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Part I

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Introduction

The central problem of this book can be introduced by thinking about even the simplest cases of phenomenal consciousness. Let us, therefore, begin with afterimages, and let us fix our ideas by reference to a novelty item that some readers may have encountered. This item is similar to an American flag, only it is printed in green, black, and yellow. A caption instructs users to stare at the oddly printed flag for 10 seconds, in good light, and then to look at a white wall or a white piece of paper. The predicted, and actual, result is that one will then see an American flag in its correct colors.

The principle behind this novelty item is that afterimages brought about by brightly colored things will have the complementary colors of the objects that cause them. This principle can easily be verified by staring at some brightly colored thing in strong light, then looking at a white surface. Red or green will each produce the other, as will blue or yellow. This little experiment will also demonstrate that the distance of the afterimage will be the same as the distance of the surface upon which one's eyes are focused.

I want to know how red comes into the situation we are in when we have stopped looking at the printed "flag" and are having an afterimage in which we see red. The reason for puzzlement here is that there isn't anything red in front of me, where a flag appears to be. Unless I have some strange disease, there isn't anything red in my brain, either. (Well, there is oxygenated blood; but this is always present, and so its color has nothing special to do with the redness in my afterimage, i.e., nothing that it doesn't equally have to do with green or blue afterimages.) But to say that there is nothing red at all anywhere in the situation would seem to

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deny an obvious fact, and to make it difficult to give an account of the difference between the redness of the stripes in the afterimage and the blueness of its upper-left-hand corner.

There are, of course, differences among the neural events that cause our afterimages. Color stimuli increase the activity in some of our cells, and different stimuli increase the activity in different sets of cells. Increase of activity in some cells results in inhibition of other cells and, when a stimulus is removed, there can be a “rebound” effect in the inhibited cells – an effect that “overshoots” the neutral state for a short time and thus produces a reverse color impression. These neural activations, however, are not something of which we are ordinarily conscious. For example, Aristotle knew about afterimages almost as well as we do, but he had no knowledge whatever about cells in our visual systems.¹ If we confine ourselves to the neuroscience of how afterimages are produced, we will never have any reason to use color words, and thus we will not have a full answer to our question of how colors come into the afterimages that neural activations bring about.

It would be natural to say, at this point, that having an afterimage of the stripes in the American flag is a situation in which it *looks like* there is something red before us. This is surely correct, but it leads to the further questions “What exactly is *looking like*?” and “What is the difference between its looking like there is something red before us, when there isn’t, and its looking like there is something blue before us, when there isn’t?” One can give a short answer, that the difference is the difference between red and blue; but as there need be no red or blue things present, this answer just returns us to the question of how colors come into situations in which we have afterimages.

In this book, I shall consider several answers to this surprisingly complex question. This question, however, is only one, readily understood, member of a family of related questions. For example, other senses could have been considered. Removing a tight hat can leave us with what we may call an “afterfeel” of pressure along a circle around the head. Some foods, or medicines taken by mouth, can leave an aftertaste. I want to know how these sensory qualities come into the situations described. I want to know what is happening that is different when (due to different hats) afterfeels are in different places on the head, and what constitutes the taste difference between two aftertastes.

1 Aristotle, *De Somniis* (*On Dreams*). I say “almost”, because Aristotle seems to have missed the fact that afterimages often have colors complementary to those of their external causes.

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Bodily sensations, e.g., pain, itch, sexual pleasantness, or nausea, do not present “*afterimages*”, but they do lead to questions similar to those about afterimages. For example, pain is caused by tissue damage, and our neurons have to be working in order for us to feel pain. But having pains does not give us knowledge about cells or about the neural causes of our painful feelings. Thus, we can sensibly wonder just how we should describe the way in which painfulness comes into a situation in which we are suffering. Similar remarks hold for a wide variety of feelings that are associated with emotions, e.g., fear, the feeling of butterflies in the stomach, the feeling one has when angry, and so on.²

Visual images (not afterimages) can be formed by most people upon request. For example, one can be asked to imagine a pink elephant or the face of some famous actor. Auditory images are likewise familiar – imagine, for example, the sound of some sinister remark by Darth Vader. Imagery of this kind is not the most typical example of the occurrences to which the arguments of this book are intended to apply, and there are many aspects of imagery that will not be investigated here. Nonetheless, the views to be considered have some bearing on the question of what kind of difference occurs when, on one occasion, we have an auditory image of, say, “red” and on another occasion we have an auditory image of “blue”.

PERCEPTION AND OUR BASIC QUESTION

Some years ago, while lost in thought, I happened to stare out through a window with a venetian blind for a considerable time without moving. When I did move, my eyes chanced to fall on my trouser leg, where, to my surprise, I saw that the brown fabric had a pin stripe in it that I had never noticed before. Or did it? How could I have never previously noticed such a thing? Yet, there it was. It was at least 15 seconds before I was able to convince myself that the unnoticed pin stripe was in fact merely the afterimage of the bright spaces between the slats of the blinds.

This anecdote indicates a close relation between what happens in cases of afterimagining and cases of ordinary perception; namely, they are so alike

2 Besides *feelings*, emotions often include a cognitive component. For example, to be remorseful, one not only has to have a certain sort of bad feeling, one also has to believe that one has failed to live up to a standard one accepts. To be embarrassed, one must believe that one has done something socially unacceptable. This book will not attempt a theory of emotions; they are mentioned here only because the feelings involved in them are examples of phenomenal consciousness.

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that one may be mistaken for the other. My puzzlement about afterimages is thus naturally entwined with the question of how colors come into our ordinary perceptions of colored things. To pursue this question, and to fully understand the motivation behind it, it will be essential to have an account of some basic facts about how we see. Fortunately, these facts are very familiar, and not controversial until the end of the account, so a brief and sketchy overview will be sufficient. As it will be helpful to consider a particular example, let us begin by telling the story of what happens when Eve sees a ripe, red apple.

Eve will not see anything if it is pitch dark, so let there be light, and let us assume it is sunlight. The light must strike the apple if Eve is to see it, and that light must be reflected into at least one of Eve's eyes. At the point of reflection, that is, on the surface of the apple, something distinctive must happen – something that transpires differently, depending on whether the reflecting surface is red, green, or some other color. This difference arises because of the particular molecular structure of the surface of the skin of the apple, which results in some of the wavelengths present in sunlight being reflected more efficiently than other wavelengths. The light reaching Eve's eye from the direction of the apple thus has a composition different from sunlight, that is, the ratios of the amounts of light at various wavelengths differ from the ratios found in sunlight.

The propensity to make this difference in the wavelength composition of arriving light and reflected light is a property of the apple's surface that it acquires when it becomes ripe and that remains with it for a good while (that is, until it spoils). It is convenient to have a name for this property, and we shall use "reflectance profile". The apple has its particular reflectance profile because of its molecular structure; but things with a different molecular structure might have the same reflectance profile, so we should count the molecular structure and the reflectance profile as two properties that the apple possesses.

Let us resume our story at the point where reflected light is traveling toward one of Eve's eyes. This light enters her eye, becomes focused by her lens, and falls on the cells that compose her retina. Some of these cells (the cone cells) contain chemicals that change their state when light falls on them. There are several of these chemicals, and they differ in the wavelength of light that is most likely to cause them to change their state. Suppose that a collection of cone cells is illuminated by light reflected from the apple, and suppose that this same set of cone cells is illuminated on another occasion by light reflected from a daffodil bloom. The reflectance profile of the daffodil bloom is different from that of the apple, so the

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wavelength composition of the light entering Eve's eye from the daffodil bloom will be different from that of the light that enters her eye from the apple. The result will be that the chemical changes in the set of cone cells will be different in the two cases.

Cone cells, like neural cells, can be regarded as having an input end and an output end. We can take the chemical changes to be the inputs. The outputs are releases of molecules called "neurotransmitters". Releases of neurotransmitters, in turn, raise the probability that other cells, namely neurons, will undergo a certain kind of change. This change commonly goes by two names, "action potential" and "firing". What these terms refer to is a process that results in a cell releasing neurotransmitters from its output end.

Our story now becomes exceedingly complex and fascinating in detail, but, fortunately, it admits of a simple summary if we take a somewhat abstract point of view. Neurotransmitters from cone cells cross the tiny spaces that separate cone cells from neurons, called "synapses". Neurons receive these neurotransmitters and, under certain conditions, undergo internal changes that lead to the release of neurotransmitters at their output ends. These neurotransmitters cross synapses and are received by other neurons, which again may undergo internal changes that lead to their release of neurotransmitters. This story is repeated again and again; in general, millions of neurons in the brain may have their activity altered as a result of the light reflected from the apple falling on Eve's retina.

In due course, Eve may respond to the presence of the apple. Perhaps she will utter the words "What a nice red apple!" or perhaps she will reach for it. In such cases, more neurons will undergo changes, release neurotransmitters, and raise the probability of other neurons firing and releasing neurotransmitters. At the end of this process, some of the released substances will encounter muscle cells instead of neurons. In this case, the muscle cells will contract, and this contraction will result in the movement of Eve's lips and tongue or her arm.

The foregoing account has been selected and emphasized for philosophical purposes, but it is the account that, so far as it goes, can be found in any introductory psychology textbook. At this point, however, further questions arise that do not have noncontroversial, textbook answers in either psychology or philosophy. We can see how they arise by quickly listing the elements we have mentioned: wavelength composition of sunlight, reflection, altered wavelength composition of the reflected light, lens, retina, chemical changes, neurotransmitters, synapses, neural activities, neurotransmitters, synapses, neural activities, neurotransmitters,

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synapses, neural activities . . . muscle-stimulating substances, muscle contractions, movements. Nowhere in this list do we find red or any other color. But Eve sees *red*. The apple she sees is red, and if conditions are normal, it looks red to her. How or where, we may ask, does Eve's experience of red come into our account at all? How is what normally happens when Eve sees a red apple like, or not like, what happens when she has a red afterimage? It will be convenient to summarize these questions into one general formulation, which will serve as a Basic Question in the early stages of our discussion.

(BQ) How does color come into a full accounting of what normally happens when a person sees a red apple?

The theories to be considered in the next few chapters do not all approach this question from the same angle, nor do they accord it equal prominence. They would differ in their ways of making the question more specific. Despite these differences, they all imply answers to the Basic Question as just formulated, and considering these answers will provide a way of comparing the commitments and success of several important theories.

The Basic Question is most easily discussed by reference to particular examples, but there is nothing special about the color red or the sensory modality of vision. The label (BQ) or the phrase "Basic Question" may thus stand indifferently for the preceding formulation or for a still more general formulation. To give the more general formulation, we will have to have a term that will cover qualities of all the kinds we have mentioned, such as colors, pitches, tastes, smells, degrees of pressure and warmth, shapes (e.g., of afterimages or apples), pain qualities, itches, sexual pleasantness, nausea, and other qualities like these. This term is "phenomenal qualities". The resulting general formulation of (BQ) is "How do phenomenal qualities come into a full accounting of what happens when a person is having a perceptual experience or sensation?" Since some philosophers have special understandings of the terms used in this general formulation, I stipulate that it is to be understood simply as a way of encompassing the example given and others that are like it in the way the items on this list are alike:

How does flavor come into a full accounting of tasting a spoonful of honey?

How does sound come into a full accounting of hearing a harp string?

How does warmth come into a full accounting of feeling the brow of a fevered patient?

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How does pain(fulness) come into a full accounting of what happens when someone stubs a toe?

How does red come into a full accounting of what happens after staring at a flag printed in the complementaries of its usual colors?

We can see red things that, like heated metals, fireflies, and the sun, emit light rather than reflect it. We can also see colors contributed by transmitting media, such as stained glass windows, or ice cubes made from pink lemonade, and colors produced by refraction, as in rainbows, diamonds, and oil slicks. Differences among these cases, however, will not make any substantive difference in the arguments to follow. I shall thus avoid the tedium of repeating these other possibilities and conduct the discussion of visual examples almost entirely in terms of objects that reflect light.

ORGANIZATION OF THIS BOOK

Let us imagine one answer that might be given to (BQ). This answer, which I will call “Minimalism”, begins by noting that we learn to apply the word “red” to a large set of objects that have a variety of reflectance profiles. Because of the structure of normal human perceptual and cognitive systems, normally sighted and normally trained English speakers almost always agree about when “red” should be applied to things they have never previously seen. According to Minimalism, the class of red things is the class of things that normally sighted people who have had the training typical of English speakers call “red”. (Of course, nonnative speakers can learn the English habit. Further, many languages have a word that is applied to all and only the same things to which “red” is applied by normal English speakers. So, despite some circularity, Minimalists may also say that the red things are those that normal English speakers call “red” and that speakers of other languages call by their term that translates as “red”.) The property red that a thing may have, according to this way of thinking, is the property of being such that normally sighted and trained English speakers would call it “red” in normal conditions of seeing if they are being sincere and are not incapacitated by drugs or disease. And, according to Minimalism, the way in which red enters into a full accounting of what normally happens when Eve sees a red apple is exactly this: the apple that Eve is seeing has the property red (i.e., the property red as understood by Minimalism).

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We may put this claim as the view that Eve is seeing an apple that is M-red, i.e., that has the property red as that property is understood by Minimalism. But a Minimalist holds that there is no other property red, no other redness in any sense anywhere to be found in the full accounting of what normally happens when Eve sees a red apple. So, Minimalists have no reason to add a special flag to their uses of the word “red”; for them, M-red just is red.

Most philosophers are not Minimalists. But if something needs to be added to what Minimalism provides, there are still many questions about what kind of addition should be made. This book will argue for a particular kind of addition. To anticipate, it will be argued that an adequate answer to the Basic Question requires us to recognize that there are non-material events that consist in occurrences of phenomenal qualities, and that such occurrences are nothing more or less than episodes of phenomenal consciousness. I call this view “Qualitative Event Realism” (QER, for short), and I will begin to explain what this label means in the next section. Chapter 2 will begin the substantive argument for the view.

QER shares its dualism (i.e., its commitment to nonmaterial events) and its focus upon phenomenal qualities with many other theories. Thus, part of what is to be done in this book is to justify the particular version of dualism presented here. Since there are several distinctive aspects of QER, this is a task that will continue throughout the book. Some of my initial efforts to motivate QER will support a variety of views, but many of the arguments to come are reasons for adding certain specific commitments to a view that begins by accepting the cogency of the initial motivations. The overall aim will be to support dualism by articulating the most defensible form of it and arguing for that.

In Chapter 3, I will explain why dualism cannot be demonstratively established in a simple and direct way. This fact entails that QER can be accepted only if it proves to be the best theory of phenomenal consciousness, all things considered. This conclusion, in turn, forces the argument for QER to have a certain structure: not only must its virtues be identified, the inadequacies of its rivals must also be shown. That is why several of the chapters that follow are devoted to the discussion of alternatives to QER.

The alternatives to QER that we must consider fall into two kinds, which can be roughly characterized as the partially sympathetic and the downright hostile. The latter are versions of materialism, and these are considered in several places, mostly in Part I. While the ultimate conclusion of these discussions is negative, it should be borne in mind that

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these views have been very thoroughly worked out. Many ideas that we must understand in order to understand phenomenal consciousness are either parts of the materialist views we will examine or are most easily understood in the context of explaining their inadequacies.

Part II has a somewhat different character. If nonmaterial qualitative events are recognized, their relation to the neural events that cause them must be investigated. Chapter 11 contains discussions of two views that appear to have some promise but are not adopted here. Chapter 12 presents the distinctive answer of this book, namely, that patterns (probably of neural activation) are the causes of qualitative events. This proposal naturally leads to a number of objections, and the view is developed in reference to these in Chapter 13. This chapter is necessarily speculative, but goes as far as seems possible toward envisaging a future unified, intellectually satisfying perspective on the problem of understanding phenomenal consciousness.

A NOTE ON TERMINOLOGY

“Phenomenal quality” was introduced earlier as a general term for qualities that enter in some way into perceptual situations, bodily sensations, emotions, and imagery. This is the meaning that this phrase will have throughout this book. In the works of some of the authors to be discussed, we will also encounter another term that has much the same use, namely, “qualia” (singular: “quale”).³

One example of a phenomenal quality is pain. This is a general property, of which shooting pain, dull pain, pain in the left leg, and so on are species. Besides having species, however, the property pain has particular *occurrences*. “I have a shooting pain in my left leg” says that an event of a certain kind is occurring, and the *kind* in question is shooting pain in the left leg. I could have other occurrences of the same kind on other occasions, and in each case I would be correctly said to have *a pain*. “A pain” *can*, of course, also be used to indicate a species of pain; for example,

3 The term “quale” goes back to Peirce’s work in the 1890s (see Peirce, 1935), where it is introduced in connection with a number of difficult doctrines. The root meaning of contemporary usage is best understood by reference to C. I. Lewis. “There *are* recognizable characters of the given, which may be repeated in different experiences, and are thus a sort of universals: I call these ‘qualia.’ But although such qualia are universals, in the sense of being recognized from one to another experience, they must be distinguished from properties of objects” (Lewis, 1929, p. 121; emphasis in the original). Lewis’s examples in nearby text were red, blue, round, and loud.