sketched them earlier) are served merely if color vision enables us to better discriminate some objects from other objects, and enables us to re-identify them as those objects when we encounter them again. Thus, a lemon would not always need to appear with the same determinate shade of yellow in order to be better discriminable from green leaves.

And for us to reidentify it by color as a lemon as opposed to an orange or a ripe tomato, it need not appear with exactly the same determinate yellow, so long as it falls in the range of yellow. One outcome of taking the biopsychological account seriously is that it would lead us to view object colors as mapping one-many onto the experience of hues, within a range of shades (see Hatfield, 1999, 2003a, for further discussion). This would be a kind of reverse metamerism. Of course, there would need to be boundaries: if a yellow object is seen under aberrant lighting conditions (say, under monochromatic blue light), then it appears dark bluish grey and not yellow, and so it doesn't appear to have the object color it does. Or if a red object is seen by a nonstandard observer (say, someone who is red-green colorblind), then it may not generate a red-experience. These are violations of standard conditions and normal observers.

If we reject the assumption about hue determinacy, the subjectivists' arguments lose their force. Dispositionalism thereby gains the comparative advantage over subjectivism because it avoids treating a functionally successful mode of perception as inherently illusory.

#### 4. EPISTEMOLOGICAL WORRIES

Dispositionalism, as I have developed it, is an account of how we see surface colors. It is committed to the notion that objects have colors and that we see them. For us to see a surface color is for an object's surface to cause us to have a visual experience of a phenomenal color through which we represent the surface of the object (for normal observers under standard conditions).

Be that as it may, dispositionalist positions have been charged with the same offense that characterizes subjectivism: they render color experience illusory. The charge arises from the fact that objects appear as if phenomenal color is an inhering categorical property in things. Dispositionalism renders color experience illusory because it tells us that things aren't colored in the way that they appear to be. After all, things don't appear to us as possessing dispositional bases for causing phenomenal experiences of color in us; they just look colored.

This objection rests on two assumptions that I will challenge. The first is an assumption about what it means for things to look colored; the second is an assumption about what ordinary observers should be able to tell about their own experience. I call the first the 'simple



property view'. I call the second the 'metaphysical transparency view'.

The simple property view holds that for a thing to look colored is for it to look like it has a property, color, in or on its surface. Objectivist representationalism embraces this assumption, and proudly proclaims that its own analysis of color phenomenology asserts that the color experience just is the representation of a surface property. However, dispositionalism can also say that object surfaces are colored and that they are presented in visual experience as being colored. Its analysis of what this means, however, differs from that of objectivism. The dispositionalist says that the property of color in an object is a dispositional basis of its surface for causing experiences of phenomenal color of a certain kind. (If illumination or surrounding colors are allowed to vary, then the *kind* of phenomenal experience might comprise a range of shades rather than a single shade.) This phenomenal color is an experience of the object's color; in my version of dispositionalism, phenomenal color represents the surface as having an unanalyzed color property. So far, both positions permit one to speak of 'the surface colors' of objects, and of the way those colors appear to observers.

The metaphysical transparency view comes into play at this point. Tye claims (1995, p. 146, 2000, p. 146) that the dispositionalist view makes our perceptual experience of color illusory. He argues that, if color in objects is a disposition to cause color experiences of certain kinds, then we should be able to see this by simple inspection. That is, if dispositionalism were true, then objects should manifestly appear to have the disposition to cause color experiences in us, instead of simply looking colored. Since they don't so appear, dispositionalism allegedly renders color experience illusory.

There is a lot being assumed here. First, regarding illusion. Tye seems to adopt a notion of illusion such that if things don't look as they are in some respect, the appearance is an illusion. But 'looking as they are' is a notoriously slippery notion. From the window of a jetliner in midflight, the roads and houses below look smaller than they usually do. Is that an illusion? As we look down a highway, the sides of the road appear to converge in the distance (even though we know they don't, and even though we know that highways of constant width look just like this). Is that an illusion? Clearly, the notion of illusion needs further specification. Normally, we take it that an appearance is illusory if objects appear otherwise than we expect them to appear in those circumstances (Hatfield, 1986). Thus, close at hand we expect lines that are straight to appear straight, and lines of

equal length (presented in plain sight) to appear of equal length. The various line illusions provide instances in which these expectations are not met: we call the resulting appearances 'illusory'.

But how should we expect a dispositional property to appear to us? Should we expect it to be obvious to all normal perceivers that color in objects is a disposition to produce color experiences? Given the functions of color vision sketched above, there is no reason for us to expect so, any more than we should expect water to appear really to be H<sub>2</sub>O, or lilies to appear to be of the same botanical family as onions and garlic. Indeed, we accept that some substances smell like they would be good to eat, and such odors are a generally reliable guide to nutritional properties, but we don't expect to be able to find the biochemistry of nutrition directly revealed in the phenomenology of odor.

At stake here are differing conceptions of what we should expect our sensory experience to reveal to us about itself. Philosophers who complain that colors in objects don't appear to be dispositional properties seem to expect our sensory experience to be *metaphysically transparent*: if we attentively inspect our sensory experience, it will reveal its real nature to us.<sup>12</sup> However, there is no reason to suppose that the senses have evolved in order to reveal the principles of their own operation, or to suppose that the true physical descriptions of the object properties that cause (and are signified by) our sensory representations should be transparently available in consciousness. Assuming that the function of the senses is to allow us to navigate the environment and that the function of mammalian color vision in particular is to enhance the discriminability of surfaces, then, if the senses present us with colored surfaces that appear the way they should given their object colors, there is no illusion.

On the dispositional account offered here, a colored surface should appear as if the phenomenal color were in or on the surface, because the function of color experience is to present the surface in a manner that enhances its discriminability. This account distinguishes between a surface looking as if it possesses a disposition to cause color experiences in us, and looking as it should look if it has such a disposition. Color experience will serve its function, and will fit the dispositional account, if a surface looks however it should given its dispositional color properties. In this regard, it is not illusory if objects are presented phenomenally as if color were a categorical property of the object surface.

The account takes for granted that there are regular relations between color experience and physical properties that underlie object

colors.<sup>13</sup> It also takes for granted that color experiences fall into phenomenally distinguishable groupings. Thus, observers can readily distinguish phenomenal yellows from phenomenal reds. To this extent, color properties are partially revealed in experience. From our color experience (in standard conditions) we can tell that two objects have different colors (yellow vs. red). We know *how* yellow and red look. We can't tell, just by looking, *what* yellow and red are as properties of an object surface. But that's alright. It is too much to expect of color experience that a surface transparently look as if it possesses a disposition to cause color experience in us – even if, given the proper theoretical knowledge, a perceiver may come to see that a surface has such a disposition.

##### 5. ANALYTIC OBJECTIONS FROM – ‘OUR ORDINARY VIEW’

Some philosophers who write about color think that conclusions about what color is must be responsive to our ‘ordinary’ ways of thinking about things. According to such philosophers, if a particular metaphysical thesis about ‘what color is’ does not “capture the content of our everyday beliefs about the colors of things” (Stroud, 2000, p. 189), that constitutes grounds for rejecting that metaphysical thesis. Such philosophers insist that metaphysics be responsive to our so-called ‘ordinary’ conceptions of ourselves as thinking, feeling, sensing beings. This approach holds that it would be unacceptable to find that most of our ordinary ways of thinking are in error. Accordingly, metaphysics must accommodate ‘who we are’ into ‘what there is’.

I have no trouble with the claim that metaphysics must accommodate human beings, including their thoughts, feelings, and experiences, into what there is. I take it as obvious that human beings exist, and that they think, feel, and experience many things. Any view that tried to deny this would put itself into a pretty big hole, as regards credibility. It would need a powerful argument to lift itself out, and I at least have never seen such an argument on behalf of a generally eliminativist metaphysics.

But to acknowledge this much is not to give our ‘ordinary’ conceptions the kind of metaphysical authority that these philosophers give them. Accommodating human beings into a philosophical view of the world, and allowing ‘ordinary’ beliefs to decide particular metaphysical questions, are very different things. Ordinary beliefs should constrain metaphysics in some areas. For example, I’d grant

that ordinary beliefs about what a family portrait should look like, or how a lawn should be kept, can and should have some impact on the metaphysics of family portraits and of lawns. But when we are trying to understand color as a property, I see no reason to give 'the ordinary' much weight. Indeed, in this context I'm not sure what 'the ordinary' is. At the University of Pennsylvania, where nearly all undergraduates take courses in introductory psychology, the 'ordinary' understanding of color theory among people on the street might be fairly sophisticated, at least to the point of understanding basic scientific findings. Somewhere else, 'ordinary' people might never have thought about what kind of property color is, and might simply think that being colored is just a matter of being colored.

In philosophical circles, 'ordinary conceptions' about color tend to be conceptions about what kind of property color is – most usually, that it is a categorical property rather than a relational one. To my mind, framing such a distinction is not really 'ordinary' at all: it is the product of previous philosophy, embedded in unexamined 'common sense' (see also Russell, 1953).

It seems to me that philosophers should be prepared to find that science tells us things about color that we didn't know or even believe before. Philosophers should be willing to have it turn out as a matter of scientific discovery that, e.g., color is a useful illusion, so that, technically speaking, things aren't really colored, or that, e.g., color is a perceiver-relative property. They should be prepared to accept these findings as proposals about what color is, from the perspective of current scientific theory. In ontology, we should give considerable weight to evidence supplied by the best current science (subject, of course, to philosophical interpretation).

This does not mean that the findings of science or of metaphysics should automatically be taken as proposals for how to talk. Someone could propose the theory that things aren't really colored, but do so only for the purposes of metaphysics and science and not expect that people more generally would stop talking about the colors of things. (I don't, of course, interpret the results of science as actually implying that things aren't really colored.)

To see that scientific advances need not change entrenched forms of speech, consider a famous development in the history of astronomy. When the Copernican theory of the solar system was accepted, it became the proper scientific account of what happens at dawn and at dusk: the earth's rotation brings the sun into view, and subsequently the rotation causes part of the earth to occlude the sun. Yet, nearly five centuries later, we continue to talk about 'sunrise' and 'sunset'. That

is, when scientists discovered and ordinary folk came to believe that the sun doesn't really rise, that was not taken as a mandate to stop saying 'the sun rises'. Nor was continuing use of 'sunrise' taken as a threat to Copernican theory.

Here I find myself at odds with some recent philosophical arguments concerning the relevance of ordinary beliefs to color metaphysics. Stroud (2000) urges that we should give due consideration to the predicative implications of our 'ordinary' perceptual talk. He offers the following eight sentences that express a perceptual or cognitive relation to color and colored things (Stroud, 2000, pp. 103–104):

- (1) Jones sees yellow.
- (2) Jones sees something yellow.
- (3) Jones sees something to be yellow.
- (4) Jones sees a yellow lemon.
- (5) Jones sees a lemon to be yellow.
- (6) Jones sees that a lemon is on the table.
- (7) Jones sees that there is a yellow lemon on the table.
- (8) Jones believes that there is a yellow lemon on the table.

Although Stroud uses these eight sentences for a variety of purposes, the main drift of his discussion is to consider various ways in which sentence (1) can be related to the others. His aim is to test the credibility of various interpretations of what (1) describes as 'seen', and what (2)–(8) attribute to the lemon on the table. In particular, he is concerned with interpretations of (1) that have it attribute to Jones the experiencing of a sensation, that is, of a phenomenal yellow that is intrinsic to that experience and yet is distinct from the physical properties of the surface of the lemon and of the light reflected from it. He finds this way of thinking about (1) to be in tension with what sentences (2)–(8) imply, because these latter sentences attribute 'yellow' to the lemon as a property. In Stroud's view, if sentences such as (8) are true, then we must take seriously the view that yellow is a (categorical) property of the lemon on the table (Stroud, 2000, pp. 114–116). Taking ordinary talk seriously yields a presumption in favor of naïve realism about the color property.

I am not inclined to think that ordinary talk can bear even this much metaphysical weight as regards the color property. Consider what conclusion we might draw by applying a similar analysis to the Copernican case and taking seriously the ordinary talk of 'sunrises':

- (A) Smith believes that the sun rose at 6 a.m.
- (B) What Smith believes is true.
- (C) We must grant that the things mentioned in Smith's true beliefs have the properties that Smith predicates of them.
- (D) Therefore, the earth doesn't turn; rather, the sun rises.

The conclusion (D) is ludicrous. But why so? Because we are well educated about the solar system and the diurnal rotation of the earth, and yet we are willing to talk of 'sunrises' without supposing that, in so doing, we contradict scientific theory.<sup>14</sup> We are able to let ordinary talk play its ordinary role, without supposing that our use of an antique expression from an earlier conception of the solar system commits us to those earlier views.

In order to investigate further the use of 'ordinary' talk in metaphysics, I want to focus on a problem that allegedly arises from taking sentences (2)–(8) seriously while also holding that sentence (1) reports Jones's experience of a merely phenomenal quality. According to Stroud, if we take Jones to believe that 'yellow' is a phenomenal quality and that 'yellow' is possessed by objects, we must ascribe to Jones the "unintelligible" thought that a "sensation" has been "transferred" to the object. This ascription is unacceptable, says Stroud, on the principle that "someone could perceive something to have a certain property only if the thought of its having that property made sense to him" (Stroud, 2000, p. 111). Stroud asserts that it is "unintelligible" to suppose that subjective properties of sensation "belong to" external objects (Stroud, 2000, p. 113). That is, if (2)–(8) ascribe a categorical property of yellowness to the lemon, and if (1) refers to a sensation, then these sentences, taken together, allegedly ascribe the quality in the sensation to the lemon in an "unintelligible" way.

My problem here is: 'unintelligible' to whom? Consider a set of corresponding sentences pertaining to the feeling of heaviness.

- (1') Smith feels heaviness.
- (2') Smith feels something heavy.
- (3') Smith feels something to be heavy.
- (4') Smith feels a heavy book.
- (5') Smith feels a book to be heavy.
- (6') Smith feels that a heavy book is in his hand.
- (7') Smith feels that there is a heavy book in his hand.
- (8') Smith believes that there is a heavy book in his hand.

Sentences (2')–(8') seem to ascribe heaviness as a property to the book. (1') can be read as the report of a feeling or sensation. If these

sentences are true, must we ascribe to Smith an understanding of the property of being heavy?

I want to consider two cases. In the first case, some of us believe that Smith has ‘spread’ a felt quality on the world, even though Smith himself doesn’t believe that. In the second, we ask whether it is necessary that Smith be able to ‘make sense’ of what heaviness is in order for us to think that he believes true sentences ascribing heaviness to things.

In the first case, let us suppose that Smith is Aristotle, who believed that objects have an absolute quality of heaviness. Aristotle considered that this quality is ‘expressed’ in our sense experience of heaviness, as a case of ‘like knows like’: it is as if the quality of heaviness in the object has migrated into the sense experience (and subsequent intellectual representation). Later philosophers who disagreed with Aristotle described this relation between the qualitative ‘form’ in the object and the subsequent sensory representation one of ‘resemblance’, but Aristotle’s own followers used the term ‘similitude’ (see Hatfield, 1998, and Simmons, 1994). Aristotle further held that things having the absolute quality of heaviness seek the center of the universe, which, for that reason, is the center of the Earth. Things would seek that center even if the Earth were not already in place.

Aristotle and his followers held beliefs that Stroud finds that “we” cannot even think: that qualities as experienced in sensation are in things, that an object would be drawn toward a region even though no matter like it (and no matter at all) was already there, and so on. We might believe that Aristotle and his followers believed these things because they reasoned by analogy directly from their experience of heaviness to the properties of heavy things. Holding up a heavy thing requires an exertion of effort; we feel our effort in lifting and holding the thing. Perhaps Aristotle or his followers (wrongly) ascribed something like that effort to heavy things, in their strivings to reach the center of the world.

What we take to be ‘intelligible’ depends on what we already believe. And what ‘we’ believe changes. Today, we think that books are heavy because of their comparative mass in proximity to a much larger mass. This is thought about in two ways: a gravitational field of attraction exists between the book and a larger mass, say, the Earth; or the book has a tendency to move along a certain line in curved space-time that leads it toward the large mass.

Does Smith need to be able to ‘make sense’ of the force of gravity and of action at a distance, or of curved space-time, in order to have the belief asserted in (8’) and for that belief to be true? I think not. We



can allow Smith to have true beliefs about states of affairs even if he does not really understand the property that the object has or that he ascribes to it. If we attribute a specific false belief to Smith, such as that heaviness is an internal striving downward (or centerward) of an object, we still can allow him to truly believe that books are heavy, even though he doesn't understand what heaviness is. Presumably, we allow that Aristotle could truly believe that logs (or stones) are heavy. Despite his grossly false understanding of heaviness, Aristotle surely knew something about heavy things, such as that marble is heavier than timber. We should be prepared to allow that his talk can function for everyday purposes, and that (8') can be true, even if his way of talking and thinking implicitly contains a bad theory about how things are. But we ought not to search for acceptable metaphysical theses by analyzing such a person's presuppositions when he talks about heavy things.

In my own dispositionalist account, Jones can believe (8), that lemons are yellow, without knowing *what yellow is* as a property of objects. Suppose that yellow in objects is a disposition to cause an experience of phenomenal yellow in a perceiver. Then Jones truly believes of a lemon that it is yellow just in case the lemon in fact possesses this disposition (whether or not she has any beliefs about dispositions, or even possesses the concept of a disposition). In order to have a true belief about a colored thing, Jones no more needs to understand the metaphysics of the color property than she needs to understand the physics (and metaphysics) of gravity in order to have a true belief about a heavy thing. Further, we need not conclude that she is using the term 'yellow' equivocally in (1) and in (8), because we need not consider Jones to be thinking like Aristotle. She might, in (1), simply be talking about the yellow color of an object. In contrast, we, as theorists, may suppose that Jones sees yellow objects in virtue of having an experience of phenomenal yellow, and so we might use a sentence like (1) to describe Jones as experiencing a phenomenal quale. But we, as (dispositionalist) theorists, distinguish 'phenomenal yellow' from 'yellow as a property of objects', and we use the former to analyze the latter. We are not guilty of equivocation, because we understand the two different senses of 'yellow'.

In this regard, dispositionalists violate another aspect of (allegedly) 'ordinary' talk. Stroud (2000) and others (e.g., Austin, 1962) believe that 'is yellow' is conceptually prior to 'looks yellow' or 'is a yellow-experience'. They support their contention by appealing to phenomenology and to the context of learning. Yellow *seems to be* a simple, categorical property. Children learn the word 'yellow' by

perceiving things that *are* yellow (lemons, color samples). Yet dispositionalists claim that ‘yellow-experience’ is *conceptually prior* to ‘object-yellow’, because they analyze object-yellow as a disposition to cause yellow-experiences. Moreover, dispositionalists can grant that ‘is yellow’ does have priority phenomenologically and in the order of learning, while still holding that ‘yellow-experience’ is conceptually prior for the purposes of color ontology. We learn to apply ‘yellow’ to yellow objects (which usually look yellow). In so doing, we need not learn what (metaphysically) yellow is. Later, as dispositionalist theorists, we come to understand that yellow-experience is conceptually prior to being yellow, even if we have already learned a wide variety of correct applications of ‘is yellow’ without knowing what yellow really is.

‘Ordinary’ talk should certainly be preserved in many domains. Ordinary talk can even set strong constraints on metaphysics in some human domains, such as in talk of human institutions and artefacts. But it does not provide the grist for metaphysics in general, including the metaphysics of the biologically based perceptual capacities of perceivers.

## 6. PHENOMENAL COLOR AND INTENTIONAL EXISTENCE

Many philosophers find it difficult to grant the existence of qualitatively characterized phenomenal states, or ‘qualia’. If we suppose that phenomenal red is real, they want to know what phenomenal red is a property of, and where it is located.

Early twentieth-century realists about perceptual qualities had ready answers to such questions. Sense-data theorists such as Russell (1914, 1915) believed that, if we experience a red round thing, a red round sense-datum exists that possesses the property of redness in the same way that that datum possesses a round shape. Both are properties of the thing. Russell called the thing a “momentary particular”, and he considered it to be real; at the same time, he regarded physical objects as described by physicists to be logical fictions, constructions out of sense data (see Hatfield, 2002). According to him (and to some but not all sense-data theorists), our sense-data are literally red and round. They possess the quality red in just the way that we experience them to possess it.

I am not a quality realist in Russell’s sense. I do not hold that phenomenal red is a property of our experience in way that Russell did. Nor do I believe that our experiences are red in the same way

that I believe objects have the property of being round or heavy. Like many philosophers today, I don't subscribe to the sense-data project. But I do think that qualitatively characterized phenomenal experiences are real, and that their qualitative characters, such as red, are aspects or features of perceivers' experiences.

Most philosophers who object to qualia set up 'natural science' as the prime arbiter of what is real. They then resist granting existence to qualitatively characterized phenomenal experience because they think that it cannot be integrated into a 'naturalistic' picture of the world. This is the problem of fitting phenomenal red (say) into one's ontology. In its general form, as a problem of integrating visual consciousness with brain activity, it has been called the "first and greatest problem" (Sherrington, 1951, pp. 109, 113) and, as a general problem about conscious experience, the "hard problem" (Chalmers, 1996, pp. xii–xiii). The problem arises because of the apparent conceptual and explanatory gap between phenomenal red and a physical description of the stimulus or a physicochemical description of brain activity (say, neurons firing in the visual cortex).

One of the chief sources of this problem comes from thinking that, if phenomenal red is real, then we must ascribe the property of being red to some thing, according to a normal substance/property ontology. So, if phenomenal color is real, something must really be colored, or have the color property, in just the way that the surfaces of things have the property of being red according to a kind of naive realism or updated Aristotelianism. If a sense-datum does not bear the property, then a brain state or some other entity must have it, or so the reasoning goes.

I find a home for qualia in experience: I construe them as intentional contents, in Brentano's original sense. Brentano originally posited the relation of intentionality to obtain between an act of perceiving and an entity that is present to consciousness (Brentano, 1874/1973, p. 88). According to Brentano, this entity exists 'in' the perception, whether it exists externally to the mind or not. Thus, the fact that we can be aware of phenomenal red as a qualitative content of our experience entails that phenomenal red exists intentionally: it is 'presented' to us in consciousness. Brentano held that our being aware of the phenomenal red in this way is neutral with respect to the further question of the relation between mental contents and "external" physical objects (Brentano, 1874/1973, pp. 92–100). For the purposes of his "empirical psychology", he was interested only in mental phenomena as present to consciousness.

I adopt Brentano intentional entities as a phenomenological description of existent 'qualia', that is, of phenomenally characterized features of experience. I, too, intend this description to be neutral about how these features are ultimately realized (say, by brain states) and I will return to the ontological status of qualia in a moment. At present, I want to recall the point from Section 4, about the lack of metaphysical transparency. As applied here, that point entails that a quale such as phenomenal red can be presented in experience without our being aware that it is a quale, or a peculiarly mental item. In being aware of phenomenal red, the theoretically uninitiated (or the holder of an alternative – and, in my view, incorrect – theory) may experience the phenomenal red simply as a property of the surface of an external object. Something that is in fact a phenomenal entity need not be experienced as being 'in the mind' or as being 'merely subjective' – even if it is a subject-dependent mental entity (see also Hatfield, 2005). Furthermore, such phenomenally present qualia may serve to present, or represent, the surface properties of external objects in ordinary acts of seeing such objects, and they may do so without subjects being aware that they see external objects by means of a subjective phenomenal content. To repeat, the phenomenal content may seem to the perceiver simply to present a categorical property of an object, rather than to be a phenomenal feature in a perceptual process through which a dispositional property of an object causes us to see the object in virtue of our having phenomenal experience of a certain kind.

I should note that the term 'intentionality' in Brentano's original sense is more specific than recent uses of that term to denote a generic representational relation. Hence, my treatment of qualia as intentional entities is opposed to so-called 'intentional' or 'representational' theories of phenomenal qualities as proposed by objectivist representationalists (e.g., Dretske, 1995; Tye, 1995, 2000). These latter theorists use the term 'intentional' simply to describe a representational relation between a state of mind and an object or object property, and they equate phenomenal content with representational content in order to do away with the dispositionalists' phenomenal qualia and with the Brentano intentionality of such qualia.

In the view on offer here, the mind and brain are such that our experience presents us with objects in the world under some phenomenal aspect or other (and usually more than one at a time). Among these aspects are both shape and color. As I would develop the theory further, both shape and color present external properties under a subjective aspect: both show subjective characteristics. In the

case of shape, we can observe the subjective aspect in the compression of Euclidean space with distance from the standpoint of the perceiver, as we see in the case of a road with parallel sides, whose sides nonetheless converge phenomenally within the visual field (Hatfield, 2003b). These ‘phenomenal aspects’ are characteristics of our experience, but neither our brains nor external objects possess the properties exactly as presented. That is the wonder of Brentano intentionality.

It may seem as if I am now obliged to provide at once an ontology of qualitative intentional content. I take that to be an unreasonable demand. It would require a solution to the mind–body problem, and no one has such a solution. But lack of an immediate answer to this demand should not lead us to repudiate phenomenal red, any more than a lack of understanding of the ontology of gravitational attraction should lead us to reject gravity, or a lack of understanding of the basis for nonlocal effects in quantum theory should lead us to deny the reality of nonlocal effects. In such circumstances, the right strategy is to remain open-minded and not to allow a “common sense” based on older philosophical and scientific positions to decide empirical matters ahead of time. Although the mind–body problem is not a simple empirical problem that can be decided by doing a few experiments, work on the problem should be responsive to ongoing empirical investigations about the relation between brain activity and mental states and activities.

As regards ontology, I propose that we simply include phenomenal red among the phenomena of nature. That is, I propose that we accept that the phenomenal is itself real. From there, we might ask how we should explain its existence and characteristics. If we don’t accept substance dualism (a position that is of no help at all in explaining phenomenal qualities), we should assume as a working hypothesis that phenomenal red depends on brain activity. However, we should not treat that hypothesis as a necessary condition on the acceptability of phenomenal red into the domain of natural phenomena. At present, no one has any idea of how to explain phenomenal red in terms of brain activity. There is some knowledge of the brain correlates of sensations, but there is no direct explanatory relation or intelligible connection between brain activity and phenomenal content (of the sort that statistical mechanics provides between the kinetic energy of the atoms or molecules of a gas and the temperature of the gas). At the same time, our theory of matter offers no assurance that we have discovered the most basic properties of matter itself: that we have found the ultimate particles and forces, or

have characterized the ultimate field structure, or even have determined that particles and fields provide the ultimate conceptualization of matter. Further, we have no settled framework for delimiting the emergent properties, if any, of complex material systems such as the brain.

The idea that the natural excludes the mental, or excludes some aspects of the mental, is itself recent (see Hatfield, 1990, 2002). It was not the dominant conception in the 17th or 18th centuries (despite potted histories to the contrary), when the mind was regarded as part of nature. The narrow conception of physicalistic naturalism arose when classical physics seemed to provide a clear and adequate picture of a physical world bereft of sensory qualities, thereby making mind the (suspect) repository of what was left over. However, classical physicalism turned out to be limited, as became apparent when quantum theory and relativity succeeded it. The more radical of these successor theories was quantum theory and its major developers were no friends of physicalism. Quantum theorists as diverse as Bohr, Heisenberg, and Schrödinger did not find that physics could or should banish the phenomenal from nature (Hatfield, 2004). They recognized the conceptual autonomy of biology and psychology from physics, and acknowledged them as legitimate domains of inquiry in advance of any grand theory capable of defining the relations among the various areas of inquiry. Their views of course are not to be accorded blanket authority, but we can agree that these physicists understood something about the explanatory power and limits of physics, and about what defines a legitimate domain of natural phenomena that is suitable for empirical investigation.

The mid-twentieth century saw, in the sciences, the demise of the classical physicalist picture of nature and the rise of a biological perspective on the senses. Philosophers tended not to keep up; many remained mired in old-fashioned physicalism. But the developments in the sciences should position us to reconsider the place of phenomenal experience in nature. We might simply accept as a fact of nature that organisms having sensory systems like ours are constituted so that at least part of our perceptual take on the world is presented via consciously available phenomenal entities, or qualia. For their part, psychologists describe such entities, detailing their causal conditions and ascertaining their roles in the cognitive and affective lives of organisms. Philosophers should acknowledge the phenomenal as a natural fact, integrating the descriptions of psychologists, or of observationally astute philosophers, into their descriptions of the mental, and situating the domain of the

phenomenal within a larger natural, cultural, and philosophical landscape. We would thereby avoid the unsavory situation of allowing largely unexamined physicalist assumptions about ‘the natural’ to back us into the position of denying the presence of phenomenal experiences populated by subject-dependent qualia. We could then seek to construct a picture of human mentality and cognitive achievement that starts from the fact that we are biological creatures endowed with a physiology that supports various perceptual and cognitive capacities, including those of having something appear to us in some way.

#### 7. ON WHAT WE SEE

At least one line of objection remains to the view that we see the surfaces of objects by having a subject-dependent phenomenal experience that mediates our perception of the object. This view may remind some philosophers of ‘representative realism’. According to some versions of representative realism, we are said to ‘see our sense-data’ or to ‘see our representations’. But, a common objection runs, the objects that we perceive in our everyday encounters with the world are surely external objects, not subjective entities in our heads. Surely we see people, trees, and cars, not sense-data. Moreover, when we think of what we perceive, or when we desire the object of our perception – perhaps a glass of mango juice – we are not thinking about or desiring our sense-data or representations.

The way of talking that this objection criticizes, according to which what we ‘really see’ are sense-data (or the equivalent), was Russell’s mature position on perception. He (along with William James and others) came to believe that we should restrict our ontology to ‘momentary particulars’ (Hatfield, 2002). On this view, we see only momentary particulars, because what we think of as ‘external objects’ – human bodies, trees, cars, and glasses of mango juice – are in fact constituted out of such particulars. Although the mature Russell was not a representative realist, in an early discussion of sense-data he endorsed a representative realism in which we ‘see’ our sense-data or representations (Russell, 1912, pp. 11–12 and ch. 2), and this form of representative realism came to be widely discussed (e.g., Ayer, 1958, chs. 2–3).

My position does not endorse this ontology, nor does it imply that we ‘see our representations’. But I do endorse a representative realism. According to my view, we see the properties of objects by having



phenomenal representations of certain sorts. These representations, these phenomenal experiences, are not *that which* we see, but *that by which* we see. This is an old response to the facile criticism that representative realism entails that we see our own experience and not the objects that such experience phenomenally presents to us (Hatfield, 1990, p. 54). The response avoids the implication that in perception we are not aware of objects themselves: we are aware of them via mediating phenomenal experiences. This position also allows that, in seeing objects by having phenomenal experiences, we are aware of the phenomenal experiences themselves – though, as explained earlier, pretheoretically we need not be aware of the phenomenal experiences *as* phenomenal experiences. In an attitude of theoretical reflection, we can attend to the phenomenal experiences themselves, but that does not involve turning our attention to a special inner object. It is a matter of attending to the same experience by means of which we see objects (Hatfield, 2005).

I remain committed to the view that phenomenal qualities exist (intentionally) as mediating experiences by which we see the colors of things. There is more to say by way of explaining intentional existence. In the meantime, I hope that this paper has removed obstacles that have hindered acceptance of what I believe to be the best position on what color in objects is: it is a disposition (or its basis) for producing subject-dependent experiences of certain kinds in perceivers, which experiences may properly be called ‘qualia’.

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#### NOTES

<sup>1</sup> There is great terminological variety in discussions of qualia and phenomenal experience. I use the term ‘qualia’ to denote subject-dependent phenomenal contents, which are subject-dependent not merely for their existence (as phenomenal

experience must be on any theory except James–Russell neutral monism and its kin) but also for their phenomenal character. I sometimes use the term ‘phenomenal experience’ broadly, to describe determinate contents of consciousness without implying that these contents are qualia. In this paragraph and at some other places in the paper (which will be clear from context), I use the term ‘quality’ to refer to properties of objects (whether relational or not). However, I use ‘qualitative’ to suggest phenomenal content. I also use ‘red-experience’ to refer to a red quale, by contrast with the potentially neutral term ‘experience of red’, which sometimes is used technically to denote the experience of a physical property that is alleged to be a thing’s redness. The terminological diversity in this field creates some potential traps: ‘representative realist’ theories of perception tend to adopt views on color ontology that are opposite to those of recent ‘representational’ or ‘intentional’ theories; and ‘intentional’ is sometimes used as a synonym for ‘representational transparency’ (in this sense, my theory of color qualia is not intentional), but at other times it is used in Brentano’s original sense (Sect. 6). Finally, although the dispositional account I develop here focuses on surface colors (since surfaces are the primary objects of mammalian vision), it could easily be extended to include radiant light from an energy source.

<sup>2</sup> Some philosophers distinguish between a disposition and the causal basis of the disposition in the actual physical (or other) properties of a thing (e.g., McLaughlin, 2003, p. 479), whereas other philosophers contend that a disposition is a causal power of the actual properties of things (e.g., Armstrong, 1999, pp. 62–64). I avoid needlessly taking sides on this issue, and I sometimes remind the reader of that by speaking of ‘a disposition or its basis’.

<sup>3</sup> In distinguishing phenomenal color from color categorization or color concepts, I do not intend to assert that conceptualization of phenomenal experience has no phenomenal effects. Such effects are, I suppose, many and varied. Expectations or conceptual identifications may influence color appearances; conceptual identification itself may change the overall phenomenal feel; and, in certain cases, adopting an introspective attitude (which brings its own conceptualizations) may affect our phenomenal experience by directing our attention to hitherto unnoticed features or aspects of that experience (see Hatfield, 2005). What I deny is that color experience is constituted by its conceptual (classificational) content.

<sup>4</sup> The fact that an animal is not sensitive to variations in the wavelengths of light does not prove that it has no color phenomenology. An animal that could discriminate only light intensities might (conceivably) experience those intensities chromatically, say, by experiencing brighter shades as yellow and darker shades as blue (thanks to Don MacLeod, personal communication). In this paper I am concerned with color experiences that arise from spectrally based sensitivities, that is, with cases in which an organism can discriminate surfaces by spectral differences (as opposed to mere intensity differences) in the light reflected to the eyes.

<sup>5</sup> Arguments for transparency typically confuse two issues: one phenomenological, the other, metaphysical. Phenomenologically, the friends of transparency claim that a qualia realist or other friend of subjective content should hold that color qualia seem to be ‘internal’ or ‘in the mind’ as opposed to seeming to be present in the surfaces of objects (Dretske, 1995, p. 162; Tye, 1995, pp. 30–31, 2000, pp. 51–52). They then rightly observe that colors seem to be in the world, not in the head, and claim an argumentative victory for representationalist transparency. In fact, this argument is based on a caricature of the notion of introspective awareness of

subjective mental contents (Hatfield, 2005). Indeed, dispositionalists can agree that phenomenal colors seem to be properties of surfaces (see Sects. 3–4). The second issue concerns the metaphysics of phenomenal experience. Objectivist representationalists contend that phenomenal color is constituted by having a visual representation with a certain physical property as its content; there is nothing more to the color: the physical property is ‘transparently’ present in experience as a phenomenal color. Dispositionalists contend that phenomenal color is a subjectively based mediating content by which we see the colors of objects. Phenomenology will not settle this metaphysical dispute (see also Crane, 2000), and this second issue is independent of the phenomenological point.

<sup>6</sup> Tye (2000) seems to acknowledge this fact in his analysis of color as a disposition to cause cone firings. He proposes to analyze a surface’s being pure red: “we may now propose that a surface is (pure) red, for example, so long as it has a reflectance that, *ceteris paribus*, under normal viewing conditions, enables it to reflect light that produces opponent processing distinctive of the experience of (pure) red” (Tye, 2000, p. 160). Although he subsequently attempts to drop the reference to the experience of red in favor of the pattern of cone firings, the cone firings can be color-typed only by their experiential effects. That being accepted, then Tye’s analysis is the same as that of the subjective dispositionalist: for a surface to be red is for it to cause a red sensation or experience in normal perceivers under standard conditions. He might of course argue that the pure red in question is transparently the representation of the physical property of the surface that causes it. But notice that he is now defining the physical property in relation to the red-experience, as the property having the disposition of causing a red-experience. He has not reduced the experience to the representation of the property; rather, he has defined the property in relation to the independently specified subjective experience.

<sup>7</sup> I use the term ‘presents’ to emphasize the sense in which phenomenal experience makes its objects present to consciousness. Presentations that make external objects present to consciousness (or that purport to do so) are also representations (of the distal object).

<sup>8</sup> This speculative description of monochromatic color vision (either with one cone type, or with multiple cone types but no comparison of outputs) is used for illustrative purposes; there might be phenomenal colors that represent light and dark (see Note 4).

<sup>9</sup> If we use the convenient metaphor of characterizing representational content through propositions, then we can say that according to an objectivist representationalist such as Dretske, color perception carries the content ‘that such-and-such physical property is present’ (using the notion of natural ‘information’, Dretske, 1995, pp. 2–4, effectively builds this sort of content into nature’s nomic relations among properties and then uses it to construct representational content). By contrast, I ascribe unsophisticated content to phenomenal color, on the order of ‘an (unanalyzed) color property is present of type x’, where x ranges over shades of color (this is the content of phenomenal color, independent of any categorization of the color shade). This content presents the object surface ‘under a description’, albeit an unsophisticated one. Such representations have intentional opacity, as normally understood; thus, if there were a single physical property of the object surface that were nomically related to a type of color experience, a description of that property could *not* be substituted into the characterization of the representational content of a phenomenal color. (Note: this concept of intentionality differs

from the Brentano intentionality that I describe in Sect. 6.) By contrast with Dretske's approach, I avoid commitment to natural information and am forced to build representational content out of the representational capacities of the organism. In this article, I have merely gestured toward the evolved representational capacities of the brain, which I see as biological functions for representing (see Hatfield, 1988, 1991, 1992).

<sup>10</sup> The terminology of color sensations as "signs" for "external qualities" comes from Hermann Helmholtz (1868/1995, pp. 166–168). (However, Helmholtz, as many dispositionalists, shares the determinacy assumption discussed at the end of the present section, on which I differ from him.) Helmholtz contrasted 'sign' with 'image'; a perception that was an image would represent its object through the same type of property that is in the object (say, spatial relations through phenomenal spatial relations). By contrast, a sign does not intrinsically reveal through its own character the character of the external qualities it denotes, which is one sense in which such a sign is arbitrary: its phenomenal content bears no intrinsic connection with what it signifies in objects. Colors may be arbitrary signs in a further sense: it may be contingent that red-experience was selected for long-wavelength colors, and blue for short-wavelength; indeed, for all we know, the kinds of phenomenal colors we experience may be one group out of a range of possible phenomenal palettes. Here, our ignorance is great, for we have no grip on the capacities of brain structures for generating phenomenal characters. Finally, it can be imagined that the initial sign-relations were not arbitrary in one limited sense: that phenomenal color originally signaled specific object properties such as nutritional or sexual readiness (in the case of red). I would argue that even if this were so, the function of phenomenal red became generalized to present bare color properties as well (or instead), thereby rendering the representational content of a red-experience independent of the nutritional or reproductive properties of red objects.

<sup>11</sup> I use the language of 'yellow-experience' here, rather than 'looks yellow', because some philosophers, including dispositionalists, hold that talk of 'looks' typically or always implies a suspected contrast between how a thing *looks* and how it *is* (between mere appearance and reality). In addition, Peacocke (1984) offers yet other reasons for contrasting 'looks yellow' with his preferred notation for yellow-experience: 'yellow'. There are, however, various senses of 'looks', including not only the appearance/reality sense but also a 'phenomenal report' sense. When I use the term 'looks' in this article, I have in mind the reporting sense of looks, which does not imply an appearance/reality suspicion, and according to which we aim to describe the character of our experience rather than focusing on our judgments concerning the actual properties of the things we are looking at (see Hatfield, 2005, p. 269 and Note 5).

<sup>12</sup> The notion that colors should 'reveal' their intrinsic character as properties to reflective perceivers has been widely endorsed. Boghossian and Velleman (1989) rejected dispositionalism on the grounds that it did not account for color phenomenology (colors don't seem to be dispositional properties) and adopted projectivism (a form of subjectivism). Johnston (1992) echoed Strawson's (1989) desire for "Revelation" of the color property in experience in arguing for a secondary qualities account of color (a form of dispositionalism). As will become clear, I do not think that the notion of 'revelation' provides any constraint on the correct theory of color ontology: object colors could be dispositions even if no one knew it. I agree with Johnston (1992) that any correct analysis of color ontology should acknowledge that

normally sighted subjects can tell on the face of it that phenomenal blue differs from phenomenal red, but I do not treat this as ‘revelation’ of the color property per se, even if it is ‘revelation’ of an aspect of colors (viz., phenomenal colors as regards their intrinsic quality).

<sup>13</sup> Many discussions of qualia employ examples that permit the relations between object surfaces and color experiences to vary, as in ‘inverted spectrum’ cases: I see a red object as you do, but Jones experiences green when looking at the same object under the same conditions (Kriegel, 2002; Shoemaker, 1996, Pt. IV). I find such cases to be of limited use. When philosophers faced verificationist objections to the very notion of phenomenal experience, the inverted spectrum offered a useful thought experiment for conceiving how two observers might be behaviorally identical and yet psychologically different (assuming Jones has learned to say ‘red’ when she has a green-experience). But on the assumption that psychophysical laws (which relate stimuli to phenomenal experience) are indeed laws, such inversion is physically (naturally) impossible. Indeed, in the usual form of the thought experiment, in which molecule-for-molecule identical individuals are attributed inverted spectra, the principle that color experience supervenes on brain states renders spectral inversion metaphysically impossible.

<sup>14</sup> What one finds plausible to assert about colors can be heavily influenced by one’s understanding of color theory. Thus, at the conference on secondary qualities in Bielefeld, one of the presenters found it plausible to assert that “Yellow lemons look green in blue light”. If “blue light” is taken to mean monochromatic blue light (or perhaps blue light composed only of lights having wavelengths such that, if any individual wavelength is viewed on its own, it appears as a shade of blue), then yellow lemons in blue light appear black or dark bluish grey because yellow lemons absorb nearly all blue light (thanks to David Brainard and Feng Gai for use of their monochromators). If one adds some greenish light of wavelength 480 nm and higher to otherwise blue light (e.g., by producing a light composed of all wavelengths from 450 to 490 nm), then the light still appears bluish and the lemon takes on a greenish cast in “blue” light (because only the green light is reflected in a significant amount). Of course, if one mixes yellow and blue pigments, one gets green: but that is a subtractive color mixture, rather than an interaction between colored light and a pigmented surface (such as the lemon’s).

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