THE OBJECTIVITY OF COLOUR-STATEMENTS

by

Jean Harvey
B.A. (Hons.), University of Wales, 1968
M.A., Simon Fraser University, 1970
M.A. (Educ.), Simon Fraser University, 1971

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

in

THE FACULTY OF GRADUATE STUDIES
Department of Philsosophy

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA
August, 1976

In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the Head of my Department or by his representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Department of Philosophy

The University of British Columbia
2075 Wesbrook Place
Vancouver, Canada
V6T 1W5

Date 7 Oct. 1976

ABSTRACT

The main purpose of the thesis is to investigate colour-concepts as they are applied to physical objects to see what is required if they are to meet the requirements for objectivity. The first part of the work is to set out in general terms the condition that must be met for an empirical statement to be objective, and that condition is claimed to be corrigibility. If an empirical statement is to be corrigible in the required sense, then it must be "possible" for a human being to test that statement "soundly", and mere logical possibility is not what is looked for. When someone tests an empirical statement and reaches a verdict as to its truth or falsity, that verdict is "basically sound" only if he follows the test-instructions correctly and has the minimum perceptual ability needed for that test to be reliable in the situation in which it is used. Other conditions affecting the verdict's soundness are desirable, but these two are required if the verdict is not to be rejected outright as unsound. So if any empirical statement is to be objective, it must be possible to reach basically sound verdicts about it, and so it must be possible to give sense to the soundness conditions and to detecting when they do not hold.

The focus is then directed to colour-statements about physical objects--statements ascribing particular colours, such as red or green, to physical objects, and also statements about the sameness/difference in colour of a pair of objects. It is argued that it is possible to detect if two people have (qualitatively) the same perceived colours when they look at the same physical object in the same environment, even if there is a 'systematic transposition' of colours holding between them. It is also argued that for a viable concept of "the colour of a physical object" there must be a general uniformity among the perceived colours human beings have on viewing physical objects. It is

this required uniformity that makes that concept anthropocentric in nature. For the uniformity to be 'non-accidental', we need to provide a description of a human viewer's physical state, a description that will cover the vast majority of all viewers' physical states. The description I refer to as the "standard-state description"; it must describe those features of a viewer's state that are relevant to colour-vision, and there are limits as to how imprecise it can be and still retain its required role. After explaining what is involved in the concept of "the colour of a physical object", I indicate how we could derive practical tests for the particular colour of a physical object, and if we can give sense to the basic soundness condition for these tests, and to detecting when these soundness conditions do not hold, then, I claim, such statements would be objective. Finally, a condition is placed on who would count as a "fine discriminator" of physical objects by their colour, and this illuminates the anthropocentric nature of the concept of "the difference of colour between two physical objects".

SECTIONS

1. Introduction

The main purpose of the thesis is to investigate colour-concepts as they are applied to physical objects to see what is required if they are to meet the requirements for objectivity. The first part of the work is to set out in general terms the condition that must be met for an empirical statement to be objective, and that condition is claimed to be corrigibility. If an empirical statement is to be corrigible in the required sense, then it must be "possible" for a human being to test that statement "soundly", and mere logical possibility is not what is looked for. When someone tests an empirical statement and reaches a verdict as to its truth or falsity, that verdict is "basically sound" only if he follows the test-instructions correctly and has the minimum perceptual ability needed for that test to be reliable in the situation in which it is used. Other conditions affecting the verdict's soundness are desirable, but these two are required if the verdict is not to be rejected outright as unsound. So if any empirical statement is to be objective, it must be possible to reach basically sound verdicts about it, and so it must be possible to give sense to the soundness conditions and to detecting when they do not hold.

The focus is then directed to colour-statements about physical objects--statements ascribing particular colours, such as red or green, to physical objects, and also statements about the sameness/difference in colour of a pair of objects. It is argued that it is possible to detect if two people have (qualitatively) the same perceived colours when they look at the same physical object in the same environment, even if there is a 'systematic transposition' of colours holding between them. It is also argued that for a viable concept of "the colour of a physical object" there must be a general uniformity among the perceived colours human beings have on viewing physical objects. It is this required uniformity that makes that concept anthropocentric in nature. For the uniformity to be 'non-accidental', we need to provide a description of

a human viewer's physical state, a description that will cover the vast majority of all viewers' physical states. The description I refer to as the "standard-state description"; it must describe those features of a viewer's state that are relevant to colour-vision, and there are limits as to how imprecise it can be and still retain its required role. After explaining what is involved in the concept of "the colour of a physical object", I indicate how we could derive practical tests for the particular colour of a physical object, and if we can give sense to the basic soundness conditions for these tests, and to detecting when these soundness conditions do not hold, then, I claim, such statements would be objective. Finally, a condition is placed on who would count as a "fine discriminator" of physical objects by their colour, and this illuminates the anthropocentric nature of the concept of "the difference of colour between two physical objects".

2. A Note on the Lockean Background of the Treatment of Qualities

Philosophers at the beginning of this century are writing against the background of British empiricism, most traditions of which stem from the work of Locke. Very briefly let us see what Locke's main points are with regard to colour-qualities.

Locke claims that we are passive with regard to perception in two respects:

(a) The simple ideas of sensation received in particular perceptual happenings are passively received: "For in bare naked perception, the mind is, for the most part, only passive; and what it perceives, it cannot avoid perceiving."[1] The simple ideas of sensation received in particular perceptions may, of course, be already familiar; not all will be new (i.e., of a type previously unencountered).

(b) The 'store' of simple ideas of sensation against which the mind 'compares' simple ideas of sensation received in particular perceptions cannot itself be enlarged except passively by the reception of a hitherto unencountered simple idea via the senses:

> These simple ideas, the materials of all our knowledge, are suggested and furnished to the mind only by those two ways above mentioned, viz. sensation and reflection. When the understanding is once stored with these simple ideas, it has the power to repeat, compare, and unite them, even to an almost infinite variety, and so can make at pleasure new complex ideas. But it is not in the power of the most exalted wit, or enlarged understanding, by any quickness or variety of thought, to invent or frame one new simple idea in the mind, not taken in by the ways before mentioned: nor can any force of the understanding destroy those that are there.[2]

The mistakes involved in using "idea" to cover things of such different kinds

[1] John Locke, An Essay Concerning Human Understanding (New York, 1959), Book II, chap. ix, sect. 1

[2] Ibid., chap. ii, sect. 2. (Locke sometimes makes a passivity claim with respect to simple ideas generally, a consequence of his double use of "idea", e.g. Book II, chap xxx, sect. 3.)

as sense-data (as in (a) above) and concepts (as in the above quotation) are pointed out and discussed by Bennett.[3] "Simple"-quality terms are just the names of the simple ideas 'stored' in the mind, and they can be understood only as labels of these ideas. Thus although Locke manages at least to distinguish a simple idea of sensation from the term referring to it (its name), he does not admit the possibility of using the term meaningfully except as the label of the relevant simple idea. In the sense of "definition" Locke uses--"showing the meaning of one word by several other not synonymous terms"[4]--the names of simple ideas cannot be defined since "the several terms of a definition, signifying several ideas, they can all together by no means represent an idea which has no composition at all . . . ."[5] This indefinability of the names of simple ideas prevents the defining of other terms from being an infinitely long task, and thus an epistemological 'hierarchy' of concepts begins to emerge.

There is a certain peculiarity in Locke's account. Although a simple idea of sensation received in some particular perception is called, say, "white" by somehow matching it with the simple idea of white 'stored' in our mind, we are given no similar explanation of how we always manage to apply the term "white" consistently to one and the same exemplary idea. If we can apply the term "white" to one and the same exemplary idea consistently without the need to introduce some yet more shadowy super-example, then one wonders why we could not also manage to consistently identify simple ideas of white in particular perceptions.

[3]Jonathan Bennett, Locke, Berekely, Hume: Central Themes (London, 1971), pp. 25-30.

[4]Locke, Book III, chap. iv, sect. 6.

[5]Ibid., sect. 7.

3. Publicity, Privacy, and Passivity with respect to Lockean Ideas

Locke draws a distinction between what he calls a "quality" and an "idea": "Whatsoever the mind perceives in itself, or is the immediate object of perception, thought, or understanding, that I call idea; and the power to produce any idea in our mind, I call quality of the subject wherein that power is."[1] He further distinguishes primary qualities (solidity, extension, figure, and mobility) which "in all the alterations and changes [the body] suffers, all the force can be used upon it, it constantly keeps . . . ."[2] from the secondary qualities (e.g., colours, smells, tastes, sounds) "which in truth are nothing in the objects themselves but powers to produce various sensations in us by their primary qualities. . . ."[3] Now of course Locke has defined "qualities" as such (both primary and secondary) as "powers in the objects to produce ideas in us", but what is important is that although the ideas of primary qualities are "resemblances" of properties of the physical object in itself such that "their patterns do really exist in the bodies themselves. . . ."[4], this is not the case for the ideas of secondary qualities. Presumably the properties resembling our ideas of primary qualities are non-dispositional, i.e., not "powers". There is some confusion in Locke in that sometimes he remembers his definition of "qualities" as "powers", but sometimes uses "qualities" to refer to non-dispositional properties of physical objects.

For Locke, colours as qualities of physical objects and colours as we ordinarily think of them are two different kinds of things. Says Locke:

[1]Locke, Book II, chap. viii, sect. 8.

[2]Ibid., sect. 9.

[3]Ibid., sect. 10.

[4]Ibid., sect. 15.

1) Although we may legitimately speak of physical objects as having colours, we are referring only to certain "powers" the objects have to produce certain ideas in us.

(2) On the other hand, what we normally think of when we speak of colours are the ideas of red and white, etc., which are caused in us by the primary qualities of physical objects. These ideas are private in the sense that they are "invisible"[5] "internal conceptions" within one's own mind[6], dependent for their existence on their being directly perceived (which Locke usually remembers) such that I am directly acquainted with mine (although no-one else logically can be). Thus the colour red, as ordinarily thought of, is an idea, not a property of a public object which exists independently of our perceptions. Further, there is no property which a physical object has in itself which "resembles" our idea of red, although we tend, mistakenly, to "impute" such a property to physical objects.

Locke tries to make this last point by saying that primary qualities are "real", whereas colour qualities and other secondary qualities are "imputed"[7], but this is misleading. All "qualities" are equally real in the sense that all qualities, by Locke's definition, are powers. Presumably the point is that a physical object has its primary-quality powers by virtue of having (underlying) non-dispositional properties which resemble our ideas of its primary qualities, but has no non-dispositional properties which resemble our ideas of its secondary qualities.

In the light of this it may be wondered how some simple ideas, namely those of all but the primary qualities of bodies, can function as the "materials of knowledge", since they are neither features of public objects nor

[5]Ibid., Book III, chap. ii, sect. 1.

[6]Ibid., chap. i, sect. 2.

[7]Ibid., Book II, chap. viii, sect. 22.

do they resemble such features. Locke, nevertheless, is careful to bestow upon the simple ideas of secondary qualities a certificate of reality in another sense. They are to be distinguished from "fantastical" ideas which are those having "no foundation in nature, nor . . . any conformity with that reality of being to which they are tacitly referred, as to their archetypes."[8] Thus he writes:

> But, though whiteness and coldness are no more in snow than pain is; yet those ideas of whiteness and coldness, pain, etc., being in us the effects of powers in things without us, ordained by our Maker to produce in us such sensations; they are real ideas in us, whereby we distinguish the qualities that are really in things themselves. For, these several appearances being designed to be the mark whereby we are to know and distinguish things which we have to do with, our ideas do as well serve us to that purpose, and are as real distinguishing characters, whether they be only constant effects, or else exact resemblances of something in the things themselves: the reality lying in that steady correspondence they have with the distinct constitutions of real beings. But whether they answer to those constitutions, as to causes or patterns, it matters not . . . .[9]

Thus for our ideas of secondary qualities, their being caused by "external objects", even though they do not "resemble" actual features of the objects, is epistemologically vital. But how in fact does Locke make this move? His distinction between simple ideas of sensation and simple ideas of reflection is defined in terms of the sources of these sets of ideas: simple ideas of reflection are those resulting from "the perception of the operations of our mind within us, as it is employed about the ideas it has got . . . ."[10] Of the other set he writes: ". . .our Senses, conversant about particular sensible objects, do convey into the mind several distinct perceptions of things, according to those various ways wherein those objects do affect them", adding the clarification, "when I say the senses convey into the mind, I mean, they

[8] Ibid., Book II, chap. xxx, sect. 1

[9] Ibid., sect. 2.

[10] Ibid., chap. i, sect. 4.

from external objects convey into the mind what produces there those perceptions."[11] He never satisfactorily supports the claim that ideas of white, yellow, heat, etc., must be simple ideas of sensation, for, it has just been noted, he defines "simple ideas of sensation" in terms of their source, and he does not try to show that one could not acquire the idea of white, for example, except as it is caused by an external object. His not feeling the need to support this claim is in large measure a result of his repeated claims that the two sources he mentions--being caused by an external object, and resulting from the mind's operations on already received ideas--are exhaustive.[12] (This claim too receives no adequate support.) Thus for Locke, to deny that the idea of white is a simple idea of sensation, i.e., is caused by an external object, is to say that it is acquired as a result of the mind's operations on already received ideas. At this point he implicitly relies on the earlier mentioned passivity claims he makes. He relies on them very heavily as guides to the epistemological trustworthiness of, in particular, simple ideas of sensation. In a revealing passage immediately following that already quoted from Book II, chap. xxx, sect. 2, and in the same context of the simple ideas of sense being the constant effects of "real beings", he argues:

> And thus our simple ideas are all real and true, because they answer and agree to those powers of things which produce them in our minds; that being all that is requisite to make them real, and not fictions at pleasure. For in simple ideas (as has been shown) the mind is wholly confined to the operations of things upon it, and can make to itself no simple idea, more than what it has received.

Now I think that Locke could make a plausible case for the claim that if "the mind" is passive with respect to simple ideas of sensation, then these ideas (since, in Locke's theory, none is innate) either arise completely spontanously

[11] Ibid., sect. 3.

[12] See, for example, Book II, chap. 1, sects. 2 and 4.

(i.e., are uncaused), or are caused by something "external to the mind". Also I think a plausible case could be made against the former of the alternatives. Even so, he would be left with the metaphor that the source of these ideas is some cause "external to the mind", and this means simply "some cause other than the mind". It does not mean "some cause external to my body"; there is no reason prima facie why events or changes in my body could not, even for Locke, cause the passive reception of some simple idea of sense by "my mind", yet he repeatedly speaks of the only possible source of such ideas as "external objects" meaning "physical objects other than my body". Like most other philosophers, Locke continuously ignores the role of one's own body in the realm of perception.[13] We may also note, before philosophers with Berkeleian tendencies begin to prod us, that even if we had a warrant for claiming that simple ideas of sense are caused not by our own mind (whatever that would mean), but by something "external to" (i.e., other than) our own body, this still is not to say that they are caused by external physical objects.

In this thesis I shall make explicit that the source of some of our actual ideas is important for epistemological reasons, but it will be shown that emphasizing the "passivity" of the acquiring of some of our ideas will not help to clarify this point. This indicating of the passivity of the acquiring of simple ideas of sense as 'proof' of their epistemological reliability is not a peculiarity of Locke. It is found again and again with varying degrees of explicitness in writings on perception theory in philosophy. Let us, then, look further at this apparent connection between passivity within perception and the epistemological reliability of some of our ideas.

[13]One of the very few mentions is in the context of one of his examples to do with heat, of how water may be felt as cold by one hand and warm by the other; Book II, chap. viii, sect. 21.

4. The Passivity Principle of Perception

For the purpose of this section, and in fact for the rest of the thesis, we can construe "an idea" to mean "an item Locke would call a simple idea of sensation, e.g., an idea of white, of yellow", without, however, importing the notion of the cause of the idea into the definition of the term.

Given the scope of the work, I shall not in this thesis set out to argue for the existence of physical objects, but the points made are made on the assumption that there are physical objects. I shall state the Passivity Principle as the claim that "Ideas of sense of the physical world (as opposed to ideas of reflection, in the Lockean sense) are necessarily acquired involuntarily or passively." That is to say, passivity is a necessary condition for acquiring ideas of this kind, but clearly not a sufficient condition. (Hallucinations, for example, could be perceived passively.) At first glance this principle seems to relate to the notion of objectivity at least in the following loose way. Many statements about physical objects seem excellent candidates for the title "objective statements". So we must consider the possibility that the Passivity Principle states a necessary condition which our sense-experience must have, viz, passivity, if that experience is to be a legitimate basis for making claims about physical objects. If passivity is a requirement that must be met for our sense-experience to be used for this purpose, and if it is true that many statements about physical objects are excellent candidates for being objective statements, then this opens the possibility that the passivity of our sense-experience is a key-feature of the situation as regards the objectivity of those statements.

I shall begin by looking at a claim discussed by Ayers, namely:

"The intuitive principle that ideas having reality are necessarily involuntary. . . ."[1], since "perception is not a voluntary activity. As Locke puts it, 'The objects of our senses do obtrude their particular ideas upon our minds whether we will or no.'"[2] (Ayers seems to use the term "idea" in the same way as I do.) This seems to be closely akin to the Passivity Principle as given at the beginning of this section, but let us see how helpful Ayers' formulation is.

Strictly speaking it is not the ideas which are passive or active, but our acquiring of them. We are to contrast ideas which are received passively with those which we actively 'bring about', for it is held that "if I am inducing my own states of mind at will, I may be picturing or imagining, but I cannot be perceiving."[3] Ayers attributes the principle to both Locke and Berkeley, and suggests that Locke considers to be "real" ideas those which have "real objects"[4], while Berkeley defines what a Realist would call "physical reality" in terms of the involuntariness of our ideas together with their distinctness, coherence, constancy, and regularity (with, of course, no mention of objects in the Lockean sense). For both philosophers, in spite of their differing ontologies, the concept of reality serves to distinguish perception, where the ideas are acquired involuntarily, from voluntary imaging. My version of the principle may, in fact, be acceptable to Ayers since he does not subscribe to Berkeley's notion of "reality", and I shall attempt various fairly obvious interpretations of this version, trying to make the principle a useful 'tool' for my inquiry.

[1]M.R. Ayers, "Perception and Action," Knowledge and Necessity, Royal Institute of Philosophy Lectures, vol. 3, 1968-69 (London, 1970), p. 95.

[2]Ibid., p. 91.

[3]Ibid., p. 95.

[4]Ibid., p. 98.

I am not discussing in this section the distinction between a 'sense-content' and its 'interpretation', though this is often thought to correlate with the passive-active distinction. Assuming, as is widely agreed, that interpreting and classifying are activities, and allowing that it is hard or even impossible for an adult to apprehend sensuously without interpreting and classifying, still I agree with Lemos that there is something "given" in ordinary perceptual situations: "The fact that the given cannot be described without transcending it does not mean that there is no given element in perception. In fact, the very statement of this objection presupposes that something is given."[5] What I am commenting on in this section is what some people call "the given", meaning the sort of item I am referring to as "an idea".

Our ideas of perception, as opposed to ideas of reflection in Locke's sense, vary with several factors. Some may be described as "external conditions", e.g., the location of the perceiver and of the objects perceived, how much light there is, whether or not there are several noises besides the noise he is interested in, etc.. Many of these conditions are relevant to only one or two of the five sense-modes. Other factors may be appropriately called "internal conditions": the bodily state of the perceiver, especially the state of his sensory apparatus, and his psychological state (e.g., his hopes, expectations).[6] I can often choose to change any or all of the external factors mentioned: I can move up to an object, bring it closer to a light, change the lighting, bring it inside out of the fog, etc., and my perceptions will often vary as I do so. The Passivity Principle cannot mean simply that:

[5] Ramon M. Lemos, "Sensation, Perception, and the Given," Ratio, VI, 1964, p. 72.

[6] See C.W.K. Mundle, Perception: Facts and Theories (London, 1971), p. 30. I am not suggesting that a person's psychological state has no physical state correlate. It may, however, be easier to identify some of these kinds of psychological states by the person's behaviour rather than by looking for the physical state correlate.

i) Nothing I can do will prevent ideas of perception of the physical world (as this phrase has been explained earlier) being received, and there is nothing I can do in order to acquire such ideas.

Both parts of (i) are false since my changing my position or the lighting, etc., will both give rise to my acquiring certain ideas I should not otherwise have acquired, and to my not acquiring certain ideas that I should otherwise have acquired. We could try to interpret the principle to mean:

ii) Nothing I can do except making a change in the external conditions, or in the external physical world (e.g., by changing my position, or moving the object perceived) will prevent ideas of perception of the physical world from being acquired which otherwise would have been acquired at that time by me, and nothing I can do except making a change in the external physical world will bring about my acquiring ideas of perception of the physical world which otherwise I should not have acquired.

This is more promising than (i), but even this is false, since there are some changes that I can voluntarily bring about in my bodily state which will affect the ideas of perception of the physical world that I have. E.g., I can close one eye when looking at the object of perception, or take certain kinds of drugs, known to affect the sensory apparatus, before visually or tactually perceiving physical objects around me.

At this point many philosophers will wish to drive a wedge between (a) our changing the position of the object perceived, or our closing an eye, and (b) our acquiring of the new ideas of the object(s). They will claim that while (a) are activities, (b) are not. Our acquiring of the ideas, it will be claimed, is passive. With respect to such a contrast, I find no difficulty in understanding the active side of it. I have agreed all along that what are mentioned under (a) are activities. But there is a difficulty in acknowledging that these activities 'give rise to' the acquiring of ideas that otherwise

we should not acquire, and yet at the same time trying to give sense to the claim that "real" ideas (i.e., ideas of perception of the physical world) are nevertheless passively acquired. It is the conjunction of these two claims which is paradoxical.

Let us try to interpret the Passivity Principle as the claim that:

iii) There are limits as to which ideas of perception of the physical world may be acquired in any particular set of circumstances.

Unlike (i) and (ii), this is at least true, but as it stands it does not perform the function (mentioned by Ayers) which one expects the Passivity Principle to perform, viz, to distinguish perception from voluntary imaging. Even though, as Ayers remarks, it is logically possible that "a man should be capable of putting himself at will into mental states just like perceptual states. . ."[7], there would be limits as to the mental states which could be self-induced at any one time. Although in the case of voluntary imaging the influence of the external factors which Mundle mentions are, ex hypothesi, eliminated, there still remain what he calls the internal factors setting limits on what can be voluntarily imaged at any one time. There would also be limitations imposed by our knowledge acquired so far. To interpret the Passivity Principle as meaning simply that there are limits as to which ideas may be acquired in any particular set of circumstances by perception of the physical world, removes the rather paradoxical air from the conjunction mentioned above, but it will not give a basis for distinguishing perception from voluntary imaging.

Nonetheless, although there are limits as to which ideas can be acquired in any particular case of voluntary imaging, and in any particular instance of perception of the physical world, the kinds of limits and the reasons for them are not the same. Our mistake has been to try to make sense of the passivity claim without introducing the role of physical entities in the 'producing of'

these ideas. Even though I may (actively) change the external conditions or my bodily state (thus affecting which ideas of perception of the physical world I receive), the ideas I receive are nonetheless "determined by" physical entities around me, their properties, and changes occurring to them, in short, by the physical world around me. In this sense, even when such changes are made, the ideas of perception of the physical world are nevertheless "passively" acquired. This too is the force of saying that the kinds of limits imposed on an instance of perception and on an instance of voluntary imaging are different. For an instance of perception to be an instance of perception, the ideas acquired must be "limited" or "determined by" the physical world present to the perceiver. In a case of voluntary imaging this is not the way in which the ideas acquired are limited. The Passivity Principle in itself, in spite of the many appeals made to it in its various forms, I find completely unilluminating. To claim passivity in this context does not indicate clearly the restrictions that are supposed to be imposed on the acquiring of the ideas in question. The hope was to use "passivity" as part of a criterion for "ideas (of perception) of the physical world", but in fact we can give sense to this notion of "passivity" only by re-introducing "ideas of the physical world" in its clarification; and this is clearly circular. We are left with the statement:

(iv) It is a necessary condition of ideas (or perception) of a part of the physical world that they are "determined by" that part of the physical world.

This tautology may seem trivial, but in fact it is very important and very useful to bear in mind. It plays a crucial role in some of the later sections of the thesis.

5. Lewis's Assumption about the Testability of Empirical Statements

The possibility of testing and re-testing for the truth (or falsity) of a statement will be central to my concept of an objective empirical statement. In this section I wish to look at a condition C.I. Lewis claims must hold for an empirical statement to be testable. This will provide a starting-place for explaining my concept of objectivity. Throughout the thesis I am concerned only with statements which:

a) do not contain any term whose definition includes the property of emotionally attracting or emotionally repelling one person or more; and,

b) may be tested by using one or more of the senses.

This is what I intend to be captured by "empirical statements".

In his earlier work, Mind and the World Order[1], Lewis's comments on qualities are exclusively about what he calls "objective qualities", by which he means "qualities of physical objects". His refusal to countenance statements about qualities which are not qualities of physical objects is based on an assumption he makes about the nature of verification. It is this assumption I shall discuss in this section.

Lewis reserves the word "knowledge" for "that which is articulate and verifiable, and has a significant opposite, 'error'."[2] He argues that knowledge "always transcends the immediately given."[3] He rests his concept of knowledge on a claim about the nature of concepts in general, on the claim that there is no concept the denotation of which does not extend beyond the immediately given, and beyond what could be immediately given.[4]

[1]Clarence Irving Lewis, Mind and the World Order (New York, 1929).

[2]Ibid., p. 146.

[3]Ibid., p. 118.

[4]Ibid., p. 121.

"The predication of a property on the basis of momentarily presented experience, is in the nature of an hypothesis, which predicts something definitely specifiable in further possible experience, and something which such experience may corroborate or falsify."[5] Lewis makes this as a general claim about the application of any concept. For example, to say that I have an apple in my hand is to imply something about what it will taste like if I bite it, what will happen if I drop it on a hard floor, what it will look like if I slice it in two, etc.. We may call these "conditional predictions", since they take the form: "If I act in certain ways, specifiable experience will eventuate."[6] Even predictions which appear not to be conditional can legitimately be construed as conditional; for example, it is true that to call something "an apple" is to imply that in a damp atmosphere it will start to rot within three weeks, but we may construe this as "If, after leaving it in the damp for three weeks, you poke it, smell it, and look at it, you will find it is soft, smells rotten, and looks mouldy." From this general claim about the hypothetical nature of a concept when used, Lewis infers that "if concepts are to be articulate and meaningful, then the application of them must be something verifiable; which means that what they denote must have a temporal spread."[7] It is important that Lewis speaks of concepts being applicable in a set of circumstances only in terms of the relationship of denoting: to say that a concept is applicable on some occasion is to say that it denotes something on that occasion. And since he insists on the predictive nature of any concept used (and thus also that it takes time to verify that a concept applies), he concludes that that which the concept denotes must have a temporal spread. But it is not obvious that this follows. It is plausible to claim that a (verifiable) empirical statement must be open to the possibility of reassessment

[5] Ibid., p. 131.

[6] Ibid., p. 140

[7] Ibid., p. 130. My emphasis.

in the light of further experience, and yet that such a statement need not be about any thing which lasts through time.

This, in fact, seems to be Goodman's position in The Structure of Appearance. Such 'things' as potatoes and tables are not conceived by Goodman as being material objects in the traditional sense, as they seem to be by Lewis. "Our tables, steam yachts, and potatoes are events of comparatively small spatial and large temporal dimensions."[8] These 'events' consist of a number of presentations of appearances: "If a thing can remain the same while its appearance changes, then clearly the real and the apparent are different. But this means not that the real thing must be something quite separate from its appearances but only that a real thing comprises many appearances."[9] ". . . the identity of a thing at different moments is the identity of a totality embracing different elements."[10] These presentations are, for Goodman, "momentary and unrecallable".[11] Without giving unnecessary detail, a presentation of an appearance is the presentation of many "concreta"--each concretum composed of a colour-quale, a spot (in the visual field), and a moment (a time spot)--forming a pattern which we identify as, say, a table. Goodman claims that judgements about these momentary presentations are verifiable in a specific fashion, and this I think is true.

> A comparison of temporally diverse presentations is indeed immune from the direct test of simultaneous comparison. If I say that the green presented by the grass now is the same as the green presented by it at a certain past moment, I cannot verify that statement by reviving the past presentation for fresh inspection. My statement might thus be looked upon as a decree. But such decrees are not therefore haphazard. . . . A decree, however safe it is from disproof, is vulnerable to cancellation

[8]Nelson Goodman, The Structure of Appearance, 2nd ed. (Indianapolis, 1966), p. 128.

[9]Ibid., pp. 127-128.

[10]Ibid., p. 129.

[11]Ibid., p. 132.

> by another decree. . . . Most important are the consequences, actual or prospective, of a given decree. When a decree causes too much trouble, we abandon it; and our decrees can lead us into such serious trouble as outright inconsistency.[12]

These decrees are subject to cancellation at least in the following way. Although the presentations of qualia are momentary and cease to be, by definition, as soon as they are apprehended (i.e., they do not have temporal spread in Lewis's sense), it is obvious I think that we may reassess a judgement about such a presentation if, in the light of further experience, we arrive at a general statement bearing on the first. Goodman himself does not mention this possibility. At the end of the passage quoted he does give an example of a decree being cancelled, but his example does not make use of the possibility of being cancelled in the light of a general statement acquired after the decree was first made.

In his example of cancelling a decree he draws upon what he calls "the useful principle of transitivity of identity (of objects)", even though he makes no attempt to explain how we arrive at the notion of identity of, say, a table through time, when all that the table comprises are qualitatively similar, momentary presentations of qualia which form patterns appearing and disappearing in our visual field. In particular, he does not say which principles of selection would allow us to distinguish an element of some already specified totality (his term for 'object') from a qualitatively similar element of a hitherto unmet totality; yet without such principles and given his phenomenalistic ontology, his notion of the identity of a 'thing' through time does not get off the ground. But this is not the place to examine these difficulties; for the present purpose it is enough to show that his qualia-statements are open to reassessment in the light of further experience even without using object-identity statements.

Goodman states that judgements about momentary presentations of qualia

[12] Ibid., p. 134.

"cannot be tested"[13], but this is false. If the statements are about momentary qualia, then I wish to say that they may not be re-examined in isolation. By this I mean that they have the status of decrees in the sense that for such a particular judgement p--a judgment about a particular presented appearance at a particular time--no future experience will support the statement not-p without the intervention of general statements of a specific kind. Only if we can 'build up' some general statement which in turn implies not-p (or, p) will the original statement, p, be open to an indirect reassessment. Depending upon whether the general statement implies p, or not-p, the reassessment can consist of rejecting the original p, or in considering it to have further support than it did originally. I shall give an example to help clarify where the general statement enters.

On first observing a 'swan', i.e., a presentation of qualia of the appropriate pattern, I may make the claim that the bird presents blue colour-qualia. And this may later be rejected as the product of an inattentive glance or an illusion, when I later perceive many other patterns of the same spatial configurations as the original pattern, all of which present what I claim are white colour-qualia. As a result of this further experience I may 'build up' a general statement about the colour-qualia presented by 'things' of the spatial dimensions in question, and via this statement reject or revoke my first decree. Equally my original statement may be supported by further experience, i.e., by perceiving many other presentations of 'things' of the same spatial configurations presenting the same colour-qualia as the original presentation. Goodman is very quiet about how a decree receives support, but surely the same expected uniformity which serves as a basis for doubting the particular statement in the first case serves as a basis for being more confident about the particular statement in the second case. This

[13]Ibid., pp. 133 & 134.

notion of a decree is thus very far from being equivalent to the notion of a purportedly empirical statement which turns out to be unverifiable. What I have said does not show that there are no significant differences between the possibility of reassessing statements about physical objects (in the usual sense of "physical object") and the possibility of reassessing qualia-statements of Goodman's kind. It may well be that the reassessability in the second case is in some way not as 'full-blooded' as in the case of statements about qualities of physical objects, e.g., the fact that we cannot directly reassess a statement about a past presentation of qualia without introducing a specific general statement (as described above) may have significant implications not mentioned in this section. Nonetheless we do have a form of reassessment in the light of further experience, even though the momentary presentation of qualia which the original statement is about does not have "temporal spread" (in Lewis's sense) and so cannot be re-examined. On this point, then, Lewis is mistaken.

It may be argued that a statement about an enduring object is no more open to reassessment in isolation than is a decree, so that the two kinds of statements are the same in this respect. Suppose we want to reassess the statement that some physical object is blue by moving closer to the object, or brushing away the dust, or turning on the light, etc.. Even if the object is kept in view throughout, so that there is no problem about re-identifying it, still we implicitly call upon general statements (not necessarily universal) of the form: "Within certain specifiable limits, moving closer to an object will provide a better basis for stating the colour of a physical object than standing at a distance", or "A statement about the 'real' colour of a physical object made after dust has been brushed away will be made on better evidence than one made when it is covered with dust", etc.. This point seems plausible, but still there is a noticeable difference in how specific these generalizations are as opposed to how specific the

generalization used in reassessing the qualia-statement needed to be. In the case of the qualia-statement, the general statement that permitted reassessment of the original statement was about all presentations of qualia having the same 'pattern' as the presentation mentioned in the original statement, i.e., the general statement was very specific.

6. Empirical Statements and the 'Possibility of Error'

It is generally claimed that all empirical statements are 'open to error', but the claim is often ambiguous. We need to distinguish two different senses of "open to error". On the one hand the phrase can mean "non-necessary", and on the other "open to assessment and reassessment in the light of sensory experience" (or simply, "corrigible"). All empirical statements are distinguished from other statements by their non-necessity--they are all capable of being factually false. It is controversial whether or not all empirical statements are corrigible. For example, it is sometimes claimed that some first-person, present tense statements cannot be discovered to be factually false, that they are perhaps the only empirical statements that are incorrigible in that they are "immune to the detection and correction of factual error".[1] My concept of an objective empirical statement is that of an empirical statement open to reassessment (regarding its truth-value) in the light of further experience, of a corrigible empirical statement, in fact. The concept will be refined in this section.

As a first step we may distinguish inter-subjective corrigibility from the possibility of self-correction (or, intra-subjective corrigibility). Some philosophers, notably Wittgenstein and his followers, identify corrigibility with inter-subjective corrigibility, with the implication that there cannot be a meaningful concept of self-correction. Wittgenstein refuses to speak of seeming empirical statements which fail the inter-subjectivity criterion as being genuine statements at all. Thus avowals of pain and so on are not treated as having truth-values (although third-person ascriptions of pain are).

However, corrigibility need not be inter-subjective since, as we have

[1]This is R.D. Bradley's explanation of "incorrigible" in "Avowals of Immediate Experience," Mind, 73, 1964, p. 190. My distinction at this point is essentially Bradley's, although I prefer to speak of corrigibility and non-necessity, rather than corrigibility and dubitability as Bradley does.

seen, someone working with the materials Goodman has to hand seems to have some notion of corrigibility available, viz, reassessment of a statement in the light of further experience. This corrigibility of Goodman's qualia-statements could be intra-subjective. In explaining how a person may re-assess a particular qualia-statement (i.e., a statement about a particular presentation of qualia) by appealing to a general statement 'built up' in the light of further experience, we did not have to suppose that the colour-spot-moment concreta involved were in any sense public. Let us suppose for the moment that they are radically non-public in that it is logically impossible for two people to be acquainted with one and the same concretum. Then my reassessing a statement about a particular set of concreta involves my recognition of the colour and pattern involved, and also involves my memory of past presentations of this kind.

Reliance on my own faculties regarding such 'non-public' entities has been regarded with sceptical eyes by followers of the Wittgenstein tradition, but total scepticism on this matter will leave us stranded with no means whereby to test any empirical statement, whether about a public entity or not. As Ayer writers:

> . . . unless there is something that one is allowed to recognize, no test can ever be completed: there will be no justification for the use of any sign at all. I check my memory of the time at which the train is due to leave by visualizing a page of the time-table; and I am required to check this in its turn by looking up the page. But unless I can trust my eyesight at this point, unless I can recognize the figures that I see written down, I am still no better off. It is true that if I distrust my eyesight I have the resource of consulting other people; but then I have to understand their testimony, I have correctly to identify the signs that they make.[2]

Thus, even when such things as books, timetables, and also other people are called upon in testing, ultimately I must still rely on my being able to recognize what I see and the sounds that I hear, etc.. So Goodman's qualia-statements may be reassessable in the light of further experience even if the

[2]A.J. Ayer, "Can There Be A Private Language?", symposium with R. Rhees, Aristotelian Society, Supplementary vol. XXVIII, 1954, p. 68.

concreta they are about are not public in any obvious sense. There is, then, a viable concept of self-correction, although just how 'robust' it is has not been established.

Since the phrase "open to error" is ambiguous, I shall use instead the two phrases "non-necessary" and "corrigible". In the terminology I shall use, to say that an empirical statement is non-necessary is to say only that we can give sense to someone's having reached the wrong verdict as to its truth-value, without any implication about the possibility of detecting the wrong verdict. To say that an empirical statement is corrigible is to say that verdicts are open to reassessment in the light of further experience. The thesis will not examine the general question of whether or not there can be grounds for deeming some sentences to express genuine empirical, non-necessary statements, while denying that these statements are corrigible. I now define "an objective empirical statement" as one which is corrigible, and I should state immediately that the detailed interpretation I shall give to "corrigible" is not one I attribute to Bradley. In outline the more detailed interpretation is as follows.

For a verdict, V, about the truth-value of an empirical statement to be open to reassessment in the light of further experience, it must be "possible" to test for its being in fact an incorrect verdict (and if it is, to correct it). I shall interpret this to mean that: it must be conceivable for a human being, using "genuine test-procedures", to test for not-V soundly, where the following basic soundness conditions are required:

1) the test-procedures are followed faultlessly
2) by someone having the minimum perceptual ability for the procedures to be reliable in the environment in question.

Once this interpretation is understood, it will be clear that if it is conceivable for a human to test for not-V soundly, it is conceivable to test for V soundly. That is to say an empirical statement is corrigible if and only

if it is conceivable for a human to test the statement soundly. The rest of the section is given to explaining more fully the terms of the interpretation of "corrigibility" just outlined.

First, let my explain briefly what test-procedures are. I mentioned in Section 5 Lewis's claim that verification of a statement makes use of "conditional predictions". These are predictions of the form: "If I act in certain ways, specifiable experience will eventuate." This I think is a useful way of looking at the notion of testing a statement, but there is one point to be made explicit. For some tests of some statements what the tester is required to do before he can see if the "specifiable experience will eventuate" involves a lot of bodily movement. He may be required to run a complicated experiment using test-tubes, bunsen burner, acids, etc.. On the other hand some tests for some statements involve very little bodily movement, e.g., they may require a tester to go to a certain place and then simply to watch for something, like watching for a shadow to cover the sun in an eclipse. And further, some tests for some statements may involve no bodily movement at all. This is especially likely to be the case for some statements about a person's sense-data alone. Nonetheless we can without strain still speak of testing these statements via "conditional predictions" since the person concerned may still be required to wait and to pay attention to sense-data of such-and-such a kind. And "paying attention to" at any rate, is an activity-concept. Looking at the form of a conditional prediction, I shall allow the first part of it, viz, "If I act in certain ways", to cover such things as "If I pay attention to my visual sense-data". With Lewis's conditional predictions in mind, I am using "test-procedures" to mean "the instructions stating what one must do in order to see if the appropriate 'specifiable experience' will eventuate'". A set of instructions constitute genuine test-procedures for a certain statement when what a tester is required to do is in fact relevant to finding the truth-value of that statement. As

a rather crude example, suppose that two people, A and B, have widely differing accounts of an incident they both witnessed, and that each person accuses the other of lying. The procedures "Have A and B fight in single combat and see who is the victor" are not relevant to the truth-value of the statement "Person A, not B, is lying in his account of the incident." This use of "genuine test-procedures" does not rely on the notion of the proper or healthy functioning of the human sensory apparatus. The requirement that the procedures be genuine does not preclude there being some test which only an unhealthy or malfunctioning perceiver can use reliably to test for the truth of some statement.

I have claimed that for an empirical statement to be corrigible it must be conceivable for a human being to test that statement soundly. Throughout the thesis the term "conceivable" will have the special meaning I give it in this section. To understand this meaning I need to introduce the phrase "given fact". I am taking as given such facts as that this or that particular causal law holds, and the fact that there is no causal connection between an event of such-and-such a kind and an event of some other kind. A great deal more cautiously I am taking as given the fact that there is a less than universal correlational law holding between some particular pair of variables, and the fact that there is no such correlation holding between some other pair of variables. In these last examples I have in mind the sort of correlational laws often used in experimental psychology where testers frequently seek correlations which are significant at the 5% level, i.e., given that the sample of things/people tested is a random one, then there is at most a one in twenty chance of the correlation's being accidental. More caution is needed in taking these correlational laws as given simply because some probability of the correlations' being mere coincidences remains, even if that probability is one in twenty, or less. We may accept these correlations less tentatively as given if we can relate them to some well established theory. For the rest of

the thesis when I claim that something is "conceivable", what is meant is "conceivable without rejecting any given fact". I shall reserve the phrase "logically possible" and its variations for possibility not qualified in this way, i.e., for possibility without regard to any given fact.

For it to be conceivable for a human to use soundly some genuine test-procedures for some statement, the test-procedures must be within a human's capacity to do and it must be conceivable for a human to have the perceptual ability required to use those procedures reliably in the situation in question. What the first of these two requirements means is that it must be conceivable without rejecting any given fact for a human to follow the test-instructions correctly. For example, consider the "possibility" of "fission" of a person's brain, where each new brain resulting from the fission is complete in its parts, i.e., each new brain is a complete brain although perhaps smaller than the original one brain. If binary fission of a person's brain is prohibited by some given fact, then a statement that can be tested only by having some person undergo such a fission is not corrigible; the test-instructions could not conceivably be followed correctly. I do not have enough physiological knowledge to be sure that this example is correct, but in any case it will serve to illustrate the point. I have said that there can be genuine test-procedures for some statement where only someone who is unhealthy can use the test reliably. There may even be some genuine test for a statement where you need to be unhealthy not only to use the test reliably, but even in order to follow the test-instructions correctly. In either of these two situations the qualification I have given the term "conceivable" limits my interest to illnesses (and malfunctions) which are not prohibited by any given fact, i.e., to those which could occur. So for an empirical statement to be corrigible I require that there be a set of (genuine) test-procedures which it is conceivable for a human to follow correctly and where it is conceivable for a human to have the perceptual ability to use those procedures

reliably in the situation in question. Whether it is conceivable or only logically possible for evidence for the statement and for evidence against the statement to result is unimportant for my concept of corrigibility. This last point has one very useful consequence in dealing with the corrigibility of true causal laws, and I think it is worth explaining.

Philosophers sometimes speak of an empirical statement's being corrigible if evidence for its being true and evidence for its being false are both, in some sense, "possible". Immediately, we may see that interpreting this to mean "in some way empirically possible " presents problems. There are some variations in definitions of "empirically possible" but to say that something is empirically possible means at least that it is not prohibited by some true and universal causal law. We have good reason to believe that the law of gravity is such a law, viz, "The force of gravitation for any two sufficiently massive bodies is directly proportional to the product of their masses and inversely proportional to the square of the distance between them." (One can say what the mass is below which a particle is not "sufficiently massive" in the sense of the law.) If this is so, then it is not empirically possible, under any interpretation of that phrase, for the force of gravity for a pair of sufficiently massive bodies to be other than what could be calculated using this law. In effect defining "corrigibility of empirical statements" in terms of empirically possible and correctly perceived evidence both for and against the statements, has the result that true and universal causal laws are incorrigible. The most frequent solution to this is to say that an empirical statement is corrigible if evidence for and evidence against it are both logically possible. For my purposes this is inadequate. In itself it does not ensure that humans could test the statements in the sense that it is within the capacity of humans to test them. This I have secured by saying that in order to be corrigible it must be conceivable for a human to test the statement soundly. After all, my primary interest is with the potential

epistemological soundness of truth/falsity verdicts about certain empirical statements, and in particular I place restrictions on what is to count as the potential to test an empirical statement. On my definition of "corrigibility of empirical statements" there is no problem in the case of true and universal causal laws. They are corrigible since it is conceivable for humans to test them soundly, and that is all that is required.

Looking at the whole definition of "corrigible (empirical) statement" it is worth pointing out that some contingent facts are not relevant to corrigibility. Consider the statement "The front of the object is circular" where the object referred to is several feet high, in good lighting, approachable to within six feet or so, not covered by anything, etc.. Suppose now that the object soon melts and that the only person near enough before it melts is blind. Then it may be "in fact impossible" for anyone to test the statement, since only the blind person was near enough. However, this does not mean the statement is incorrigible as I am using the term. It is conceivable for a human being to test the statement soundly, and no more is needed.

It may be objected that this interpretation of "corrigibility" leads to an infinite regress of tests. If soundly testing an empirical statement requires the two basic soundness conditions to hold, then does not testing the statement involve also establishing that the two conditions do hold? But if it does, then establishing each of the conditions will itself involve a further set of soundness conditions, and these requirements in turn will have to be established. And so on.

In reply to this, I should point out that usually if we test a statement and reach a verdict which is further confirmed, we do not question that the basic soundness conditions hold. It is when we reach conflicting verdicts about a statement that we query the soundness of both verdicts. Even here we are not involved in an infinite regress of tests if we can solve the

dispute by testing for the soundness conditions non-circularly. Suppose two people are testing the statement "The front of the object is circular" by looking through the fog at it from a fair distance away. Their verdicts conflict. Given that looking at the object is a genuine test, then the two soundness conditions hold for both verdicts if: 1) neither makes a mistake in his following of the test-instructions and, 2) both have the minimum perceptual ability required for the test to be reliable in the circumstances in question. The second requirement, for example, can be tested by using test-procedures which do not themselves involve the same requirement. This constitutes a non-circular testing of requirement (2) provided that defects in the kind of visual perception in question are not systematically correlated with defects in the different kind of perception they now propose to use. If one of the two people is suspected of having an illness which interferes with both visual and tactual perception, then both people cannot test non-circularly the hypothesis about defective visual perception if reliable tactual perception is required to do it. In such a case we may say that the two kinds of perception are not independent in the sense required for non-circular testing of a suspected low perceptual ability. In our example, suppose both people approach the object and touch it, and feel sharp protuberances on what should be the smooth circumference of a circle. Both then agree that the original statement about the shape of the object is false. The earlier conflict of verdicts may then be resolved by concluding that one of the two people did not have the perceptual ability to test the statement reliably using the visual-perception test in those circumstances. This is to say, they may conclude that the second soundness requirement does not hold for one person. It would constitute non-circular testing of the requirement since only tactual perception is used to do it, and the requirement is to do with some kind of visual perception. Thus the poor visual perceiver himself can take part in this test to show that he has poor visual perception relative to the visual-

perception test mentioned.

The most interesting cases where the second soundness requirement does not hold are where one or more testers can follow the test-instructions and yet do not have the required minimum perceptual ability. Cases where the second requirement does not hold because the 'tester' cannot even follow the instructions present no special difficulties. For example, a blind man cannot meet the second requirement for a test relying on visual perception, but this is very easily spotted. My focus will be on the less straightforward cases.

To return to our example, the tactual test to show that the second soundness requirement does not hold for one person will itself involve some requirement of the same form, but we are not involved in a vicious regress of such tests. If the original dispute can be resolved in this way then the testing stops here. There is always some final requirement which remains assumed rather than tested, but this is not to deny that the final requirement is clearly non-necessary. Indeed, there may be circumstances where it would be absurd to test for this requirement, although at some later time in the light of fresh evidence it may become absurd not to.

If someone reaches a verdict using a genuine test and the two basic soundness conditions hold, this of course does not logically entail that the verdict is correct, nor even that this is the soundest verdict we can reach. However, I am suggesting that this is the least we require for a verdict to have some epistemological worth. That is to say, showing that one or both of the conditions do not hold is enough to reject the verdict as unsound, whereas the fact that other possible soundness conditions do not hold does not warrant an outright rejection. For example, we naturally assume that a verdict reached using the most reliable test available is consequently sounder than one reached using some other test. Also, we tend to assume that a verdict which concurs with the results of other "independent" tests is sounder

than a verdict that conflicts with them. (Usually we assume that different tests performed by some one person, and the same test performed by different people, constitute independent tests.) Such features certainly may 'weight' the decision between conflicting verdicts, since they are clearly desirable features.

7. Inter-Subjectivity and Normality-Requirements

I now wish to examine specifically the corrigibility of inter-subjective statements. There is inter-subjectivity, in the sense I want to capture, if the judgement of one person, made as a result of following the procedures for testing the truth/falsity of the statement, P, is relevant to the judgement which another person makes about P as a result of following the test-procedures. Where this relevance obtains, the statement is inter-subjectively corrigible. In my general definition of "corrigibility" I have not required inter-subjectivity; I am not taking for granted that there are no statements open to self-correction, or, that there are no statements which are open to self-correction and to no other correction. So, I shall say that an empirical statement is inter-subjectively corrigible if and only if:

> It is conceivable for a human being to test it soundly, where the test can be adequately described without designating any particular individual as the tester.

So for a statement to be inter-subjective, the test for it must not require, either logically or causally, some particular individual to be the tester.[1]

For a set of procedures to be commonly accepted as a test for some statement, they must be successfully employable by most people at least to some minimum extent, although for some statements there may be several tests which are of unequal standing. For example, in the northern hemisphere one can test the statement "I am facing north" by making use of the fact that moss grows on the northern sides of trees. But moss can be confused with lichen, and the northern side of a tree may be quite wide; and so this test is both vulnerable

[1] This feature was not guaranteed in the case of Goodman's qualia-statements, where it was claimed that a particular qualia-statement is reassessable in the light of some general statement 'built up' later. It remains possible that logically only one person can support such a general statement (if qualia are radically non-public entities), in which case it would not be an instance of inter-subjective corrigibility.

and imprecise. It would be better to use a compass if one is available. However, in both cases the Inter-Subjectivity condition given above--I-S condition, for short--holds. Both are inter-subjectively corrigible in the required sense and therefore a fortiori both statements are objective.

Sometimes a test is described in a way which involves the notion of better or worse implementation of it. For example, the statement "Bob hit the bull's-eye with his last shot" may be verified by the test "Move as close as possible to the optimum distance from the target and look at it."[2] This test is better implemented by going to within ten feet of the target and looking than by going to fifty feet and looking. For simplicity, I shall speak of test X being more adequate than test Y both in the case of X's being straightforwardly different and better than Y, and in the case of X and Y's being different implementations of some formulatable, common procedure where X is a better implementation than Y.

When we are discussing a sound verdict reached after using some very common test, the second soundness requirement, but not the first, very often takes a special form. Instead of simply "The tester must have the minimum perceptual ability for the test to be reliable in the environment in question" (which is the general form of the second soundness condition), we have the special form, "The tester must have (at least) normal perceptual ability of the kind required." That this is only a special form of the second condition tends to be overlooked, since many writers refer only to this version. As an example, let P be the statement "The two vases are different shapes", and let us assume that the I-S condition holds, i.e., that the test-procedures do not essentially involve any particular individual. If the commonly used test involves looking at the shape of the two objects, then we require than an

[2]There will be some minimum distance, varying with the size of the bullet or cannonball used, at which testers should stand if their viewing is to be the most effective possible.

acceptable tester follow the test-instructions correctly and have (at least) normal visual perception of shape. If two testers disagree about the statement, P, we may be able to resolve the dispute by finding that one of them has made a mistake in his following of the test-instruction, for example, perhaps he has viewed the wrong pair of objects. But if we cannot find such an error, and if the test itself is generally adequate, then we must consider if we are mistaken in assuming what we do about the testers. The obvious assumption to query in this case is that they both have (at least) normal visual perception of shape. Quite often, once formulated the two soundness conditions can be non-circularly tested, and this holds true for this special form of the second of these conditions, viz, where (at least) normal perceptual ability is required. Since this special form of the second condition is used so often (namely, in cases where the test is commonly accepted as reliable), I now wish to examine it quite closely.

Suppose that a requirement of this kind--that the testers have at least normal perceptual ability--does not hold. Then it is true to say, relative to some commonly accepted test, something of the form: "At least one tester is an abnormally poor ϕ-perceiver." This concept of normality will rest ultimately on the concept of one person's being <u>better</u> than another at ϕ-perception, and this primary concept will be construed throughout as one person's being <u>more reliable</u>, <u>more likely to have his verdict further confirmed</u>, than someone else. First I want to look at this basic issue--the ways in which one person may show himself to be a poorer ϕ-perceiver than another, or a poorer ϕ-perceiver than most people.

Sometimes a person can obviously make finer discriminations of some kind than can someone else. I am particularly interested in cases where this can be non-circularly tested. Suppose we suspect that a person, A, cannot make as fine visual shape-discriminations as can someone else, B. We can prove this to the satisfaction of both A and B providing we can use some feature other than shape to show that B can consistently discriminate objects which A cannot

where the only plausible explanation is that B is discriminating by visual shape. For example, suppose that B can look at randomly presented pairs of objects which are very slightly different in shape (e.g., various solid blocks) but which are the same colour, same 'visible' texture, from his viewpoint. (They may well differ very slightly in size, because of the slight difference in shape.) And suppose that B can consistently discriminate between some pairs which A finds visually indistinguishable. Both the testers may agree that A has the poorer visual shape-discrimination providing the objects can be identified by both in some other way, for example, if each object has a different embossed number on it, hidden from the viewpoint, which can be tactually perceived. As a more cautious formulation of the differing abilities of A and B we may say, for example, that A has poorer visual discrimination of oval shapes than does B, if this is all we are actually testing for. For this discrimination test we require that both people have normal or better tactual perception of shapes if they are both to discover that A has the poorer visual discrimination of oval shapes (if that is what shape the ovoids present as they are set out). Nonetheless the testing of "A has poorer visual discrimination of oval shapes" is non-circular.

If we can show one person to be poorer/better than another at some kind of perceptual discrimination, we can also show one person to be poorer/better than most people. Experiments similar in design (but hopefully less primitive) can thus be used to test for extremely defective visual shape-perception. In our example about the vases being different shapes, if we can show that there are many kinds of shapes (besides ovals) such that A cannot discriminate between objects on the basis of 'visual' shape although most people (including B) can discriminate those objects, then our original dispute about the vases' being different shapes can be resolved. Since the ability to discriminate visually between shapes is needed for testing the statement, and since A is poorer at this than B, A should defer to B. B's verdict is far more likely

to be correct than A's where these conflict, although it always remains possible that B's verdict will be rejected later in the light of fresh evidence. In practice, we may sometimes leave such disputes unresolved. I am suggesting that if some group of people can make finer discriminations than some other group, we may conclude that if one group is to defer for epistemologically relevant reasons, then the latter should defer to the former. Of course, on occasion this may mean that the majority should defer to some minority who are far better than normal at that kind of discrimination. For all of the five senses, we may employ this notion of a person's making finer/poorer perceptual discriminations than most people.[3]

A person is a better ϕ-perceiver than another if he can use some or all tests requiring ϕ-perception more successfully than can the other person in certain environments. (Remember that I am not dealing here with one person's being worse/better than another at ϕ-perception because of how accurately he follows the test-instructions for which ϕ-perception happens to be required. This falls under the first soundness condition, not the second.) Suppose there are two tests, X and Y, for some statement, P, and that X is a better test than Y. One test can be better than another in being more reliable and/or in being capable of testing statements of greater precision. For simplicity, I shall focus only on reliability. For example, the test of looking at a compass is more reliable than the test of looking for moss on trees

[3]It is possible on occasions that the more discriminatory should defer to the less discriminatory for reasons which are not epistemologically relevant. For example, suppose a small minority of people can discriminate consistently between the tastes of two kinds of food although the majority of people cannot, such that the majority (left to themselves) claim the statement, "These two kinds of food have no difference in taste" to be true. Now if an agreement about the statement is required in order to decide whether or not to offer one of the kinds of food as an alternative first course to the other in a public restaurant, then the finer discriminating will probably defer to the majority. This is not a case of the minority's coming to agree with the majority as to the truth or falsity of the statement. They defer precisely because the majority of people are so much worse at taste-discriminating than they are.

if we are trying to test the statement "He is facing approximately north". Using a compass is also capable of testing statements of greater precision than can the looking-for-moss test (e.g., "He is facing in a direction within one degree of north"), but let us leave this aside. To say that test X is more reliable than test Y is to say: For the normal perceiver, if a verdict arrived at after faultlessly following the instructions for text X conflicts with a verdict reached after faultlessly following the instructions for test Y, then the former verdict is more likely to be correct, and so more likely to receive further confirmation than that the latter is. (This is compatible with the two verdicts' usually concurring.)

So A is poorer at ϕ-perception than B if B has more success with verdicts reached after correctly following test-instructions requiring ϕ-perception than does A. Suppose that for the poorer test, Y, ϕ-perception is required, and that for the better test, X, ψ-perception is required. If they test some statement using Y and reach different verdicts, and if later they test the same statement using the better test, X, and agree that B's earlier verdict is confirmed, then they will have shown that B used test Y more successfully than did A, and that therefore (given that they both followed the test-instructions correctly) it is very likely that B is a better ϕ -perceiver than is A. I have already referred to a case of this kind, where two people test the statement "The front of the object is circular" first by looking at it and then by touching it (above, pp.30-32). Suppose that A and B are testing that statement by using first the test, "Stand sixty feet from the object in good lighting and look at (the shape of) it"[4], where this test requires ϕ-perception, which I shall leave uninterpreted for the moment. Both A and B follow the test-instructions correctly, neither looks in the wrong direction nor at the wrong object, etc., but their verdicts

[4]Since a little more detail may be helpful here, assume that the object is very small, some four inches high, so that the two tests are on an unequal footing.

conflict. Suppose now they re-test the statement using the much better test, "Run your fingers around the edge of the front face of the object." They both agree that the statement is false since they can feel sharp protuberances on what should be the smooth circumference of the circle. This better test involves only a requirement about normal tactual perception, and so we know at least that the requirement about " ϕ -perception" is something different, since the poorer test involves only the visual sense. If, then, it is B's earlier verdict which receives further confirmation, the statement "B is better than A at ϕ-perception" is non-circularly tested, and the statement is shown to be true to the satisfaction of both A and B.

How should we interpret " ϕ -perception" in this case? We could say that B is better than A at distant, visual perception. But this suggests that he is better than A at, for example, colour-perception at a distance, and perhaps at some other kinds of perception involving vision. But to assume, e.g., that A is a poorer colour-perceiver of objects at a distance, simply on the basis of this test, is to presume too much. We may claim that B has better visual, shape-perception. This sounds more plausible, but it is not very informative. E.g., perhaps he can make finer discriminations than A even at very close range. Or perhaps he has better visual, shape-perception in some particularly adverse conditions. The above case is of that kind, but so also would be a case of B's being able to detect visually a shape in semi-darkness, or in a very short space of time, where A cannot. We can be more informative as to the kind of adverse conditions in which B reveals that he is better than A by saying that B has better visual, shape-perception at a distance than A. This cautious formulation avoids suggesting that B is better than A in some of those other conditions. Indeed, it remains possible that B, who is long-sighted, is much poorer than A at visual, shape-perception at very close quarters. Depending on how successful most people are in using the poorer test, we may find that A is poorer than most at visual, shape-

perception at a distance, or perhaps that B is better than most.

Ordinarily when a statement is inter-subjectively tested, using reliable procedures, and the verdict is agreed upon, we need not ask if the testers are normal perceivers. After all, to say that the test is (in general) reliable means that it is reliable for most people. If we do formulate this requirement in such a case, we may be content to do so in very general terms; e.g., "This test is designed for testers having (at least) normal colour-perception", or, "This test is designed for testers having (at least) normal tactual perception." Only when it is doubtful that all the testers fit the requirements do we query them and, in particular, decide how specific these requirements should be. We must decide just what the tests we employ to query the requirements do, in fact, test, and it may take considerable judgement to reach the description with the most predictive value. A person who is well trained in the psychology of perception may be aware of which perceptual abnormalities are usually correlated with some others, and so may be able, justifiably, to give a less specific description of the kind of perception required than someone not so trained. Likewise a person so trained may give a more specific description than would someone else, since he may know that certain intuitively expected correlations between the type of perception tested for and some other type of perception, in fact, do not hold. (For example, it is easy to assume that if someone is worse than the majority at discriminating brown shades, then he is worse than the majority at discriminating shades of any colour; but this may be false.) In the example above we make the fairly cautious statement that A is poorer than B at visual, shape-perception at a distance. It is intuitively plausible to expect A to be poorer than B at visual, size-perception at a distance as well, especially in testing statements of the form: "Those two small objects are the same size." There may even be a logical connection between the ability to perceive shape and the ability to perceive size. But if they are not logically connected in

a tight enough way, then it is wisest to make no commitment about their being contingently connected until we have all the relevant empirical evidence.

I have described ways in which a person could reveal that he is a poorer ϕ-perceiver than most people. The one thing common to all cases is simply that if the verdict of the poor perceiver conflicts with that of most people, then it is more likely that his verdict is wrong than that theirs is. His verdict is less likely to receive further confirmation. The comparisons are between the verdict he reaches and the verdicts the majority of people reach when they all test the same statement using the same test in the same environment. This last term is given a special meaning in this thesis, and it will be used quite often in regard to visual perception. A perceptual environment for testing some statement about a physical object/group of them by using visual-perception remains constant providing all features except the state of the perceiver remain constant, i.e., if the part of the physical world viewed remains constant, and if the location of the perceiver remains constant. The location includes the direction he is facing, and the orientation of his eyes. The state of the perceiver is not included in "the environment". The perceiver's state can vary and yet the environment remain constant. (Mutatis mutandis for two environments' being the same.)

There are two options as to how we define "normal perceiver". In one of them there is no reference, either explicitly or implicitly, to a certain level of ability a person must have in order to be a normal perceiver; to be precise there is no requirement that a normal perceiver be able to use reliably certain tests in certain environments. E.g., suppose you define "the ability of a normal perceiver" as "the ability of the majority of the people now alive and as they are right now". Then on this usage, it will be logically impossible for the majority of people at any one time to be abnormally poor perceivers, but the level of ability of a normal perceiver can vary from one time to another since the level of ability of the majority of people can vary from one time to another.

The other option is to define "normal perceiver" so that it does make reference, explicitly or implicitly, to a level of ability, so that there are certain tests a person must be able to use reliably in certain environments if he is to qualify as a normal perceiver. In fact, this is the option I have had in mind during this section. For the points in this section I have in mind the minimum level of perceptual ability found in the majority of a specific group of perceivers, viz, the actual individuals now alive and as they are now. On this usage it is possible at some other time that the majority of people then living and as they then are are abnormally poor perceivers for some kinds of perception. The point is that some people will die, some will be born, and in any case an individual's level of perceptual ability can vary. There may be a general decrease in ability of some kind, or even a general loss of that perceptual ability altogether, so that tests now reliable may then require that testers have a minimum level of ability which is much higher than most people then have. In this case, most people at that time would not satisfy the normality-requirements as I have here interpreted them. Of course there may be circumstances that would prompt us to change the specific group of people that constitute the reference group. E.g., we may keep it as I have suggested--most people now alive and as they are now--if a general loss of ability is temporary, but we may change the reference group if some general loss becomes a permanent feature of humans. I still prefer this way of defining "normal perceiver" over the first option, since this last way makes it clear that when we say "a test is reliable" we mean it is reliable for people having a certain minimum level of perceptual ability. It is theoretically important not to forget this and suppose, e.g., that any reliable test is always reliable for the majority of people at any time. Of course, we expect a person's perceptual ability to remain fairly constant for very long stretches of time, and we also tend to assume that which group we refer to in speaking of "the majority" does not usually matter, but it

could matter. Given the option I have chosen, i.e., given that my definition of "normal perceiver" makes use of a specified reference group of perceivers, an abnormally poor ϕ-perceiver is a perceiver whose ability is less than that common to the majority of people of the reference group. And given the reference group I have chosen, an abnormally poor ϕ-perceiver is worse at ϕ -perception than the majority of people now alive as they are now. An abnormally good ϕ-perceiver is one who is better at this kind of perception than the majority of the reference group.

8. Resolving Disputes

As yet nothing has been said about the causes of abnormally poor perception, but knowledge of such causes may be very useful. Having an abnormal bodily state which interferes with perception can be usefully characterized in at least two ways: a) "having an unnatural state which interferes . . .", and b) "having an unhealthy state which . . ." .

a) "An unnatural state of the body's sensory apparatus"

Even the notion of "unnatural" is open-ended, but it is to include such a state as having artificial limbs or sense-organs, or pieces of shrapnel in the body, or having some part of the body missing, etc.. With the exception of the last, these states may be roughly characterized as "having a foreign body/substance either in the body or as part of it". An unnatural state of the sensory apparatus is one of these states or a state of the sensory apparatus which results from one of these states.

b) "An unhealthy state of the body's sensory apparatus"

Some imprecision remains here, first, because it is usually supposed that one of the features of a healthy state is that it is desirable, and secondly, because healthy and unhealthy states lie on a continuum. Sometimes it is difficult to decide if someone is unhealthy or not, for example, if someone has no disease or injury but lacks stamina through lack of exercise. We do not even have a definite number of obviously unhealthy states, since we are still accumulating knowledge of the human body. For this reason we may more confidently describe a bodily state as unnatural than as unhealthy.

We expect it to be generally easier to design reliable tests for people not having an abnormal state of the sensory apparatus than it is to design them for those who do have such a state. This is not an entirely arbitrary expectation and its basis is not simply that there are far more people without

such states than there are with them (if, in fact, this is true). It is based on a further belief: where there is a difference between the levels of perceptual ability between a group having some abnormal state of this kind affecting perception, and a group having no such state, then providing the abnormal state was not deliberately brought about in order to improve the person's perception, the group without the abnormal state will be more likely to have the higher ability; they will be more likely to reach correct verdicts. We do not expect abnormal states to cause an increase in perceptual ability. Naturally, we expect it to be easier to design tests for those with the higher level of ability, since they are less restricted in the tests they can use reliably.

In our examinations of the human body we assume that the various organs and parts have some function or other and that this function is best displayed when the body is healthy and not unnaturally tampered with. As I mentioned, it is usually supposed that a healthy state is desirable, and one of the ways it can be desirable is in permitting the body's functions to be performed well. A state which causes a lowering of perceptual ability of some kind becomes a prime candidate for the label "unhealthy state" or "impaired state", and, significantly, these labels are often interchangeable.

We may sometimes be able to design a test which can be used reliably by an unhealthy person with lowered perceptual ability. It is even conceivable that some abnormal state may cause an increase in perceptual ability and so make designing a reliable test much easier. E.g., a bodily state may be deemed unhealthy if it is undesirable because it causes pain and discomfort, even though it does not impair any bodily function or even though it causes a better functioning in some way.

Many unhealthy bodily states do impair our perception since this is often the grounds for their being called "unhealthy". For other abnormal bodily states we can see if they tend to cause a significant loss of perceptual

ability if we can have affected persons using certain tests involving the kind of perception in question, and look for further confirmation of their verdicts, and compare their rate of success with that of healthy perceivers in the same environments. Of course, they may be bodily states which cannot aptly be described as either "unnatural" or "unhealthy", but which do cause a decrease in perceptual ability, and there may be some unnatural or unhealthy states which do not cause poor perception. Nonetheless, the two characterizations of "abnormal bodily state" are useful. There is a fairly high correlation between having them and having impaired perception of some kind because of the teleological assumptions we are entitled to make about the human body.

Knowing such causes of perceptual impairment can be useful in resolving disputes. In case of conflicting verdicts between two people, if we show that one has an abnormal state of the sensory apparatus which tends to impair the kind of perception being used, then we know that his verdict is probably wrong. It is obviously better to check the verdicts directly, by looking for further confirmation of one of them using optimally different tests, rather than assume that the ill tester's verdict is incorrect (although we expect to reach the same conclusion both ways). However, there may be occasions when contingencies make the usual further tests impossible; e.g., we may test for the shape of a small object by looking at it from sixty feet away and then find it melts before we can reach it to test the statement tactually. Then being able to show that one of the disputants has such a bodily state gives us a non-arbitrary solution by showing indirectly which verdict is likely to be incorrect. In paradigm cases of this sort we are drawing on general information about the effects of the abnormal state, where this information was acquired when it was in fact possible to test the verdicts of affected people by using independent tests.

Also it may be possible to show non-circularly that someone has such

an abnormal bodily state, i.e., it will be possible to show it without making any commitment about the type of perception this kind of state impairs. For example, suppose that sclerosis causes abnormally poor tactual perception with respect to some common test: an affected person cannot test reliably the statement "The object has two sharp points" by sense of touch if the points are an inch apart (or less). In those circumstances he cannot distinguish tactually the object's having one sharp point from its having two, although the normal perceiver can. (Whether or not this is true, it will serve as an illustration.) And suppose that one of the two disputants has sclerosis. If the test leading to the dispute involves tactual perception of that kind, then a case can be made for one person's deferring to the other if we can show non-circularly that the former has sclerosis; i.e., if the illness can be diagnosed without relying on tactual perception, so that, in principle, the person affected can diagnose it himself. If this is done, then we have shown indirectly that he is very probably an abnormally poor tactual perceiver.

I now wish to give a summary of the guide-lines for resolving disputes about the truth/falsity of a statement between one person/group of people and another. In the following points the basic soundness conditions can be understood in their most general form (where no reference is made to "normal perceivers"), i.e., (1) the test-procedures are followed faultlessly, (2) by someone having the minimum perceptual ability for the procedures to be reliable in the environment in question. In judging the soundness of a verdict for some statement, we apply first the elimination rule provided by the two basic soundness conditions: "Reject (or at least, do not rely on) any verdict reached when either (or both) of the conditions does not hold." As we have seen, the second of these can be tested for directly, or indirectly via known causes of a lack/loss of perceptual ability rendering the test unreliable for the tester(s) concerned. (We looked at the special form of this condition where "at least normal perception" is required, but the possibility of indirect

testing need not be so restricted.) This elimination rule applies even when there is no dispute, i.e., when we have a group of the same verdicts (perhaps only one verdict) for some statement, reached using some one test a number of times (perhaps once). The verdicts may still be rejected on these grounds. A group of concurring verdicts which pass this test become candidates for the title of probably correct verdicts.[1]

Suppose we now have a dispute, i.e., we have two groups of verdicts for some statement reached after using some one test a number of times, where all the verdicts of one group are "true" and all the verdicts of the other group are "false". The comments I shall make apply whether the dispute is interpersonal or intrapersonal, i.e., whether the verdicts are reached by different people, or by one person at different times. Although we know that one group of verdicts must be correct, we may find that none of them is basically sound, and so have no epistemological reasons to claim the precedence of one group of verdicts over the other. Then the matter remains unresolved. On the other hand, if one group of verdicts is unsound but the other basically sound, then the latter are more likely to be correct, and we have a non-arbitrary resolution of the dispute.

Where all the verdicts appear to be basically sound, we may take note of or try to establish other soundness conditions which are desirable rather than required. E.g., if the original statement is re-tested using a test independent of the first, we may find one of the earlier groups of verdicts to be consistently confirmed. If this re-testing is basically sound, it provides a non-arbitrary resolution of the earlier dispute.

Or we may re-test the original statement by using far less of the kind of perception used in the original test, e.g., by moving to a far more

[1]The verdicts, although all basically sound, need not be the soundest verdicts. E.g., basically sound verdicts reached using a more reliable test may be deemed to be sounder.

favourable location, so that this re-test requires less perceptual ability than does the original. Again, if we find one of the earlier groups of verdicts to be consistently confirmed in this way, and if this re-test is basically sound, then it provides a non-arbitrary resolution of the dispute.

Another important feature we may look for when we have a dispute where all the verdicts seem basically sound is the ratio of the one group of verdicts to the other. If there is good reason to believe that in all uses of the test the tester (whether one person or more) does follow the instructions correctly and does have the minimum perceptual ability for the test to be "reliable" in the environment in question, then a large enough majority of one of the groups of verdicts gives us a non-arbitrary resolution. How large the majority needs to be depends on how you define "reliable". I shall explain this general point about a possible resolution by setting out the usual, special form of it where (at least) normal perception is required.

Suppose we require at least an 80% success-rate for an individual to use a test "reliably", i.e., this must be his rate of reaching the correct verdict after following the test-instructions correctly. Then for some test which is reliable for the normal perceiver for some statement, we expect the proportion of correct:incorrect verdicts to be 4:1 or better (i.e. >4:1). The statement, "Using procedures, X, correctly is a reliable way of testing the statement, P, for the normal perceiver", may legitimately be construed both intrapersonally and interpersonally. It gives grounds for believing both that:

i) it is reliable in its many uses by any one normal perceiver who follows the instructions correctly (where these uses take place at different times);

and that ii) it is reliable in its many uses by a group of normal perceivers who follow the instructions correctly (whether or not these uses take place at different times)

provided we are prepared to make the following assumption: the sample set of cases (whether interpersonal or not) is a random sample and, therefore, likely to be representative of the total set of such cases. Here "the total set of cases" means all actual uses of the test by normal perceivers who follow the instructions correctly, whether or not these uses have occurred already, are occurring, or will occur. Assumptions about random sampling are used a great deal in experimental psychology, but always with the qualification that by chance a random sample will be unrepresentative a small, calculable, percentage of the time. This applies to our samples too. So, in any random sample of uses of a reliable test, we look for the correct verdict's being reached in at least 80% of the uses in this sample, and expect to be 'let down' very rarely. Resolving a dispute in this way will be appropriate only where at least one of the groups of verdicts does involve a number of uses of the test, and where the ratio of "true":"false" verdicts is either 1: $\geqslant$4 or $\geqslant$4:1. Resolving in favour of the majority is then not simply a rule of expedience.

Where the ratio of the verdicts is 1: <4 or <4:1, we must decide whether or not the ratio is close enough to that expected to support resolving the dispute in this way. Obviously, the further away from the expected split, the less confident is our belief that the majority of verdicts are correct. When this happens we may, e.g., hypothesize that the random sample of uses is not representative of the total uses of that test by normal perceivers who follow the instructions correctly, or, perhaps, that in some uses one or both of the basic soundness conditions did not in fact hold.

One other factor besides that of the ratio of the "true":"false" verdicts affects our confidence in the majority-verdicts, namely, the actual number of test-uses in the sample. The larger the sample, the less likely that the verdict-ratio here is unrepresentative of the verdict-ratio of the total set of test-uses.

There may well be other desirable soundness conditions to weight the choice between verdicts all of which appear basically sound, but the concurrence of the independent tests or of easier tests, and there being a vast majority of either "true" or "false" verdicts are probably the most commonly sought conditions.

9. Testing for the Sameness/Difference of Colour of Physical Objects

My questions are asked in the context of a non-solipsistic physical object theory, i.e., where it is assumed that there are physical objects, including the bodies of other people who do have perceptual experiences. Also my comments are restricted to the colours of physical objects which are not the bodies of any of the perceivers involved in viewing the objects. Finally, I am discussing the sameness/difference of the present colour of physical objects, where the colour is the colour the objects have at the time of the attribution of sameness/difference of colour. I am not here looking at attributions which refer to the colour physical objects have in what is deemed to be a "standard environment" (for those kinds of objects)--sometimes referred to as their 'real' colour.

To begin with, I shall make two points about what is required if we are to have a concept of "the sameness/difference of colour of two physical objects". First, for something to be a quality of a physical object I do not require that it be a quality "in the object itself", as Locke phrases it. What the phrase "in the physical object itself" covers is not altogether clear, but presumably a simple relational property such as "being to the left of . . . (some physical object)" is not a property which is "in the object itself". The condition I do consider to be necessary if something is to count as a quality of a physical object can best be expressed in terms of statements ascribing such qualities to physical objects.

Necessary condition: In a constant environment containing a physical object, conflicting verdicts for a statement ascribing the quality to the object necessitate one (group of) verdict's being incorrect.

(The environment includes the location, but not the state of the perceiver.)

This is part of what is meant by the statement's being genuinely "about (a

quality of) a physical object", and any statement for which this does not hold cannot be about a particular physical object, no matter what its surface grammar. A simple relational property such as "being to the left of . . . (some physical object)", although not "in the object itself", can be treated as a property of physical objects in that statements ascribing the property to objects meet the important condition set out above. The requirement is intended not to preclude relational and dispositional properties per se being treated as genuine properties of physical objects.

There is a second point to do with what is involved in the concept of "the sameness/difference of colour of two physical objects". This is about a requirement our sense-experience must meet if the experience is to count as experience of colour-qualities of physical objects. Early in the thesis I made the point that if some ideas are ideas of the physical world, then they must be determined by the physical world (in Section 4 above). If we are legitimately to make certain attributions of colours to certain physical objects on the basis of the perceived colours of someone viewing the objects, then these perceived colours must be determined by those physical objects. This is a conceptual requirement for taking ideas of colour to be, at least sometimes, ideas of the physical world. Also, if, at least sometimes, on the basis of a difference in perceived colours when viewing a pair of physical objects, we are legitimately to claim the objects to be different colours, then the difference in the perceived colours must be determined by the physical objects, given their environment. This is to say there must be some difference in the properties of the two objects which accounts for the difference in perceived colours. The properties need not be non-relational or permanent. Some relational and dispositional properties meet the crucial condition for being considered properties of physical objects. It is useful to capture the point that some relational properties of the viewed physical objects are relevant to the perceived colours the viewer has, by saying that the perceived

colours must be determined by the physical objects, given their environment.

The requirement--that ideas of colour of some physical objects must be determined by those objects, given their environment--allows us to draw at least one distinction that we cannot afford to ignore. It is the basis of the distinction between the perceived colour of a physical object, and an hallucination. A visual hallucination occurs precisely when one's perceived colours are not determined by part of the 'external' physical world. Suppose that you are presenting and re-presenting pairs of physical objects to a person to see if he can consistently discriminate between the two objects in each pair. So far as I know it is conceivable (without rejecting any given fact) for a person to hallucinate in such a way as to discriminate or match some of his colour sense-data in a pattern isomorphic to the presentations and re-presentations of pairs of physical objects. I am certainly not suggesting this as a probable hypothesis if the person involved in the discrimination test gives responses which are isomorphic to the presentations and re-presentations of the physical objects. Nonetheless the point remains that without this requirement about the determining of his perceived colours by the physical objects presented in the chosen environment, the person cannot be discriminating physical objects on the basis of their colour.

Given that this requirement is a necessary condition for some of our ideas of colour to be ideas of some viewed physical objects, how can we decide whether or not we in fact have such ideas. Certain empirical tests can support the claim that we can have perceived colours that are systematically correlated with physical objects in our perceptual environment, tests like the discrimination-test mentioned above. We can present and re-present pairs of physical objects to a sighted person in an environment that otherwise remains constant, and ask whether or not he can discriminate the two objects of each pair by colour. The objects can be all of the same shape and size, but with some identifying device perceivable only by the tester, and the pairs can be

presented and re-presented in a random order. If the person tested discriminates consistently between the objects of certain pairs, no matter when the pairs are presented, then, since ex hypothesi the objects are the same shape and size (and same 'visual' texture, etc.), the probable hypothesis is that the viewer is discriminating between the objects of such pairs by colour. That is to say, his discriminations are made on the basis of his perceived colours at the time of the presentations of these pairs; and to account for the consistency of his responses, the probable hypothesis is that some properties of the objects presented, given their environment, determines these perceived colours he has.

Of course, for a pattern to emerge in the viewer's responses, there needs to be some other pairs of objects the members of which he consistently matches, or consistently hesitates over. If his response to all presentations of the pairs of objects is that the two objects "have different colours", then the fact that he responds consistently to the presentation and re-presentation of each pair is not as "significant" as it would otherwise be. The use of "significant" here is very close to that used in psychological experiments. Very crudely, the higher the significance of a correlation, the less likely that the correlation is a mere coincidence. In psychology there are ways of calculating what the "level of significance" of a correlation between two variables is. For my purposes here it is enough to point out that the correlation between the perceiver's responses: "same colour", "same", "different", "same", "different", "different", . . . etc., and the presentations of the pairs of objects: "A & B", "C & D", "B & C", "C & D", "E & F", "B & C", . . . etc., provides better support for the claim that the perceived colours of the person tested are determined by the properties of the physical objects presented, than would the response "different colours" made for every presentation of objects.

So with the emergence of such a pattern of responses, the simplest hypothesis is that the person's perceived colours are determined by the presented physical objects (given their environment), rather than that the correlation between responses and pairs of objects is a mere coincidence. By testing other people, it may be found that many, or even all, of the group tested give consistently one and the same response for this or that pair of objects when presented. Such correlations are in a sense just brute facts about the world. And in the face of these facts, the very probable hypothesis that properties of the presented physical objects determine the perceived colours of the viewers so that their ideas of colour are ideas of these physical objects, is enough to make it very likely that we can arrive at a coherent concept of "the colour of a physical object". We have already a solid base for the locution.

For the moment I shall focus on the concept of "the sameness/difference of colour of two physical objects". The next move towards making this concept coherent is to explain what constitutes a mistake in judging the sameness/difference of colour of two physical objects on the basis of one's perceived colours on viewing them. To do this we shall need to refer to the relevant properties of physical objects, given the environments in which they are being viewed, i.e., those properties that determine the difference in perceived colours when a person discriminates by colour between two physical objects. As stated already, these properties may include relational properties of the objects.

In a situation like the one described earlier where physical objects of the same size, and shape, etc., are presented in pairs in a random order to viewers, a viewer who can consistently discriminate between two objects that no-one else can discriminate, is thereby deemed a "finer discriminator" than the rest of the people. This of course implies that his verdict--that

the two objects differ in colour--is correct, whereas the verdicts of the rest of the people tested--that the objects are the same colour--are wrong. What this amounts to is that whatever the relevant difference in the properties of the two objects, i.e., whatever difference in their properties determines the difference in the "finer discriminator's" perceived colours on viewing them, that difference is what makes those two objects "different colours". Which properties are relevant, and just how these properties differ in those objects, are empirical questions. What is not an empirical claim, however, is that any other two physical objects the relevant properties of which are qualitatively the same as the relevant properties of the two objects referred to above, also differ in colour. (We can expect the relevant properties to include the relational property giving the relative position of the perceiver.) The "finer discriminator's" difference in perceived colours on viewing such a pair of objects must be determined by a difference in the properties of those objects, otherwise there would be no grounds for deeming him to be a finer discriminator (of the colours of physical objects). His verdict--that such a pair of objects are different in colour--is correct; any one claiming that those two objects, or any other two objects the properties of which differ in the same respects, are the same colour, will be making a mistake. The fact that not many, perhaps no-one except the one person, can discriminate by colour between these pairs of physical objects is irrelevant to this point.

It would also constitute a mistake to claim that two physical objects the relevant properties of which are qualitatively the same are, in fact, different in colour. A mistake of this kind can be described as a consistency-error. It would constitute a mistake because of the necessary condition for something to count as a quality of a physical object, viz, "In a constant environment containing a physical object, conflicting verdicts for a statement ascribing the quality to the object necessitates one verdict's being incorrect." Any physical object in a constant environment (which means that the

perceiver's location, among other things, remains constant) remains the same colour. The necessary condition amounts to a demand for consistency in these verdicts. To meet the same demand, it is also true that any two physical objects in qualitatively the same environment (which includes the non-relational properties of the objects themselves) are the same colour. It is conceivable that some features of their environment are not relevant to their present colour. Whether or not this is in fact the case, it is legitimate to claim that two physical objects in environments that are relevantly the same have the same colour, or, what amounts to the same claim, any two physical objects the properties (including the relational properties) of which are the same in all the relevant respects are the same colour. These consistency requirements can legitimately be made even before we have finally articulated just which are the relevant properties. They are not empirical claims, but claims to do with the concept of "the sameness/difference of present colour of a pair of physical objects", where the basis of this concept is the perceived colours some people have on viewing the objects.

At the moment our tests for the sameness/difference of present colour of a pair of objects involves looking at them with the naked eye, ideally when the objects do not differ in their shape, size, etc.. Eventually we may hope to have a different kind of test which involves locating a relevant difference in the properties of the two objects. (Contrary to the pessimism of some philosophers, we already do have a great deal of empirical knowledge about which properties are and which are not relevant.[1]) This new test will not render the common tests invalid. Part of its vindication will be the

[1]It is possible that the empirical findings may be complicated by a "plurality of causes" at work here. I do not wish to dwell on this possibility here (although the possibility is discussed in a later context, in the section on transposition of colours), nor claim that it empirically is the case with regard to the issue mentioned here. I shall point out, however, that this possibility does not affect any of the points made in this section.

concurrence of verdicts reached by a "reliable" perceiver's using it and verdicts reached by a "reliable" perceiver's using the common tests. It will not change the fact that ultimately the basis for the concept of sameness/difference of colour of physical objects is the perceived colours some people have when they view the objects. We shall not have to decide on a general priority between the new test and the visual discrimination tests described earlier. They are not rivals in that sense. (There may be some particular odd instances where a priority must be decided upon.) The visual discrimination tests using pairs of physical objects having the same shape, size, etc., depend for their validity upon there being properties of the viewed objects which determine the sameness/difference of some viewers' perceived colours.

10. Smart, on Colours

In the light of the last section I want now to look at some points made by Smart in his paper, "Colours."[1] Central to these points is his concept of a "normal perceiver". This term he defines in two steps: "A person A is more normal than B with respect to a certain type of colour discrimination if he can discriminate things with respect to colour that B cannot so discriminate."[2] He then defines "normal perceiver" as "one who is at least as normal in respect of any colour discriminations as is any other percipient. Thus if A can make discriminations with respect to colour that B cannot make then B is not a normal percipient."[3] A normal perceiver in this sense may be an imaginary person combining the abilities of several actual people. One oddity about this concept is that no-one can at any one time be better at colour-discrimination than someone who is a normal perceiver at that time, but this, though unusual, seems to cause no serious problem in itself.

I wish to look at two suggestions Smart makes as to the meaning of the term "red". The first is that "'this is red' means roughly that a normal human percipient would not easily pick this out of a heap of geranium petals though he would easily pick it out of a heap of lettuce leaves."[4] To begin with, Smart clearly accepts that if one person can discriminate between two physical objects, but another person cannot, then this shows that the first person has "superior ability" to that of the second.[5] As I pointed out in the last section a necessary condition for someone's discriminating two

[1] J. J. C. Smart, "Colours," Philosophy, 36, 1961.

[2] Ibid., p. 136.

[3] Ibid., p. 137.

[4] Ibid., p. 139. This suggestion he made first in his paper "Sensations and Brain Processes," Philosophical Review, 68, 1959. At this stage and for simplicity only, I shall substitute "would match it with a heap of geranium petals" for "would not easily pick this out of a heap. . .". This does not affect the validity of what follows.

[5] Ibid., p. 137.

physical objects on the basis of a difference in perceived colours is that the perceived colours and the difference between them be determined by the physical objects. I.e., there must be some difference in the properties of the two objects which accounts for the difference in perceived colours. The person is not displaying "superior ability" at discriminating the physical objects by colour if, for example, he is hallucinating. Since it is necessary here to introduce the difference of the relevant determining properties in the two physical objects, we are logically obliged also to acknowledge the two kinds of error to do with the sameness/difference of the determining properties along: claiming that two physical objects are (at present) the same colour when their properties are relevantly different, and claiming that two objects are different colours when their properties are relevantly the same. We can make sense of the claim that a person who "can discriminate" between two objects thereby displays superior ability only if we recognize that his resulting verdict that the objects are different colours is correct, whereas the resulting verdict of someone who cannot so discriminate will be incorrect--he will claim that the objects are the same colour when the properties of the objects are relevantly different.

Returning now to Smart's first suggestion as to what "This is red" means, it has two limitations as it stands. The first is to do with the fact that the discriminatory ability of what he calls a normal perceiver can vary. The second is to do with the fact that the suggestion is that we define a particular colour-term, "red", in terms of discriminatory ability alone. It is useful to set out these limitations and see some of the features desirable for an account of the colours of physical objects. I should state immediately that the first limitation is based on what is conceivable in my sense (i.e., without rejecting any given fact) rather than on what is in fact the case in the world at present. I have every sympathy with not intending one's account

of the meaning of colour-terms to cope with problems stemming from situations that are logically possible but not conceivable (not "empirically possible"). My major concern throughout the thesis is to do with what is conceivable, what it is possible for humans to know, and what possible problems may be encountered, in the light of the given facts of the world. On the other hand an account can be unnecessarily restricted in that it cannot, as it stands, cope with situations that (empirically) may occur, even if they are not expected to. An account which cannot deal with situations that do occur is clearly defective, but an account which is unnecessarily limited in that it cannot, but some other can, cover some conceivable cases that do not at this time occur and that may not be expected to occur, is for that reason less desirable than a more comprehensive account. The first limitation I refer to is to do with a drastic reduction in the normal perceiver's discriminatory abilities. I am not suggesting that the situation I describe is one that Smart intended to cover but did not, but I do suggest that it is more desirable to cover it than not.

Suppose there is some environment which remains constant and which contains a geranium petal, a lettuce leaf, and some other physical object, x, and that normal perceivers (in Smart's sense) can easily discriminate x from the leaf (by colour), but cannot discriminate x from the petal. Relying on Smart's suggestion, in this situation x is red. Suppose now that at some later time normal perceivers have a far, far lower discriminatory ability (e.g., as the result of some disease, or interference from drugs, or some malfunction of the sensory apparatus of sight from some other cause--all of which are compatible with their being normal perceivers, since his definition of "normal perceiver" is in terms of comparative discriminatory ability alone) and that, as a matter of fact, they cannot now discriminate the leaf from the petal by colour. A fortiori they cannot both discriminate x from the leaf

and match it with the petal. Ex hypothesi I am supposing that the petal and the leaf are genuine examples of a geranium petal and a lettuce leaf, typical of those kinds of objects, and that the environment (which includes the petal and the leaf) has remained constant. In such a situation, the normal perceivers are no longer able to discriminate geranium petals from lettuce leaves--a conceivable but unexpected circumstance. If we keep the original suggestion, then in this situation x is not red since it is not an object which normal perceivers both match with geranium petals and discriminate from lettuce leaves (since ex hypothesi they cannot discriminate between the petals and the leaves by colour). But this would mean that one and the same physical object, x, in a constant environment is both red and not red, and this violates a necessary condition for something to count as a quality of some physical object, viz, in a constant environment containing the physical object in question, conflicting verdicts for statements attributing the quality to the object necessitates one verdict's being incorrect.[6] This violation is not surprising given the role the notion of "a normal perceiver" would have here and given that the discriminatory ability of a normal perceiver can vary with time. We can, in fact, say more than that the verdicts are incompatible. The verdict of the later group of normal perceivers would be unsound, since in order to reach a verdict about this soundly, one must be able to judge accurately the sameness/difference of colour of the leaf and the petal, and this ex hypothesi they cannot do. Regardless of the sameness of their perceived colours when they view the petal and the leaf, the two physical objects are different colours if their properties are relevantly different. This conceivable

[6]Some relational properties of the object are not features of the environment, viz, those determined by the state of the perceiver, the state of the perceiver being itself excluded from the notion of the environment. So, although these relational properties may well have changed in this example, this does not mean the environment has not remained constant.

situation I should prefer to deal with rather than not. It is in fact easy to deal with in the way I indicate above, by arguing that the verdicts of normal perceivers at the later time are unsound since they do not have the ability to test the statement "x is red" in the way suggested. To resolve the conflict of verdicts in this way one must first have acknowledged that for someone's perceived colours to be "ideas of the physical world" (even if the ideas do not "resemble" properties that physical objects have "in themselves"), they must be determined by the physical world, and secondly, when the properties of a pair of physical objects are relevantly different, someone whose perceived colours are the same when he views the objects will have an unreliable basis for judging the sameness/difference of colour of those objects. In short, one must understand the role played by the relevant properties of the physical objects in their being the same/different colour. And since this understanding is required even for ordinary cases of using one's perceived colours as a basis on which to judge the sameness/difference of colour of a pair of physical objects (i.e., for the cases that do now occur), one may as well make it explicit and then show how it covers problem-cases, even if the problems are not expected actually to occur.

There is one other limitation to Smart's suggestion as to what "this is red" means, and it is a limitation which applies to his second suggestion as well. I should make explicit that Smart does make passing reference to the second limitation elsewhere (in his Philosophy and Scientific Realism), so he is aware of the problem. Still, since the matter is not mentioned in the paper discussed it will be helpful to describe it clearly, as something to be dealt with. Smart's second suggestion is that we can regard such a phrase as "the colour of tomatoes" as a definition of "red".[7] From the context of the paper, it is clear that Smart means "the colour of tomatoes as seen by a

[7]Smart, "Colours," p. 140.

normal perceiver (in his sense)". This, he claims, is a "perfectly good instruction" for someone who knows the word "colour", but not the word "red".[8] It is much less cumbersome to explain the second limitation by referring to this second suggestion of Smart's since it involves only one kind of physical object, viz, tomatoes. Again the limitation is to do with situations which are, I believe, conceivable (in my sense), although they may not in fact occur at this time.

Looking now at Smart's second suggestion that we regard "the colour of tomatoes (as seen by normal perceivers)" as a definition of "red", there are two different ways of defining the term "tomato": so that there is no restriction as to the actual perceived colour tomatoes present to any one perceiver, or, so that there is some such restriction. To be more specific for my purpose here, the term "tomato" can be defined a) so that no perceived colour a normal perceiver has upon viewing a physical object in "standard" environments (for that kind of object) can in itself preclude the object's being a tomato; or, b) so that there is at least one particular colour which, if perceived by a normal perceiver when he views a physical object in one of those "standard" environments, precludes the object's being a tomato.

Suppose we define "tomato", or rather, to give Smart's suggestion the best basis, suppose we define "ripe tomato" in the first of the two ways, e.g., in terms of its shape, texture, plant producing it, its having seeds inside it, etc., but with no reference to its presenting any particular perceived colour in any particular kind of situation. Then the colour a normal perceiver sees when he views such an object in a standard environment is to be called "red". But then if at some time there is an instance of the same normal perceiver's seeing a very different colour when he views a tomato in a standard environment, then that colour too is to be called "red". And this

[8] Ibid.

situation is, I think, conceivable. For example, imagine a normal perceiver seeing a ripe tomato which presents him with a colour which the reader would call "red". If the same normal perceiver at some time later sees a ripe tomato and thereby perceives a colour that he and the reader would call "yellow", then that colour is to be called "red", and "yellow" becomes a redundant term.[9] This situation could be brought about by tampering with the perceptual environment including the tomato, with tomato-plants, or with the perceiver, providing that after the changes the perceiver would still be a normal perceiver and the environment could still legitimately be described as standard for viewing such things as ripe tomatoes. The production of such instances could result in an absurdly reduced stock of colour-terms, which would not be useful given the great variety of different colours many people perceive. I am not suggesting that this possibility cannot be dealt with, nor even that Smart could not deal with it. I am claiming, however, that in order to deal with it one must be prepared to make reference to the particular perceived colours, or, in Smart's phrase, the "actual qualia of our [colour] sense-data", an individual has at different times. He does at one point claim that "the actual qualia of our [colour] sense-data matter not at all so long as there is a one-one mapping of the set of sense-data produced in me on to the set of sense-data produced in you by various stimuli."[10] Smart makes this claim in reference to inter-subjective differences in perceived colours, but it is nonetheless misleading as it stands. (This is the point he acknowledges in his book, Philosophy and Scientific Realism.) Even if there is always such

[9]This is a bit simplified. This one instance would not make the term "yellow" redundant, since it would still be used for those shades 'of yellow' not involved in this instance. Strictly speaking, the term "yellow" would be redundant if instances like the one described occurred for every shade previously called "yellow" by the perceiver mentioned.

[10]Smart, "Colours," p. 129.

a mapping between my set of perceived colours and your set, the actual "qualia" still matter in that they may have to be referred to in order to sort out confusions resulting from certain intra-subjective changes in perceived colours from one time to another. The situation described above and the confusion involved is just such a case.

Looking back at the situation mentioned above and the proposal we have to hand--that we define "red" as the colour of ripe tomatoes (as seen by a normal perceiver)"--there is one amendment to the proposal that may seem at first glance promising. It does not, in fact, prevent the kind of reduction in colour-terms described earlier, but since it is an amendment that refers only to the sameness/difference of colour of physical objects and to the sameness/difference of perceived colours, looking at it briefly will help show how we need also to refer to the <u>particular</u> perceived colours involved. That is to say, it will help to show why, even with the amendment, the particular perceived colours (the "actual qualia") still 'matter'. The amendment I have in mind is the introduction of sameness/difference-of-colour relations holding between usual ripe tomatoes and other physical objects. For example, let us amend the proposal to read: Red is the colour of a ripe tomato when seen by a normal perceiver in a standard environment (for tomatoes) <u>providing</u> the perceived colour is the same as that presented to the normal perceiver (in standard environments) by a geranium petal, a letter-box, a stoplight, etc., and different from that presented to the normal perceiver (in standard environments) by a lettuce leaf, bluebells, snow, etc..[11]

[11]Again, this contains the same simplification as that referred to in fn. 9 in this section. "Being the same colour as" can here be read as "being the same or a <u>very similar</u> colour", and "being a different colour from" as "being very unlike", but since these phrases have not yet been examined, I shall not use them here. This simplification holds for the rest of this section.

It will not be helpful to interpret this amended proposal so that it is a sufficient and necessary condition for the tomato's being red that all of a long list of such relations hold, i.e., so that if even one of them does not hold, then the tomato is not red. This would produce contradictions. For example, suppose all the relations specified hold for the perceived colour a normal perceiver has when viewing a ripe tomato in some standard environment. Then, on this proposal, the tomato is red. But if at some later time any of the physical objects mentioned change (e.g., by developing flowers which we should call "geraniums", but which present a normal perceiver with a very different perceived colour from that seen when viewing earlier examples of geraniums), then some of the specified relations do not hold. And if it is a necessary (as well as a sufficient) condition for the tomato's being red that all the specified relations (of sameness/difference of colour with other objects) hold, then, at this later time, the tomato is not red. But the perceived colour presented by the tomato to a normal perceiver could be qualitatively the same at both times, and so too could the environment in which it was viewed. Given my use of "environment", to say here that the environment remains constant is to say that the particular physical object in question--the tomato--remains constant. We should thus have a contradiction since, in this situation, one and the same physical object in a constant environment is deemed to be both red and not red, and this violates the necessary condition for something (here, "being red") to count as a quality (perhaps a relational property) of some physical object, i.e., the condition that "in a constant environment, conflicting verdicts for statements attributing the quality to a physical object necessitates one (group of) verdict's being incorrect." (This condition was first mentioned on p.53 above.)

To try to avoid such contradictions, we can interpret the amended proposal as a sufficient, but not a necessary condition, for the tomato's being

red. But for this proposal also, there are some situations which I believe are conceivable[12] which it would, therefore, be desirable to deal with, but which cannot be dealt with by this proposal. The proposal can result in a drastic reduction of colour-terms if the following situation is conceivable: that a normal perceiver (in Smart's sense) at one time sees the colour c_1 when viewing a tomato in a standard environment, and all the specified sameness/difference-of-colour relations hold, and that at some other time, being still a normal perceiver, he sees the colour c_2 when viewing a tomato in a standard environment, and all the specified sameness/difference-of-colour relations hold, where c_1 and c_2 are very different colours (e.g., what the reader would call "red" and what he would call "yellow"). If we relied on the proposal in this situation, then both c_1 and c_2 are to be deemed to be instances of the colour "red", and a reduction of colour-terms can result. Here it would be the colour-term "yellow" (for the reader) that would be in danger of becoming redundant. (It would be redundant if situations like the one described occurred for every shade previously called "yellow" by the reader.) If this situation is conceivable, even if unexpected, then I consider it desirable for an account of the meaning of colour-terms, such as "red", to be able to deal with it. This can be done, but only if one is prepared to make explicit reference to the actual perceived colours (aside from the terms covering them) presented by certain physical objects in certain situations to certain people.

I wish now to glance at the alternative way of construing Smart's suggestion for a definition of "red", by defining "tomato" in sense (b), i.e., so that there is at least one particular colour which, if perceived by a normal perceiver when he views an object in a standard environment (for tomatoes), precludes the object's being a tomato. The phrase "the colour of tomatoes",

[12] "Conceivable" is always to be construed in the sense I use it, i.e., "conceivable without rejecting any given fact", and is to be distinguished from "logically possible" which is not qualified in this way.

Smart claims, can be taken as a definition of "red"; it is "a perfectly good instruction" for someone who knows the word "colour" but not the word "red". First of all it is clear that if we take the suggestion to be that we give the phrase as a purely verbal instruction to a sighted person, then the instruction will be unhelpful, even if the sighted person receiving this instruction is a normal perceiver. To make use of the verbal instruction, he must be able to then look at tomatoes and see the perceived colour they present. But this he cannot do until he can identify some physical objects as tomatoes (ripe tomatoes), and given the way the term "tomato" is here defined, he cannot do this until he knows which perceived colours preclude an object's being a tomato, and so preclude its being red. In short, the verbal instruction would be useful only to someone who has no need of it.

So I shall construe the suggestion in a differentway and drop the references that Smart makes to "the phrase 'the colour of tomatoes'". I shall suppose that the instruction is to be given ostensively, by pointing to an example of a tomato, so that, tautologously, the object indicated does not have any colour which, in itself, precludes a physical object's being a tomato, and so precludes its being red. The ideal case here is when the instruction is given by a normal perceiver to a normal perceiver in a standard environment (for tomatoes). Again there are situations where there would be problems with the proposal, and if those situations are conceivable, then even if Smart did not intend his account to deal with them, it is still more desirable to do so than not. Suppose that a normal perceiver ostensively defines "red" for another normal perceiver by pointing to a tomato in a standard environment, and suppose that the instructor here perceives some colour c_1 and that the other perceiver sees c_a (where c_1 and c_a may or may not be the same colour). The instructor can also indicate physical objects which present perceived colours which in themselves preclude the objects' being tomatoes (and red). As an

example of this, suppose the instructor points to an object which presents him with the colour c_2 in that environment and presents the other perceiver with c_b (which may or may not be the same as c_2). Since they are both normal perceivers (in Smart's sense), they discriminate between the same pairs of physical objects, and since c_1 and c_2 are different colours, so too are c_a and c_b. In fact, at the time of these showings the sameness/difference-of-colour relations holding between the perceived colour of the tomato and the perceived colours presented by other objects are the same for both perceivers; e.g., any object in a certain environment which presents the instructor with the same perceived colour as that presented by the tomato here will likewise present the other perceiver with the colour he perceives when he views the tomato here. In this situation, the latter will conclude that c_a is red and that c_b, among others, is not red. But if the following is conceivable a contradiction can arise. Suppose that at some time later in the same environment the instructed perceiver views the 'tomato' and perceives a colour he earlier concluded from his instruction was not red, a colour, in fact, which he believed precluded an object's being a tomato, e.g., the colour c_b. And on viewing the objects which previously presented to him the perceived colour c_b and which were shown to him as presenting examples of a colour which precludes an object's being a tomato (and red), he now perceives the colour c_a, which he thought earlier was the colour red. The two colours c_a and c_b have, in this environment, 'inter-changed'. If the instructor's perceived colours in this environment have not 'inter-changed' and he repeats his instructions at the later time, then the other perceiver will be left with two contradictions: first he will conclude that c_a is red and c_b, among others, is a colour precluding an object's being a tomato, and if it is conceivable for a normal perceiver to see one colour at one time and another "very different" colour at another time when viewing one and the same physical object in a constant environment[13], then something more

[13]The environment, with my definition of the term, does include the physical object in question but does not include the state of the perceiver.

is needed for the definition not to run into trouble in regard to such a situation. As both the earlier and the later time, the sameness/difference-of colour relations between the person's perceived colour when he views the 'tomato' and his perceived colour when he views some other object are the same. It has been explained earlier in the thesis that in order for perceived colours to be epistemologically trustworthy for ascribing sameness/difference-of-colour to a pair of physical objects, or for ascribing a particular colour to a particular object, the perceived colours must be determined by the physical objects in question. We may hope eventually to discover precisely which properties (relational and non-relational) of a physical object are relevant to the perceived colour it determines for a viewer, and then to produce tests for the relevant sameness/difference of these properties in two (or more) physical objects. But this in itself would not solve the contradictions referred to above, since those conflicting claims are not merely about the sameness/difference of colour of various pairs of physical objects, but are about the particular colours of the objects in question. All that such a test would do would be to confirm that the person has a genuine conflict of claims, since it would enable him to check that the relevant properties of the 'tomato' have indeed remained constant (as they did, since ex hypothesi the environment remained constant).

I conclude that the most promising account of the epistemology of colour-statements will acknowledge the role of the relevant "determining" properties of physical objects (i.e., those properties relevant to the determination of someone's perceived colours on viewing the objects), and will permit reference to the actual perceived colours (the "actual qualia of colour sense-data", in Smart's language) aside from the terms that will be deemed to cover them. It will also include certain a priori statements about the incompatibility of some colours, and a closer investigation into the role of the perceiver's state in

colour-perception of physical objects.

11. Transposition of Colours Between Perceivers

Smart claims that a person "could never be sure" that he saw the same colour as some other person, and it seems to be in response to this that he claims that "the actual qualia of our [colour] sense-data matter not at all so long as there is a one-one mapping of the set of sense-data produced in me on to the set of sense-data produced in you by various stimuli."[1] What Smart has in mind here are inter-subjective differences between the colours seen by different people. I shall explain in Section 12 that there are theoretical reasons why such differences would "matter". In this section I shall argue that the motivation for claiming that they do not matter is dubious in that the 'problem' it is intended to avoid--that one can "never be sure" that one sees the same colour as another person--is not an insoluble problem.

It is commonly held that there are special problems to do with the "logical possibility" of a systematic transposition of colours in the colour-vision of different perceivers. The central claim is that since this is logically possible, we cannot be sure that two or more people who can discriminate by colour between the same pairs of physical objects do, in fact, see the same perceived colours in each situation, since a systematic transposition logically could not be detected. I shall refer to this core as the "Transposition Argument".

To understand the Transposition Argument a distinction must be drawn between systematic transposition of colours between two people, and what I shall call "over-lapping" transposition. This can be done most clearly by making use of a few symbols. We have systematic transposition of colours between two people when and only when: there is a set of different colours, C_1, C_2, C_3 . . . C_n, and another set, c_1, c_2, c_3 . . . c_n, which is one-one correlated

[1] Smart, p. 129.

such that where the one person perceives colour C_1, the other person perceives colour c_1, and also where the latter person perceives c_1, the former perceives C_1 and where there is no case where one person sees one colour and the other person a different colour where not all of the above holds. There can, of course, be cases where both people see the same colours. As a simple example, "suppose you see the Union Jack as purple, yellow and green while I see it as red, white and blue. In other words, when you see a proper Union Jack you get the same sense-data as I get when I see a purple, yellow and green Union Jack. Suppose also that the reverse holds, and that you see the purple, yellow and green "Union Jack" as though it were a proper red, white and blue one."[2]

There is overlapping transposition of colours between two people when and only when: there is some case where one person sees one colour and the other person a different colour, but where the different colours are not one-one correlated in the way set out in the paragraph above. This kind of transposition is always in principle detectable in that there would always be some case where one person sees two different colours and the other sees two samples of the same colour, i.e., where one person makes a discrimination by colour which the other does not. This does not mean that one person has to be overall a finer discriminator than the other, since it may be that for each of them there is some case where he does and the other does not make a discrimination by colour. What I give above is the minimum that is guaranteed, and it will be helpful to a later point to sketch very briefly how this is guaranteed:

(1) If there is an overlapping transposition of colours between two people,

[2]Ibid.

P_1 and P_2, then, by definition, there is at least one case where P_1 sees one colour, c_a, and where P_2 sees some different colour, c_b;

(2) and, also by definition, c_a and c_b are <u>not</u> systematically transposed, i.e., it is not true that [(where P_1 sees c_a, P_2 always sees c_b) and (where P_2 sees c_b, P_1 always sees c_a)] ;

(3) and since the whole conjunction in (2) above is false, then

<u>either</u> (a) there is a case where: [(P_1 sees c_a) and (P_2 sees c_m)] where $c_m \neq c_b$

<u>or</u> (b) there is a case where: [(P_2 sees c_b) and (P_1 sees c_n)] where $c_n \neq c_a$;

(4) if (a), then there are situations where P_1 sees c_a throughout, but where P_2 sees sometimes c_b and sometimes c_m;

if (b), then there are situations where P_2 sees c_b throughout, but where P_1 sees sometimes c_a and sometimes c_n.

In this general form of the argument, replacing "situations" by some more precise phrase, e.g., "when confronting physical objects some of type X and some of type Y", is unwarranted. We have no information about the kind of case where the transposition of colours occurs.

So it is always logically possible to detect <u>that</u> there is an overlapping transposition. It will be important in this section to keep clear the distinction between detecting <u>that there is</u> a transposition (of one or the other kind) between two perceivers, and detecting <u>which colours</u> are transposed (in the sense that after this detection, one knows by acquaintance which colours are transposed). The above argument in itself does not show that <u>which colours</u> are transposed is also detectable.

The distinction between systematic and overlapping transposition is usually drawn by writers on the topic (although the labels may differ), but not often in a precise fashion. However, the distinction does need to be made

precise if we are to locate the suspect part of the Transposition Argument. The confusion in the argument lies in the statement "where one person sees one colour, the other sees a different colour." As it stands this is unclear. Obviously we shall not capture the notion of systematic transposition if "where" is interpreted in a crudely literal sense, for example, as "on the physical objects or parts of them where one person sees . . .". With no time reference a case can be constructed which meets this systematic transposition criterion which is indistinguishable from overlapping transposition. Rather the "where" needs to be read as "in the same conditions" or "in the same situation". At this point it is important to make use of a distinction I have already drawn between the state of the perceiver and the environment in which a perception takes place. The latter includes all qualitative features of the situation except the state of the perceiver. I say "qualitative features" here meaning that the time of the perception and the location of the environment as a whole are not in themselves part of what I call "the environment". The location of the perceiver, however, is included. "In the same situation", then, can be interpreted in two different ways: a) "in the same environment", or, b) "in the same environment and given that the two perceivers are in qualitatively the same state", and each of them creates problems for the Transposition Argument.

If we take (a), then the concept of a systematic transposition of colours is unproblematic; clearly such a consistent, symmetrical transposition of colours between two people is logically possible in any environment. But I deny that it is logically impossible to detect such a transposition. There are here two possible bases for detecting that a systematic transposition holds. The weaker of the two can be explained fairly simply; the stronger basis, although all the material required has already been covered, is worth explaining in more detail.

The First Basis and Its Use

The basis of the first solution is the claim: "Experiences and brain states (or, brain processes) are 'correlated', so that for any two different

experiences, there will be two different brain states." In this section, I shall refer to this as simply "the correlation-claim". If this claim is correct, then one has enough to detect systematic transposition. Immediately I must point out that the phrase "correlated with" here is being used so as to permit the experiences to be identical with the brain states. Some writers use the phrase so that "A is correlated with B" entails that A and B are distinct, but this entailment does not hold in my usage here. On the contrary, it is true to say that "both the dualist and the identity theorist agree that there is a correlation . . . between mental states and physical states", where "correlation" is being used "neutrally without prejudging which side is correct."[3] Of course, someone holding an identity-thesis about experiences and brain states will make also the following claim: "For any two qualitatively the same experiences, there will be two qualitatively the same brain states." This I have not included in the "correlation-claim" above, and this is intentional. However, the omission should not be construed as a veiled indication that many people who accept the correlation-claim do not, as a matter of fact, accept this further claim. The point is the correlation-claim as given does not in itself entail the further claim above, at least, not without begging the question against the possibility of "a plurality of causes" for a certain (kind of) effect. That is to say, if a "plurality of causes" is logically possible, then it is logically possible for someone to accept the correlation-claim (as given) and to accept as logically possible that "For two qualitatively the same experiences, there may be two qualitatively different brain states." I shall not tackle the issue about the possibility of a plurality of causes here; instead I shall at this point omit reference to the claim: "For any two qualitatively the same experiences, there will be two qualitatively the same brain states." It is not, in any case, required for the logical possiblity of detecting cases of systematic transpositon using the correlation-claim as the basis.

[3]Saul A. Kripke, "Naming and Necessity," Semantics of Natural Language, 2nd ed., Donald Davidson and Gilbert Harman (Dordrecht, Holland, 1972), p. 355.

Let me explain how the correlation-claim, if true, can be made to function here. Suppose, to begin with that there are two (sighted) people who at the time of viewing any part of any constant environment have qualitatively the same brain states. It follows from the correlation-claim that at the time of viewing they see qualitatively the same colours, and since ex hypothesi this is true for any part of any constant environment they view, it follows that there is no transposition (of either kind) holding between them. Suppose later that a systematic transposition of colours does hold between them; let us say that perceiver P_1's colour-vision remains unchanged and that P_2's has changed, so that the transposition now holds. By viewing physical objects in environments which have remained constant and in which P_2 has viewed prior to the change in his colour-vision, P_2 can detect that the colour-change has occurred, and that he has not gained nor lost discriminatory ability (ex hypothesi his discriminatory ability will not have changed since his colour-vision before and after the change are systematically transposed); in short, he can detect that a systematic transposition of colours has occurred 'within' the life-span of his colour-vision. He also, of course, can detect which colours are transposed, i.e., he can know by acquaintance which colours are transposed. And if the correlation-claim is true, then in one of the constant environments where he now sees a particular physical object to be a different colour from the colour he saw before the change, then when he views that object his brain state now will be different from his brain state when he viewed the object before the transposition; and so also it will be different from P_1's brain state when he (P_1) now views that physical object in that constant environment, since P_1's colour-vision remains unchanged. Now I know the claim that it is logically impossible to detect that there is a systematic transposition of colours between two people is made in regard to a permanent, life-long transposition of colours between them, but what I have described above does provide enough to detect it even in such a permanent case. The key is that

if the correlation-claim is true, P_2 can legitimately produce the generalization: "In those constant environments where his (P_2's) change in colour-vision is in effect when he views certain physical objects, if two other perceivers view the physical objects in question, and their brain states at the time of viewing differ one from the other in precisely the same way as P_2's brain states differ before and after his change in colour-vision, then P_2 can conclude that there is a systematic transposition of colours between these other two people." Also he will know by acquaintance which colours are transposed, and he can legitimately generalize to the effect that for systematic transposition involving these two brain states on viewing these physical objects in this and this constant environment, this and this colours, which he knows by acquaintance, are transposed. The first of these two generalizations can be used in the following way. Suppose there is a third perceiver, P_3, who, in those constant environments where P_2's change in colour-vision is in effect and on viewing the physical objects in question, has a brain state qualitatively the same as P_2's after his (P_2's) change. If this is true for all constant environments where P_2's change is in effect, then at the times of these viewings, P_3's brain state and P_1's brain state differ in precisely the same way as the brain states of P_2 before and after his change in colour-vision. And since, ex hypothesi, there is a systematic transposition between P_2's colour-vision before the change and his colour-vision after the change, there is also a systematic transposition of colours holding between P_1 and P_3. This transposition could therefore be detected even if it was permanent for both P_1 and P_3. And I should make explicit that the claim that there is a systematic transposition here could be made justifiably by both P_1 and P_3 unless there is some argument why in general a person should not be relied upon when judging the difference of some of the perceived colours he has at different times in his experiences. So far as I know no-one has claimed that the Transposition

Argument either depends upon or is a way of revealing the unreliability of a person's judgements as to the difference of some of the colours he perceives, with or without the qualification that he perceives the colours in question at different times. In any case, we cannot reject altogether reliance on someone else's judgements about the sameness/difference of his perceived colours without undermining the generally accepted claim that overlapping transposition is detectable. And we should need to re-specify what counts as overlapping transposition if we are to guarantee that the detectability of it never depends upon someone's judging the difference of colours perceived at different times. I do not see any obvious reason for deeming the judgements in question to be in general unreliable, but if an argument to this effect is put forward and the corresponding revision of what counts as overlapping transposition is made, then the crucial difference between systematic and overlapping transposition is not at all what many writers on the subject believe.

If the correlation-claim is true, then since what I have described above is logically possible, it is logically possible to detect that there is a systematic transposition between two people.[4] This is true even if the transposition is permanent. In fact, it is true even if permanency is made a definitive feature of systematic transposition. P_1 and P_3 were able to detect that there was such a transposition between them even though it was permanent. (If we did make permanency a definitive feature, then we should need to make a trivial change in the description of P_2's change in colour-vision. Instead of saying there was a systematic transposition between his colour-vision before and his vision after the change, we should say there was a 'systematic transposition' between his colour-vision before and after the change, i.e., the difference between his colour-vision in the two phases is precisely that of

[4]This claim is about "systematic transposition" with its first interpretation where the phrase "in the same situation" is interpreted to mean "in the same environment". (See p. 78 above.)

systematic transposition except for the one feature--being permanent.)

In the last section I referred to Smart's claim that "we could never be sure that you see the same colours as I do."[5] If there is what I call a systematic transposition, then, Smart claims "the difference between us will be undetectable."[6] This, however, is just false, since Smart makes clear elsewhere that he does accept the correlation-claim about brain processes and experiences, and so the above possibility of detection is open to him. In his paper "Sensations and Brain Processes"[7], he claims "sensations are nothing over and above brain processes" and "when I say that a sensation is a brain process or that lightning is an electric discharge, I am using "is" in the sense of strict identity."[8] He is using "sensation" in its broad sense, where it is not restricted to "sensation of touch". The example he discusses is that of an after-image. His thesis then clearly entails what I have called the "correlation-claim", viz, "Experiences and brain states (or, brain processes) are 'correlated', so that for any two different experiences, there will be two different brain states." Smart himself considers the use of the term "correlation" to be inaccurate, since the two sets of entities, sensations and brain processes, are not, in his thesis, distinct. But the ambiguity of "correlation" here has already been eliminated; I have used the term so that it is neutral as to whether the two sets of entities are identical or distinct.

It is important to realize that the comments above about Smart's view are made with regard to the first interpretation of "systematic transposition". In this interpretation the term "where" in the sentence "where one person

[5]Smart, p. 129.

[6]Ibid..

[7]J. J. C. Smart, "Sensations and Brain Processes," Philosophical Review, 68, 1959.

[8]Smart, "Sensations and Brain Processes," p. 145.

perceives colour C_1, the other person perceives colour c_1, . . ." is interpreted to mean "in the same environment". The second interpretation, in which the term "where" is interpreted to mean "in the same environment and given that the two perceivers are in qualitatively the same state", makes the concept of systematic transposition incoherent for Smart, given his thesis about the identity of sensations and brain processes. If we take his identity-thesis to be true then it is not logically possible to have a systematic transposition at work when the two perceivers are in the same (i.e., constant) environment, and in qualitatively the same state. If they are in qualitatively the same state, then they logically cannot be having different visual experiences. In the same environment and in the same state, they logically cannot be perceiving different colours. So given Smart's identity-thesis, the only non-contradictory concept of systematic transposition of colours is in its first interpretation, and again, given his identity-thesis, systematic transposition in that sense logically could be detected.

I return now to the general argument in this section before remarks specifically about Smart were made. It has already been established that given the first interpretation of "systematic transposition", it is always logically possible to detect that it holds between two people. I want now to look at a possible objection to the effect that although P_1 and P_3 may detect that they have a systematic transposition of colours, they logically cannot detect which colours are transposed (so that they know by acquaintance which colours are transposed). But this is misleading as it stands. Suppose that the only two colours transposed are C_1 and c_1; i.e., suppose that in any constant environment where P_1 sees C_1, P_3 sees c_1, and also that in any constant environment where P_3 sees c_1, P_1 sees C_1. Still assuming the correlation-claim (about experiences and brain states) to be true, it is contingently possible to detect that there is a systematic transposition by showing that at the

appropriate viewing times, P_1 and P_3 have different brain states like the brain states of P_2 before and after his change, without thereby giving P_1 and P_3 the right to claim to know which colours are transposed. Very simply, P_1 may never have had the brain state P_3 has at a viewing when the transposition is in effect, and in that case he will not know by acquaintance which colours are transposed. (Mutatis mutandis for P_3.) But this same point is true also of overlapping transposition. It is contingently possible to detect that there is an overlapping transposition of colours between two people without thereby giving the two people the right to claim to know which colours are transposed. This can best be seen if we look back at the short argument showing that it is always logically possible to detect that there is a case of overlapping transposition (on pp. 76-77 above). The feature distinctive of overlapping transposition guarantees that there must be some situation in which one of the perceivers discriminates some items by colour, and the other does not. Let us take one of the two possible conclusions of that argument: "there are some situations where P_1 sees c_a throughout, but where P_2 sees sometimes c_b and sometimes c_m (where $c_a \neq c_b$, and $c_b \neq c_m$)." (The following remarks can be made, mutatis mutandis, about the alternative conclusion.) It is possible for P_1 to detect that there is an overlapping transposition (by observing the difference in discrimination) even if he has never perceived the colours c_b and c_m; likewise it is possible for P_2 to detect that there is such a transposition even if he has never perceived the colour c_a. So it is contingently possible for them to detect that there is an overlapping transposition without thereby having the right to claim to know by acquaintance which colours are transposed. Both in the case of systematic and overlapping transposition, it is logically possible for a person to detect that there is a transposition of colours between himself and another person, even if he has never perceived and will never perceive the colours the other person perceives in viewings where the

transposition is in effect. Being acquainted with those colours is not a necessary condition for the logical possibility of detecting that there is a transposition (of either kind).

The problem of knowing (by acquaintance) which colours are transposed is to do with one person's not having another person's visual experiences, and not to do with how consistent or symmetrical the transposition is. The distinction between overlapping and systematic transposition is not crucial here. Assuming the correlation-claim to be correct, then of course detecting that there is a transposition (of either kind) may give the pair of perceivers with the transposition the right to claim to know which colours are transposed; e.g., when a perceiver knows which brain state(s) is(are) correlated with the colour(s) the other person sees when the transposition is actually in effect, he may know that he has been in the brain state(s) himself, and he may know which colour(s) he saw when in the state(s). But in any case, if the correlation between experiences and brain states does hold, it is surely always logically possible to ensure that both perceivers do know which colours are transposed simply by deliberately changing their brain states to the one(s) involved in the transposition. This could always be done in a way that would not violate the permanency feature of systematic transposition, if permanency is made a definitive feature of systematic transposition. The interpretation of "systematic transposition" being used here is that of an 'inter-change' of colours in certain constant environments when the two perceivers in question view certain physical objects in those environments. Now this transposition can remain permanent without making it impossible to produce in the one perceiver the brain state(s) correlated with the colour(s) the other perceiver sees when the transposition is actually in effect, simply because we can produce that brain state in the first perceiver when he is not viewing any physical object, e.g., when his eyes are closed. For the purpose here there is

nothing wrong in tampering with his brain directly, and if his eyes are closed, then no matter what his visual experiences they cannot affect the claim that the systematic transposition is permanent, since that claim is only to do with certain differences in the experiences of the two people when they view certain physical objects in certain constant environments.

Before leaving this investigation into the logical possibility of detecting that there is a systematic transposition (and which colours are transposed) if one accepts the correlation-claim, there is one more point to notice. This is that the remarks made about the impossibility of Smart's making use of the second interpretation of "systematic transposition" are generalizable for all philosophers who accept any version of the correlation-claim. In the second interpretation the term "where" in the sentence "where one person perceives colours C_1, the other person perceives colour c_1, . . ." is interpreted to mean "in the same environment and given that the two perceivers are in qualitatively the same state". If the correlation-claim is true, then this second interpretation is not coherent.

For my investigation it is more important that it be conceivable (i.e., without rejecting any given fact), rather than merely logically possible, to detect a case of permanent systematic transposition. If the correlation-claim is true, then it will be conceivable to detect a case of systematic transposition if it is conceivable for someone to do what I have described P_2 as doing--undergoing a 'transposition' within his colour-vision without necessarily (logically or causally) losing his ability to judge the difference of the relevant perceived colours before and after the change--and thereby to detect (the relevant features of) the correlated brain states, and produce eventually generalizations like the one described above. (See pp. 80-81 above.) My use of "conceivable" does not require that, e.g., we can expect someone actually to be able to give an adequate description of the brain states; it is required only that no given fact prohibits this. Given my use of "conceivable", there

is one fairly obvious query I shall answer here. It may be thought that it is not conceivable (in my sense) that someone should be able to describe the brain states adequately since this would take a long time, and long before the description of a state was completed, the state would have changed. But this need not constitute a genuine problem. If it is conceivable to record the state in some way mechanically, then the fact that it would take a long time for a human to give an adequate verbal description of it is irrelevant to my question.

There is another question about conceivability here, viz, whether or not it is conceivable to detect which colours are transposed. Of course for this to be conceivable it is necessary that detection that there is a case of systematic transposition be also conceivable. It is conceivable to detect which colours are systematically transposed if it is conceivable to detect that there is systematic transposition, and if it is conceivable to produce the relevant brain states in the two perceivers without breaking the permanency feature (assuming this feature to be made definitive of "systematic transposition"). The second of these two requirements seems unproblematic. I have suggested that the obvious thing to do, once one knows which brain states are the ones involved, is to produce those states for the perceivers when the perceivers are not viewing any physical objects of their environment (e.g., when their eyes are closed). Obviously the brain states can occur in humans, since they were discovered to occur; so it seems safe to claim that it is conceivable to produce them intentionally when the eyes of the perceivers are closed. The first of the two requirements is of course what I was discussing in the previous paragraph. At this point I shall not say any more about the question of whether or not it is conceivable to detect that there is a permanent systematic transposition of colours between two people. The question is very important for my programme and I shall discuss it in some detail, but I shall do this after carefully setting out below the second basis for detecting that a

(permanent) systematic transposition holds. I have described the first basis--the reliance on the correlation-claim about brain states and experiences--as being weaker than the second. What I mean by this is that the correlation-claim by itself does not bring to light the most important points relevant to this detection. The second basis does, and thereby provides the material relevant to the question of the conceivability of such a detection.

The Second Basis

I shall explain now what this second basis is. The conclusion of section 4 of the thesis was that: "It is a necessary condition of ideas (of perception) of the physical world that they are "determined by" the physical world." (The phrase "of perception" was to distinguish these ideas from what Locke calls "ideas of reflection".) We are concerned now only with perceived colours, to be precise with perceived colours a person has upon viewing some particular physical object(s) in a constant environment. After all, the basis I am here setting out is to do with the detectability of systematic transposition where "systematic transposition" is given the first interpretation--in which the term "where" in the sentence "where one person perceives colour C_1, the other person perceives colour c_1, . . ." is interpreted to mean "in the same (constant) environment". If, then, some of our perceived colours are ideas of certain physical objects (other than the perceiver's body), then it is a necessary condition that these ideas be "determined by" the physical objects in question. This, of course, is not to assume that the ideas "resemble any property in the physical objects themselves (i.e., any non-relational property of the physical objects)". The claim is not empirical; it does not state that we do have perceived colours that are determined by physical objects in this way. Rather the claim makes explicit a necessary condition for ideas to count as ideas of certain physical objects in the environment around us, even if the ideas do not resemble a non-relational property of them. For example,

it is this necessary condition that distinguishes such ideas from perceived colours that a person has during an hallucination. It is included in the concept of a (visual) hallucination that the person's visual experiences, including his perceived colours, are not determined by physical objects around him as they must be if his experiences are to constitute a case of genuine (visual) perception of the physical world in his environment.

Before explaining what is contained in this notion of "determining", there is one other point to make about looking at physical objects in a constant environment. Necessarily it involves using "the sense of sight". It is part of the meaning of the phrase "viewing physical objects (other than one's own body) in the environment around one" that the sense of sight is being used. Also, it is a definitive feature of a human's using his sense of sight that his sense-organs of sight are, at that time, functioning, and a human's sense-organs of sight are his eyes. Strictly speaking the definitive feature is that one eye is functioning at the time, but for simplicity I shall speak of both eyes. I am not here equating "functioning eyes" with "properly functioning eyes"; some kinds of malfunctions do not prohibit the eyes' functioning altogether. The eyes are functioning when they are open and receiving the appropriate "input", whatever that turns out to be, from parts of the perceiver's environment, which means he is receiving "input" from a part of the physical world.[9] Also, since viewing the physical world around one necessarily involves using the eyes, and so necessarily involves some features of one's physical state, we can give sense to the concept of the physical end-state for that perception. This concept applies since the physical state is involved and perceptions do occur, i.e., they are 'completed'. The fact that we can give sense

[9] "Functioning eyes" is being construed non-dispositionally to mean "being open, being directed in the appropriate direction, and receiving the appropriate 'input' (whatever that input is)".

to the concept does not in itself tell us what the end-state will be if it is empirically true that parts of the physical world do determine a perceiver's ideas. It does not tell us, e.g., if the end-state is something other than a state of the eyes. Again, since the use of the eyes is necessarily involved in viewing the physical world we can give sense to the notion of certain variations in the perceiver's physical state "affecting" the ideas he has, since we can give sense to the notion of certain variations in the state of his eyes "affecting" his ideas. There may be other variations in his physical state that would "affect" his ideas, depending, e.g., on what the physical end-state is.

We have seen that ideas of some part of the physical world must be determined by that part. Ideas of some physical object must be determined by that physical object given its environment. The phrase "given its environment" is not an arbitrary way of 'spelling out' what "that part of the physical world" amounts to here. It must be remembered that we are dealing still with a physical object's present colour (as opposed to, e.g., "its real colour" where this phrase refers to its present colour in some specially selected environment), and its present colour will be, in a sense, environment-dependent. Describing the part of the physical world as "the specified physical object given its environment" will be seen to be useful once we move on to making empirical claims about a person's viewing a physical object. Some relational properties of an object in a certain environment may, in fact do, affect its present colour, the point being that other features of the environment (besides the non-relational properties of the object) may affect its present colour, e.g., a change in the kind of lighting used in the environment, or a change in the position of the physical object in regard to the source of light. So if a perceiver's ideas are ideas of the part of the physical world, then they are determined by the specified physical object given its environment.

Now to say that X determines Y is already to say something about a certain regularity in the occurrences of X and Y, a certain lawlikeness: "If X determines Y, then whenever X occurs, Y will occur." Otherwise it is gratuitous to say X determines Y rather than, e.g., that on a number of occasions Y has followed X. The regularity is part of what is included in the concept of "determining". So if a certain physical object given its environment determines a certain idea in a perceiver (when he views the object), then whenever the same situation occurs again, it will determine an idea which is qualitatively the same as the first. The phrase "the same situation", however, covers more than the object and the rest of the environment. Since the person's viewing the object necessarily involves his using his eyes, some features of his physical state constitute part of "the situation". I have stated already that it would be an empirical claim what other parts of the perceiver's body are involved, and what variations in his physical state affect his perceived colours when he views the object referred to. What is not an empirical claim is the following: if whenever there is "the same situation" the object, given its environment, is to determine qualitatively the same idea, then the ways in which variations in the perceiver's physical state affect his ideas must also have the same regularity. For a rather crude description of this point (before I go on to refine it), suppose X is the physical object given its environment (i.e., the object viewed), Y is the idea(s) the perceiver has on viewing the object, and Z is the perceiver's physical state. If "X determines Y" involves both X's effects on Z, and Z's effects on Y, then to ensure a lawlike regularity of the form "In the same situation, the same X determines the same Y", both X's effects on Z, and Z's effects on Y need to have a lawlike regularity.

The description above (in terms of X, Y, and Z) of what is involved in the notion of a part of the physical world's determining a perceiver's idea(s) needs to be refined. In particular, I need to clarify what Z is. This will

be done by making use of the concepts of "the input ('through' the eyes)", "the 'route' of the input in the perceiver's body", and "the physical end-state". Functioning eyes (as I have clarified the phrase) are necessarily involved, but what the physical end-state is could be discovered only if parts of the physical world do actually determine ideas a perceiver has on viewing, and then we investigate empirically what the physical end-state is. Without these empirical findings we need to remember that the end-state could be some state of the perceiver's eyes so that the 'route' of the input collapses into nothing. Even so there will be some end-state even if that state is the only change in physical state brought about by the person's viewing the part of the physical world referred to. I shall go on to claim later that parts of the physical world do determine ideas a person has on viewing it, and that the end-state has been discovered to be a brain state and that the input has been discovered to be electro-magnetic waves. First, however, I shall clarify in some detail the description I gave (in terms of X,Y, and Z) of what is involved in the concept of a part of the physical world's determining a perceiver's ideas. The core of that first description is: If "X determines Y" involves both X's effects on Z, and Z's effects on Y, then to ensure a lawlike regularity of the form "In the same situation, the same X determines the same Y", both X's effects on Z, and Z's effects on Y need to have a lawlike regularity. Here I shall clarify what Z is, i.e., I shall explain what is meant by "the perceiver's physical state" in this context. First I give two claims that capture the lawlike regularity required if we are to give sense to "a part of the physical world's determining a perceiver's idea(s) when he views that part":

i) On two occasions of a perceiver's viewing a physical object, if he views the same physical object in a constant environment, and his physical state is the same on both occasions, then he will have the same idea(s);

ii) On two occasions of a perceiver's viewing a physical object, if he views

> the same physical object in a constant environment, and has on each occasion a different idea (or set of ideas), then his physical state is different on each occasion.[10]

(There are other claims to do with this regularity, but for our purposes these two are the important ones. Our investigation here is to help eventually with the question of whether or not systematic transposition, in its first interpretation, is detectable; and in its first interpretation, the term "where" in "where one person perceives colour C_1, the other person perceives colour c_1, . . ." is interpreted to mean "in a constant environment".) I shall use claim (ii) above as the vehicle for explaining what is meant here by "his physical state is different on each occasion". At first glance the explanation looks more complicated than it really is; the underlying notion will be seen to be quite simple. What is meant by "his physical state is different on each occasion" as it is used in claim (ii) above is:

> There is a difference in the perceiver's physical state on each occasion at some time (temporally) prior to the beginning of the physical end-state, where
>
> a) this difference in physical state is not itself caused by the input, and where
>
> b) this difference in physical state affects (in a lawlike fashion) the ideas the perceiver actually has--in that if there was not this difference and the states were otherwise left unchanged, the perceiver would have qualitatively the same idea on both occasions.

There is one corollary I shall state here:

> If there is genuinely a 'route' the input 'travels' in the perceiver's body, i.e., if the physical end-state is not simply the initial change

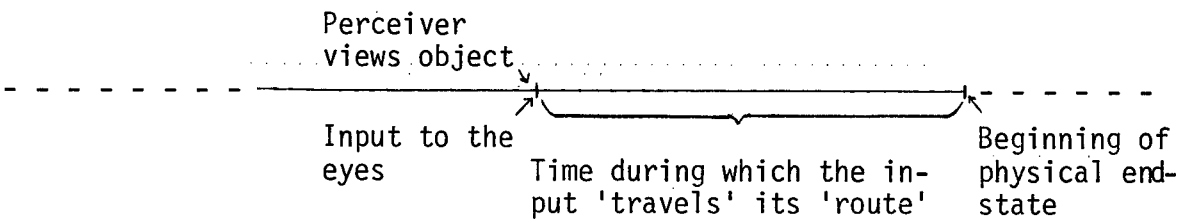
[10] These claims and all the points following apply likewise to cases where a different perceiver views the physical object on each of the two occasions. It is slightly less cumbersome, however, to refer to only one perceiver here.

(in the state of the eyes) brought about by the viewing, then the difference in the perceiver's state referred to--the difference that is not caused by the input from the viewed part of the physical world, but which affects the ideas the perceiver actually has--will obtain immediately prior to the beginning of the time taken by the input to 'travel its route' in the perceiver's body, or at some time during the time taken by the input to 'travel its route' (from the eyes), but in any case temporally prior to the beginning of the physical end-state.

The difference could be immediately prior to the period of time referred to if it was a difference in the state of the perceiver's eyes affecting his ideas. Also, even though the difference must obtain prior to the beginning of the physical end-state, it can be a difference in state in that part of his body where the end-state will occur; e.g., if the end-state is located in a certain part of the brain, the difference in state can be a difference in the state of that part of the brain immediately prior to the beginning of the end-state.

Very crudely, the underlying notion of the explanation and its corollary is this: if there is a lawlike regularity in the part of the environment's determining the perceiver's idea(s), then a difference in his ideas on two occasions can be accounted for only if there is a difference in the determining factors, and since, ex hypothesi, the object viewed and its environment remain constant, the difference in the determining factors must be some difference in the perceiver's state "prior to" his having the ideas, where this difference affects his colour-vision. All this is part of what is contained in the concept of a part of the physical world's determining a perceiver's ideas when he views a physical object in that part. It is required to ensure the lawlike regularity the concept of "determining" involves. A simple diagram helps to clarify the temporal references made in the corollary to the explanation of "his physical state is different on each occasion" as this sentence is used in

claim (ii) (on pp. 93-94 above.)



(The diagram here, of course, does not represent the lengths of time proportionately.)

Several points can now be made about the "difference in physical state" being referred to, some about the general explanation, some specifically about the corollary. First there are two simple points to do with the general explanation. Some differences in physical state which affect a person's perceptions may hold for a long time. They may hold prior to the two viewings, and some may hold for a long time after the beginning of the end-state, but they need not do so to be effective in the required way. Also, the physical end-state can vary in duration (which is why in the diagram the end-state is given no specific temporal duration). It will also help to give a brief word as to why, if the physical world's determining the ideas is to occur, there must be a difference prior to the beginning of the physical end-state (as "difference in physical state" is being used in claim (ii) above). If a difference in the end-states was the only difference involved in the two viewings, then the same input (since in both cases the perceiver is viewing the same object in a constant environment) can on two occasions affect a perceiver in exactly the same physical state during the time the input 'travels its route' and yet two different physical end-states result.[11] It would not be true that both the input's effects on his physical state and the effects of his physical state on

[11]The physical end-state must not be confused with the location of it. There can be a difference in that part of the perceiver's body prior to the beginning of the end-state, where this difference affects his actual ideas.

his ideas had the lawlike regularity involved in the physical world's determining his ideas.

There are also a couple of points worth mentioning which are specifically about the corollary. The time the input takes to 'travel its route' may be short, perhaps so short that we should not normally think of the 'route-travelling' as taking time at all but rather speak of "the time" at which the perceiver both views the object and has the resulting ideas. But we must remember that there is always a period of time involved. For example, if the perceiver's eyes altered during his viewing of an object, it would be important to know whether the alteration occurred before or after the input 'left' the eyes. If the alteration post-dated the 'departure', by however little, the alteration would not count as producing "a difference in physical state" for purposes of my analysis.

It has not been specified that the difference in physical state occur on the 'route', and this is the second point I wish to make about the corollary. It is true, of course, that the difference must make some relevant difference to the 'route' at the appropriate time, but it is still useful not to require that it be on the 'route' for the following reason. There may be some differences in physical states that are easy to detect, that determine a difference in a perceiver's ideas in a constant environment, but which may not usefully be described as being differences in a part of the person's sensory apparatus of sight, even though the differences affect that apparatus. Indeed, there are such cases. I understand that a severe obstruction of bile--the cause of jaundice--can affect a person's ideas (of colour) in a constant environment, yet most people would not wish to refer to the bile duct as part of the person's sensory apparatus of sight.

The Use of the Second Basis

Let us return now to the question for which this second basis is provided. We are asking if systematic transposition, in its first interpretation, is detectable; in the first interpretation of "systematic transposition" the term "where" in the sentence "where one person perceives colour C_1, the other person perceives colour c_1, . . ." is interpreted to mean "in a constant environment". As before, I shall ask first if it is logically possible to detect it, and afterwards ask about conceivability. Suppose that a systematic transposition does hold between two perceivers, P_1 and P_3. Given the first interpretation of "systematic transposition", this means there are some constant environments in which P_1 sees colour C_1 (for a part of the environment viewed), and P_3 sees colour c_1 (for the same part), where $C_1 \neq c_1$, and there is no constant environment where P_1 sees C_1 (for a part viewed) but where P_3 does not see c_1 (for the same part), and no constant environment where P_3 sees c_1 but where P_1 does not see C_1. When the systematic transposition is in effect, then, the environment is constant, or, as Smart described the environment here, the "stimuli"[13] are constant, and for both viewers, their perceived colours are ideas of a part of that environment, and so are determined by (that part of) the environment. Since, ex hypothesi, the environment is constant, by appealing to what I have called "the second basis", we know that at the times when the two perceivers actually view the part of the environment in question there is a difference in their physical state. To be precise: there is a difference in their physical states (on occasions when they view the part of the environment in question) at some time prior to the beginning of the respective physical end-states, where (a) this difference in physical state is not itself caused by the input, and where (b) this difference in physical states affects (in a lawlike fashion) the ideas the perceivers actually have--in that if there was not this difference and their states were otherwise left unaltered,

[13]Smart, "Colours," p. 129.

the perceivers would see qualitatively the same idea(s) (of colour) on these occasions.[14] Even if the systematic transposition between P_1 and P_3 is permanent, it is logically possible to detect that there is a systematic transposition holding between them, since we can make use of another perceiver, P_2, as we did earlier in the section (when we were using the "first basis" for tackling the Transposition Argument). Very briefly here, it will be logically possible for P_2 to view the part of the environment in question on different occasions where, on some of these occasions, his physical state--in the sense specified above (p.94)--is qualitatively the same as P_1's, and where on other occasions his physical state is qualitatively the same as P_3's. P_2 will then experience the difference in perceived colours resulting from this difference in physical state, and it will be logically possible for him (and others) to detect this difference in physical state and produce the generalization that any two perceivers (or one perceiver at different times) with this difference in physical state will have a systematic transposition of colours between them. If permanency is made a definitive feature of systematic transposition, then the relevant generalization he (and others) will make will be that any two perceivers having permanently this difference in physical state will have a systematic transposition of colours holding between them. The generalization could then be applied to perceivers P_1 and P_3. So it would be logically possible to detect that a (permanent) systematic transposition of colours holds between two perceivers; and it would be detectable by the pair of perceivers actually involved.

Will it be logically possible to detect which colours are transposed (so as to know by acquaintance which colours are transposed)? Of course, P_2 given the role he has, can detect which colours are transposed since it is logically

[14]This explanation of "difference in physical state" as used here is first given on p.94 above.

possible for him to be in the state of P_1, at one time, and in the state of P_3, at another time, and to view the part of the environment referred to whilst in these states and actually have the different perceived colours. However, the interesting question here, as it was earlier in the section, is whether or not P_1 and P_3 can know which colours are transposed, and in particular, whether or not theycan know if permanency is made a definitive feature of systematic transposition. (If the transposition happens to be permanent but permanency is not a definitive feature of systematic transposition, then it will be logically possible for P_1 and P_3 to detect <u>which</u> colours are transposed between them simply because it will be logically possible for each to undergo the relevant change in physical state--as P_2 did-- and so actually have the transposed perceived colours. This will be logically possible even if their transposition happens to be permanent, just so long as permanency is not a definitive feature of systematic transposition.) It has been shown earlier in the section that detecting <u>that</u> there is a systematic transposition by reference to a person having the role of P_2 does not <u>thereby</u> guarantee detection of <u>which</u> colours are transposed. But it was also shown that this is not a problem specifically to do with systematic transposition; the same point was shown to be true of detecting <u>that</u> there is an overlapping transposition. What this means is, although the question (of whether or not it is logically possible for the perceivers involved to detect <u>which</u> colours are systematically transposed) is worth asking, it would be a mistake to construe it as a demand that must be met for cases of systematic transposition if those cases are 'to be on a par with' cases of overlapping transposition. That is to say, it would be a mistake to make the demand as though in cases of overlapping transposition, by virtue of the feature that makes them cases of overlapping transposition, the demand is guaranteed to be met. As has been shown, the feature that makes them cases of overlapping transposition does not guarantee that <u>which</u> colours

are transposed is detectable.

Bearing this in mind, let us ask whether it is logically possible in a case of (permanent) systematic transposition for the perceivers involved to detect which colours are transposed. It should be remembered that I am not asking this question in vacuo, but with regard to the claims of the "second basis". One point mentioned earlier in the section--in connection with the "first basis" for tackling the Transposition Argument--is relevant here. If it is logically possible for one of the two perceivers involved to have his eyes closed, and so not "functioning" (as I have used this term), and yet to have the perceived colour in question, and know that it is the appropriate perceived colour, then it will be logically possible for him to detect which colours are transposed without breaking the permanency condition of the systematic transposition. The condition will not be broken in such a case because the interpretation of "systematic transposition" here is in terms of what the two perceivers see when they view some part of some constant environment, and this is not affected by claims about the perceived colours the two people have sometimes when their eyes are not functioning. One possibility here is to make use of the concept of a "physical end-state of a viewing", but to do so I need to say a little more about the concept. The points here will be in quite an abstract form, since they will be to do with explaining the concept rather than making empirical claims about what the end-state actually is and what the 'input' actually is for cases of viewing by humans. (The latter will appear below in this section, in the context of asking about the conceivability of detecting systematic transposition, given the "second basis".)

Without going into undue detail, then, the following are the important points. Suppose that a perceiver views some physical object in a certain environment, and that the idea (of colour) determined by that object (given its

environment) is the idea, X.[15] First, the physical end-state of that viewing of that object is determined by the input resulting from that viewing (whatever that input turns out to be). Secondly, the physical end-state for this viewing is that physical state, which the perceiver does have, which is "sufficient" for his having the idea X in this viewing, where "sufficient" is to be explained in the following way. For our purpose here what interests me is that the person had the idea X rather than some other idea; I am not primarily interested in more general sets of contrasts, e.g., that the person is sighted rather than blind. So let us take as given that the person is sighted and awake, which means taking as given those features of his physical state that are conditions for his being sighted and awake. Also, if there are some general conditions for a person's having "functioning eyes" (which is a non-dispositional concept, as I have used it), where these conditions (a) are rather different from (perhaps just more specific than) those conditions needed for the person to be sighted and awake; and (b) can be specified without thereby specifying the conditions for the perceiver's having a particular idea (say, X), or some particular set of ideas, then these conditions too may be taken as given for the purpose to hand. In fact, take as given all conditions of his physical state required for the person to view the physical object, where these conditions as specified are not in themselves conditions for the perceiver's having a certain idea, say, X. The set of these conditions can be called "the viewing-conditions of a person's physical state". In brief then, for our example where the person views a certain physical object and has as a result the idea (of colour) X, the physical end-state is: the last set of changed features he has, which is determined by the input of his initial

[15]We should expect a whole configuration of ideas (of colour) to be determined by any physical object when viewed, but this would make the following points very cumbersome. So I have simplified by writing as though just one idea (of colour) is determined in the example I look at. This does not affect the soundness of the points.

perception of the object, where the set is sufficient for the perceiver's having the idea X, taking it as already given that what I call the viewing-conditions hold for the person's physical state (at the time of viewing).

There will always be some change in physical state when a person views a physical object in his environment, since it is a necessary condition of such viewing that the person have functioning eyes at the time, where one of the things included in the notion of "functioning eyes" is that the eyes are being affected by the appropriate input (whatever that turns out to be). This has been mentioned already. It will not be possible to decide a priori what the end-state is for a viewing (or for any other perception of the "external world"); it is logically possible that the end-state for such a viewing is some changed state brought about in the eyes. Only empirical investigation could show otherwise. What does not require empirical support is the following claim: "If a perceiver, on two occasions, has qualitatively the same physical end-state, he has/will have qualitatively the same idea(s)." This again is part of what is contained in the concept of the physical object's determining the person's idea(s) on his viewing that object. The claim, as it stands, is intentionally neutral as to whether or not the physical end-state is identical with the experience (hence the options "has" or "will be"). Even though it is neutral in this way, it still must be true if, in the case of a viewing, both the effects of the part of the physical world viewed on perceiver's physical state, and the effects of the perceiver's physical state on his ideas (if there are any effects of this second kind), are to have the lawlike regularity required by the concept of a part of the physical world's determining the person's ideas (on viewing that part). It is important to notice also that the claim that the physical end-state is "sufficient" for the person to have the idea(s) he has is likewise neutral with regard to the issue of whether or not the idea is identical with the physical end-state.

The concept of the physical end-state of a viewing (of a part of the physical world) is useful when asking if the two people involved in a systematic transposition of colours logically can detect which colours are transposed without breaking the permanency condition of the transposition. Its usefulness lies in the claim (given above): "If a perceiver on two occasions has qualitatively the same physical end-state, he has/will have qualitatively the same idea(s) (mutatis mutandis for two perceivers, rather than one at two different times)." I have said that the physical end-state of a person's viewing a certain physical object and having as a result the idea (of colour) X, is determined by the input resulting from the viewing (whatever that input turns out to be). However, if qualitatively the same physical state as that physical end-state can be brought about in a person without its being determined by a part of the physical world (when viewed), then it is logically possible for two people involved in a systematic transposition to detect which colours are transposed without breaking the permanency condition of the transposition. The crucial point is that if a systematic transposition holds between two people, then on occasions when the transposition is actually in effect in whatever environment(s) that occurs, the two people will have different perceived colours, and so their physical end-states for those viewings will be different. Now if it is logically possible to produce in one of the people the physical end-state had by the other when the transposition is in effect, where this end-state is produced when the person concerned is not viewing any part of the physical world (e.g., when his eyes are closed), then the person being altered will have the perceived colour the other person has when the transposition is in effect, and he will have it without breaking the permanency condition of the transposition. Since the transposition is about certain systematic differences that occur when the two people view a certain part of the physical world (when that part is kept constant), what happens when they are not viewing any part of the physical world will not 'interfere with' the transposition. More specific points about the possibility of producing qualitatively

the same physical end-state in this way can be made when asking about the conceivability of detecting systematic transpositions of colours, since in that context I shall make use of certain empirical facts (e.g., as to what the physical end-state actually is for sighted humans). Here I shall point out only that there is nothing in the "second basis" that is inconsistent with the notion of "a plurality of causes" for some event/state. The lawlike regularities referred to in the "second basis" are, very crudely, of the form: "Same cause, same effect", "Different effect, different cause". And the idea that there may be "a plurality of causes" for a physical end-state (which is sufficient for a certain experience) is far from original. It goes back at least as far as Descartes. He, of course, makes explicit that he does not accept the identity-thesis (about experiences and the physical end-states), but he apparently does accept that there can be more than one cause for a physical end-state.

> . . . when I feel pain in my foot, my knowledge of physics teaches me that this sensation is communicated by means of nerves dispersed through the foot, which, being extended like cords from there to the brain, when they are contracted in the foot, at the same time contract the inmost portions of the brain which is their extremity and place of origin, and then excite a certain movement which nature has established in order to cause the mind to be affected by a sensation of pain represented as existing in the foot. But because the nerves must pass through the tibia, the thigh, the loins, the back and the neck, in order to reach from the leg to the brain, it may happen that although their extremities which are in the foot are not affected, but only certain ones of their intervening parts which pass by the loins or the neck, this action will excite the same movement in the brain that might have been excited there by a hurt received in the foot, in consequence of which the mind will necessarily feel in the foot the same pain as if it had received a hurt. And the same holds good of all the other perceptions of our senses.[16]

(It is not suggested, of course, that Descartes' description of what the

[16]Rene Descartes, "Meditations on First Philosophy, VI," The Philosophical Works of Descartes, trans., Elizabeth S. Haldane and G. R. T. Ross (London, 1911), I, pp. 196-197.

physical end-state is in his example, is accurate.) Since, then, it is logically possible that a physical end-state can have several different causes, it is logically possible that an end-state may be brought about in a person when he is not viewing the physical world. In this case, it is logically possible for the two people involved in a case of systematic transposition of colours to detect which colours are transposed without breaking the permanency of the transposition.

In regard to the logical possibility of detecting systematic transposition by relying on the "second basis", it remains to be stated that the second interpretation of "systematic transposition" is incoherent. In the second interpretation of "systematic transposition" the term "where" in the sentence "where one person perceives colour C_1, the other person perceives colour c_1, . . ." is interpreted to mean "in the same environment and given that the two perceivers are in qualitatively the same state". To say here that they are in qualitatively the same state means:

> On viewing some physical object in some constant environment, there is no difference in their physical states immediately prior to or during their viewings, but prior to the beginnings of their end-states (where this difference is not caused by the input of the viewings).

Making use now of the "second basis", when two people view a part of the physical world and have ideas of that part of the physical world, then necessarily those ideas are determined by that part of the world. And for the ideas to be determined in this way when people view that part of the physical world (which involves their having "functioning eyes" at that time), there needs to be a lawlike regularity in the effects of the physical world on the physical states of the perceivers, and between the effects of their physical states on their ideas. So in a case where two people view the same part of the same (constant) environment, and are in the same physical state (as clarified above), the

determining factors of their respective ideas are the same, and so they will have (qualitatively) the same ideas. It is not logically possible that they should both view the same part of a constant environment, have ideas of that part of the physical world, be in the same physical state (as clarified above), and yet have (qualitatively) different ideas. But that is precisely what is required for the second interpretation of "systematic transposition" here, and therefore the concept of systematic transposition, given this second interpretation, is incoherent.

It remains to be asked if systematic transposition is conceivably detectable on the "second basis". Here proposals are restricted by the given facts of the world, but so also is the problem. That is to say, I am here interested only in conceivable cases of systematic transposition, where "systematic transposition" is given its first interpretation (in which the term "where" in the sentence "where one person perceives colour C_1, the other person perceives colour c_1, . . ." is interpreted to mean "in a constant environment"). To ask if cases of systematic transposition are conceivably detectable, we must ask explicitly if there are conceivable cases of systematic transposition, and then if they are conceivably detectable. If we reach a negative answer for the first of these two questions, then systematic transposition (first interpretation) is itself inconceivable, and the question about the conceivability of detecting it evaporates. There must be a kind of equity about the setting up the question, and in restricting the means for answering it. It is legitimate to ask about the conceivability of detection providing what is meant is the detection of conceivable cases. If it is being asked if logically possible cases of systematic transposition can be detected, where the cases can be in fact prohibited by the given facts of this world, then one is entitled to call upon what is logically possible, without regard to given facts, in describing how they can be detected. What would be inequitable would be to demand the

conceivability of detection of cases of systematic transposition that are merely logically possible, but not conceivable (i.e., cases prohibited by some given fact). My major interest in this thesis is with questions to do with conceivability rather than to do with merely logical possiblity. I am primarily concerned with the potenial knowledge humans can acquire in this world, and with the potential hazards involved. In regard to my present question, conceivable cases of systematic transposition are all the cases that I am obliged to consider.

For systematic transpositon to be conceivable, it must be conceivable that there are some constant environments in which perceiver P_1 sees colour C_1 (for a part of the environment viewed), and another perceiver P_3 sees colour c_1 (for the same part when viewed), where $C_1 \neq c_1$, and there is no constant environment where P_1 sees C_1 (for a part viewed) but where P_3 does not see c_1 (for the same part), and no constant environment where P_3 sees c_1 but where P_1 does not see C_1. This involves its being conceivable for humans to have ideas of a certain part of the physical world on viewing it, i.e., ideas determined by that part of the physical world. As noted above (in Section 9) there is much empirical evidence that this often actually happens. It was explained how in an environment otherwise constant, a tester could present to any number of sighted people many pairs of physical objects having the same shape, same size, same 'visible' texture, so as to be indistinguishable to the viewers on any other basis than that of perceived colours, although the tester, from his position, could see some identifying feature of the objects. By presenting and representing the pairs, the tester can acquire evidence of a "significant correlation" (as this phrase is used in psychology) between the pairs of objects and the perceived colours seen by each viewer. (Providing the pairs were presented carefully, this evidence could be acquired via sameness/difference-of-perceived-colour judgements given by the viewers in respect of the pairs of objects presented.) Evidence for a "significant correlation" could be acquired

without presupposing that the perceived colours for each viewer were qualitatively the same for each object presented; the test can be set up so as to provide evidence that there is a significant correlation between the presentation of certain pairs of objects and the perceived colours of each (rather than all) viewers tested.[17] With a very high degree of correlation, it is correspondingly very probable that the correlation is not a coincidence. The simplest hypothesis for an overwhelmingly high correlation is that the presented objects, given their environment, determine the perceived colours of the viewers. And it is important to note that there can be overwhelming evidence for this hypothesis even if it is not as yet clear precisely which features of the objects and their environment are the determining factors of the perceived colours.

Given that we are referring to perceived colours that are ideas of a certain part of the physical world when we refer to a case of systematic transposition, and given also that in such a case the perceived colours are different for two viewers, even though the environment is constant, then, by using the claims of the "second basis", there must be a difference, between one person's viewing and the other's, in the only other determining factor of their perceived colours, viz, their physical states. So for systematic transposition to be conceivable, there must be at least one pair of different physical states such that in some constant environment two viewers, one in each state, will perceive different colours on viewing some part of that environment. I accept that there are in fact such pairs of physical states, although of course I cannot give a long list of them since I lack the empirical knowledge required. Apparently, being with and without a fairly severe obstruction of bile constitutes such a pair.

[17] For more details, see Section 9 above.

The question I wish to ask, then, is: Is it conceivable to detect that there is a case of systematic transposition between two perceivers whose physical states ex hypothesi are a pair which do as a matter of fact result in a systematic transposition of colours? A (conceivable) case of systematic transposition of colours holding between two people is detectable if: it is conceivable for some third person, whose physical state is like that of one of the two perceivers in all the relevant respects, to change so as to be in a physical state like that of the other perceiver in all relevant respects, without necessarily--logically or causally--changing his discriminatory abilities and without leaving him unable to judge the sameness/difference of the perceived colours in question. A crucial question, then, is whether or not it is conceivable to discover which features of a perceiver's physical state are relevant to his colour-vision when viewing parts of the physical world, and specifically, which differences in physical state will result in a difference in perceived colours when viewing some part of some constant environment.

There are at least two kinds of grounds for claiming that certain features (and the various combinations of them) of a person's physical state are irrelevant to his colour-vision. One way to acquire the grounds is to vary these features (singly and in combinations) in many ways to see (via the perceiver's reports) if any of these changes results in some change in his perceived colours when he is viewing some part of some constant environment. If none of them does result in a change and if a great many variations have been undergone by the perceiver, there are grounds for claiming that these features are irrelevant.[18] Another way of acquiring evidence about irrelevant features is so simple it may be overlooked (although I have mentioned earlier, in explaining the "second basis"). Colour-vision of parts of the external world is

[18]There is no suggestion here that we test for all conceivable variations.

just that, vision, i.e., a sensory activity involving the sense of sight. By the definition of "the sense of sight" one feature that is relevant is that of having eyes (actually, at least one eye) that can function when open and the perceiver is viewing part of the physical world. That is to say, on an occasion of such a viewing, the person has "functioning eyes" (as I have used this phrase), eyes via which the part of the physical world viewed determines the visual ideas in the person concerned (which is saying more, of course, than that the person concerned has visual ideas at a certain time). Functioning eyes are relevant to the sense of sight in that if a person never has them, he is blind, i.e., deemed to be without the sense of sight. Given that having functioning eyes is relevant (since required for) viewing colours of physical objects, so too are states of any sensory apparatus involved in the functioning of the eyes. And here we have a way of deciding that some features are not involved (not relevant) which is rather different from that of varying the feature in question to see if a person's perceived colours in some constant environment are reported to change. One may discover first what the input via the eyes is, and then, crudely speaking, one may observe the 'route' of the input, if it has a 'route'. The nature of the input (resulting from viewing the physical world) as it moves through the person's body has been discovered to be electro-magnetic waves, and they have been discovered to pass via the nerve then appropriately labelled "the optical nerve" to a certain part of the brain. One result of such tracing beginning with the sensory organ that is definitive of (human) viewing of physical objects is that one has some grounds for claiming, e.g., that the perceiver's foot is not involved in this, that its size is not relevant to the sensory act of viewing, and that the length of the perceiver's finger-nails is not relevant, etc.. Of course there are some risks involved here. The claims are empirical and depend on the accuracy of the tracing mentioned. Also there may be some, perhaps many, parts of the body

which are not on the 'route' of the electro-magnetic waves, where a very small number of conceivable states of those parts do affect some part of the 'route', and so indirectly affect a person's colour-vision; e.g., a severe obstruction of bile. Still, the claims, about certain features of a person's physical states being irrelevant to colour-vision, made on these grounds have some support, and the support does not involve varying the features in question (the size of the foot, the length of the finger-nails). The two kinds of grounds--tracing the electro-magnetic waves from the eyes, and varying the features in question--are not exclusive. Some features may be claimed to be irrelevant (to colour-vision) on both grounds, e.g., the length of the person's finger-nails.

Claiming that certain features of a person's physical state are irrelevant to his colour-vision, by tracing the 'route' of the electro-magnetic waves from the functioning eyes, is very useful for cases of systematic transposition where one or both of the perceivers involved have some feature(s) that cannot conceivably be changed in the following way: a third person in exactly the same physical state (in the specified sense) cannot conceivably change (or be changed) so as to be in exactly the same physical state as the other perceiver. Systematic transposition may be conceivably detectable, nonetheless, if the features of the state that cannot conceivably be changed are features which can justifiably be claimed to be irrelevant to viewing the colours of physical objects, on the basis of their irrelevance to the traced 'route' of the electro-magnetic waves from the functioning eyes. In this case systematic transposition of colours, holding between perceivers P_1 and P_3, can conceivably be detected by having a third perceiver, P_2, who is like P_1 in all the relevant respects, change his physical state so as to be like P_3 in all the relevant respects, and by having him view a part of a constant environment where P_1 and P_3's colours are transposed, both before and after his (P_2's)

change in physical state, so that he will be aware of the change in his colour-vision. Using the "second basis", he can then justifiably generalize that, since the environment, ex hypothesi, remained constant, the change in his perceived colours was the result of the change in his physical state, and that any pair of perceivers whose states differ (in regard to features relevant to colour-vision) as his did before and after the change, see different colours when viewing the part of the environment referred to. And since P_2 can conceivably discover that his discriminatory abilities have not changed, he can justifiably claim that such a pair of perceivers would have a systematic transposition of colours holding between them. Perceivers P_1 and P_3 in the case described above would be entitled to claim that a systematic transposition holds between them in these circumstances.

Also P_2 will know which colours are transposed between P_1 and P_3, and between any other pair of perceivers like this pair in the relevant respects. Assuming the transposition between P_1 and P_3 to be permanent, is it conceivable for them to detect which colours are transposed between them? Here one can make use of the concept of the physical end-states for the viewings P_2 made before and after his change in state. P_2 was first like (in the relevant respects) P_1, and after the change, like P_3. It will be conceivable for P_1 to detect which colour P_3 has when the transposition is in effect if it is conceivable to produce in P_1 the physical end-state in question (the earlier of P_2 different end-states) without P_1's viewing any part of the physical world at all at the time, e.g., when his eyes are closed and so not functioning. If this can conceivably be done then P_1 can detect which colours are transposed without breaking the permanency condition of the transposition. (Mutatis mutandis for P_3's detecting which colours are transposed.)

To answer the question of whether or not all conceivable cases of systematic transposition are conceivably detectable requires a great deal more

empirical knowledge about visual perception than I have, probably more than any one has. The question is not without an answer, but to try to answer it without an adequate knowledge of the relevant causal laws is virtually to ignore the condition of conceivability, viz, "without rejecting any given fact". Someone in the field of medicine or the psychology of perception will have far more relevant knowledge here. Always, of course, there will remain the possibility of discovering unexpected empirical truths, perhaps causal laws, which alter one's claims, but this is just the standard reservation about any claim whose truth depends upon that of some empirical statement(s). I realize that questions about conceivability are not as easily settled as those about the logical possibility of some situation, but I argue that my notion of conceivability has the greater utility when we are investigating what is essentially an epistemological problem, that of what is in the power of human beings to know.

It is clear that there is a connection between what I have called the "first basis" and the "second basis" for tackling the Transposition Argument. The second basis is to do with what is contained in the concept of a part of the physical world's determining a perceiver's ideas when that person views that part of the world. The first basis involves at least one empirical claim, viz, that in the case of a person's viewing a part of the physical world, the physical end-state (as I have used this phrase) is a brain state. The two bases connect in the following way. It can be seen by examining the second basis that in order for there to be the lawlike regularities involved in the concept of a part of the physical world's determining a person's idea on viewing that part, these two claims (among others) must be true: (a) If two perceivers have different ideas (or sets of ideas), then their physical end-states are different; (b) If two perceivers have the same physical end-state, then they have (qualitatively) the same ideas. If these claims are combined

with the empirical claim that the physical end-state in the case of visual experiences is a brain state, then we arrive at the "correlation-claim", viz, "Visual experiences and brain states are 'correlated', so that for any two different visual experiences, there will be two different brain states", and also we arrive at the claim that "If two people have the same brain states, then they will have the same visual experiences" (a claim used along with the correlation-claim in the early part of the section). The second basis is, in a sense, more important than the first in another way too. By making permanency a condition of systematic transposition, we thereby make it likely that the cause of the difference in perceived colours when two people with a systematic transposition view the same part of some constant environment is some permanent difference in their physical states, where "difference in their physical states" is to be construed as it is in the second basis, and not as "different physical end-states at the time of viewing". There will, of course, be different end-states also, but the end-states are temporary states, and the cause of a permanent transposition can reasonably be expected to be of a permanent nature. Finally, in regard to the two bases, the claims made in both of them are neutral with regard to an identity-thesis about visual experiences and the physical end-states. (This has been explained in the section at appropriate points.)

This section contains the points needed to deal with the frequent objection that "we can never be sure" if two people, in some constant environment, see the same colours when viewing the same part of that environment. This is 'the other side of the coin' to that of showing that some perceivers see different colours (in some constant environment). For all conceivable cases where no transposition of colours, systematic or overlapping, holds between two perceivers in any constant environment, is it conceivable to detect that no transposition holds? For any conceivable physical state (as this phrase is used in the "second basis") it is conceivable that more than one person have

that state, and so a fortiori it is conceivable for more than one person's state to be the same in respects relevant to colour-vision. I cannot think of reasons why it should be inconceivable to detect the total or partial similarity of states here. It is, of course, no objection that as yet we do not know all there is to know about which features are relevant to colour-vision and how differences in these features affect colour-vision. If it is conceivable to acquire enough knowledge to make well supported empirical claims about these things, that is all that is required. It is not a 'defect' that a mistake may be made; the possibility of error remains as it does for all empirical statements.

12. Ascribing Particular Colours to Physical Objects

I want now to look at errors that can be made in ascribing a particular colour such as red or green to a physical object, for making sense of mistakes about such colour-statements shows that we can make sense of the second soundness condition's not holding for these statements. Someone who quite often reaches a wrong verdict in certain environments is someone for whom the second soundness condition does not hold in these conditions; he is not reliable. There are two ways in which one can err about the sameness/difference of colour of one physical object at different times: someone may claim on the basis of his perceived colours that a physical object in a constant environment is different colours at different times, or someone may claim on the basis of his perceived colours that some physical object remains the same colour when in fact its properties change relevantly so that its colour too in fact is different at different times. In neither case does the perceiver have the perceptual ability to test reliably the statement "The object in question remains the same colour during the specified time period" by simply viewing the object in the environment(s) throughout that time period.

This in itself suggests that mistakes can be made in ascribing a particular colour such as red to a physical object. If we look at the first of the two examples mentioned in the paragraph above, a similar structure will give us a case of conflicting verdicts about the ascription of some particular colour, of an inconsistency in fact, and thereby we give sense to the notion of a mistake in making such an ascription. Suppose a perceiver views some physical object in a constant environment and declares sometimes that the statement "The object is red" is true, sometimes that it is false (e.g., perhaps his perception is affected by various bodily changes because of some drugs taken). Given that the environment is constant, the verdicts are inconsistent. The perceiver, then, does not have enough perceptual ability to test reliably

in that environment the statement "The object is red", just as in that environment he does not have enough perceptual ability to test reliably the statement "The object has remained the same colour during the specified time period" by simply viewing the object throughout that time. The important point here is that having the perceptual ability to detect reliably the sameness/difference of colour of the object throughout the time period is all that is needed to know that the perceiver is making some mistakes in his verdicts about the object's being red. One need not know if the object is in fact red. It is enough to know that it has remained the same colour.

There is a problem if we try to do the same kind of thing with the second example given of the second soundness condition's not holding for a perceiver who is testing the statement "The object remains the same colour", viz, where someone claims on the basis of the colours he perceives that the object remains the same colour when its properties change relevantly so that its colour too is in fact different at different times. At least, there is a problem if we remove a simplification employed in the section on Smart's paper and acknowledge that one colour-term such as "red" is permitted to cover several different colours. For the second example, if we try to produce a case with a similar structure but about mistakes in the ascription of a particular colour, we find that one could not know that the perceiver has made some mistake(s) if all one had was the perceptual ability to judge reliably the sameness/difference of colour of the object throughout the time period involved. To begin with it will not do to describe the case (with a structure similar to that of the example given in this paragraph) simply as: on the basis of the colours he perceives someone throughout the time period always reaches the verdict "true" for the statement ascribing the colour red to the object when in fact the properties of the object change relevantly so that it is different colours at different times. It will not do because this case as described need not

involve the perceiver's making any mistake in his ascription of the colour red. That the object changes colour is consistent with its remaining red throughout, and so is consistent with the perceiver's verdicts' being all correct.

To make this point clear it will help to introduce a distinction between two meanings of "the same/different colour": i) where two physical objects are "the same colour" when they are exactly the same colour, and where they are "different colours" in all cases where they are not exactly the same colour (regardless of whether or not some commonly used colour-term can be used to cover both colours); ii) where two physical objects are "the same colour" when some one commonly used colour-term can be "legitimately" used to refer to the colour of each. Sense (i) is the meaning the phrases have in, e.g., Section 9 above, and now sense (ii) becomes important. Two objects which are "the same colour" in being "covered by the same colour-term" may be "different colours" in the other sense. For clarity I shall speak of two objects' being "the same/different colour" when I mean "exactly the same/different colour" as in sense (i) above. I shall speak of two objects' being "the same/different colour_t" when I mean they are "both legitimately covered by some commonly used colour-term" as in sense (ii) above. When I write about ordering physical objects by colour, I shall explain what is meant by "legitimately covered by some one colour-term". Here it is necessary to acknowledge only that two physical objects which are the same colour_t may not be exactly the same colour. This point does not affect the case described in the second paragraph where conflicting verdicts are reached for a statement ascribing the colour red to a physical object in a constant environment (where the relevant properties of the object, therefore, remain the same throughout), but it does affect the case being dealt with now.

It is in fact because of this point that the first attempted description

of the case will not do: the case where, on the basis of the colours he perceives, someone throughout the time period in question always reaches the verdict "true" for the statement ascribing the colour red to the object when in fact the object has different colours at different times, need not constitute a case where the perceiver makes some mistake(s) in his verdicts since the object's remaining red (and so remaining the same colour$_t$) is compatible with its being different colours (i.e., not exactly the same colour) at different times. There is an asymmetry of a sort at work here: to claim that a physical object is different colours$_t$ at different times when in fact the environment and so the colour of the physical object remains the same throughout constitutes a mistake; but to claim that an object is the same colour$_t$ all the time when in fact the relevant properties vary in such a way that it is different colours at different times need not constitute a mistake. For our description to be that of a case where some mistake(s) about the ascription of a particular colour is made, it is not enough that the perceiver always reach the verdict "true" for the statement ascribing the colour red to the object when in fact the colour of the object is different at different times. We need to specify also that either the object is in fact different colours$_t$ within the time period in question, or, if the object is in fact the same colour$_t$ throughout, that colour is not red. This does ensure that a mistake about the ascription of a particular colour is being made, but it is no longer detectable simply by virtue of having the perceptual ability to detect reliably the sameness/difference of colour of the object throughout the time period. In this respect this case of some error(s) about the ascription of a particular colour differs from the first case of this mentioned.

We have at any rate one situation in which a perceiver's making an error in ascribing a particular colour can be detected by someone having the perceptual ability to detect reliably the sameness/difference of colour of

physical objects in the environment involved, viz, where the perceiver, on the basis of the colours he perceives, declares sometimes that the statement "The physical object in question is red" is true, sometimes that it is false, whereas in fact the environment remains constant. But an error in consistency in ascribing a particular colour to a physical object, which is what this case amounts to, in itself tells us nothing about what constitutes a correct verdict for a statement about such an ascription, and surely, to use the notion of an error in order to give sense to the second soundness condition for such statements, we need an understanding of what constitutes a correct verdict here as well as a more full-blooded notion of an incorrect verdict. Then there is some content to the point that the second soundness condition does not hold for such a statement when the perceiver has not the ability required to reach correct verdicts reliably in the environment(s) involved. And once this is done, we can claim that statements about ascriptions of particular colours to physical objects are objective, since it is easy to give sense to the first soundness condition here. E.g., the first condition does not hold if the perceiver looks at the wrong physical object(s).

In investigating the notion of an error in ascribing a particular colour to a physical object at present, there is one set of a priori truths we should bear in mind--the a priori statements about the incompatibility of certain colours. E.g., it is commonly accepted as being a priori true that "No physical object can be both green and red in the same part at the same time." Two points need to be made explicit immediately. In the first place, what are being referred to are the paradigm cases of green and red, and a colour that is "reddish green" (if this could describe some colour) does not count as a counter-example to the claim. Of course, the notion of a "border-line colour" between, e.g., red and green has not been discussed, but it is a point to remember here. Secondly, the incompatibility-claim refers to the perceptual qualities

a physical object has at any one time, as opposed to the colour it is deemed to have by reference to "standard conditions" which may not be in force at some times. For example, a banana may have at present the perceptual quality grey as a result of its being viewed at a distance in the dusk. Still, most people would claim that its "real colour" is yellow, i.e., in what are deemed to be "standard conditions" for viewing bananas it has the perceptual quality yellow. It can be true, then, that at present the banana is perceptually grey, and also at present its "real colour" is yellow. There is no conflict here, and this does not count as a counter-example, e.g., to the a priori incompatibility claim: "No physical object can be both grey and yellow at the same time in the same place." The a priori incompatibility-claims state the impossibility of a physical object's having as perceptual qualities two very different colours simultaneously (and on the same part). It follows that if someone does claim that a physical object is simultaneously red and green (on the same part), his claim is a priori false. This kind of error reduces to a case of being inconsistent. To claim that the physical object is red is to preclude its being, at that time, green. So the person is claiming that the object is a colour which precludes its being green and that it is green. This is a consistency-error of the kind described at the beginning of the section. We know that either his ascription of red or of green (or both) is incorrect, i.e., we know he has made a mistake. But we need more than what is given here to know which ascription (if either) is correct.

I have already acknowledged that differences in the states of two perceivers can result in their having different perceived colours when they view a part of some constant environment, so that there is a case of overlapping or systematic transposition of colours between the perceivers. I have argued that it may well be conceivable to detect such differences in perceived colours, and to detect in other cases that no transposition holds.[1] For none of this

was the notion of "a correct verdict" about the particular present colour of a physical object required. This concept I shall now examine, and in doing so, I shall look at the related concept of "a state giving rise to perceived colours that are epistemologically trustworthy for reaching such correct verdicts (i.e., verdicts about the particular present colour of an object)".

Some states of perceivers are such that they produce hallucinations so that if the person is asked to look at a particular physical object he is, at that time, incapable of doing so. Such a case lacks a necessary condition for his perceived colours' being epistemologically trustworthy for ascribing a particular colour to the physical object, since his perceived colours are not determined by the object (given its environment). In this instance his state interferes radically with his perceptions of the physical world, but there can be 'interference' of a less radical kind. The point is that although a person's perceived colours must be determined by the physical object, given its environment, if the perceived colours are to be "ideas of (that part of) the physical world", this is not sufficient to ensure that the ideas are epistemologically trustworthy. Even when the ideas are so determined, a perceiver's state may 'interfere with' his perception so that his perceived colours are misleading. E.g., presumably this is the usual situation when in a constant environment one person cannot although another can discriminate by colour between two physical objects having relevantly different properties. The first person's perceived colours are misleading for the purpose of testing the statement "The two objects are the same colour". By relying on his perceived colours he will reach the verdict "true", and that will be incorrect. In regard to an ascription of a particular colour to a physical object, the role

---

[1]It would be a mistake to take this claim to be really a weak one. A great deal of support is offered in the last section. The phrase "may well be conceivable" reflects merely my lack of the detailed empirical knowledge required to show that it clearly is conceivable.

of the perceiver's state will be found, in fact, to be central to the very concept of such an ascription, so that the concept is anthropocentric.

To correctly attribute the present colour, say, red, to a physical object solely on the basis of the perceived colour of a person viewing it, I am not suggesting that the object must have a property "in itself, which resembles one or other of a certain group of perceived colours". No point made so far and none following requires this. Rather than spend time examining what this feature, which is not required, amounts to, I shall set out and argue for what <u>is</u> required for us to have a viable concept of a physical object's "being now red". It will become clear that the concept can be anthropocentric without affecting the objectivity of the statements about such ascriptions. The account I offer of a physical object's being (at present) red does not rest on a simple appeal to the perceived colours the majority of sighted people now alive would have if they viewed the object. Such an appeal can give rise to contradictions which I avoid. It will be clearest to state the central claim of the account and then to explain it and indicate how it overcomes certain problems that some other accounts encounter. What is given below is a statement of what it is for a physical object to be now red. Afterwards I shall explain how to derive from it tests to be used in practice, for deciding whether or not some physical object is at present red. As a reminder, the account is of what it is for a physical object to be <u>at present</u> red, as opposed to what it is for the "real colour" of a physical object to be red, where by "real colour" is meant its present colour <u>in some specially chosen environment(s)</u>. The latter concept is in fact parasitic upon the former, as I shall explain.

<u>THE CENTRAL CLAIM</u>: A physical object is now red if and only if (given its present environment) it would determine for an overwhelmingly large part of the time when viewed by all standard-state perceivers one

or other of the perceived colours deemed to be samples of red--providing that if the physical object is the body of a sighted person, his perceptions are not included in the total of standard-state perceptions.

Let me state immediately that this will turn out to be a non-circular account of a physical object's being now red. Also, the rider at the end is not an arbitrary manoeuvre. It will be easiest to explain first the central claim without this rider, and then to state briefly why the rider is required. At this stage it is enough to remember that the account can cover the colour of a physical object which happens to be the body of a sighted person; all that is needed for the case to be on a par with other cases is that this physical object have the same role as any other viewed object, i.e., for the person's body to be the object viewed by other people. But I shall give the reason for this at a more appropriate point in the section. While I examine the central claim without the rider, I shall have in mind the central claim as it applies to physical objects which are not the bodies of any sighted person.

Given the physical states of viewers of a physical object, if their perceived colours on looking at a physical object are not determined by that object (given its environment) in a lawlike and regular fashion, then the concept of "the colour of a physical object" does not have a solid basis at all. I have argued earlier that there are correlations between viewers' perceived colours and presented physical objects that constitute empirical evidence that viewers' perceived colours are determined by the objects viewed (given their environment). But although this is required for the concept to be viable, more than this is needed. As it stands this requirement can be met in, e.g., a situation where a number of viewers look at some one physical object in a constant environment and have different perceived colours because their physical states are relevantly different. This is to say, this requirement about

the perceived colours' being determined by the viewed object says nothing about how similar or how different the perceived colours of the viewers need to be, but there is a requirement about this for "the colour of a physical object" to be a viable concept.

Very crudely to begin with, the requirement is that there be a kind of uniformity in the perceived colours humans have on viewing a certain physical object in a certain constant environment. Without this uniformity it is gratuitous to attribute particular colours to particular physical objects (given their environment). It is required because of the role the viewers' perceived colours have in giving the meaning of "the colour of a physical object". The phrase is defined in terms of the perceived colours of certain viewers. So, bearing in mind that the perceived colours do not "resemble" properties "in the objects themselves", if there is no uniformity in people's perceived colours on viewing particular physical objects, there is no basis for deeming a particular physical object to be one colour rather than another. (In this situation we could retain our colour-terms as they apply to our colour sense-data. This has not been denied.)

In the central claim on pp. 124-125 I have made the logically first step of the account deciding that certain perceived colours are to count as samples of "red". A common colour-term such as "red" is used to cover quite a number of different colours (which are nonetheless deemed to be the same colour_t).[2] In deciding which perceived colours will be called samples of "blue", which, samples of "red", etc., there are obviously decisions about conventions involved. Such and such a group we shall choose to call "red", some other group "blue", and which group receives which label in this first step of the account is arbitrary. On the other hand, how various colours are combined to constitute such a group is not entirely arbitrary. Members of such a group

[2]This includes the terms "black" and "white".

are related to one another so as to form a small "ordered series", each colour "more like" its neighbours than any other in the series. (I shall say more about these small "series" after this section.)

Two points need to be made, or rather repeated, here. In the first place, suppose that someone has perceived the different colours that are covered by the term "red" and that when he perceived them he was informed that those colours are covered by that term. This will provide a basis for his use of the term "red" only if he can quite reliably recognize other samples of those colours in the future. This is true; at least, it is if we are talking of a person's describing a physical object as red simply on the basis of his present perceived colours as he views the object. But as I pointed out early in the thesis Ayer is correct when he argues that each person is obliged ultimately to rely on his ability to identify and re-identify certain elements of his experience if he is to make any empirical knowledge claims at all. Secondly, it may be objected that we cannot make this logically first step deciding that certain perceived colours are to count as samples of "red" since, if we do, we can never in principle know that two people are using the colour-terms such as "red" in the same way, i.e., that they are both using the same term to cover much the same group, or much "the same range", of colours. This problem, however, has already been faced in the previous section. To do our best to ensure that two people use the term "red" to refer to much the same group of colours, we can make use of a constant environment (or several)where the relevant perceived colours are determined by various physical objects which are easy to indicate. This is a simplification, of course; the person instructing the other one will assume that they each have qualitatively the same perceived colours when each of them stands in the appropriate position and views the object(s) indicated. This assumption may be false--as an advocate of the Transposition Argument

will hasten to point out. This has never been denied in this thesis, but it has been denied that such a difference in the perceived colours of two people must be obviously in principle undetectable. If their perceived colours are determined by the object(s) viewed (given its environment) and yet are different for each viewer, then since ex hypothesi the environment remains constant, the difference must be the result of a difference in the perceivers' states at the time of viewing. It has been argued in the previous section that it is, therefore, logically possible, and may well be conceivable, to detect such a difference in perceived colours, especially if we continue to acquire and make use of knowledge as to which differences in viewers' states are relevant to the colours they perceive in a certain environment. Equally, if we have grounds for claiming that two viewers' states are the same in all relevant respects, we have grounds for claiming that they do perceive the same colours in a constant environment.

It is clear from what I have already written in this section that I reject the idea that mere verbal agreement about which particular perceived colours most people have when they view objects in constant environments is an adequate basis for the concept of "the colour of a physical object". If there is no general uniformity about these perceived colours, then such claims as "The so-and-so (which is a physical object) is red" are very misleading. Either they are claims about just the speaker's colour sense-data in a particular situation, or, at most, they are abbreviations for statements about an isomorphism in the pattern of the sameness/difference relations holding between the perceived colours determined in viewers by the object referred to and the perceived colours determined in viewers by other objects in other environments. On the first of these alternatives, someone's claiming "The so-and-so is red" amounts to his claiming "I have colour sense-data of such-and-such a kind in this situation." Even if it is specified that his colour sense-data

are determined by the object given its environment, that in this environment he always has colour sense-data of this kind of viewing that object, and that other people can discover which colour sense-data he is having, it still does not warrant the ascription of a particular colour, such as red, to the object if there is no strong tendency for viewers of that object in that environment to perceive one or other of a relatively small group (or "series") of colours. The point is that speaking of a physical object's being coloured has currency only insofar as there is a relationship between perceivers viewing physical objects and their resulting perceived colours, more specifically insofar as the objects determine the viewers' perceived colours. Speaking of a physical object, given its environment, having one particular colour rather than some other particular colour has currency only if, in the perceived colours determined in viewers by that object in its environment, there are some perceived colours rather than others. At the very least there needs to be a strong tendency for there to be some perceived colours rather than others. That is to say, more is required for the concept of "the (present) colour of a physical object" than simply that physical objects determine perceived colours in people who are viewing them; there also needs to be some general uniformity among the perceived colours people have in viewing one and the same object in a constant environment.[3] I said earlier in this paragraph that if there is no such general uniformity, then at best statements like "The so-and-so (which is a physical object) is red" are abbreviations for statements about an isomorphism in the pattern of the sameness/difference of the perceived colours people have on viewing various physical objects. Let me clarify briefly what I mean

[3]I myself do not find it at all bizarre to claim that physical objects could be coloured without each physical object (in any one environment) being some one particular colour, since, for physical objects to be coloured fewer facts need to obtain than are needed for each physical object (in any one environment) to be some particular colour. For the first of these all that is required is that physical objects determine perceived colours in people who are viewing them.

by this. So far the facts assumed to hold are that the speaker's perceived colours are determined by "the so-and-so" (given its environment), that in this environment he always has colour sense-data of this kind on viewing that object, and that other people can discover which perceived colours he has. In addition, suppose that the sameness/difference of his perceived colours on viewing this and other objects in different environments is isomorphic to the sameness/difference of the perceived colours of other people when they view the same objects as he does in the same environments as those in which he views them. Even with this I deny that there is an adequate basis for ascribing particular colours to physical objects, unless there is also a general uniformity among the perceived colours viewers have when looking at some one physical object in a constant environment. If there is no such general uniformity, then when the original speaker (or anyone else) claims that "The so-and-so is red" this means at best that "The perceived colour the so-and-so determines in me when I view it in this environment is like the perceived colour determined in me by the such-and-such in this environment, but unlike the perceived colour determined in me by this and this object in that environment, etc., etc., and there is a general uniformity, an isomorphism, in the pattern of the sameness/difference relations holding between the colours people perceive in these various environments when they view these various objects." Some writers claim that, supposing this isomorphism between the perceived colours of viewers generally to hold, it is "impossible" to detect if the particular perceived colours people have in viewing some one object in a constant environment vary a great deal from one person to another, and that in any case such differences do not matter. In effect, this does "reduce" statements such as "The so-and-so is red" to statements of the form given above (about the isomorphism of the sameness/difference of perceived colours of people when they view various physical objects in various environments). But I reject both of

these claims; I argued in the last section that it is not logically impossible, not even clearly inconceivable, to detect differences in the perceived colours of different viewers in a constant environment. And in this section I have argued that the particular perceived colours of viewers are important in that if the perceived colours of viewers in a constant environment differ a great deal, then we do not have an adequate basis for the concept of "the (particular) colour of a physical object". There needs to be some general uniformity in the perceived colours of viewers in a constant environment. It is not the "impossibility" of detecting differences in perceived colours among viewers that gives rise to the "reduction" of statements ascribing particular colours to physical objects to the kinds of statements described above, since, I have argued, such differences are open to detection. What would lead to the "reduction" would be the empirical discovery that there is not a general uniformity among the perceived colours of different viewers in a constant environment, and this "reduction" would amount to losing the concept of "the (particular) colour of a physical object".

In summary, given that our perceived colours do not "resemble" properties "in the objects themselves", if there is no general uniformity in people's perceived colours on viewing particular physical objects in a constant environment, then there is no basis for deeming a particular physical object to be one colour rather than another. The concept of "the colour of a physical object" is relational and essentially involves reference to certain human visual experiences. In a sense, all the structural features of how we classify physical objects by their particular colours must, therefore, be found within this range of human visual experiences if the concept is to be viable. And so I reject Smart's claim that in order to ascribe particular colours to physical objects, "the actual qualia of our [colour] sense-data matter not at all so long as there is a one-one mapping of the set of sense-data produced in me on

to the set of sense-data produced in you by various stimuli."[4]

In the next section I shall look more closely at what this requirement about a general uniformity in viewers' perceived colours involves, and in doing so I shall examine the notion of a "standard-state perceiver" referred to in the central claim on pp. 124-125.

[4]Smart, "Colours," p. 129.

13. Standard-State Perceivers

The next stage is to investigate who would count as a standard-state perceiver, since this notion is central to my account of what it is for a physical object to be, e.g., red. One crucial point here is that the account of what constitutes a standard-state must safeguard the necessary condition for "being (at present) red" to count as a property of a physical object in some perceptual or potential perceptual environment, viz, "In a constant environment containing a physical object, conflicting verdicts for a statement ascribing the property to the object necessitate one (group of) verdict's being incorrect." This is to say, if my account of which physical objects are red is to be viable, I need to prevent contradictions arising as a result of it. The account must not produce conflicting verdicts as to whether or not some physical object, given its environment, is at present red. It was pointed out earlier that this necessary condition holds for relational as well as for non-relational properties of a physical object in a constant environment. E.g., in a constant environment a conflict of verdicts for the statement "The table is taller than the armchair" (given, of course, that the statement is rendered unambiguous) necessitates one verdict's being incorrect just as it would if a conflict arose over the statement "The table-surface is rectangular." I have already claimed that if this necessary condition is not met, then no matter what the surface grammar of the statement in question, it is not genuinely about a property of a physical object in the environment in question. It is, for example, the core of the distinction between claiming on the basis of what you now see, "The book-cover is red" and claiming "I now 'seem to see' a red book-cover." In the latter case there is no genuine conflict if someone else (or you at another time) in the same (i.e., constant) environment claims on the basis of his perceived colours "The book-cover is blue." The formulae "I seem to see", "I seem to hear", etc., are traditionally used to make claims which are not about the physical world

(other than one's own body)[1]. In a constant environment an individual's claim can change as a result of changes in his perceived colours from "I seem to see a red book-cover" to "I seem to see a blue book-cover", and still there is no genuine conflict here. If there is good reason for the perceiver to suppose that the change in his perceived colours is the result solely of a change in his bodily state, he may well choose to make claims only about what he "seems to see", simply because this commits him to much less. The account I offer will ensure this necessary condition for red to count as a property of a physical object.

The concept of a physical object's being red essentially involves reference to viewers' perceived colours--in my account, to the perceived colours of "standard-state" viewers. One point that I can make immediately is that I am not basing the account on an appeal to "the perceived colours of the majority of perceivers alive at the time of the ascription of red to the physical object in question". Suppose that people agree to use the term "red" to cover much the same group (or "series") of colours. (This could be checked, if my earlier points about the Transposition Argument are correct.) In fact, for the rest of this section let this assumption be true and known to be so. Then if "So-and-so (some physical object) is red" means simply "So-and-so would determine now in the majority of perceivers alive one or other of the colours deemed to be red", contradictions can arise. If the majority of perceivers undergo some change in physical state which affects their colour-vision, then at another time the same object in the same (i.e., constant) environment could determine in the majority of perceivers very different colours, so that on this account the object is now <u>not</u> red. There would be a contradiction that in a constant environment one and the same physical object is both red and not red.

[1]As a reminder, this restriction remains in force. The rider to the central claim of what it is for a physical object to be red has not yet been explained.

In the account I offer the reference is to the perceived colours of all "standard-state" viewers--all who have lived, are alive, or will live. The "general uniformity" of perceived colours on viewing physical objects, which we require for the concept of "the colour of a physical object", should be found in the perceived colours of this group of people. Why do I specify "standard-state"? The nature of the human sensory apparatus of sight is relevant not only to how humans test statements ascribing a particular colour to a physical object, but to the very concept of "the colour of a physical object". For example, consider some animal having a sensory apparatus of sight very unlike that of humans, e.g., a fly. Apparently the eye of a fly is very unlike a human eye. Even if we knew a great deal about the visual experiences of flies, those experiences are just not relevant to the concept being 'set out' here. (Perhaps we could start work on a new concept specifically to do with the colour-vision of flies, but it would be a different concept from that being discussed here.) Of course, it is easy enough to disregard the visual experiences of flies and lizards when we give an account of what it is for a physical object to be, e.g., red, but the interesting question is whether or not there are grounds for ruling some visual experiences of human beings to be likewise irrelevant to such an account. There is a great deal of unifomity in the sensory apparatus of sight in humans, but can there be "deviations" that would render a person's perceived colours irrelevant to setting out such an account? Or, as I prefer to formulate it, is it conceivable for a human being to have a physical state which renders his perceived colours irrelevant to providing such an account? This question does not specify that the physical state be a state of the sensory apparatus of sight, although the state must affect this apparatus so as to have some effect on the perceived colours he has on viewing some parts of the physical world. And by "physical state" in this question, I am referring to something other than the physical

end-states of the perceptions "affected".[2] If there are any such physical states I shall deem them to be non-standard.

It is tempting to reject the question outright as absurd, to say that the visual experiences of all human beings are relevant to <u>setting out</u> the concept of a physical object's being red, and that only a state that would render the person not a human being at all could be "non-standard" as I am using this term. This response, I think, is an oversimplification of what the anthropocentric nature of the concept is. The question is not settled that easily. E.g., perhaps it will be possible one day to provide artificially manufactured replacements for at least some of the parts of a person's sensory apparatus of sight if those parts are damaged in some way. It would not be surprising if in the early stages of developing such replacements, manufactured parts were produced which permitted a person to have perceived colours on viewing the physical world, but which nonetheless functioned in <u>some</u> "radically different" way from the sensory apparatus of sight of most human beings. At least, I think we need to examine quite closely the possibility of there being human beings in a non-standard state.

At this point I wish to distinguish two different questions. They are related, but nonetheless different.

1) Which human beings are standard-state humans? I.e., the perceived colours of which group of viewers <u>constitute the basis of the concept</u> of "a physical object's being red"? Or, in which group of viewers shall we look for the "<u>general uniformity</u>" of perceived colours (when viewing certain physical objects) which is the basis of the concept of "a physical object's being red"?

2) Can this or that person, or group of people, <u>test reliably</u> in a certain

[2]These last two points about the use of "physical state" I am not explaining here since they have been explained in detail in the context of the "second basis" for tackling the Transposition Argument.

environment a statement ascribing the colour red to some particular physical object in that environment?

At the moment I am asking question (1). As a temporary rough guide only, the two questions relate in the following way. There will be a very strong tendency for standard-state viewers to be reliable in the sense referred to in (2). However, there need not be such a strong tendency for people who are reliable in that way to be standard-state viewers. (One of the reasons for this is that there may be ways of testing a statement ascribing the colour red to a physical object other than by simply viewing the object and reaching a verdict solely on the basis of one's perceived colours.)

In order for a state to be a non-standard state, it must affect the person's perceived colours on viewing some physical objects. That is to say, there must be some ways in which we can change this state, leaving the rest of his state constant, which will result in different perceived colours on viewing some physical objects from the perceived colours he had (or would have had) on viewing these objects in the same environments before such a change in state. Strictly speaking, what is meant by "leaving the rest of his state constant" is "leaving constant whatever features of his state can conceivably be left constant, given that the specified change in his state has occurred". E.g., there may be some features not mentioned in the description of the changes to be made, but which causally must change if that specified change in state occurs.[3]

In answer to question (1), I suggest that there are at least two kinds of reasons for deeming a physical state which affects a person's perceived colours on viewing some physical objects to be non-standard:

[3]If the kind of "change" that would produce different perceived colours is in fact inconceivable (i.e., one person could not conceivably change in this way), then the point can be stated in terms of two people and how their states differ in certain respects, rather than in terms of one person and how his state changes.

a) It is the state of some part of his sensory apparatus of sight where this part is in appearance "radically different" from that of the vast majority of viewers.

b) It is a state of (or a state which affects the state of) his sensory apparatus of sight such that the functioning of some part of that sensory apparatus is "radically different" from the functioning of that part in the vast majority of viewers.

(These two possibilities are not exclusive.)

I shall make some remarks about (b) since this is the more interesting of the two. As they are stated, (a) and (b) amount to guide-lines for declaring some states of humans to be non-standard; they are not sufficiently precise to be more than that. Partly this is because I do not have the detailed empirical knowledge to give a lot more information about these two possibilities, although I shall say something about (b). Also, their being rather imprecise makes them more useful rather than the reverse, since there are no rigid restrictions as to what can legitimately be deemed to be a non-standard state. Even the most knowledgeable in these matters may find this an advantage if they encounter some 'peculiar' state not previously thought of.

Looking at (b) above, the functioning of part of a person's sensory apparatus of sight could count as being "radically different" from that of the vast majority of viewers for two different reasons: that the physical objects' properties (including their relevant relational properties) which determine his perceived colours in looking at them are different from the properties determining the perceived colours of the vast majority of viewers; or, even though the properties determining his perceived colours are the same as those determining the perceived colours of the vast majority of viewers, there are nonetheless some variations in this set of determining properties that for him result in very different visual experiences from those of the vast majority.

(I shall give at least one kind of case that could be an example of this last situation.) For both these situations what I mean is that in some constant environments there is one or other of these differences in how his sensory apparatus of sight functions. Therefore, since we are referring to constant environments, there is some difference between his state and the states of the vast majority of viewers that results in the difference in how his and their sensory apparatus of sight functions.[4] We may deem the one viewer's physical state that results in this difference in functioning to be a non-standard state.

I shall describe in general terms the first of the two reasons for claiming that a person's sensory apparatus of sight functions in a radically different way from those of the vast majority of viewers. Suppose that the properties of a physical object (including their relevant relational ones) that determine for the vast majority of viewers their perceived colour are the properties A, B, C, D. These are the properties some variations of which will produce different perceived colours in many viewers; e.g., suppose that a physical object having the properties A_1, B_1, C_3, D_2 determines in most viewers a perceived colour different from that determined by an object with the properties A_2, B_3, C_3, D_1. Also, and more important here, if the properties are all the same for two physical objects being viewed (e.g., both objects have the properties A_1, B_1, C_3, D_2), then for the vast majority of viewers the perceived colour the one object determines will be the same as that determined by the other object. Suppose now that we discover that for one viewer the properties that determine his perceived colours are properties A, C, E, F, so that some variations in these properties between two physical

[4]This is so because of the "lawlike regularity" that must hold between the environment's effect on a viewer's physical state, and the viewer's physical state on his perceived colours, if those perceived colours are to be determined by some part of that environment. (See the "second basis" for tackling the Transposition Argument, Section 11.)

objects consistently produce a difference between his perceived colour on viewing the one object and his perceived colour on viewing the other object, and also so that if all these proeprties--A, C, E, F--are the same for two physical objects being viewed, then the properties determine in him the same perceived colour on viewing the one object as on viewing the other object.

If any such situation is conceivable, then there will be some big differences between the one person's colour-vision and that of most viewers. E.g., suppose that there are two physical objects which, given their environments, have the same A, B, C, D, properties, i.e., whatever particular A-feature one object has (e.g., A_2) the other object has too, etc.. Then for the vast majority of viewers one object will determine the same perceived colour as that determined by the other object. In fact, we can say more than this. We can claim that if the two objects are the same in respect of these properties they are in fact the same colour. But consider now the one viewer whose perceived colours are determined by the properties A, C, E, F, of physical objects. Two objects the same in respect of the set of properties A, B, C, D, may nonetheless differ in respect of the set of properties A, C, E, F (their E and/or F properties may differ), and differ in such a way as to determine in the one viewer very different perceived colours. In fact, they could consistently determine in that one viewer perceived colours that are so different they could not be samples of the same colour$_t$. This is how different the colour-vision of the one viewer and the majority can be as a result of the difference between how his and their sensory apparatus of sight functions.

Although I have made it clear that I do not have the detailed empirical knowledge required to give specific and clearly conceivable examples of such a situation, I think we must be cautious about assuming that there are no such conceivable examples. We are still acquiring knowledge about visual perception, but we know already that humans respond visually to a certain

'range' of the stimulus.

> The stimulus is radiant energy, which originates at a primary source, as the sun or a light bulb. The energy sometimes comes directly to the eye, but more commonly it reaches the eye after reflection from some object. . . . Newton, in 1704, reported that a prism breaks up a band of white light into a spectrum of colours, ranging from red to violet. That is, the prism spreads out the mixed waves that comprise the white beam into a sheath of waves, each element of which is homogeneous with respect to wavelength. These wavelengths have been measured with much precision; the ones that correspond to the visual spectrum run from about 380 millimicrons [(thousandths of a millionth of a meter)] at the violet end to 720 at the red end.[5]

The spectral limits given are to some extent arbitrary since "the spectrum 'peters out' at each end".[6] There is of course a great deal of variety in the visual mechanisms of other animals, and apparently "many of these respond to slices of the electro-magnetic spectrum different from that which affects our eyes."[7] I do not know whether or not 'buried' in these kinds of facts is the information needed to construct some conceivable examples of the kind described. A conceivable case can be one deliberately brought about (i.e., by deliberately changing someone's physical state), all that is required is that the change does not leave the subject non-human. I must leave the issue unsettled, but I think I have given enough to explain what I have in mind.

I mentioned that the functioning of part of a person's sensory apparatus of sight could count as being "radically different" from that of the vast majority of viewers for another reason also, where, even though the set of properties (of physical objects) determining his perceived colours is the same as that determining the perceived colours of the vast majority of viewers, there are nonetheless <u>some variations in this set</u> of determining properties

[5]Robert S. Woodworth and Harold Schlosberg, <u>Experimental Psychology</u>, 3rd ed. (London, 1954), pp. 362-363.

[6]Ibid., p. 363.

[7]Mundle, p. 55.

that for him result in very different visual experiences from those of the vast majority. For this kind of case it will be easiest to focus on examples of the kind of thing I have in mind. My interest is in differences functioning affecting colour-vision. A very small number of humans now (about 3 in 100,000) are able to make very few discriminations by colour. A series of discrimination tests will reveal a small number of different perceived colours they have when viewing in environments where the vast majority of viewers have very many different perceived colours. This much can be tested for even without knowing which particular perceived colours the small number of people have. Given that ex hypothesi in the discrimination tests the small number of people and the vast majority view objects in constant environments, the difference in their visual experiences, in particular in the number of different perceived colours they have, must be the result of some relevant difference in their physical states at the time of viewing. The retina of the human eye contains two kinds of receptors, rods and cones. The 3 in 100,000 viewers referred to have only rod vision. That is to say, having only rod vision has been empirically discovered to change one's colour vision drastically; in fact, the sensory apparatus of a viewer having only rod vision is "radically different" in its functioning from that of the majority of viewers in that some variations in the properties (of physical objects) that determine the perceived colours of viewers result in very different visual experiences of colour in him from the experiences of the vast majority viewing the same objects. The term used by psychologists to refer to people with this very rare feature of the human eye is "monochromats". The psychologists' claims about monochromats go beyond what I have given here. As well as locating the cause of their severely limited number of different perceived colours, it is commonly claimed that "they cannot distinguish any except the so-called neutral colours (greys, black and white)."[8] Even the little I have said about

monochromats reveals a promising empirical programme for discovering which particular perceived colours they do have--by isolating the common cause, by trying to isolate the functions of the rods and the cones, and by trying to isolate, in people who have both, the function of the rods. (There is also not to be forgotten the possibility of making use of the notion of the physical end-state--the brain state of a monochromat when he views various parts of his environment. This may well be another level of complexity altogether from the programme just outlined, but if it is conceivable to detect the relevant brain states and bring them about in other humans, then for my inquiry this solution is as legitimate as the other.) Given that the vast majority of viewers now do not have only rod vision, and given that having only rod vision results in colour-vision "radically different" from that of viewers with cones as well, then the physical state of having only rods (or, only rods functioning) is a likely candidate for the label "non-standard state" as I am using this phrase. I.e., it *will* be a non-standard state if there are very few monochromats among the group of <u>all</u> viewers. And if this is true, then viewers in such a state are not part of the group of viewers whose perceived colours <u>constitute the basis of the concept</u> of "a physical object's being red" ("red" being our sample colour-term).

I think the above example serves to show that even if the same set of properties (of physical objects) determine the perceived colours in the monochromats and in the majority of viewers, there can still be grounds for claiming that the functioning of the sensory apparatus of sight of the monochromats is radically different from that of the majority. I do not actually claim that the set of properties is the same for both groups of viewers since I do not have enough empirical knowledge to be sure. Without going into detail, it will be clear that the same points can be made about viewers having only

---

[8]Ibid., p. 124.

two kinds of cones (some 2-3% of white males). This has been discovered to be a cause of a radical difference between the colour-vision of these viewers and that of people who have three kinds of cones. (People with only two kinds of cones are those usually referred to as being "colour-blind". Psychologists sometimes prefer to call them "dichromats" to remove the ambiguity between this group of people and the monochromats.) The physical state of having only two kinds of cones is also likely to count as a non-standard state. Here again the viewers are likely not to be part of the group of viewers whose colour-vision constitutes the basis for the concept of "the colour of a physical object".

What other states would count as non-standard I can only indicate generally. Some illnesses and injuries can bring with them a change in physical state that radically changes a person's colour-vision so that it is very unlike that of other viewers, e.g., apparently jaundice can do this. So if a very small proportion of all viewers have jaundice, it will count as a non-standard state. It would be desirable to give other specific examples of conceivable non-standard states human beings could be in, conceivable non-standard states being all that I am concerned with. However, as I have said before, to give such specific examples one would need a great deal of empirical knowledge about the sensory apparatus of sight, how it functions, what causes changes in its functioning, etc.. Without that knowledge one cannot be reasonably sure that the examples given do not depend upon rejecting some given fact, and if an example did depend upon this, it would not be conceivable (as I use that term). However, I do not think the small number of sample cases of non-standard states prevents our understanding the role of "a standard-state viewer" in relation to colour-concepts (applied to physical objects).

Whatever the specific content of the description of a standard state viewer, the description must be coherent and informative, it must contain

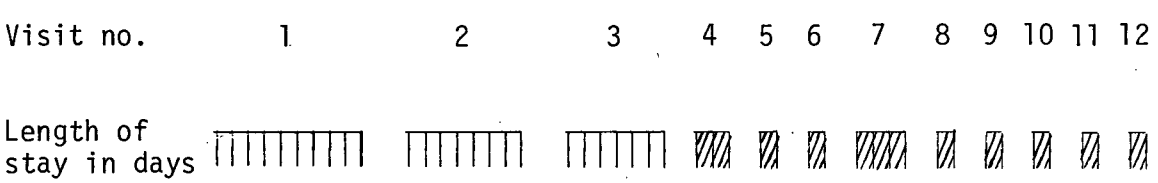
reference to features of people's physical states that are relevant to colour-vision and not contain reference to features which are irrelevant. And perhaps the most important requirement, it must hold true for the vast majority of viewers--the majority of all viewers, whenever they live. When I say the description must be informative, I mean there must be some uniformity of physical state worth capturing in the description, e.g., "having two eyes" as the only 'description' of the eyes is not precise enough to be worthwhile. And when I say the description must hold true for the vast majority of viewers, I mean that it is not legitimate to keep 'chiselling away' one feature after another as being structurally non-standard, or non-standard in the way that feature affects the functioning of the sensory apparatus, until we are left with an equally infrequent set of features which is arbitrarily labelled "standard".

It should be remembered that I am explaining what is meant by "standard-state viewer" in order to understand the role that notion has in the account of what it is for a physical object to be red (our sample colour). I am not here setting out the practical tests we must use in order to test a statement ascribing red to some particular physical object. My reference to all viewers--past, present, and future--is intentional; this is the group of viewers within which there needs to be a "general uniformity" among their perceived colours on viewing physical objects if we are to have a viable concept of "a physical object's being red".

The central claim of the account I offer of what it is for a physical object to be red is: "A physical object is now red if and only if (given its environment) it would determine for an overwhelmingly large part of the time when viewed by all standard-state perceivers one or other of the perceived colours deemed to be samples of red." (Temporarily this omits the rider I gave to this claim.) Having given some indication of what would count as a

non-standard state, the next move is to clarify what is meant by the phrase "for an overwhelmingly large part of the time when viewed by all standard-state perceivers". The phrase I have used in this section--"the vast majority of viewers"--is really a simplification, and it is time to explain why. When it is claimed that a standard state is one that the vast majority of viewers have, it reads as though what is involved is simply "counting heads", but it is not that simple. After all, there is nothing in the notion of a "standard state" that prohibits its being a temporary state of the viewer. E.g., if having a severe case of jaundice results in a non-standard state, then a viewer may be in a non-standard state for a very small part of his lifetime. The fact that the vast majority of viewers are in a certain physical state at some point in their lives does not preclude its being a non-standard state. Also, the length of different viewers' lives varies and this too can affect whether or not a state is non-standard. A simple analogy will clarify why "counting heads" will not do, and more important it will display the kind of measure I am referring to in my central claim.

Suppose we wish to know if it typically has been fine or wet for your visits to a certain town, and suppose that you have made twelve visits which are indicated in the diagram below.

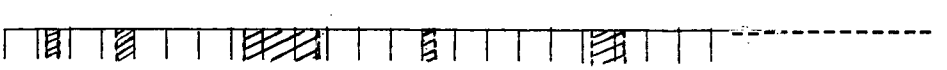


The length of each line indicates in days the length of your stay in the town on each visit, and the shaded parts of each stay indicate that it rained for that period. If you answered the question by calculating if it rained at all during the majority of your visits, the answer will be "yes". Even if you answered by calculating if it rained for most of the time for the majority of visits, the answer will be "yes", since it rained for all the time on visits

4 to 12, i.e., 9 out of 12 visits. However, the total units of rainy time during your visits is 12 days, whereas the total units of fine time during your visits is 25 days. The two ways of calculating whether or not it typically rains during your visits are just not adequate. The measure one needs here is the proportion of the total time of (all) your visits that it was raining. We simply 'add together' all your visits and treat it as one very long visit, and then see if it rained for most of the time during this long visit. This is analogous to the way I look for the "general uniformity" of perceived colours in standard-state people viewing physical objects. In that case too I make use of a certain 'theoretical construction'. It forms the basis of the account of what it is for a physical object to be red.

To understand what this 'theoretical construction' is, first suppose that we have a complete 'life history' of the physical states of each individual, sighted person. That is to say, suppose we have a record for each sighted person of all the actual physical states he has during his lifetime; it records not only all the qualitative changes his physical state undergoes, but also how long this or that feature of his physical state lasts. Then in each individual record, mark off those periods in his life-time when the person is not viewing part of the physical world around him, e.g., those periods when he is asleep, or unconscious, or has his eyes closed. For example, consider the case of a certain individual now dead. His record of his physical states throughout his life-time may have a form like that in the diagram below.

His record, marked off in units of time:



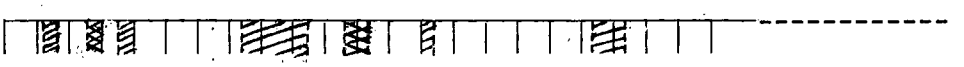
The shaded parts of his record are the parts of his life history when he was not viewing some part of his environment.

And since I have argued that if we are to have the concept of "a physical

object's being red", the "general uniformity" of perceived colours needs to hold among all viewers, past, present, and future, let us suppose we have such a record for all viewers. (I am aware that my account of what it is for a physical object to be red essentially makes reference to the perceived colours of viewers not yet born. This is one of the consequences of the anthropocentric nature of the concept of "the colour of a physical object".) The actual length of time during their lives when people are viewing can vary a great deal from one person to another.

The next stage is to look at each life history and focus on those periods when the individual is viewing. Within these periods, we need to mark off all those periods where the individual is in a non-standard state. I have indicated what kind of features of a person's physical state would make that state non-standard for the constructing of the concept of "the colour of a physical object", and I think from what I have written it is clear that many different physical states will fall under the standard-state description.

His record, marked off in units of time:



The shaded parts of his record are those periods of his life when he is not viewing; the cross-hatched parts are those when he is viewing but he is in a non-standard state.

Finally, to reach the 'construction' I have referred to, we place all such records of all sighted people 'end to end' just as we placed all the separate visits 'end to end' in the analogy. Now we have a record of the actual physical states of each sighted person throughout his life. It records for each person when in his lifetime he is viewing part of his environment, and it records when, during these viewings, he is in a non-standard state. It also records all the actual variations of his physical state while he is a standard

state viewer.

Looking back, the central claim of the account I offer of what it is for a physical object to be red is: "A physical object is now red if and only if (given its present environment) it would determine for an overwhelmingly large part of the time when viewed by all standard-state perceivers one or other of the perceived colours deemed to be samples of red." There is one other move to make before this claim is explained. The claim is that on viewing the physical object there needs to be a particular kind of uniformity for a very large part of the time in the perceived colours of all standard-state perceivers. To understand roughly what this means before giving the last refinement consider the 'construction' of the life histories of all sighted people's physical states. Then the claim is that if all the sighted people in turn viewed the object in question in its environment while undergoing all the physical states they actually have in their standard-state, viewing periods of their lives, then there needs to be the specified kind of uniformity in the resulting perceived colours. The standard-state, viewing periods of their lives would be the parts of their records not shaded and not cross-hatched.

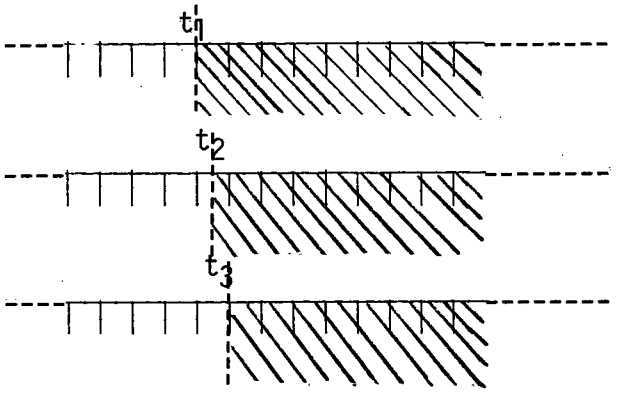
There is one problem in interpreting the central claim of the account in this way, although it is easy enough to accommodate it once it is noticed. The problem is that if in the 'construction' all of them in turn were to view the particular object in its environment while undergoing the actual physical states they have in the standard-state, viewing periods of their lives, then they would have the visual experiences they actually have at those times, not the visual experiences resulting from viewing the particular object in question. After all, since brain states are apparently the physical end-states of visual perception, whatever brain state a person has at a certain time determines what visual experiences he has at that time. So if every sighted person in turn were to 'view' the particular object while undergoing the actual

physical states he has during certain periods of his life, then he would undergo, among other things, the changes in brain state that he actually has. But in that case, he would have the visual experiences that he actually does have during his standard-state, viewing times. He would not, could not, have visual experiences determined by the particular object in question.

The way to deal with this problem is to drop the idea of each person in turn continuously viewing the particular object while at the same time undergoing the actual physical states he has during his standard-state, viewing periods. Instead we can substitute a series of separate appeals to what would be the visual experiences of the people if we 'interrupted' their standard-state, viewing periods on a regular and very frequent basis and had them at those points in their lives view the particular object in question. And since what we are doing here is clarifying what is meant by the demand for a "general uniformity" in viewers' perceived colours, we can have 'interruptions' as frequently as we wish. As an example, suppose we 'interrupt' some one viewer during one of his standard-state, viewing periods, first at time t_1, then at t_2, then at t_3, etc., and appeal to what his perceived colours would be if he viewed the object in question at each of these points in time. What do these 'interruptions' amount to? To say that he is 'interrupted' at t_1 and that we then appeal to what his perceived colour(s) would be on viewing the object means this: we suppose that someone in the physical state the viewer is actually in at t_1, then views the object in its environment; as of t_1, he is to view the particular object in its environment, and we are appealing to his first set of perceived colours that would be determined by that object. So his actual physical state at t_1 would have its effect on this viewing of the object that follows, but his actual physical state after t_1 would not have an effect. Also, the fact that his actual visual experiences immediately after t_1 may differ from the visual experiences he would have viewing the object

after the 'interruption', is no longer a problem. A series of such appeals could be made at very frequent intervals during a person's standard-state, viewing periods.

Three 'interruptions' of a person's standard-state, viewing period:



Shaded area of the person's record indicates it can be ignored for that 'interruption'.

If we make regular and very frequent appeals to every person's standard-state, viewing periods, in turn, then we have the visual experiences within which we need to look for the "general uniformity" of perceived colours required for the concept of "a physical object's being red". It is by these appeals that I explain the meaning of: "the object would determine for an overwhelmingly large part of the time when viewed by all standard-state perceivers one or other of the perceived colours deemed to be samples of red". So it is by appeals of this nature that I explain the central claim of my account of what it is for a physical object to be in fact red. For this "general uniformity" of perceived colours to hold, it is not necessary of course that most of the perceived colours be exactly the same as each other. We have a viable concept of a physical object's being red if most of the perceived colours are one or other of the particular colours labelled "red". The more precise the colour-term we are dealing with, the more stringent the uniformity will need to be simply because fewer perceived colours will be deemed to be samples of that particular colour. E.g., "scarlet" is a more precise colour-term than "red", and so a greater uniformity in the perceived colours is required if we are to have a concept of a physical object's being scarlet. It should be

emphasized that I am talking strictly about the uniformity required for these colour-terms to be applied to physical objects. If there is not enough uniformity among the perceived colours to warrant the concept of "scarlet" as applied to physical objects, it does not follow that the term "scarlet" is therefore altogether useless. It has another use, viz, as it applies to a person's perceived colours. In fact this use would be required in order to make sense of the claim that there is "not enough uniformity" in the perceived colours referred to to warrant the term's being applied to particular physical objects. After all, what is meant by that is that too small a percentage of the perceived colours are samples of the colours deemed to be scarlet.

This account of what it is for a physical object to be (at present) red does not produce contradictions. It preserves the necessary condition for red's being a property of a physical object, viz, "In a constant environment containing a physical object, conflicting verdicts for a statement ascribing the quality to the object necessitates one verdict's being incorrect." This has been ensured by appealing to the perceived colours of all standard-state viewers, past, present, and future, rather than to some particular subset of them. (Appealing to the experiences of subsets of viewers will be important in deriving practical tests from this account.) Also there will be no contradictions arising from viewers looking at the object from a different position. I have specified that all the standard-state viewers look at the object "in its environment", and this <u>means</u> they are all viewing it from the same location. The perceptual environment of a physical object includes the position (but not the state) of the perceiver.

In conclusion, the property of "being (now) red" as it applies to particular physical objects is a relational and dispositional property. The concept of "red" as it applies to physical objects is anthropocentric in that giving sense to the concept essentially involves reference to viewers' perceived

colours which are determined by physical objects, and further, there must be a certain amount of uniformity among the perceived colours standard-state viewers would have if they all looked at the same physical object in a constant environment. This uniformity among those perceived colours that are determined by particular physical objects constitutes the basis of the concept. Without it there is no warrant for deeming a particular physical object in a particular environment to be one colour rather than another. Just how stringent the uniformity needs to be depends on how precise the colour-term "red" is. This uniformity requirement provides a role for "standard-state viewers". Within bounds it is legitimate to refine and adapt the standard-state description in order to 'capture' a uniformity of the kind needed among viewers' perceived colours, but the description must still cover the vast majority of viewers during the actual viewing periods of their lives.[9]

[9]I mean by this it is legitimate to correct a standard-state description, not that there can be two or more competing but valid descriptions.

14. Testing for a Particular Colour of a Physical Object

In this section I wish to make some final points about the concept of "red" as it is applied to particular physical objects, and then I shall describe how we could arrive at practical tests for statements ascribing that colour to physical objects.

The concept of "the 'real' colour of a physical object" is parasitic upon the concept of "the colour of a physical object" that I have been examining. My reference was explicitly to the colour the object had, in its environment, at the time of the ascription. The 'real' colour an object has is the colour it has in a specially chosen environment (or set of them), in fact in environments deemed to be standard for viewing that kind of object. The phrase "the 'real' colour" is misleading in a way since it suggests that the colour it has in these environments has some special logical status, when really what we have are conventions to do with that kind of object which are convenient to adopt. Often the environments chosen will be those in which most viewers will most often see that kind of object, but this need not be the case. E.g., perhaps some art forgeries and stamp forgeries are detectable using very high intensity light, or even ultra-violet 'light', even though they are not distinguishable from their genuine counterparts in daylight or usual office light.[1] If so, checking such items in the unusual kind of light would be very valuable, and for this reason may be deemed to be the standard kind of environment for those kinds of objects. Even when the standard environments for an object are the environments most people see them in for most of the time it does not follow that it will be a case of viewing the object in daylight. If you work in an office that needs to be permanently

[1]Stamp collectors frequently look at stamps under ultra-violet 'light', and stamps that are the same colour in daylight may be slightly different in colour in these conditions. (Don Locke mentions this fact in his Perception and Our Knowledge of the External World (London, 1967), p. 100.) I do not know if this actually could help to detect some forgeries.

lit by fluorescent lighting it is sensible to refer to "the" colour or "the 'real' colour" of the walls as the colour displayed in that kind of lighting. Sometimes daylight is thought to have a special status, but it does not. It just happens to be more frequently deemed to be part of the standard environments for viewing various kinds of physical objects.[2]

My account of what it is for a physical object to be (at present) red rests ultimately on an appeal to the perceived colours all viewers would have if they viewed an object in their actual physical states. In the section on Smart I claim that it is desirable that an account deal with not only what is the case, but with what conceivably can be the case. In fact, there is no inconsistency between the nature of the account I offer and the remark I make in that earlier section. There the phrase "what is the case" means "what is the case now". In the central claim of the account the reference to actual physical states is to all actual states, past, present, and future. Knowing about people's actual physical states now does provide some evidence for claims about all actual states, but at some time in the future there may well be changes in the physical state of the majority of people then alive, changes that have not yet occurred, or at least, have occurred in only a few people, e.g., perhaps changes affecting colour-vision may occur as a result of certain kinds of pollution. One thing we do know about such changes even if they have not occurred in more than a small number of people so far is that they are conceivable. All actual states are a fortiori conceivable. So there is a point in trying to envisage conceivable situations even if they are not at this time actual, to see how they would affect our colour-concepts as applied to physical objects. The point is that although not all conceivable situations will be actual, all actual situations are conceivable. What is conceivable

[2]Throughout the remainder of the thesis I shall refer only to "a physical object's present colour" (as I have used this phrase) and not to its 'real' colour.

sets the boundaries to the problems that can arise for our use of these concepts, and since the concepts essentially involve reference to the visual experiences of people not yet born, it is useful to look beyond simply what is the case right now.

Attached to the central claim of the account of what it is for a physical object to be red is a rider: "If the physical object is the body of a sighted person, his perceptions are not included in the total of standard-state perceptions." The physical object is still the body of a person who happens to be viewing this or that part of his body. This fact should not be ignored, just in case it is conceivable that his viewing a certain part of his body could affect the colour of that part. But he is ignored in the general appeal to the perceived colours of the vast majority of viewers which decides whether or not the viewed physical object is red. When we ask if the viewed physical object determines, for an overwhelmingly large part of the time when viewed by all standard-state perceivers, perceived colours that have been deemed to be samples of red, the person whose body is being viewed is just left out of the group of "all standard-state perceivers". Since we are asking if his body is (at present) red, we are asking if his body <u>given</u> its present physical state is red. But if the person is also included in the general appeal to the perceived colours of all standard-state viewers, then we must ask what his perceived colours would be if he viewed the object while going through all the physical states he actually has in the standard-state, viewing periods of his life. The rider is the easiest and the most harmless way of avoiding the problem of having a person going through all these physical states while viewing his own body which is in a particular state. There is another reason for the rider, to do with the necessary condition for something to count as a quality of a physical object, viz, "In a constant environment containing a physical object, conflicting verdicts for

a statement ascribing the quality to the object necessitate one verdict's being incorrect." The environment includes the location but not the state of the perceiver, so that even if the physical state of the perceiver (or of one of the perceivers) changes, this does not change the environment containing the object viewed. Even if we deal with the problem mentioned above, there is another related but slightly different one. E.g., suppose that by appeal to the perceived colours of the vast majority of viewers, the viewed object at the time referred to is red. Then, by referring to the necessary condition, that object continues to be red if the environment remains constant. But that object happens to be the body of a perceiver, and if the state of one of the perceivers changes but nothing else does, then the environment is still constant. In this particular case, however, it certainly does affect the environment since in fact if the perceiver's state changes, so has the viewed object, and the change may result in that object being in fact no longer red. This problem occurs because of the double role of the one perceiver's body. No doubt one could complicate the necessary condition so as to deal with the case, but given the scope of this thesis, that would be an unprofitable complication. Instead, I have explicitly restricted the account of colour-concepts so as to apply to physical objects not having the role of the body of a viewer. Either solution preserves the sense of the necessary condition for something to count as a quality of a physical object.

In the rest of this section I shall deal with questions about tests for statements attributing the colour red to a particular physical object, given its environment. To begin with I shall look at two fairly familiar proposals since I now have the material to explain why they are inadequate. The first proposal is that to test the statement "X is red" (where X is some physical object) we appeal to the discriminations the vast majority of viewers now

make among physical objects on the basis of the perceived colours the objects determine when viewed. What is looked for is an isomorphism in the pattern of perceived colours determined in individual viewers by various physical objects when viewers all look at the various objects in constant environments. The basic idea is that each person makes a record of which objects in which environments all determine the same or very similar perceived colours in him, and which determine very different perceived colours in him, so that he can refer to 'bundles' of objects where the objects (given their environments) in any one 'bundle' determine very similar perceived colours.[3] To be precise the proposal I have in mind is: "If there is such an isomorphism that holds for the vast majority of viewers now, and if X is a member of a 'bundle' of objects conventionally given the label "red"; (rather than "green" or "blue"), then X is red." This may not look very familiar, but that is because the proposal is usually made implicitly--by declaring that people do discriminate between physical objects in much the same way on the basis of the perceived colours those objects determine, and this is all we need to discover whether or not a physical object is red. Sometimes it is explicitly stated that the sameness/difference of perceived colours from one person to another in a constant environment does not matter. But as I have argued, whether or not the perceived colours of different viewers are similar certainly does matter if we are to have a viable concept of "the colour of a physical object". There needs to be a general uniformity in the perceived colours of all viewers when they look at particular physical objects, in order to claim legitimately that a particular physical object is this particular colour rather than that, e.g., red rather than green. We may well have colour-concepts applicable to sense-data even without this uniformity, but we should not have the basis for

[3]This is rather a crude explanation, but the underlying idea is one that has been mentioned elsewhere in the thesis, so I am keeping the description here to a minimum.

attributing particular colours to physical objects. Even if we suppose the isomorphism to hold for the perceived colours of all viewers, past, present, and future, and appealed to this isomorphism, it still would not be an adequate proposal. The fact that all viewers make much the same discriminations between physical objects on the basis of the perceived colours those objects determine, and that all viewers happen to use the term "red" for objects that determine perceived colours similar to that determined by X, is still insufficient grounds for treating this as a genuine ascription of a particular colour to X. Isomorphic discriminations and verbal agreement together do not constitute an adequate basis for the concept of a physical object's being red. There also needs to be the uniformity of perceived colours from one viewer to another, and the most promising method of seeing if there is such a uniformity is to look for similarity in the viewers' physical states, at least insofar as these states affect colour-vision (i.e., introduce the concept of a standard-state viewer). Once the concept of a standard-state viewer begins to function, one does not feel tempted to insist that of course perceived colours may differ from one viewer to another, even if their discriminations do not, but that you could never detect it. There is no longer the pressure to try to refer only to viewers' discriminations between physical objects in the account of what it is for a physical object to be red.

The second proposal on how to test "X is red" rests on an appeal to a uniformity among the perceived colours of the majority of sighted people now alive, if they view X (in its environment). To be precise, I mean the proposal that: "If X (given its environment) would determine in the vast majority of viewers now living one or other of the perceived colours deemed to be red, then X is red." It has been pointed out earlier in the thesis that this proposal can lead to contradictions. If the physical state of the vast majority of viewers changes so as to affect the perceived colours they have on viewing X,

then one may be obliged to claim that one and the same physical object in a constant environment is both red and not red, and this violates the necessary condition for something to count as a property of a physical object (even if it is a relational property). And such changes in physical state are conceivable, I think, even if they are not expected to occur. It does not seem to violate any given fact to suppose that the majority of viewers at some one time could all have jaundice, or that they could all be under the influence of some drug that affects colour-vision (without making viewing physical objects impossible).

I have argued that a physical object is in fact red if there is a uniformity among the perceived colours the vast majority of all sighted people would have if they, in turn, viewed that object during their standard-state, viewing periods of their lives. So we are entitled to appeal to the perceived colours of the vast majority of viewers now living only insofar as we have grounds for claiming they are standard-state viewers, and it is not true that the vast majority of viewers now living must be standard-state viewers, i.e., that they could not conceivably be in non-standard states. To say that the vast majority of viewers now alive need to be standard-state viewers means there needs to be a description which covers nearly all the physical states they go through during the viewing periods of their lives; and that this description also covers most of the actual physical states of all viewers; and that the state-description is of features of the physical state relevant to colour-vision, where the effects of such states on colour-vision are known; and finally, that the state-description is detailed enough to warrant the claim that the perceived colours of the viewers now alive will be a representative sample of the perceived colours that would be determined by having all viewers going through all of their actual states while looking at a particular object in a constant environment. Surely all this is enough to show why the

result of a simple appeal to the perceived colours the vast majority of viewers now alive would have if they looked at X, is not what constitutes X's being red, or being not red. And even when using this appeal as a test for X's being red, rather than as an account of what it is for X to be red, it is clear that implicitly at least one must look beyond what most people alive would see if they viewed the object now, in order to justify the appeal. I am not suggesting that one could not ever justify such an appeal, I am merely pointing out what is involved.

Presumably it is the possibility of changes in the physical state of the majority of viewers resulting in changes in their colour-vision that prompts some writers to claim that statements like "X is red" (where X is a physical object) can be true at one time and false at another solely as a result of a change in the state of the people viewing X.[4] This amounts to dropping the necessary condition a quality must meet if it is to be a quality of a physical object, viz, that in a constant environment conflicting verdicts for a statement ascribing the quality to a physical object necessitate one verdict's being incorrect. It does seem conceivable that the majority of viewers at some one time could undergo a change in state resulting in quite a big change in their colour-vision. E.g., I suggested the majority of people could at some time have jaundice, or be under the influence of some drug which affects colour-vision, neither of which is the case at the moment. I can only sketch what I think is the right way to tackle this possibility. The really important point is this; that even if after many hundreds of years the physical state of the majority of viewers changes (so as to change their colour-vision), it still need not be the case that the majority of viewers are at this later time in non-standard states. At first glance it may seem that they must be, or rather that we must assume that they are, since they

[4]Bennett seems to suggest this in Locke, Berkeley, Hume: Central Themes, p.103

have just changed and their previous state-description held true for hundreds of years. So surely their previous state-description is the likely candidate for the title "standard-state description"? The matter really is not that simple. The crucial matter is what the nature of the change is, in particular what we can predict about the permanency of this kind of change. E.g., we can predict that even if the majority at some time happen to have jaundice, the majority will not always have jaundice, in fact they will not have it for very long at all. The same could hold true for many other cases, e.g., the drug example. On the other hand there could be some changes that we should predict would be permanent from then on, e.g., perhaps there are some conceivable changes that could be brought about by radio-active fall-out which would so affect the genetic structure of humans that permanent differences in state would follow, bringing with them a different colour-vision. Certainly it is not true that we should always deem to be the standard-state the state that up until now has been the most frequent. Given that the standard-state description is to cover the majority of all viewers, what will be the state of viewers in the future is also crucial. There can be reasons for hypothesizing that a fairly recent kind of state is nonetheless the standard-state. In cases where the change can be reasonably predicted to be very temporary, e.g., jaundice, I do claim that the state of the majority during that short period is non-standard. It then becomes an open question how reliable they are in judging the colour of physical objects by relying simply on their perceived colours on viewing objects. Just where we draw the line between reasonable refinements or corrections to our standard-state description and 'frequent' ad hoc hypotheses about what the standard-state is, will not be definite. Nonetheless there are limits as to how frequently the state-description of the majority of viewers can change bringing with it quite a big difference in colour-vision, if we are to retain the concept of "the colour of a physical

object". These limits are set by the requirement of a "general uniformity" in the perceived colours of all viewers when they each in turn look at a particular physical object in a constant environment (i.e., the same environment for all viewers). Without this there is no warrant for concepts of particular colours except as applied to sense-data.

A red physical object is one which, given its environment, would determine for an overwhelmingly large part of the time when viewed by all standard-state perceivers, one or other of the perceived colours deemed to be samples of red. (Mutatis mutandis for a physical object which is not red.) This gives us the notion of an incorrect verdict for a statement ascribing red to some particular physical object (either claiming the statement is true when the object is not red, or claiming the statement is false when the object is red). Now the two basic soundness conditions for testing a statement are 1) following the test-procedures correctly, and 2) having the minimum perceptual ability to use that test reliably in the environment in question. Let us consider someone testing the statement "X (some physical object) is red" by simply viewing X in its environment and basing his verdict on the perceived colour X determines in him. If the second soundness condition does not hold for him, that means he is unreliable testing the statement in that way in the environment in question, i.e., his verdicts are quite often incorrect. So we can make use of the notion of an incorrect verdict about the statement "X is red" in order to give sense to the second basic soundness condition's not holding for someone. Assuming the person does know (by acquaintance) which perceived colours would be samples of the colour red, then if he follows the test-instructions correctly and still reaches incorrect verdicts quite often, he does not have the perceptual ability required to test the statement reliably.

How could we test a person to see if this soundness condition holds

for the test of "X is red" that the person is using? I have said that there is more to testing his perceptual ability than investigating whether or not his perceived colours on viewing X are very similar to those the vast majority of people now alive (and in the state they are now in) would have if they viewed X in the same environment. We should need reasonable grounds for claiming that the majority of viewers now alive form a representative sample of the majority of all viewers. That is to say we should need grounds for claiming that the vast majority of viewers now alive and in the state they are now in are standard-state viewers, since it is conceivable that they are not. This would involve looking for a common state-description that covered the vast majority of people now alive in the states they are now in, and then looking to see if the description covered the vast majority of states of past viewers, and making checkable predictions about the states of the majority of people in future years. Investigations into the physical states of viewers now dead and of viewers yet to be born naturally has its limitations, but it is conceivable that some of the limitations of investigating the physical states of viewers who have died can be lifted, at least for future generations of investigators, by keeping records of them. In any event, in spite of the limitations, some such investigation is involved in arriving at the most promising candidate for the standard-state description, and the role of a standard-state viewer is essentially involved in the concept of "the colour of a physical object"; it is part of what makes the concept anthropocentric. Returning to viewers now alive, if we have reasonable grounds for claiming that the majority of them now are standard-state viewers, then we have grounds for claiming that they form a representative sample of all standard-state viewers. It would not be logically guaranteed, but with support for the assumption that the majority of people now alive constitute a random sample of all standard-state viewers, it would be very probable that they were representative of all

such viewers. It would matter whether or not the majority now formed a representative sample of all standard-state viewers, since on my account X can be red even if in a small number of cases some of the group of all standard-state viewers have a very different perceived colour, i.e., the appropriate perceived colours are required only for "an overwhelmingly large part of the time when viewed by all standard-state viewers". So if, in order to test the statement "X is red", we appealed to the perceived colours the majority now alive would have on viewing X, it would be important that the group of standard-state viewers made up of this majority did not have 'more than its fair share' of the total number of these permitted exceptions.

If we did have reasonable grounds for claiming the vast majority of viewers now alive to be a random sample of all standard-state viewers (and so very probably representative of the group of all standard-state viewers), then it would be legitimate to appeal to the perceived colours of this majority on viewing X in order to test the statement "X is red". Also, we could legitimately test the verdict of one viewer or a small group of them by referring to the perceived colours of this majority. Nonetheless, there would remain the crucial difference between appealing to the present majority and appealing to the majority of all viewers. If for nearly all of the time for the vast majority of all standard-state viewers, X would determine perceived colours that have been deemed to be samples of red, then X would be red. If for nearly all of the time for the vast majority of viewers now alive, X would determine the appropriate perceived colours, then if these people were standard-state viewers, X would very probably be red.

What, then, are the conditions under which statements ascribing particular colours to objects would be objective? I have claimed that certain facts about human visual experiences need to hold to warrant using particular-colour terms to apply to particular physical objects. There needs to be a

"general uniformity" in the perceived colours of all standard-state viewers on looking at some physical object in a constant environment. Without this, such colour-concepts would be gratuitous. Of course, to acquire evidence of a "general uniformity" we should not need to investigate the visual experiences of every viewer. Suppose that we did acquire enough evidence to warrant the introduction of the concept of "the colour of a physical object." Then it would be conceivable to acquire evidence (as described in this section) for whether or not the majority of people at some time were standard-state viewers, and so conceivable also to investigate whether or not the majority of viewers at some time had the ability to test reliably the statement "X is red". That is to say, it would be conceivable to investigate whether or not the second soundness condition held for this majority when they tested such a statement by relying simply on their perceived colours on viewing X in its environment. It would also be conceivable to investigate whether or not some individual alive at that time had the perceptual ability required to test the statement reliably by simply viewing X, e.g., we could investigate if his perceived colours were very like those the majority at that time had, and if the majority were likely to be standard-state viewers; we could investigate if his visual experiences were like those of the majority of some other group, and whether or not that majority of viewers were likely to be standard-state viewers, etc.. It would be, therefore, conceivable to investigate whether or not the second soundness condition held for a person who was testing "X is red" simply on the basis of his perceived colours when viewing it. The first soundness condition for the person testing "X is red" in this way would be that he looked at the right object, X, in whatever environment it was in at the time of the ascription. This would be all he needed to do to follow the test-instructions. It would be easy to give sense to this condition's not holding, and to our being able to detect

that it did not hold. Then statements ascribing particular colours to objects would be corrigible in the required way: we could give sense to testing them, we could give sense to the basic soundness conditions' holding (and to their not holding), and it would be conceivable to detect whether or not those two conditions held. I.e., these are the conditions under which statements ascribing particular colours to particular physical objects would be objective.

In the last section I distinguished two different questions: 1) which human beings are standard-state humans? I.e., the perceived colours of which group of viewers constitute the basis of the concept of "the colour of a physical object "? and, 2) can this or that person, or group of people, test reliably in a certain environment a statement ascribing the colour red to some particular physical object in that environment? If the concept of "the colour of a physical object" was warranted, then there would be a general uniformity among the perceived colours of standard-state viewers if they all looked at some physical object in a constant environment. Because of this uniformity, a standard-state viewer would be very likely (but not logically guaranteed) to have epistemologically trustworthy perceived colours when he looked at a particular physical object in order to test the statement, say, "The object is red". A standard-state viewer would be very likely to reach a correct verdict for such a statement. After distinguishing the two different questions I stated that although there would be a very strong tendency for standard-state viewers to be reliable in testing such statements in this way, there might not be such a strong tendency for people who can test those statements reliably to be standard-state viewers. Let me explain this remark briefly. The basic point is very simple. There would be ways of testing the statement "X is red" other than by simply relying on one's perceived colours on viewing X. Some writers argue that a person could not "reliably

test" a statement if the statement involved some concept he did not understand, and further that one could not understand the concept of "red" unless one was acquainted with the perceived colours deemed to be samples of red. (The concept referred to frequently is left ambiguous as to whether it is the colour-concept applicable to physical objects, or the related but different colour-concept applicable to perceived colours.) On the other hand some writers have denied at least the second of these assumptions. Smart, e.g., claims that congenitally blind people could understand colour-concepts.[7] I am not examining this dispute in the thesis, but in any case even if we accept the second assumption--that one must be acquainted with the appropriate perceived colours in order to understand the related colour-terms--there would still be ways of testing statements such as "X is red" (where X is some physical object) other than by simply relying on one's perceived colours on viewing it. Suppose that you were not a standard-state viewer but that you did know by acquaintance which perceived colours were deemed to be samples of red. Even though your state was non-standard, you might still be able to reach correct verdicts by relying on your perceived colours together with knowledge of how your colour-vision differed from that of the majority of standard-state viewers. It might be possible to 'calculate' from your perceived colours the perceived colours the majority of standard-state viewers would have on viewing X, and in this way test "X is red". You could be relying on correlations discovered to hold in some circumstances between your perceived colours and the colours of these other viewers. Or, if your non-standard state was very temporary (perhaps as a result of an illness, or drugs), it might be possible to 'calculate' whether or not X was red by relying on correlations you had found to hold in some situations between your perceived colours at this later time and those before the change in state. As another possibility you might be

[7] Smart, "Colours," pp. 140-141.

able to test "X is red" by making use of knowledge acquired about which properties of physical objects (given their environments) determined which small group of perceived colours in standard-state viewers. Here again it would not be necessary for you to have perceived colours, that were samples of the colour red, in the same environments as those in which the majority of standard-state viewers had them. I think this is enough to show that even if it is accepted that one must know by acquaintance which perceived colours are samples of the colour "red" if one is to understand that concept, it still does not follow that only standard-state viewers would be likely to reach correct verdicts for such statements as "X is red". The distinction between the two questions given above would still remain.

Finally in this section let me say a word about the phrase "normal perceiver" and colour-vision. I have intentionally avoided referring to standard-state viewers as "normal perceivers". The phrase "normal perceiver" is ambiguous in much of the literature on colour-perception. Quite often just not enough detail is given to distinguish between two possible meanings. I shall leave the reader to choose between them. In general terms for any kind of perception, we can, on the one hand, specify who is to count as "a normal perceiver" without making success or failure with any perceptual test in any environment part of the specification either explicitly or by implication. In this case it is always an open question whether or not a normal perceiver can, in a certain environment, reliably use a test which relies on that kind of perception. Only by empirical investigation can we discover if the level of perceptual ability required for a test is within that of the normal perceiver. E.g., we could specify as "the normal colour-perceivers (of the colours of physical objects)" the majority of sighted people as they are at this time (i.e., given the states the majority of viewers now living happen to be in). In this case it would be an empirical question whether or not "normal

perceivers" could use reliably any of the colour-vision tests for statements ascribing particular colours to particular physical objects. In my terminology, if the present majority were in non-standard states, then there might be some environments where they could not use reliably some tests of "X is red", (especially tests relying simply on one's perceived colours on viewing X.) On the other hand if we specify explicitly or by implication that "a normal perceiver" is one who can use reliably some particular test in certain environments, then tautologously he can use it reliably in those environments. But then only by empirical investigation can we discover if an individual or group of people not specified in terms of any successful use of a test, are in fact normal perceivers. (E.g., if we specified that "the normal colour-perceivers" were "the vast majority of standard-state viewers, who in fact do have a general uniformity in their perceived colours when they all view the same object in the same environment", then by implication there would be some tests relying on colour-vision that they would be able to use reliably. The description of the group is a bit simplified, but I think the basic point is clear.) So depending on how we define "normal perceiver", there are two different results as to which questions about normal perceivers are empirical. The really important point behind both these results does not, of course, rely on which of the two ways of defining "normal perceiver" we choose, but depends on our being able to give sense to the second basic soundness condition for a test relying on the kind of perception referred to, i.e., the condition that the perceiver have enough perceptual ability to use that test reliably. The point is that if this can be done, then whether or not a description of the first kind, e.g., "the majority of sighted people as they are at this time", and a description of the second kind, e.g., "(members of) the vast majority of standard-state viewers, who in fact do have a general uniformity in their perceived colours . . .", specify overlapping groups of people is an empirical

question. Providing it is made unambiguous, which of the several different roles "a normal perceiver" has is a matter of choice.

15. The Anthropocentric Nature of Difference in Colour between Physical Objects

There is one final major point to make about colour concepts as they are applied to physical objects. It is to do with who would count as a fine discriminator of physical objects by colour. I argued earlier (in section 9) that the initial reason for introducing the concept of the sameness/difference of colour of two physical objects is the correlations found to hold between people's judgements about the sameness/difference of their perceived colours and presentations of pairs of physical objects (ideally having the same shape, size, etc.). The most probable hypothesis is that the objects determine the perceived colours the viewers have. By using discrimination tests of this sort we might find that some person could consistently discriminate between some pairs of objects that no-one else could distinguish, and in this case we should naturally conclude that he was a finer discriminator than the rest of the people. In all usual cases this conclusion might be correct, but it is important not to suppose automatically that if a person consistently had different perceived colours on viewing a pair of physical objects although no-one else does, he must be a "finer discriminator".

Suppose a certain person did consistently discriminate between some pairs of objects on the basis of his perceived colours, and that he was the only person who can do so. Then it might be thought the only grounds for withholding the title of the finest discriminator alive, would be the discovery that his perceived colours were in fact not determined by the physical objects (given their environments); e.g., perhaps he was hallucinating. Certainly this would constitute grounds for withholding the title, but there is another reason also--that the viewer was in a non-standard state. Just why this is so important I shall explain. The central point of this section is not to suggest that discrimination tests like those described are not valuable. The condition about

who would count as a fine discriminator does not undermine the general use of such tests.

There is one crucial difference between the concepts of "a physical object's being red" and "a pair of objects' being different in colour". The first concept gains a foothold only if there is a general uniformity (of the appropriate kind) among the perceived colours of all viewers when they look at the same physical object in the same environment. But the case of the second concept is different. To be precise, to have a viable concept of "two objects being different in colour" it need not be the case that for the vast majority of all viewers the two objects determine different perceived colours (given their environments). There is nothing essentially wrong with the idea that only one viewer, ever, could consistently discriminate between a pair of objects on the basis of his perceived colours, and if this occurred it could be grounds for claiming that the objects are in fact different in colour. In this respect there is an asymmetry between the two concepts which I readily acknowledge. However, this asymmetry could produce a basic incoherence in our colour-concepts as they apply to physical objects. The condition I make on who would count as a "fine discriminator", I think, removes this possibility.

Which colours are covered by some one common colour-term, such as "red" or "green", is not an entirely arbitrary matter. There is an element of convention in that, for the logically first step, the group covered by the term "red" could instead have been covered by a different term. But which colours constitute a group to be covered by one of the usual colour-terms is not arbitrary. Each group forms what I call a small "series" of colours. There has to be some similarity among these colours if they are legitimately to be deemed samples of "the same colour$_t$".[1] I shall give only a sketch of the main points

[1]The distinction between "sameness/difference of colour" and "sameness/difference of colour$_t$" was introduced on p.119 above.

about such a series. I should make explicit that it is only in regard to these series that the points are intended to apply. There is no attempt to give a general theory about "the" order of (all) colours--an order which includes all the colours any human has perceived, where no qualitatively the same colour appears in two positions in the order, and where each colour is more like its neighbours in the order than it is like any more remote member of the order. There has been at least one quite forceful argument presenting reasons for doubting if such a complete order is possible. In his paper on this topic W. C. Clement writes, "It has not been shown to be possible to construct complete perceptual orders of qualities in which each quality of a certain type occupies a unique position determined by its relation of likeness to other qualities of that type."[2]

For the kind of ordering these series depend on it is helpful to make use of a three-place predicate: "x is more like y than like z", where $x \neq y \neq z$. This relation is to do only with how members of a group are related to each other. It does not give the guide-lines of where the boundaries of a group are drawn. Just where the boundaries are is chiefly a matter of convention, and colour-terms can vary in how precise they are (e.g., "scarlet" is a more precise term than "red"). Suppose we consider the group of colours deemed to be samples of red. For any member of the series, it is more like its neighbours than it is like any more remote member of the series. (A member of the series can have one neighbour rather than two, if it is the 'end' or borderline colour. Precisely which colour is deemed to be the 'end' colour is not very important.) This means that within such a series, a colour does have a unique position, regardless of whether or not we can construct a complete order for all colours and still give each colour a unique position. Speaking now of what this series is for some one perceiver, it will be a group of

[2]W. C. Clement, "Quality Orders," Mind, 65, 1956, p. 193.

perceived colours he is acquainted with, where each member is more like its neighbours than it is like other members of the group, and there will be omitted from the series no perceived colours that he is acquainted with and which is "like" members of this group. Intentionally I have said "is acquainted with" and not simply "could be acquainted with". How he becomes acquainted with them, e.g., by viewing physical objects, or by having someone bring about a certain brain state in him, does not matter for the points about what the series is. The groups of colours covered by two different colour-terms can overlap, i.e., they can contain common members--colours that appear in both groups. E.g., the groups covered by the terms "scarlet" and "red" overlap. But for the pairs of colours the a priori statements of incompatibility are about, there can be no overlap. E.g., since it is a priori true that no object can be both red and green at the same time (in the same place on the object), the groups of colours covered by these terms cannot overlap.

Given the relations that must hold between members of a series of perceived colours if all members of the series are to be deemed to be samples of red, or green, etc., this has implications about relations between physical objects that are in fact all the same colour$_t$, e.g., all red. I am not here forgetting that "the colour of a physical object" is a relational concept, that no properties "in the objects themselves" "resemble" people's perceived colours. The central claim of what it is for a physical object to be red is: An object is red if and only if it would determine for an over-whelmingly large part of the time when viewed by all standard-state perceivers one or other of the perceived colours deemed to be samples of red. So a physical object which would determine this kind of uniformity would be red. If all standard-state viewers were to look at an object while going through (in turn) all of the actual physical states of their viewing periods, then for nearly all of the

time, the perceived colours the object would determine would have to be epistemologically reliable for testing the statement "The object is red." It follows from what the basis of the concept is. Further, when we referred to the uniformity of the resulting perceived colours, we should mean that they were "similar" to one another (at least, for nearly all of the total viewing time). To say that they were all samples of red would mean that they were all members of one series of colours. This is what the requirement about the uniformity of the perceived colours (if the object is to be red) is about. All objects that would determine the appropriate kind of uniformity (i.e., appropriate for the ascription of red, rather than green) among the total perceived colours of all viewers would be in fact red and in fact similar in colour. The grounds for claiming the one would involve the grounds for claiming the other. And since the grounds for the first would be such as to make it true that the objects are red, they also would make it true that the objects were quite similar in colour.

Besides this it will help to make some remarks about the people we call "colour-blind" before setting out the condition needed on who is to count as a "fine discriminator". It has been discovered empirically that the number of kinds of cones a person has in the retina of his eye greatly affects the number of discriminations among physical objects the person can make on the basis of his perceived colours when viewing them. Having three kinds of cones enables a person to discriminate between more pairs of objects than having two kinds of cones, but by having two kinds, you can still discriminate between more pairs of objects than if you have only rod vision. Evidence for these claims has been acquired by using the kinds of discrimination tests described earlier, e.g., by presenting pairs of objects of the same shape, size, etc. As well as these kinds of tests where we are comparing the responses of various people, some with three cones, some with two, some with none, there have also

been a few rather surprising tests performed by people who have three cones in the retina of one eye, and two cones in the other, and these too have confirmed that fewer discriminations between objects on the basis of colour can be made with only two cones functioning.[3] The difference in discriminations between someone with two cones and someone with three is not just the difference between a person who cannot discriminate between some pairs of objects, and another person who can just manage it. As we know the difference is more radical than that. People with three cones can apply consistently several colour-terms, each covering a series of colours, to objects which all present very similar perceived colours to people with two cones, similar enough that they cannot use consistently the terms the three-cone viewers use. People with only rod vision can use even fewer colour-terms consistently. For this reason both the people with two cones and the very rare people with only rod vision are called "colour-blind".

So far there is no problem. The mistake that can produce an incoherence is to take for granted that "even if 98% of us suffered from this kind of colour-blindness, i.e., 2-cone "blindness", they would still have grounds for calling themselves 'colour-blind'."[4] There certainly could be circumstances where it would be inappropriate to call them "colour-blind", even if a small minority had three cone vision. Actually, in explaining these circumstances I want to make use of points made already about our sample colour-term, "red". So let me adapt Mundle's claim and make reference to four-cone people. I.e., imagine that there are such people (although not very many), and that they can make many more discriminations than can three-cone people, in fact suppose that their colour-vision of physical objects differs from that of three-cone viewers in as radical a way as that of three-cone viewers

[3]These cases are referred to in Woodworth and Schlosberg, p. 394.

[4]Mundle, p. 92.

differs from that of two-cone people. This is not obviously inconceivable. Some animals do have four kinds of cones, e.g., bees, and, as Mundle points out, presumably they can make far more discriminations than can three-cone people between parts of the physical world.[5] However, even if the situation is inconceivable, it does not affect the point I make, since the point will also be given in general terms.

Suppose, then, that 98% of the people had three-cone vision and that 2% had four-cone vision, and that there were very many discriminations the 2% could make among objects all presenting very similar perceived colours to the rest of the people. The colour-vision of the 2% would be radically different from that of the rest of the people. Should we declare the 98% "colour-blind"? If this meant only that there were very many pairs of objects the 2% could discriminate that the 98% could not, so that there was quite a radical difference between the colour-vision of both groups, it would cause no problem. It would be misleading to call the 98% "colour-blind", but not illegitimate. There would be a problem if we declared that the judgements of the 2%, made about the sameness/difference of colour of physical objects to be far "better" than that of the 98% in certain circumstances, i.e., where the objects viewed were ones the 98% were "colour-blind" about. It is a certain uniformity among the total perceived colours of all viewers looking at the same object, that would be the very basis of particular-colour concepts as they apply to physical objects. And if, for some object, the appropriate uniformity among the perceived colours of all viewers existed, and if we could give a detailed state-description (of features relevant to colour-vision) covering that majority, then that would constitute the object's being in fact the particular colour in question, say, red. (The state-description would help ensure that the uniformity of perceived colours was not an accidental product of very many relevantly different physical states, i.e., different in the features affecting colour-

[5]Ibid., p. 55.

vision. It would help ensure that the concepts were at least anthropocentric, that they were based upon certain facts about human colour-perception.) The same would be true for all objects producing the required uniformity--they all would be in fact red. They might not in fact be exactly the same colour, but they all would be the same $colour_t$. The perceived colours of the vast majority of all standard-state viewers would have to be epistemologically reliable for ascribing the colour red to a physical object, and the grounds for claiming that all these objects were in fact red would include grounds for claiming that they all in fact had relatively similar colours. The uniformity that would make it true that they were all in fact red would make it true that they were all in fact similar in colour. If the standard-state description included "having three cones", then that would be one of the physical features of the people whose total perceived colours would have to be epistemologically trustworthy for testing the claim that "all those objects are red (and quite similar in colour)". Now suppose that a four-cone person, one of the 2%, could discriminate between these objects which were in fact red, and could do so on the basis of several small "series" of colours that these objects determined in him. Even so, it does not follow that he would have to be a "finer discriminator" than the 98%. If his perceived colours led him to claim that some pairs of those objects were "very different" in colour so that they could not be the same $colour_t$, then his judgement would have to give way to that of the standard-state viewers. The objects would be in fact not so "very different" in colour.

It would be harmless to claim that viewers who made far fewer discriminations than the vast majority of all viewers are therefore "poorer discriminators" than that majority, but it does not follow that a person or group of people who can make far more discriminations than that majority must therefore be "finer discriminators" than that majority. To assume this is to disregard

precisely what the basis is for having colour-concepts that apply to physical objects.

In none of this have I denied that the four-cone person, in the situation described, might have on viewing parts of the physical world around him perceived colours qualitatively unlike any that a three-cone person would have. Nor have I denied that he could obviously make consistent discriminations between physical objects on the basis of the perceived colours they determined in him, where three-cone people could not. But, strange though it looks at first glance, I am denying that the fact that he could make these discriminations (consistently) on the basis of his perceived colours, where the vast majority could not, would have to make him a "finer discriminator". Also, I have not claimed that the kinds of discrimination tests mentioned early in the section are of no use. On the contrary, they are extremely valuable for showing if one person/group of people can make more discriminations among physical objects on the basis of their perceived colours, than can some other person/group of people.

Although I have used Mundle's claim--that 98% of us could have two cones and so be "colour-blind"--as a starting point, this section is not intended to be an objection specifically to his claim. There are some ambiguities in the description of his case, and these would make a difference. E.g., it would matter if 98% were at some time two-cone viewers with 2% three-cone viewers, or if it was permanently the case that 98% of sighted people were two-cone viewers with 2% three-cone people.

It helps to remember the distinction between the two questions: 1) Which human beings are standard-state humans? (The perceived colours of which group of viewers constitute the basis of colour concepts as they apply to physical objects?) and, 2) Can this or that person/group of people test reliably in a certain environment statements involving the various colour concepts as they

apply to physical objects? Really we need to be very clear about the answer to (1), and its implications, before we can confidently tackle (2). The fact that a group of people, say, four-cone people, might be in non-standard states would not mean they could not possibly test reliably any statement involving colour-concepts (as they apply to physical objects), but it would mean it would be an open question whether or not they could.

The important condition on who would count as a "finer discriminator" is: it must be conceivable for a standard-state viewer to make the discriminations which are the basis of the ascription of "finer discriminator (of this or that group)". We now have the material to point out the anthropocentric nature of the concept of "the sameness/difference of colour of physical objects". Whatever the set of properties of objects that determines the perceived colours of standard-state viewers, if those particular properties are the same for two objects given their environments, then those objects are in fact the same colour. (This was mentioned back in Section 9.) But also, if those particular properties differ and yet it is inconceivable for a standard-state viewer to discriminate between them on the basis of the perceived colours they determine in him, then here also the objects are in fact the same colour. The objects can be in fact different only if it is conceivable for a standard-state viewer to discriminate between them on the basis of the perceived colours they determine in him. This does not mean that most standard-state viewers actually do discriminate between them (or would if they were in the appropriate environment). It preserves the possibility that only a few or even one viewer is able to discriminate between some pair of objects and yet those objects are in fact different colours. In fact, it allows the possibility of some pair of objects being in fact different colours even though no-one who actually lives could discriminate them, providing some standard-state viewer conceivably

could discriminate them.[6] But even though the condition I give preserves these possibilities, I think it nonetheless safeguards also the appeal to a certain uniformity in the colour-vision of humans.

I should like to make a precise statement about the limitations on "how different" in colour two objects can be in relation to the capacities of a standard-viewer, but far more work on the concept of "ordering colours" would be needed. I can however give the rough guide-line that I have argued for in this section: two objects cannot be in fact "very different in colour", so different that they "could not be" the same $colour_t$, unless for an overwhelmingly large part of the total time when viewed in turn by all standard-state viewers, the pair of objects would determine "very different" perceived colours. Statements about "how different" two objects are in colour form the 'link' between statements ascribing particular colours to physical objects and statements about the sameness/difference of colour of physical objects.

[6]This applies to objects that are "very close" in colour.

16. Summary

A general summary of the whole thesis may be found in the "Introduction". In this section I shall mention the points at which the thesis departs from the more familiar theories about colour-concepts as applied to physical objects. In the first place, for the concept of "the (present) colour of a physical object" I do require that there be inter-subjective similarity among the perceived colours people have on looking at an object in a constant environment. How similar they need to be to justify the use of particular colour-terms, such as "red", "scarlet", depends on how big a 'series' of different colours the term covers. One of the main points of the thesis is that if all that was true was that an object determined in each viewer some perceived colour or other, but with no worthwhile inter-subjective similarity, then we should have no basis for deeming such an object to be one colour rather than another. If this were the case, the perceptual facts could still be described, since of course colour-terms as they apply to perceived colours (or sense-data) would remain. One could even speak of such objects as being "coloured", if this was interpreted to mean "determining some colour or other in each viewer". However, in this situation the surface grammar of ascriptions of present colour, such as "The pen is blue", would be even more misleading than Locke claimed. The objects would not have a non-relational property "resembling" viewers' perceived colours, nor would any one object tend to determine in viewers one of a significantly restricted 'series' of perceived colours. I.e., an object would not have even the relational property suggested by the grammar of "The pen is blue". What it would have in a constant environment would be the relational property of "determining in one viewer the perceived colour, A, and in another viewer the perceived colour, S, and in another viewer, M, etc." where the colours A, S, M, etc. are as different as you please. And if this was the kind of relational property it had, it

would not warrant the introduction of a particular colour-term, say, "blue", to be applied to that object in that environment. The concept would be gratuitous.

I also argue that inter-subjective differences in perceived colours on viewing objects logically can be detected, and this too is usually denied by writers in this area. It is very likely, of course, that the belief that such differences logically cannot be detected in a case of 'systematic transposition' is the main reason why inter-subjective similarity among perceived colours is not made a requirement for applying particular colour-terms to objects. But I have already explained why one cannot provide an adequate basis for this by reference to similarity among discriminatory responses alone.

The other important requirement for using these concepts is that the similarity among viewers' perceived colours be non-accidental, and to ensure this I require that the vast majority of viewers be "standard-state" viewers. It is usually acknowledged by other writers that colour-concepts as applied to physical objects depend upon the nature of the human sensory apparatus of sight, but usually the only dependence that is acknowledged is captured by the claim: "If the human sensory apparatus of sight was radically different from what it is, a new set of colour-concepts might result." This is true, but I wish to state clearly the need for a uniformity of features (including how the apparatus functions) in the sensory apparatus of sight of most humans if the uniformity in perceived colours is to be non-accidental. So this uniformity of the sensory apparatus, I argue, is required for colour-concepts as applied to physical objects.

Writers who look for a significant uniformity among the perceived colours of a smaller group of humans will have a theory different from mine in several respects, but there will still need to be some version of the requirement about the vast majority of those humans being what I call standard-state viewers. I.e., there will still be the need to ensure that the uniformity they

seek is non-accidental, and there will still need to be a way of ruling out temporary changes in physical state (which affect colour-vision) from affecting the basis of colour-concepts as applied to physical objects.

One of the principles used in the thesis is the necessary condition for a quality to be a quality of a physical object, viz, "In a constant environment containing a physical object, conflicting verdicts for a statement ascribing the quality to the object necessitate one verdict's being incorrect." The principle makes use of the notion of an environment, as I have defined this term. When the notion was first introduced (on p. 42) I emphasized that I should be using it in regard to visual perception. Here I wish to make explicit what range of qualities the principle is intended to cover. It covers what I call "visually perceptible qualities", and this, as I use the phrase, is not equivalent to "non-relational visually perceptible qualities". There can be relational qualities of this kind. To understand what the phrase does mean on my usage we need to refer to the statements ascribing such qualities.

> A quality is a "visually perceptible quality" if and only if at the time of the ascription of the quality to a particular object, there is at least one perceptual environment for the object where there is at least one adequate test for the ascription simply by having some conceivable standard-state person view the object in that environment.

E.g., a statement such as "The chair is taller than the couch" is a statement ascribing a visually perceptible quality to the chair and a different one to the couch, since both objects can be put within one perceptual environment to test the ascription, i.e., there is some environment where visual perception alone could be used by a conceivable standard-state person as an adequate test for the statement. The quality ascribed to the book in "The book is (at present) blue" is also visually perceptible. In this case the obvious perceptual environment to use is the one the book is actually in at the time of the

ascription. Moving the book to a different environment will be a very risky way of testing the ascription. Also the statement "The 'real' colour of the book is blue" is an ascription of a visually perceptible quality since there will be some specially chosen environment(s) where the book is deemed to have its 'real' colour. It may or may not be the environment the book is actually in at the time of the ascription. A likely candidate for a quality which is not a visually perceptible quality is that ascribed in "He is a widower".

Finally, my main interest is in what it is conceivable for humans to know (given my use of that term). Therefore, some of the specific questions raised can be answered confidently only by someone who has knowledge of the relevant "given facts". That is to say, empirical knowledge is relevant to the philosophical investigation I have undertaken. This makes the overall inquiry more difficult than it would be if no empirical fact had any bearing on it, but I have argued that this also makes the epistemological inquiry more valuable by limiting it to questions about what it is within the power of humans to know, and what kind of problems could in fact arise.

WORKS CITED

Ayer, Alfred Jules. "Can There Be A Private Language?", symposium with R. Rhees. Aristotelian Society, supplementary vol. XXVIII, 1954.

Ayers, M. R. "Perception and Action." Knowledge and Necessity, Royal Institute of Philosophy Lectures, vol. 3, 1968-1969. London: Macmillan, 1970.

Bennett, Jonathan F. Locke, Berkeley, Hume: Central Themes. London: Oxford University Press, 1971.

Bradley, R. D. "Avowals of Immediate Experience." Mind, 73, 1964.

Clement, W. C. "Quality Orders." Mind, 65, 1956.

Descartes, Rene. "Meditations on First Philosophy, VI," The Philosophical Works of Descartes, trans., Elizabeth S. Haldane and G. R. T. Ross, vol. I. London: Cambridge University Press, 1911.

Goodman, Nelson. The Structure of Appearance, 2nd ed. Indianapolis: Bobbs-Merrill, 1966.

Kripke, Saul A. "Naming and Necessity." Semantics of Natural Language, 2nd ed., ed., Donald Davidson and Gilbert Harman. Dordrecht, Holland: D. Reidel, 1972.

Lemos, Ramon M. "Sensation, Perception, and the Given." Ratio, VI, 1964.

Lewis, Clarence Irving. Mind and the World Order. New York: Dover Publications, 1929.

Locke, Don. Perception and Our Knowledge of the External World. London: Allen & Unwin, 1967.

Locke, John. An Essay Concerning Human Understanding, 2 vols. New York: Dover Publications, 1959.

Mundle, C. W. K. Perception: Facts and Theories. London: Oxford University Press, 1971.

Smart, J. J. C. "Colours." Philosophy, 36, 1961.

_____. "Sensations and Brain Processes." Philosophical Review, 68, 1959.

_____. Philosophy and Scientific Realism. London: Routledge & Kegan Paul, 1963.

Woodworth, Robert S. and Harold Schlosberg. Experimental Psychology, 3rd ed. London: Methuen, 1954.