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AN EXAMINATION OF THE DUALISM OF
SCIENTIFIC OBJECTS AND PERCEPTUAL OBJECTS

By

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Being a thesis presented to
the Department of Philosophy
at the American University of
Beirut, in partial fulfilment
of the requirements for the
degree of Master of Arts.

Beirut, Lebanon, 1950.

TO
RICHARD H. SCOTT
with deep gratitude,
and
to her who is
a never-failing source
of inspiration.

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P R E F A C E

It is not the purpose of the present inquiry to trace the historial genesis and evolution of the metaphysical theories of the dualism of so-called scientific objects and perceptual objects. That is left to the historian of philosophical ideas. My approach is primarily analistic and critical, an attempt to assess the doctrine in the light of logical principles and brute facts. The examination in hand confines itself to the more refined forms which the dualistic doctrine has taken in contemporary thought, and of those forms the form which holds that perceptual objects are mental as well as causally subjective.

The inquiry in hand is a metaphysical one. But as the subject-matter of the present work it was arrived at as a result of epistemological reflections, in particular as a result of reflection on perception as cognitive, as a source of knowledge of the external world. The study of the various theories of perception led me to inquire into the dualistic theory of perception and reflect on its validity. The question as to whether knowledge of the external world is mediate or immediate is equivalent in meaning¹ to the question whether what we apprehend perceptually is the external world — the world as it exists

¹However, it is not exactly equivalent in meaning because it may be held (as is held by Russell) that knowledge of the "external world" is mediate, though what we perceive is part of the external world, the mediacy being involved, of course, in the knowledge of that "part" of the external world which is imperceptible.

independently of our perception of it — or another world which is conditioned in some manner by the percipient organism. Put in another way, this question raises the basic issue: what is the nature of the perceived world, which common-sense realism regards as the external world. The dualist's answer to this question brings in his doctrine of the dualism of scientific objects and perceptual objects: the topic of the inquiry in hand.

It was mentioned above that the form of dualism which I have chosen for examination is one of the forms which dualism has taken in contemporary thought. The reason of this choice of a contemporary formulation of the doctrine is the desire to benefit from the history of philosophy, from the criticisms, modifications and refinements which critics of dualism and dualists themselves have indulged in since its first formulations in modern times by Descartes and Locke. I shall speak about this point later in connection with Lovejoy's The Revolt Against Dualism in which, among other things, the author expounds his dualistic view. It may be mentioned here in anticipation that in examining the doctrine in its present refined forms one is spared the task of repeating over what the history of philosophy has done for him; and what is more important, is guarded from losing himself in the unessential inconsistencies and ambiguities of its original formulations; thus missing the essential part of the doctrine which may be valid even if its exponents may not have presented it consistently, clearly, or convincingly. In criticizing the really unessential details of the doctrine

one may fall into the error of supposing that he has refuted the doctrine as a whole. I would like to mention in this connection by way of a digression, that to my mind what one should direct his energies to particularly in criticizing a doctrine believed to be untenable, should not be merely the doctrine as it has been or is held by certain thinkers, but the doctrine as a possible interpretation of matters of fact. Thus the particular formulations of the doctrine actually held may be untenable, without the doctrine being invalid in a modified form. In this connection one should not only examine and assess the validity of arguments actually brought forward in support of the doctrine being examined, but consider arguments which can be brought in its favour. The purpose of criticizing a doctrine is not to refute its exponents but to find the truth by first eliminating ineligible candidates to the truth.

To return to one main discussion Lovejoy points out in discussing the First Phase Of The Revolt against dualism in contemporary philosophy what he considers polemics against dualism caused by misconceptions of dualism, partly produced by the seventeenth century conceptions of "ideas"².

Now dualism as held in contemporary philosophy is of two main forms: the form which considers perceptual objects to be psychic in the sense of being conditioned existentially by the mind's awareness, and the one which considers perceptual objects to be physical. Both forms consider knowledge of the

² Lovejoy, A. O., The Revolt Against Dualism, ([N.p.], 1930), pp.36 ff.

external world, by which is meant here the non-perceptual world, or of objects which exist independently of the awareness of sentient beings, to be mediate. But whereas the former is metaphysically dualistic, the latter is not. A contemporary exponent of the former form of dualism is Lovejoy; and Russell is an exponent of the latter form. The present inquiry confines itself to the former form of dualism. The reason for thus delimiting the area of inquiry is the brevity of time at my disposal. It is preferable in any serious inquiry, however much time one may have at his disposal, to confine oneself to as small — and as fundamental — an area of inquiry as possible in order to be sufficiently exhaustive. But this is indispensable when the time is brief.

Now it is possible that the position that perceptual objects are physical is untenable, and that any dualistic theory must hold, in order to be validly dualistic, that perceptual objects are psychic. In other words, it is possible that epistemological dualism, as defined by Lovejoy necessarily entails psychophysical dualism in respect to perceptual objects³. As a matter of fact Lovejoy maintains that epistemological dualism does entail psychophysical dualism, though epistemological dualism can be established without either holding that perceptual objects are mental or that they are physical. Hence if it is true that the only tenable form in which dualism may be held is the form which holds that perceptual objects are mental and it is shown that that form of dualism is not tenable, it

³I say "in respect of perceptual objects" because one may be a psychophysical dualist independently of his conception of the nature of perceptual objects.

will mean that the form of dualism which holds that perceptual objects are physical is also untenable. Hence I have chosen that form of dualism which holds that perceptual objects are mental rather than that form which holds that they are physical, since my inquiry into dualism consists in an attempt to refute the doctrine.

Moreover, what I am interested in in the present inquiry is the metaphysical dualism, the bifurcation of nature which the doctrine concerned holds: hence my choice of Lovejoy's and not Russell's form of dualism, since the former bifurcates nature metaphysically, while the latter does not⁴.

In addition to the fact that I have chosen for my inquiry that form of dualism which holds that perceptual objects are mental, I have chosen as foundational Lovejoy's exposition of this form of dualism. But in addition to this, I have used extensively Lovejoy's The Revolt Against Dualism. Both as a reference in my text and as a whole in my endeavour to have an adequate understanding of dualism, and the arguments brought in its favour and against it, in all their intricacies, subtleties and details. I acknowledge my particular indebtedness to this work for making me aware of the various problems involved in the theory of perception, for stimulating me to study dualism more extensively and for making me devote my present inquiry to it. The seeming convincingness and finality of the work by way of truth,

⁴Russell bifurcates nature epistemologically into an order of immediately known and an order of mediately known entities.

particularly in its attempt to show that the contemporary revolts against dualism have all failed, impressed me strongly, on my first reading of the work, and challenged me to inquire more earnestly than I had hitherto done whether dualism cannot be shown to be false. With this in mind, it was my policy during the period of my study of the various theories of perception in preparation for the present work to attempt to explain in terms of this theory all the facts which a theory of perception is meant to explain, and to attempt to overcome any arguments which might be brought against it, until I should find a point in the doctrine at which it breaks down. The results of these attempts — my belief that dualism does break down somewhere — form the contents of the present work. My thesis, put summarily, is this: the dualistic bifurcation of nature into two orders, one subjective, private, and the other objective, but unperceived and unperceivable, known only mediately, is untenable.

But it may still be asked why I chose Lovejoy's, The Revolt Against Dualism in particular as foundational for my present work. The reasons for this choice are several.

(1) The Revolt Against Dualism is not only an exposition and a demonstration of the dualistic view and the grounds from which dualism arises logically, but also a comprehensive exposition of the revolt against dualism, particularly in contemporary philosophy, and an attempt to show that this revolt has been unsuccessful.

(2) Hence the work concerned is also a historical survey of contemporary philosophy so far as theories of perception are concerned. It presents a picture of the various non-

dualistic theories held in contemporary thought, though it seems to me that its author misrepresents, or misunderstands the positions of such thinkers as Whitehead, Russell, Broad, and Eddington.

(3) The work is rich in thought exhaustive, and closely reasoned, and manifests uncommon critical acumen and insight. It has elicited the praise of such men as Brightman, E.S., another dualist, who believes that Lovejoy's criticism of monism is conclusive⁵.

(4) Finally, and as mentioned before, Lovejoy's above work refines on and clarifies the positions of the first modern formulators of dualism — Descartes and Locke — and thus guards the interpreter — from misunderstanding the positions of these thinkers, and from wasting one's energies in polemics over the unessential ambiguities and inconsistencies of these thinkers and missing the essentials of the doctrine.

As will be seen from my bibliography, my references are fairly exhaustive of the immediate field of the present work. In terms of the resources which were available to me in Beirut during the time of preparation of this work the bibliography almost exhausts the available resources. Certain books, such as H.H. Price's Perception, would have been pertinent to my discussion, but were unobtainable in Beirut.

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Beirut, June, 1950.

⁵ See Brightman, E.S., A Philosophy Of Religion, (New York, 1947), p.414 footnote 7.)

THE EPISTEMOLOGICAL DUALIST'S CONCEPTION OF
THE RELATION OF SCIENTIFIC OBJECTS
TO PERCEPTUAL OBJECTS

The aim of this chapter is to present the doctrine of the dualism of scientific objects and perceptual objects. For this purpose I shall start by discovering the empirical starting-point or points from which dualism may be constructed as a logical system. By the empirical starting-points I mean starting-points grounded in immediate sense-experience, in sense-data.

Sense data are the ultimate data of all knowledge¹. And any empirical proposition must directly or indirectly rest upon sense-data. Whether sense-experience can and does give us a certain and indubitable ground for the upbuilding of knowledge, or only a ground where probability operates, there is no escape from sense-experience. Even those thinkers who may come to reject sense-data as the ultimate logical starting-point of their system, and even those who reject all systems and deny the possibility of any knowledge, cannot reach such a position except through starting from sense-data themselves. And it will be reflection upon sense-experience and sense-data that will convince them that sense-data are not the unquestioned data to start from². I might add that the adequacy of such

¹ Cf. Whitehead, A.N., The Aims of Education And Other Essays, (New York, 1949), pp.111, 165.

² In saying the above I do not exclude Descartes, who, as is well-known, grounded his philosophy on the fact of his consciousness. Why Descartes may be thought an exception is that the fact of consciousness may appear not to qua consciousness may appear

a repudiation of sense-experience and sense-data, and the adequacy of the doctrine involving this repudiation, will have to be tested in the light of empirical fact and therefore ultimately in the light of sense-data.

Granting, therefore, that we have to start from sense-data, we now have to look for the particular data in their manifold which point beyond themselves to an order of existence not perceptually given, but which sense-experience necessitates. In other words, what experiential grounds can be found for assuming that the perceptual world is not existentially self-sufficient and cannot supply its own sufficient reason or explanation.

It is true, to begin with, that no existing thing contradicts or can contradict other existing things. The perceptual world, whatever nature, cannot be self-contradictory. Hence according to Russell,

"... if ... we are to believe in the existence of things which we neither perceive nor recollect, it must be either on the

not to involve sense-data. That this is not the case is seen when we consider that consciousness is consciousness of a certain object or "content". And sense-data are part of this content. It is true that for Descartes it was not sense-data as such that were the logical starting-point of his Cogito, ergo sum, and therefore of his philosophy, but these sense-data as experienced by a subject. It was sense-data as presentation, as experienced, as object of consciousness, that was for him the ground for his existence. From sense-data taken by themselves nothing else could follow: there are colours, shapes, odours, pains, etc. — ergo what? Colours, shapes, odours, pains, etc. Exist — nothing more, whatever 'exist' may mean here, and assuming that the notion of existence can be conceived and have meaning to a man at this stage. But the awareness of sense-data qua given is not an immediate unreflective datum. Awareness of sense-data presupposes sense-data in the first place; and awareness of sense-data qua given presupposes awareness of sense-data (and therefore sense-data), and also awareness of a subject to which sense-data are given. The awareness of the distinction between an experiencing "subject" and an experienced "object", or the awareness of a "subject" as against an "object", and vice versa, results from reflection on the nature of the sense-data presented, and on the fact of experiencing.

ground that we have other non-inferential ways of knowing matters of fact, or on the basis of an argument which has not the type of cogency that we should demand in pure mathematics, in the sense that the conclusion is only probable."³

Since we do not have "non-inferential ways of knowing matters of fact", so far as the external world is concerned, other than sense-experience, or what is reducible to sense-experience, we have to resort to an argument. But data of experience simply as existing things are neither true nor false: they simply are. This really says in another way that existing things cannot be mutually contradictory. How then can an argument utilize sense-experience as evidence for its truth or probability? How, in the first place, can we infer anything about sense-experience itself beyond the immediately presented — about the experienceable but not actually experienced at a given moment? And more fundamentally for our purposes, how can we infer from anything immediately presented something which can never be presented? If this last question is answered in the negative, clearly we can never know with any degree of probability whether a non-perceptual world exist or not; and if a theory does affirm the existence of such a world, we can neither demonstrate nor refute this theory. If we have any grounds for assuming the possibility of inference from the directly given to what is not given but which can be given; i.e. if any fact can tell us anything about other facts and not simply about itself, then it seems, at least so far as

³ Russell, B., The Analysis Of Matter, (London, 1927), p.200.

the present discussion goes, that we can also utilize the immediately given to infer something about what is not given and cannot be ever given. That we do have grounds for assuming the former will be granted unless one is ready to maintain that we have no knowledge at all of anything beyond the sheer enjoyment of what is given at any moment.

How then do facts serve as the ground for a theory? How shall we go about inferring dualism from sense-experience? The answer lies in this: we have to use principles of interpretation of these facts, these sense-experiences. We have to show that certain facts mean certain things about the nature of reality. And principles of interpretation are based on assumptions. Assumptions deal either with a portion of reality or with reality as a whole. The latter are the ultimate principles which have to be taken for granted if we are to have a start somewhere and therefore have any knowledge at all. The given in experience, coupled with these assumptions, furnishes us with the material of and ground for all knowledge. The given in experience is that which is to be grasped intellectually and explained; the primary principles and assumptions determine the manner (philosophically speaking) in which the given is grasped and explained.

I have already isolated and spoken about the material starting-point. What then are the assumptions which ~~the~~ dualistic theory makes (implicitly or explicitly, consciously or unconsciously) in the arguments used in elaborating and demonstrating its thesis, and what are the assumptions it makes taken simply as a philosophical doctrine, independently of any particular supporting evidence? As we now proceed to construct the dualistic conception, we shall touch upon some of these assumptions.

But the full exposition of these assumptions will be given in my second chapter.

The immediate data involved in the construction of dualism may be described concretely as follows: at any given moment we perceive a certain presentation-continuum within which are distinguishable more or less clearly-defined configurations or patterns of sense-qualities &—what we call colours, odours, hardnesses, etc. These sensible patterns appear to be external to those sensible patterns which we call collectively the body, and seem to be situated at certain perceived distances from it. Let us loosely call these sensible patterns "objects". At the next moment another complex of sense-data or objects is introduced into the perceptual field, in such a manner as to lie between the objects perceived and the percipient. The objects perceived first are now no longer perceived, but new objects are perceived which differ from the former with respect to one or more qualities. Or instead, the position of the observer relatively to the perceived objects is changed; or again, several persons view the objects from different positions. In the case of one percipient, the perceived shape (and perhaps other qualities also) of the objects change. More exactly, new objects are perceived occupying more or less the same spatial locus as the previously observed objects, but differing from them in shape (etc.). Similarly, in the case of several observers, different shapes (etc.) are perceived occupying the same locus. But these shapes are seen simultaneously occupying the same place (assuming here of course that the observers compare their perceptions), and not successively, as in the case of a single observer. As instances of the above may be cited the cases of introducing a piece of coloured glass, or a lens,

between perceived objects and our eyes; the almost worn-out instance of looking at a coin from different angles; the instance of looking at a spoon in air and then in water⁴; the variation in a perceived colour with the variation in the colour of its ground⁵; the variation in the colour of an object with variations in the light falling upon it when it is being perceived⁶. Such instances can be multiplied indefinitely, though some that may be cited are not found in ordinary experience and require suitable arrangements and experimentation. Such are, for instance, some of the examples we shall cite when we discuss the role of the percipient organism in conditioning perception.

Let us now see what can be inferred from the above data. In the case of the interceding of a transparent object between the percipient and the perceived object, the interceding object seems not to affect the nature of the perceived object, or even to be capable of doing so, as it lies between the object's perceived place and the percipient's. Moreover, no other object is

⁴These instances, and our discussion of perceptual relativity, involve only the visual type of sense-presentation. The relativity becomes more complex if the simultaneous presentations (of the same object) of several senses — particularly sight and touch — are considered.

⁵See for instance so-called Meyer's Experiment, in which "what appears greenish on a red ground will appear of an orange tint on a ground of blue...." (Ward, J., "Psychology", Encyclopaedia Britannica 13th Edition, Vol. XXII, p.558).

⁶An interesting instance of the above is the case of a body which would be normally perceived under ordinary light as green, when perceived in red light illuminating its surface. The body will then appear to be not green but black. (See Clarke, E., "Vision", Encyclopaedia Britannica 13th Edition, Vol. XXVIII, p.137).

perceived to affect the object while it is being perceived. Therefore, since the object does appear different from what it was perceived to be when seen before the interceding of the transparent object, and since the same object cannot possess simultaneously and in the same sense different qualities of the same type (e.g. colours, shape) it follows that what is perceived in the latter case is not the object, but an "appearance" of it. Thus in common language we say that the object appears so and so, implying that the appearance is not the same as the object supposed to be perceived, and yet that it must be in the same way related to that object: the appearance is an appearance of that object.

Similarly in the case where perceived qualities vary with variation in the observer's position: the object cannot possess the discordant perceived qualities simultaneously. A coin cannot be both round and elliptical. Assuming that it is round, the "coin" perceived to be elliptical must be an "appearance" of the real coin, and not the coin itself. It must be a distinct entity.

The above argument assumes that in one instance we can and do perceive the object itself, as it is in itself. And as far as the argument goes, this may well be true. In the example of the coin, the coin is perceived as it is when it appears to be round. At this level of the argument as well as for commonsense, the "true" nature of the object may be taken to be what it is perceived to be under what may be called "favourable" or "normal" conditions. Such "normal" conditions are determined in part by the appeal to the testimony of the other senses — particularly touch — and its agreement with the visual data.

In the above example the coin is taken to be round to

start with⁷ because we tactually perceive it to be round, not elliptical. Other "normal" conditions may take into consideration such factors as the nature of the intervening medium, the observer's relative position, and the state of his sense-organs and neuro-cerebral structure. From this it is possible to assume that a biologically sound person will perceive an object as it is if he perceives it in sunlight, in air, (which is the medium in which we naturally perceive objects), at a distance from which it can be seen most distinctly, manipulated, inspected and measured, and from directions in which visual and tactual perceptions agree. As a matter of fact this is what common-sense does — more or less unconsciously. And it accounts for perceptual variations by noting the departure of the conditions involved from the "normal" conditions of perception, taking "normal" perceptions, if we may use the term, as veridical.

Philosophically of course so far as our analysis goes there is no reason to suppose that under these particular conditions and not others, the object is perceived as it is in itself. If it is to be more than a convention to consider the above conditions the "normal" conditions, a ground for this assumption has to be found. And here it may be said, for instance, that perceiving is a natural activity like breathing, eating, doing, in the same sense that there is nothing peculiar in the fact of perceptual cognition. In perception as in other

⁷ It is however apparent that for our purposes any perception of the object may be taken as the veridical one. The point to be established at this level of the argument is that in one case — whatever that may be in any particular case, and whether we know what it is or not — it is possible that we perceive the object as it is in itself. At this point in the analysis it is possible that the elliptical "coin" of a certain particular shape is the "true" coin, and the round "coin" an appearance and not the "true" coin.

biological activities, we encounter objects as they are. If so, we would perceive objects as they are at least when and if they are perceived under conditions which prevail normally in perceiving — conditions unmodified by man's activities. And these are the "normal" conditions mentioned above. It may be remarked here that an epistemological realist or monist may not consider the above conditions as those under which objects are perceived as they are; or if he does so, that they are the only conditions under which perception is veridical. But he would agree with the common-sense attitude in taking certain percepts as veridical and taking account of variations in what is perceived as departures from these veridical percepts.

Common-sense stops at this level. The argument for dualism proceeds further. It is unpalatable and highly improbable, though by no means impossible, that one particular presentation should be privileged to disclose the object. It seems much more reasonable to suppose that no presentation discloses the object, but that various qualitatively similar presentations are in some way related to it, it being imperceived and unperceivable. The determination of the relationship — existential and qualitative — between the various presentations and the object⁶ of which these presentations are "appearances", and the metaphysical status of both the perceptual objects and the scientific objects, cannot be undertaken on the level of the immediate experiences we have used in the foregoing discussion. That is achieved only on the

⁶Which will henceforth be called the scientific object. It is variously known as the physical object, or the scientific object. The term 'physical object' has an intimation of 'physical' as against 'mental', which is undesired here. 'Scientific' object is better for our purposes. It is called 'scientific' because it is considered by dualism the object which science deals with.

level of the organized knowledge — organized to some extent at least — of natural happenings conceived as possessing a discoverable structure; in other words, science. And indeed, dualism here calls in the generally accepted scientific principles as corroborating the independent results arrived at from a consideration of immediate experience, supplying additional evidence of the first magnitude of importance for the dualist's contention. In contemporary thought the dualist has called in the corroboration of relativity physics as well as traditional Newtonian physics; and he finds in their results, particularly in the more refined relativity physics, the strongest evidence at his command. Thus, assuming with physics the finite velocity of light, and assuming that perception occurs through the action of light rays transmitted from the object to the eye, it is seen that a perceptual act occurs later than the instant the light rays leave the supposedly perceived object.

Since the object considered as existing in the particular state at the instant the light rays left its surface no longer exists when the perceptual act occurs, whether the object has changed qualitatively during the interval, or not, the percept cannot be numerically identical with the object, unless we hold either that the past object still exists in some (other) manner, or that the percept is the percept of the object at the instant the perceptual act occurs. However, the dualist denies the tenability of these alternatives.

The temporal discrepancy between object and percept is not confined to visual perception. It obtains also in other types of perception, such as tactual perception for instance. For though in tactual perception the object seems to be in

contact with the body, the nervous impulse from the terminal nerve-endings of the skin to the brain is not instantaneous, but occupies a finite, though a brief, time. The tactual percept also is therefore numerically distinct from the touched object.

Assuming causality as accepted by science, and the causal nature of the process resulting in perception⁹, as in the case of all processes in nature, namely the causal nature of the forces involved in the transmission of light rays from an object to a percipient's eye and its action upon the retina, etc., and the causal character of the neuro-cerebral processes involved in the transmission of the nervous impulse to the brain and the resultant visual perception — if these things are assumed, it is seen that the object is the cause of the physico-physiological changes in the percipient organism which are involved in the production of a percept. The percept is the product of the interaction of the object with the percipient organism. Even if we assume that the percipient organism does not condition the percept qualitatively, still the conclusion is unavoidable that the percept is numerically distinct from the object, unless we are to think of perception as a process in which the causal action of an object on a percipient enables him to literally

⁹It is to be noted that for the purposes of the above discussion — the so-called Causal Theory of Perception — causal action is all that need be assumed. There is no need to assume the law of causality, the recurring association of events which have been associated once. The law of causality enters in, however, when the causal relationship between perceptual objects and scientific objects is made the basis for inferring the nature of the latter from that of the former. See the discussion of epistemological objectivity, etc. pp. 18-19.

see objects external to him, as commonsense conceives perception to be. The dualist rejects such a conception as contrary to the scientific understanding of causal action. As to the percipient organism, the dualist does not see any valid grounds for exempting it from causally conditioning the percept, especially such a complex structure and mechanism, if we are to believe general physiology and anatomy, physiological optics and neural physiology¹⁰. Thus the percept is causally subjective, in the sense that the occurrence of a percipient event¹¹ is a necessary condition for its existence¹².

¹⁰Some of the known cases in physiology and psychology, which show the conditioning effect of the percipient organism, may be cited here: "In passing a colour from the periphery to the centre of the yellow spot, remarkable changes in hue may be observed. Orange is first grey, then yellow, and it only appears as orange when it enters the zone sensitive to red. Purple and bluish green are blue at the periphery, and only show the true tint in the central region. Four tints have been found which do not thus change: a red obtained by adding to the red of the spectrum a little blue (a purple), a yellow of 574.5, a green of 495 and a blue of 471". (Clarke, E., "Vision", Encyclopaedia Britannica 13th Edition, Vol. XXVIII, p.138).

"Valentine noticed that, if the finger were held against a blunt-toothed wheel, and the wheel were rotated with a certain rapidity, he felt a smooth margin." (M'Kendrick, J.G., "Touch", Encyclopaedia Britannica 13th Edition, Vol. XXVII, p.96.)

"Suslowa made the curious discovery that if the area between two points distinctly felt be tickled or be stimulated by a weak electric current, the impressions are fused." (M'Kendrick, J.G., "Touch", Encyclopaedia Britannica 13th Edition, Vol. XXVII, p.95).

Wundt's Law and Weber's Law are formulations of the principle of the relativity of sensation. Weber's Law for instance, states that "... we can only detect a difference of intensity when this is of finite amount and bears a certain constant ratio to the initial intensity with which it is compared" (Ward, J., "Psychology", Encyclopaedia Britannica 13th Edition, Vol. XXII, p.562).

¹¹The phrase 'percipient event' does not commit itself here to meaning either that it is only the physico-physiological happenings in the percipient's body, particularly his brain; or that it is these happenings accompanied — and necessarily so, and therefore as an essential element — by a psychic act of awareness. So far as causal subjectivity is concerned, this matter is indifferent. (See footnote 13, p. for existential subjectivity).

¹²Levejoy, A.O., The Revolt Against Dualism, ([N.p.], 1930), p.95.

The reader may have noticed that in the above discussion I have depicted the causal process involved in perception as a two-term relation between the scientific object and the percipient organism. We spoke of the scientific object as the cause of the changes in the percipient which result in the percept. This is an oversimplified picture. It does not take account of the share the intervening medium or media have in the complex of causal forces interplaying in determining the percept. We have spoken about the physico-physiological make-up of the percipient; and it may be considered a complex medium. But what is usually meant by the intervening medium is the medium lying between the object and the percipient's body, especially his sense-organs. Taking into consideration the medium or media involved, it is seen that the causal chain is usually a long and complex one and the determining elements several or many.

The causal theory of perception not only corroborates the dualist's argument from qualitative relativity, which we discussed earlier in this chapter, but also appears to explain this relativity. The changes in sense-data brought about with changes in the intervening medium or media, and with change of relative spatial position, are explained by physics and physiological optics by the causal laws of reflection, diffusion and refraction of light, colour absorption, perspective, and so on.

To return to the percipient event: I have noted already (footnote 11, p.12) that the question whether the percipient event involves a psychic act of awareness as a necessary element is irrelevant so far as causal subjectivity is concerned. If the percipient event consists merely in physico-physiolo-

gical changes in the percipient's body, the percept can exist without necessarily being perceived, without becoming an object of awareness. In that sense its esse is not its percipi. If, on the other hand, the percipient event includes an act of awareness, then clearly the percept's esse is its percipi. The dualism denies that the percipient event means simply physico-physiological changes in the body. An act of awareness or perceiving is an essential element in the occurrence of the percipient event. Since awareness is an activity of an individual percipient, numerically distinct from the awareness of another percipient (which here means also that it cannot be shared by another percipient), and since the existence of a perceptual object is conditioned by a particular act of awareness, and it is that particular act of awareness whereby the perceptual object is both generated and known, a particular perceptual object exists only for one particular percipient, and only so long as the act of awareness continues. Thus the perceptual object is existentially subjective¹³; and what is causally subjective is also existentially subjective¹⁴.

It seems to follow from the causal subjectivity of a percept that the percept cannot be itself attributed as a character to the scientific object. The scientific object exists independently of perception, while the percept is causally and existentially so conditioned. Moreover, the scientific object is the ulterior relatum of the causal chain, while the percept is generated at the place where the proximate relatum —

¹³Ibid., p.96.

¹⁴Ibid., pp. 101-2.

the percipient organism — is located, if not in some sense as a part of this proximate relatum: unless we are to suppose, as Russell puts it, that the last effect suddenly jumps back to the starting-point, like a stretched rope when it snaps¹⁵. And if the percept cannot be attributed numerically to the scientific object, and if it is existentially subjective, it cannot be located in the space in which the scientific object is located. Thus the percept may be said to be attributively subjective, using the term 'attributively subjective' as the antithesis of Lovejoy's term 'attributive objectivity'¹⁶. And again, since the percept is existentially subjective, the percepts of one percipient cannot be perceived by other percipients though they may be located in the same space as the percepts of another percipient. I shall call the space in which the percepts of a percipient are actually located "percept-space", and the space in which a percipient perceives percepts to be located "perceptual space". Thus each perceptual space is private to one percipient¹⁷, though the percept-spaces of different percip-

¹⁵Russell, B., The Analysis of Matter, (London, 1927), p.320.

¹⁶See Lovejoy, A.O., The Revolt Against Dualism, ([N.p.], 1930), p.97. "A character, even though it is admitted to be causally, or even existentially, subjective, might nevertheless be said to have attributive objectivity if it is ascribable to the object of knowledge as an attribute, or to the place which that object occupies." (Italics in original).

¹⁷Whether we assume the numerical identity of the perceptual space and the percept-space of percipient A, or not, A's perceptual space will be inaccessible to percipient B, if the percepts are private, the space in which they are located must also be private, in the sense that it will not be perceived by other percipients. This seems to follow whether we adopt an absolutist or relativist conception of percept-space: but it is less obvious on the former ground. The same thing may be said in the following terms: If the percepts are held to be mental, in the sense that they are conditioned by a psychic act of awareness, the space in which the percepts are located will also be mental, and will be therefore inaccessible to percipients other than the percipient

ients may be numerically identical. Whether the percept-space of a percipient is numerically identical with his perceptual space, or not, does not concern us here; nor the question whether the percept-spaces of different percipients are or are not numerically distinct. Two or more percipients may have qualitatively very similar or (theoretically) perhaps even identical percepts; but these percepts are numerically distinct from one another. In this sense there are as many percept-worlds as there are percipients.

Returning to the causal theory of perception, it is seen that since the perceptual object is always the effect of causal action of scientific objects upon the percipient organism, any change that appears to take place in perceptual objects is really the (perceived) end-effect of change in the causally antecedent scientific object or objects. This means that a perceptual object lacks causal efficacy. It never interacts causally with other perceptual objects, and least of all with scientific objects. The latter part of this statement may not seem entirely true, because it may be thought that at least scientific objects act causally upon perceptual objects. But reflection will show that it is not the perceptual object upon which the scientific object acts, but the percipient organism, as a result of which the perceptual object is generated. And since the effect of the causal action of a scientific object upon a percipient organism at any given instant is the generation of the perceptual object — at

whose mental space it is, since we cannot perceive the minds of others. If we assume that the perceptual space of a percipient is numerically identical with his percept-space (which seems to follow if we adopt a relativist, but not an absolutist, conception of perceptual space or/and of per-

least that is what dualism holds—the scientific object cannot act upon any perceptual object, whether it be one which the particular scientific object conditioned existentially, or one conditioned by other scientific objects. The same result is arrived at by considering the distinctness of physical objective or scientific space and (any) percept-space¹⁸.

Summing up the metaphysical characteristics of the scientific objects and the perceptual objects, we have encountered so far, the following may be said: the scientific object exists independently of perception; its esse is not percipi; it exists in a space and time or space-time common to all scientific objects¹⁹, in a common causal framework; it is related to the perceptual object as cause to effect, and perhaps in other respects also. The perceptual object on the other hand is causally, existentially and attributively subjective, i.e. its esse is its percipi; it is related to the scientific object as effect to cause; and finally, it has no causal efficacy.

cept-space), then of course percept-space also will be private. That in a relativist conception of space the above follows may be shown thus: The perceived extension of percepts or perceptual objects must have as much reality as any determination or quality of percepts or perceptual objects and as much reality as these percepts, etc. themselves. Hence extension must be extension in percept-space. Hence if space is considered a character of the experienced world as possessing extension or as extensive (relativist conception), percept-space will be the space as a character of the perceptual continuum as possessing (perceived) extension — which is perceptual space; i.e. percept-space and perceptual space will be numerically identical. In other words, if perceived extension defines both perceptual space and percept-space in the same sense, the two are numerically identical.

¹⁸For a detailed discussion of subjective space and objective space, and of change in the perceptual world, see Chapters V and VI respectively.

¹⁹I am not taking here into account the possible existence of more than one time-series.

The foregoing metaphysical considerations entail important epistemological consequences. Since the scientific object cannot be perceived, any knowledge about it will be ~~indirect~~ indirect and hence mediate. Since perceptual objects are all the immediate data we have — so far as the external world is concerned — if we are to have any knowledge of scientific objects it must be based on and derived from knowledge of perceptual objects. The causal relatedness of percepts to scientific objects presents dualism with the means whereby to pass in knowledge from the former to the latter. The perceptual object is held to refer us in knowledge beyond itself as immediately given, to the scientific object. Since, as we found out, the forces interplaying in perception are complex and at least several, the epistemological problem becomes how to know the nature of one of the determining factors (primarily the scientific object) by examining an entity which is determined by several factors (at least). Still, the dualist holds that the scientific object is not a Kantian Ding-an-sich or Spencerian Unknowable. It is not simply known to be in some manner the cause of the perceptual object, but no more. A dualist like Lovejoy holds that we can and do know structural and at least some intrinsic characteristics of the scientific object²⁰. To put the matter in Lovejoy's terms, the perceptual object has epistemological objectivity or is epistemologically objective. Russell does not go as far as Lovejoy, at least so far as

²⁰Ibid., pp.257-302.

his views at the time of writing The Analysis Of Matter go (1927). And it seems to me that if his position has since changed, it will be more in the direction of lesser and not of greater confidence in knowledge. To Russell, what we can know about scientific objects is the relations between them, their structure, properties that are expressible mathematically. But complete agnosticism is the only legitimate attitude concerning the nature of scientific objects in themselves, the intrinsic character of these objects²¹.

²¹ Russell, B., The Analysis Of Matter, (London, 1927), pp.10, 227, 253, 270-1, 335;
The Problems Of Philosophy, (London, 1946), pp. 25, 31-2.

II

THE ASSUMPTIONS AND PRESUPPOSITIONS OF DUALISM

In the previous chapter I outlined the assumptions and presuppositions of dualism. In this chapter I propose to discuss these assumptions and presuppositions.

Let us consider the case of looking at an object first with the naked eye and then through a coloured glass. Let us call the presentation-complex seen with the naked eye 'a'; and the presentation-complex seen through the coloured glass 'b'. I shall designate the objective constituent of the presentation-complex a, which we called the "object" looked at with the naked eye, 'A'. The a is a certain patch of colour of a certain shape. When we look through the coloured glass at the object we see a patch of colour of a different colour from, but of the same shape as, a. Finally the coloured glass is removed, keeping the direction of the eyes fixed, and a is seen again. Thus we have the following series of presentations in the order of being seen, as indicated by the arrows:

$$(1) \underline{a} \text{ -- } \underline{b} \text{ -- } \underline{a}$$

Common-sense identifies a with A; or rather, the two are not distinguished at first. Hence, for simplicity, I shall use 'a' to designate both the presentation-complex and the objective constituent, distinguishing between them only when necessary. Dualism also starts from the above conception, and does not distinguish a from A at first. But it finds ultimately that A and a are numerically distinct from each

other¹, in the same way that A and b are numerically distinct, as shown by the discussion which follows. Dualism infers from the above experiment that b, considered as a set of characters, is numerically distinct from A. It reasons as follows: the object observed by the naked eye is the same as the object looked at through the coloured glass. And yet it appears different when seen through the coloured glass. Hence the change is not in the object itself, but is apparent; and therefore what is seen when looking through the coloured glass is not the object, but an appearance of it, an existent numerically distinct from the object.

It is assumed above that the object is the same throughout the experiment, that we have $A - A - A$ from the moment we first see a to the moment we see a again. Hence we get

$$(2) \begin{array}{c} (\underline{A}) \\ \underline{a} \end{array} - \begin{array}{c} (\underline{A}) \\ \underline{b} \end{array} - \begin{array}{c} (\underline{A}) \\ \underline{a} \end{array}$$

We have a at the beginning and at the end of the experiment; hence the first and third A's. The second A is a hypothetical intermediary. Let us call it A_2 .

Now there is no proof that A existed while b was perceived (i.e. that A_2 is a real existent) or during the time A was not perceived; since I said in effect that A and b are numerically distinct from each other. However, dualism assumes that A existed during the time it was not perceived. The perception of b (while looking through the coloured glass) as not changing its position, and the perception of a at the end of the experiment, may be taken as common-sense indications that A existed during the time it was not perceived.

¹See Chapter I.

Dualism assumes also that A has not changed during the experiment, at least not appreciably. The following seem to be the reasons on which the presupposition rests:

(1) No change of colour, size, or shape is perceived either during the time a is first being perceived, or during the time b is being perceived. Or if a change was perceived, it was such that it could not account for the whole difference in character between b and a.

(2) The coloured glass is assumed not to have affected A since it lay between the object and the percipient.

I said above that dualism assumes that A continued to exist unperceived. Thus dualism assumes in this experiment (1) that there are entities which exist unperceived, entities whose existence is not conditioned by perception; (2) that the world is not a Heraclitean flux, a perpetual change with no permanence whatsoever; or at least that some portions of it do not change appreciably at least while an observation for instance is being made. If we assume that A may have gone out of existence when not perceived (as a), and then came back into existence when it was perceived again, we cannot infer that b is an appearance of A; we cannot say that b is related to A.

But assuming that the object observed through the coloured glass is A at the time we are perceiving b, on what grounds is it inferred from this fact that b is numerically distinct from A? It is assumed that A cannot be characterized by b since it is characterized at the same time by a. In other words, (3) Aristotle's law of contradiction along with the law of identity (and hence also the law of excluded middle)

are assumed.

The first presupposition, above, is so-called metaphysical realism, the belief in the existence of entities which are not conditioned existentially by perception. In this metaphysical realism dualism agrees with the realism of what Lovejoy calls epistemological monism or realism, which does not posit (like dualism) an indirectly-known world of scientific objects over and above the world of perceptual objects. But whereas epistemological realism holds that what exists independently of perception is itself the world we experience in sense-perception, dualism holds that it is a world causally related to the perceptual world, but numerically distinct from it. The perceived world is existentially conditioned by perception. Thus, so far as metaphysical realism is concerned, dualism and epistemological realism differ only in what they consider to be existentially independent of perception. And it is because dualism as a metaphysic holds that this world existing independently of perception is not perceived and therefore is known (assuming that it is known) only mediately, through the perceptual world, that it differs from realism epistemologically, and its peculiar epistemology arises.

It is to be noted that the dualist's presupposition that the world is relatively stable does not follow from the laws of contradiction, identity, and excluded middle, as such, because these laws are not violated by a metaphysic of Heraclitean flux.

This is true whether change is conceived as discontinuous or continuous, whether on the one hand change consists in the

destruction of existents and the creation of other existents, or in the replacement of an existent by another, or on the other hand, in the literal transformation of one existent into another. Only it should be assumed that the particular changes are not instantaneous, but involve a duration, however small the duration may be². Granting this, no two different characters of the same type will come to exist in the same spatio-temporal locus.

Again, returning to our experiment, it is seen that b is considered an appearance of A because it is assumed at first that it occupies the same spatial locus as a, simultaneously with the latter. ~~The~~ b is perceived to be located in the same region as a. If that is not assumed, it cannot be inferred, on the basis of the law of contradiction, that b is apparent, because the law of contradiction would not be violated. The assumption that b occupies the same region as a because it is perceived to be so located, presupposes the identification of the apparent location of b with its actual location.

The reader has noticed that in discussing the experiment imagined at the beginning of the chapter, I spoke in terms of an object A, its assumed character-complex a, and its apparent character-complex b. The discussion assumed a certain relatively stable existent located in a certain region in space. For our purposes, the object (A) was equivalent to

²If duration is not assumed, change would become impossible. Change has to be change in time. But there will be no time if there is no duration.

the character-complex perceived with the naked eye (i.e. a). The b was first referred to this object; but analysis showed that it could not be so referred. However, no assumption was made, so far as the argument went, that A is anything more or other than the perceived character-complex a. No substratum underlying a was assumed. That much was essential, however, because without a posited stable character-complex, I could not proceed in my argument in distinguishing between it as that which is to be perceived (if possible), and b. It can be said, therefore, that in the above-defined sense of "object" or "thing" the dualistic argument I discussed, and therefore dualism, presupposes (4) the existence of objects or things, which (assuming metaphysical realism) continue to exist when unperceived. The fact that I was all the time inquiring concerning A and its appearances without reference to the rest of the presentation-continuum of which a and b were spatial parts again presupposes relatively distinct stable objects. However, as we shall see later on, I do not mean by an "object" an entity completely self-sufficient and independent of the rest of reality³.

Furthermore, dualism assumes, like common-sense, (5) that sensuous cognition is cognition of objects, and not cognition of distinct, sensible characters varying spatio-temporally: of shifting colours and configurations and hardnesses and odours, etc. etc. Sensible characters which are perceived

³For further discussion of this point, see pp. 311-32.

at a given moment to occupy a certain spatial locus, are associated together in thought as constituting a self-subsistent object, preserving its identity amidst change. The following discussion will, I hope, make clearer what I mean here:-

Let us assume that an observer is gazing at what we call 'a star'. What is actually perceived is a certain luminous point of a golden line, etc., among other such luminous points interrupting a large somewhat concave patch of a dark blue colour which we call 'the sky'. With the luminous point concerned we associate certain characters — a certain mass, volume, shape, motion, etc. etc. — all of which together constitute a "star" in astronomy. We do not see the "star" in the state, shape, and size, which it is supposed to have. But we still say that we are observing a star when as I said, we are observing only a tiny luminous point. And if we observe the luminous point for a sufficiently long time, we may see that it is changing its relative position with respect to some point which we take as fixed (usually a terrestrial point). But we still consider the point in the changing positions the same "star" we were observing at first: which involves the notion of self-identity amid external change.

So far so good. But when we consider the distance of the "star" from us, and the time light rays take to travel from its surface to our eyes, and when we consider that these light rays are refracted as they pass through the earth's atmosphere, we become puzzled as to whether what we are perceiving is the star, or only an "appearance" of it. We

then say that what we are perceiving at a certain moment is the state in which the star was at the time the rays left its surface, perhaps thousands of years ago. But even here we are still referring the perceived luminous point to the star, though a temporal chasm is opened between the two. And when we speak of the luminous point as an "appearance", we are still referring it in some manner to the star. And we continue to refer the presentations to the star even when the spatio-temporal and qualitative chasm between the two becomes increasingly wide and deep. And finally, in the causal theory of perception the star (which by now has become a scientific object) becomes the cause of the existence of the luminous point, the common cause of a group of qualitatively and quantitatively associated presentations. A scientific object is posited to account for the similarities of groups of presentations. And different scientific objects are posited to account for pronounced qualitative and other differences between a group of (qualitatively and quantitatively) associated presentations and other such groups. Common-sense constructs objects from presentations, and associates the presentations with these objects. And it assumes that we perceive objects, and that sensuous (and also non-sensuous) cognition is cognition of objects. Dualism takes over these common-sense assumptions, but repudiates the vague common-sense belief that though an object cannot possess all the discordant characters it appears to have, yet all these characters are in some way "in" the object. Common-sense remains a non-bifurcationist, while dualism bifurcates nature.

It was mentioned that one of the reasons why the object A was assumed not to have changed during the hypothetical experiment discussed was that the coloured glass lay between the object and the percipient, and therefore it was assumed that it could not have affected the object. However, since a change did take place — a different sensuous pattern (b) was perceived — and the only difference in the conditions involved in the perception of a and of b was the introduction of the coloured glass in the manner described before, the coloured glass must have affected some object in some manner. The position, as such, of the coloured glass relative to the object and the percipient does not tell us whether it affects the object, or the percipient, or both. It is because it is assumed that perception involves action of the object on the percipient, and not vice versa; and because this action is assumed to be modified through the presence of the coloured glass, that the position of the latter between the object and the percipient enters in as a determining element in perception. In other words, the above assumption concerning the effect of the coloured glass presupposes (6) the causal theory of perception. Assuming the traditional scientific conception of the nature of the perception as a physical process and so far as it is a physical process, an object acts upon the percipient organism through light rays which it emits or reflects. Any effects which the object, or the medium (or media) may have on the percipient organism through action other than that of, or associated with, light rays, are assumed to be irrelevant to the percipient event and what is perceived as a

result of that event. But if the percipient organism located in a certain region affected the object, presumably this change affects the light rays emitted, resulting in a corresponding effect on the percipient event. However, if the medium acts upon the object, the object would be different from what it would be in the absence of the medium. The changes perceived when the medium is present would not then be apparent. If such effects of the medium on the object are granted, we cannot infer validly the numerical distinctness of the object and the sensuous character-complex perceived when the medium is present. Thus the inference that the object and the sensuous character-complex are numerically distinct presupposes the premise that the medium acts causally only upon the light rays emitted from the object and not on the object itself; or if it does so act, this action is such that it cannot account for the perceived differences between the presentations (a and b).

This fact, coupled with the fact that one causal relation or chain of relations is picked out as essential for perception, from all the causal relations which may obtain between percipient organism, medium, and object, all these mean that dualism assumes that (7) the causal relations between objects vary in relevance and importance in determining or affecting the objects so related, that some relations are essential so far as a particular state or character of an object are concerned, while other relations are not essential; or that relations may be absent between certain objects in respect to certain characteristics they have, and states in which they are involved. Thus although objects may be relational, still, not every relation which an object enters into with another or other

objects is essential for it in the sense of being constitutive of its essence.

In isolating certain causal relations or chains of relations as essential in respect to a certain happening, disregarding others as unessential, dualism follows scientific practice in its construction of ideally isolated systems. Such isolation of factors assumes that spatial and temporal remoteness means causal disconnection⁴. Thus even if it is granted that the medium acts on the object-to-be-perceived-if-possible when the medium is close to the object, such action is denied when the object is remote from the medium. For example, the earth's atmosphere is usually considered to have no effect on a star observed from the earth.

Note that in the argument in hand direct causal action at a distance seems to be avoided by positing light rays passing from the object, through the medium, to the percipient organism. And in every case of visual perception, including perception of heavenly bodies separated from us by almost a perfect vacuum, the causal chain seems to involve only contiguous bodies. Similarly in perception involving the other senses. However, remembering the atomic structure of matter, it is seen that this causal continuity is apparent only. The vibrating atoms, etc. are not contiguous except in cases of atomic bombardment, which is a rare phenomenon. It seems to me therefore that the causal theory of perception presupposes the possibility of

⁴See for instance Whitehead, A.N., The Aims of Education And Other Essays, (New York, 1949), pp.149-151.

action at a distance, though it is true that the action of individual atomic particles involves comparatively small distances only.

In discussing metaphysical realism I said that dualism assumes that there are objects which exist independently of perception. But I did not explain the somewhat "independence from perception" meant in that connection. To speak precisely, dualism assumes that there are objects existentially independent of the awareness of sentient beings. These objects may be conceived as relational in nature, in the sense that the relations they enter into determine the characters they have. Or they may be conceived as non-relational. It is to be understood, however, that if the former view is adopted, awareness is not one of the relations determining their characters. But on that view the percipient organism will be a conditioning factor as a physical object. Further, the percipient organism's spatio-temporal standpoint may then be one of the conditioning factors. The nature of the percipient organism (qua physical object) and its relations to an object seem to me to determine the qualitative aspect of the characters conditioned by the percipient organism. The relative spatio-temporal standpoint seems to me to determine the quantitative, measurable aspect of the characters. If a percipient were in a different relative standpoint from the one in which he actually is, the characters would have been different quantitatively, but not necessarily qualitatively. Thus for instance the length of a moving body decreases in the direction of its motion relatively to a reference-system which

has a smaller velocity in the same direction as that of the body, as the velocity of the body increases (Lorenz-Fitzgerald Contractions). Similarly the mass of an electron increases as its velocity increases in respect to a reference-system which has a smaller velocity in the same direction⁵. But in the first example the body still has some length, and in the second case some mass.

However, when dualism asks the question what things are in themselves, it assumes that it is meaningful to speak of the characters of things without mentioning the reference-system in respect to which these characters are possessed. Now this question does not refer to any particular object, but to objects in general, considered as a class. Now if what I said concerning the determining role of the standpoint is correct, the above question does not assume the respectivity⁶ of characters. However, if the characters as such are assumed to be conditioned by spatio-temporal standpoints, then the above question does involve a respective conception of characters.

We come now to a discussion of the presuppositions of the doctrine of causal, existential, and attributive subjectivity of percepts.

⁵Briscoe, T.H., The Structure And Properties of Matter, (New York, 1935), p.95.

⁶"A character is said to be "respective" when the term designating it has no meaning, as a possible predicate of a subject of discourse, unless, besides that term and the subject, some definite third term is implicitly or explicitly specified." (Lovejoy, A.O., The Revolt Against Dualism, ([N.p.], 1930), p.92).

The finite velocity of light makes it impossible for a percept resulting from the action of light rays on a percipient organism to exist at the same time light rays leave the cognoscendum. Hence the percept and the cognoscendum cannot be numerically identical.

This argument assumes not only that perception is conditioned by a chain of causal action, but that (7) what is perceived is also conditioned in character or content by the nature of the causal action⁷. And hence if what is perceived is to be identified with the cognoscendum, it has to be identified with the cognoscendum as it existed at the moment the light rays left it, since the percept will be qualitatively similar to the cognoscendum as it existed at that particular moment: the moment when it initiated the causal chain resulting finally in the percept. But the cognoscendum, so far as its particular state at that moment is concerned, no longer exists. Hence the percept must be numerically distinct from the cognoscendum.

But in saying that the percept's character is determined by the cognoscendum and other objects in the causal chain, is it not already assumed that the percept is existentially determined by causal action upon the percipient organism, and not only by the percipient event, the event which culminates in perceiving? If the causal action determines the percept's

⁷See Lovejoy, A.O., The Revolt Against Dualism, ([N.p.], 1930), p.62.

character, it determines first of all its existence, and therefore causal action generates the percept. Hence it is not the fact that the percept exists after the light rays have left the cognoscendum that constitutes the real reason for rejecting the identity of percept and cognoscendum. The percept cannot be identified with the cognoscendum even as it exists at the moment the light rays left it, because causal action is believed to generate the percept as well as to produce the percipient event. The very fact that the percept is generated by the causal action of the cognoscendum, etc. involves the numerical distinctness of the percept and the cognoscendum. And this generative function of causal action is presupposed in the assumption that causal action determines the character of the perceptual content, as explained above. When the dualist says that the percept must exist where the proximate relatum — the percipient — is located, and not anywhere else on the causal chain⁸, he is again attributing a generative function to causal action. He is assuming that the effect of the causal process resulting in perceiving is more than just the occurrence of a percipient event⁹.

⁸Cf. Russell, B., The Analysis of Matter, (London, 1927), p.320.

⁹Here the percipient event includes awareness.
 N.B. One of the arguments which Lovejoy brings against the view that "... the present content of a visual perception is identical, not with the present state of a perduring object from which, in some previous state, the light emanated, but with some other physical object, some real character-complex, now actually occupying the position in space which the perceptual datum appears to occupy" (The Revolt Against Dualism, (N.p., 1930), p.67) is the following: "these luminous objects scattered about in space, though unknown to astronomers, would not be, in any full-blooded sense, physical:

In conceiving causal action to be generative, and therefore in locating the percept where the percipient is situated, and in holding implicitly that awareness can be only of entities which are related directly to the process of awareness, dualism is able to avoid assuming perception at a distance. Along with this the possibility of perceiving objects external to us as well as percepts, simultaneously with our perception of these percepts, is ruled out.

Let us return to causal subjectivity. As we saw in chapter one, causal subjectivity may be established irrespective of whether the conditioning percipient event is considered purely physico-physiological or also psychic. And as we saw in the foregoing discussion, the attribution of a generative function to causal action is a sufficient ground for inferring the numerical distinctness of the percept and the cognoscendum. The doctrine of the dualism of perceptual objects and scientific objects does not presuppose psychophysical dualism so far as the doctrine merely holds that the two orders are distinct. Thus Lovejoy is right in ~~maintaining~~ that the two issues, epistemological and psychophysical dualism, are distinct¹⁰. We

that is to say, they would not conform to any of the physical laws which have been reached through inferences from experience tested by observation of the congruence of their implications with further experience; nor would they, in particular, have any inferrible dynamic interaction either with one another or with scientific objects." (Ibid., p.68) This argument seems to me not only to attribute a generative function to causal action, but also to attribute a psychic nature to the percepts generated as a result of that causal action (assuming that whatever is not physical is psychic).

¹⁰Op.cit., p.26.

shall now see whether any other item of the dualistic doctrine presupposes psychophysical dualism.

It will be remembered that according to dualism a percept exists only so long as the percipient event occurs. This does not imply necessarily that the percept must be psychic. Even if the percept is physical and therefore can exist unperceived, it may never actually exist unperceived, simply because it may always be accompanied, as a matter of fact, by awareness, without the two being necessarily related, however. This may appear unplausible; but it is possible, and that is sufficient for my purpose here. Also, the belief that a percept can be perceived by one percipient only does not imply that a percept must be psychic. Here again, even if the percept is physical, it will be private so far as perception is concerned, so long as we hold the dualistic position. It may be thought that if awareness is considered as mental, the percept, which is the object of awareness, must be private, since awareness is private (being mental). But reflection will show that the privacy of the percept in perception follows even when awareness is considered a physico-physiological act. The privacy of a percept in perception follows from the assumption that causal action is generative, and that the object of awareness cannot be the ulterior relatum but an existent located where the proximate relatum is located. Perception is awareness of an existent directly related to the percipient event, and each percipient is a distinct entity. Therefore the percipient event connected

with a particular percipient cannot be shared literally by other percipients.

It may be thought also that if percepts are physical, they will be imperceptible, like all physical (scientific) objects, in accordance with the dualistic doctrine; hence that not even one percipient will perceive a given percept. But since a particular percept is supposed by dualism to be perceived by one percipient, it follows that the percept is mental and not physical.

Now assuming that it is true that if percepts are physical they will be imperceptible, it does follow from the above argument that percepts are not physical and hence are mental. But it is well to note that the dualist may question the above assumption¹¹. Probably the dualist who holds that percepts are

¹¹ Russell, for instance, is an epistemological dualist who holds that percepts are physical; and yet he does not seem to think that that view raises a question as to how percepts are perceptible. So far as I know Russell does not say why percepts are perceptible even though they are physical, when at the same time he holds that scientific objects, which are also physical, are not perceptible. In other words, assuming with Russell the causal theory of perception, it is not explained why no causal action of percepts on the percipient organism is involved in their apprehension. It is clear that if such causal action is assumed, the percepts themselves will be imperceptible. And if the effects of these percepts on the percipient are assumed to be physical, the question again arises whether they will be perceptible; and so on. And we will either regress to infinity or will be forced to concede that these effects, or that percepts themselves, are mental, and are therefore directly and immediately apprehensible. But I do not want to suggest that perceptibility of percepts may not possibly be explainable on dualistic grounds without ascribing a psychic nature to percepts.

physical assumes that they are perceptible because they are causally subjective. But it may be questioned whether perceptibility follows necessarily from causal subjectivity.

Whatever the outcome of the above issue, psychophysical dualism seems to be presupposed, however, in the conception that percepts are located in spaces other than the space in which scientific objects are located. It was said in chapter one that percepts are not identical numerically with scientific objects. And from this it was inferred that percepts cannot be located in physical space. This conclusion seems to follow only if percepts are not physical existents. If percepts are physical then they will be located in the same space as scientific objects¹², though the space in which a group of percepts appears to be located may not be numerically identical with physical space. In holding that a percept exists in a space other than physical space dualism presupposes that awareness, or some other psychic process or act is an essential element in the production of a percept; and therefore it presupposes psychophysical dualism.

Since the existence of a percept and not merely its being known is conditioned by awareness, a percept must be related to awareness in nature, assuming that what is an essential condition for the existence of a thing determines, at least in part, the nature of that thing¹³. Hence a percept is mental, in the

¹²As it is in Russell's theory of perception. See The Analysis Of Matter, (London, 1927), p.265.

¹³We have seen that this is one of the assumptions of dualism. It may be said in passing that this assumption is fundamental in the dualist's claim to know scientific objects.

sense in which an act of awareness is mental. And since percepts exist in a spatial and temporal order, the mind may be said to consist of percepts characterized by such an order. In this sense the mind may be said to be an "entity", and dualism may be said to presuppose mind as an entity in the particular item here discussed. Whether mind spoken of as an "entity" is only a logical construction of percepts, or an existent which "contains" percepts or of which percepts are "modifications", is not important for my immediate discussion.

It may be well to mention here that no item of the dualistic doctrine presupposes the existence of more than one percipient, and that the doctrine can be established without positing the existence of other percipients.

In discussing the metaphysical realism of dualism I discussed the dualist's conception of scientific objects. The dualist identifies the scientific objects he posits as a dualist with the objects which physical science deals with, though he does not necessarily identify scientific objects with these objects as currently conceived at a certain period or another. He identifies scientific objects with the objects science as such deals with, or more exactly, he identifies the field of scientific inquiry with the order of existence constituted by scientific objects. In brief, dualism assumes that the field of scientific inquiry is the objective world which we have called the world of scientific objects. I shall now attempt to discuss the presuppositions which an identification of the objects of physical science with the objective world presupposes. And for that purpose I shall distinguish (in the following discussion only) between the

scientific objects and the objects physical science deals with. I shall call the latter objects "physical objects". The importance of the above identification of scientific objects and physical objects is twofold for dualism: (a) the disparity in character between physical objects and perceptual objects is taken by the dualist as affording additional evidence for his thesis; (b) our knowledge of physical objects is equivalent for the dualist to knowledge of scientific objects, objects as they are in themselves. The presuppositions of the above conception are the following:-

(1) Physical objects — atoms, electrons, electromagnetic waves, etc. — and the spatio-temporal framework in which they exist, are actual existing things (inferred from the perceptual world) and neither

(a) logical constructions in the sense that any factual propositions about them are reducible to empirical propositions about sense-impressions; nor

(b) mental constructions in the sense that they are abstractions from the concrete world experienced in perception, expressing relations between existents, but not themselves objects or things.

To hold that physical objects are logical constructions means that they are not existing things. The same follows from the doctrine that they are mental constructions. On neither interpretation could physical objects be put over against perceptual objects.

(2) Physical objects

(a) are objective entities; (b) constitute the whole of the objective world; (c) differ irreconcilably in nature from

perceptual objects.

(3) To say that physical objects are objective entities means for dualism that they are existentially independent of our awareness. Since these objects are found through scientific inquiry involving observation and experimentation; which in turn involve perception, the above means that perception does not determine in any way the nature of the results obtained through these procedures.

We have seen¹⁴ that we can say that scientific objects exist independently of awareness, and yet validly hold that they are relational in respect to other physical objects, including the percipient organism; and are conditioned by the percipient's spatio-temporal standpoint. All this holds equally of physical objects. All that is assumed is that if physical objects are relational, awareness is not one of the conditioning relations.

The present chapter dealt only with the presuppositions and assumptions of dualism as a metaphysical doctrine. I have left out the presuppositions and assumptions of dualism as an epistemological doctrine: the presuppositions and assumptions underlying its claim that scientific objects are knowable, and that we do have some knowledge (at least) about them. It is true that I have discussed the presuppositions and assumptions underlying the dualistic conception of the objects of science. But I discussed the matter only in so far as dualism has its peculiar viewpoint concerning these objects, and concerning science in general, and not in so far as dualism holds that science gives us knowledge of "scientific objects".

¹⁴Pages 10 ff.

III

THE LOGIC AND METHOD OF DUALISM

In Chapter Two I examined the presupposition and assumptions of dualism. In this and in the following chapters I shall examine the validity of the dualistic arguments and assess the truth of the dualistic metaphysic.

Let us take up first the dualistic arguments from qualitative relativity. These arguments involve two types of situations: (1) qualitative relativity associated with change in or of the medium intervening between an object and an observer; (2) (a) qualitative relativity associated with change in the position of one observer from an object; and (b) qualitative relativity associated with the simultaneous perception of an object by several observers situated in different positions from an object.

(1) In Chapter Two I analysed the situation involved in the perception of an object first with the naked eye and then through a coloured glass. It will be remembered that in that situation a was the presentation-complex perceived with the naked eye, and b the presentation-complex, supposedly of the same "object", perceived through the coloured glass. Such a situation is an instance of (1) above.

We saw in Chapters One and Two that the dualist argues that if in the above instance a and b are actually located simultaneously in the same spatial locus in which they are perceived in succession to be located, the law of contradiction is violated. Now in the above instance a and b are not perceived simultaneously occupying the same spatial locus.

When a is perceived b is not perceived, and vice versa. Hence, as was mentioned in Chapter Two, if a case of apparent multiple inherence¹ is to arise, it has to be assumed (1) that a continues to exist when b is being perceived; i.e. that a continues to exist while it is not being perceived; hence that it is existentially independent of awareness. (Similarly for b, and in general, for any presentation-complexes which are perceived successively in supposedly the same spatial locus). (2) that a and b occupy the same spatial locus.

The dualist argues in effect that if the above two assumptions are made, a self-contradiction arises — the law of contradiction is violated — and he proves by a reductio ad absurdum argument that (1) and (2) cannot both be true. So far the dualist's argument is logically valid. The dualist himself assumes that (2) is true, i.e. that a and b are really located in the same region of space², and on the basis of his argument he concludes, in effect, that (1) is false, i.e. that a does not exist when it is not being perceived. Similarly for b. In general, he holds in effect that of a number of presentation-complexes perceived successively in supposedly the same

¹ See Chapter II, p.

² See Lovejoy, A.O., The Revolt Against Dualism, ([N.p.], 1930), p.22. Russell, however, appears not to hold the above assumption. Thus he says: "... when the aspect of the table changes as we walk round it, and we are told there cannot be so many different aspects in the same place, the answer is simple: what does the critic of the table mean by "the same place"? The use of such a phrase presupposes that all our difficulties have been solved; as yet, we have no right to speak of a "place" except with reference to one given set of momentary sense-data. When all are changed by a bodily movement, no place remains the same as it was." Our Knowledge Of The External World, (London, 1918), pp.86-87.

region of space, all but one are existentially subjective.

Let us now take up the above two assumptions and try to find out which assumption is untenable, and which is true. For that purpose I shall take first assumption (1) and the contradictory of assumption (2), i.e. I shall assume that a continues to exist while b is being perceived, but that a and b do not really occupy the same spatial locus. I shall then try to discover whether apparent multiple inherence still arises. The outcome of the analysis will determine for us which of the two assumptions is false and which is true.

Now the contradictory of assumption (2) is that a and b do not really occupy the same spatial locus. This means either that (a) a and b are not in the same space; or (b) a and b are in the same space, but they are located in different regions of that space. Let us talk in terms of b. The b is assumed to be perceived in the same place as a (the dualist's assumption). Hence (b) is untenable, since then b would be located in two places in the same space at the same time; which is impossible. Hence, we have to assume that b is actually in a numerically different space than the space in which a is actually located (alternative (a)), but that this "b-space"³ is in some manner superimposed on "a-space"⁴ such that b in its space actually falls where a is in "a-space". This situation is similar to that described by the theory of psychic additions⁵, as

³The space in which b is located.

⁴The space in which a is located.

⁵The theory of psychic additions is a form of dualism which holds the partial subjectivity of perceived characters: colour, odour, sound, taste, and in general Locke's so-called

Whitehead calls it. But in that case there is no need to assume two spaces. The b, though not actually in the space in which a is located (because b is psychic according to the above-mentioned theory, while a physical, existing in physical space), is projected onto a's locus, and thus is perceived to occupy the same locus. But the similarity does not go further, because since it has to be assumed that b is psychic, b will be conditioned by awareness, and therefore will not exist while it is not perceived. But this violates the assumption made in this connection that both a and b continue to exist while they are not perceived.

Let us return to our main discussion. Now whether or not a and b are located in numerically distinct spaces, so long as they are perceived to be located in what is supposed to be exactly the same locus, the difficulty of multiple inference is not overcome. Hence alternative (a) also is untenable. Therefore, since assumptions (a) and (b) are false, it follows that it is false that assumption (1) and the contradictory of assumption (2) are both true, i.e. that assumption (1) is true and assumption (2) is false. Hence, assumption (1) is false and assumption (2) is true. This means that a and b actually exist in the same locus as the one in which they are perceived to be located, but not simultaneously; i.e. a does not exist while it is not being perceived (when b is perceived), and vice versa.

Ideas of secondary qualities are subjective; but perceived extension, size, shape, motion are objective; perceived extension, etc. and extension etc. in objects are numerically identical. However, the colour, sound, etc., though subjective, are projected onto the objects perceived, and we see coloured, sounding, odorous extents. See Whitehead, A.N., The Concept Of Nature, (Cambridge, 1926), pp.42-43.

Hence either b or a is conditioned by awareness. Or in general, of two or more presentation-complexes which appear to be located in the same locus, all but one presentation-complex are existentially conditioned by awareness (unless we assume that it is purely accidental that presentation-complexes cease to exist whenever they are not perceived). Now since a is perceived to be located in space, if it is conditioned by awareness and therefore is subjective, the space in which it is perceived to be located will also be subjective. Hence if b is regarded as objective, i.e. as not conditioned by awareness, it must either (i) be located in a space numerically distinct from that in which a is located, and yet the two spaces must be superimposed in such a manner that a falls in the same locus in which b is found; or (ii) be located in objective space into which a is projected so as to be perceived to be located where b is actually located, though a itself is not located in objective space. If neither (i) nor (ii) is tenable, it follows, (iii) that b is subjective and not objective. And we can assume that b is in the same (mental) space as a, and (with dualism) that it is located in the same region of that space.

The first alternative does not suffer here from the difficulty of multiple inherence which persists when (1) and the contradictory of (2) are assumed to be true, since in this case a and b do not exist simultaneously. The second alternative is similar to the situation delineated by the theory of psychic additions, as was pointed out earlier. The third alternative is the one which dualism adopts. The whole perceptual world is subjective, and not a world in which psychic entities are found side by side with physical, objective entities. But

however unpalatable and improbable the first two alternatives may be (if they are improbable and unpalatable), there is nothing, it seems to me, which invalidates them logically. The dualist's argument from immediate experience seems to me to leave open the possibility that either of these two alternatives may be true. The dualistic conclusion does not follow necessarily from qualitative relativity. Lovejoy recognizes this latter fact. For he says that

It is of course conceivable so far as the present consideration goes, [i.e. consideration of qualitative relativity] that one of the discordant appearances might be identical with the object-to-be-known or with some part of it [But he does not think that it is a probable hypothesis, that] while almost all perception is mediate, [i.e. what is perceived is subjective] a few privileged observers now and then attain direct access to the object [i.e. perceive something objective].

Let us now take the second type of qualitative relativity which was mentioned on page forty-two, namely (a) qualitative relativity associated with change in the position of one observer from an object; and (b) qualitative relativity associated with the simultaneous perception of an object by several observers situated in different positions from an object. (a) involves the same kind of considerations as those which have been discussed already in connection with (1), i.e., qualitative relativity associated with change in or of the medium intervening between an object and an observer, and hence the same conclusions which we arrived at in the

⁶ Lovejoy, A. O., The Revolt Against Dualism, ([N.p.], 1930), pp.22-23.

⁷ Loc. cit.

case of (1) apply to it. We may therefore pass on to (b). And for purposes of analysis let us take any two mutually-exclusive characters, \underline{x} and \underline{y} , perceived simultaneously by two observers.

Now if we assume with dualism as in (1) that several observers may perceive simultaneously mutually-exclusive sensible characters occupying supposedly the same spatial region, the following possibilities are open to us which if we assume we might be able to avoid violating the law of contradiction:

either (1) \underline{x} and \underline{y} exist simultaneously, but not in the same locus, in the sense that they are located in numerically distinct spaces,

or (2) \underline{x} and \underline{y} do not exist while they are not being perceived,

or (3) \underline{x} and \underline{y} are each private to one percipient, i.e. they can be perceived by one percipient only.

Now since \underline{x} and \underline{y} are perceived simultaneously (though by different observers), (2) does not here solve the difficulty of multiple inherence. Whether \underline{x} and \underline{y} exist or not while they are not being perceived, so long as they are being perceived simultaneously, they exist simultaneously. Hence we are left with possibilities (1) and (3).

Again, assumption (3) also does not overcome the difficulty of multiple inherence. The law of contradiction is concerned with the simultaneous occupation of a single locus by mutually-exclusive characters. Whether all of these mutually-exclusive characters are perceived simultaneously by

one and the same observer or by several observers is immaterial here, so long as it is assumed (as I have done from the outset) that these mutually-exclusive characters are actually located in the same region. Hence we are left with (1).

Now (3) really means that the space in which x is located is inaccessible in perception to the percipient who is observing y or any other "aspect" of the object of which x and y are assumed to be two specific aspects. On the other hand (1) here means that x and y are actually in two numerically distinct spaces, since x and y cannot be in different loci of the same space, otherwise they will be in two places at the same time. For we are assuming all the time that x and y are perceived in the same locus (the dualist's assumption) and therefore in so far forth they are really in the same locus. Hence (3) means that x and y are in numerically distinct perceptual spaces, while (1) means that x and y are in numerically distinct percept-spaces.

Now let us assume with (1) that x and y are in numerically distinct percept-spaces; (in this sense x and y are in different loci). And in accordance with the dualist's above assumption, we have to assume that the percept-spaces in which x and y are located are superimposed in a hypothetical common space such that x and y occupy simultaneously same locus. But if these things are assumed, multiple inherence is not overcome. So long as x and y occupy the same locus, whether in an actual or a

hypothetical space, the difficulty of multiple inherence remains. It might be suggested that x and y do not coincide in position in the hypothetical space. But if this is assumed, we run counter to the dualist's assumption that x and y occupy the same spatial locus. And it is remembered that on the basis of this assumption the dualist argues that x and y, and in general all perceived character-complexes are subjective. Hence if we hold on to this assumption, the above account will be untenable. Moreover, if the above position is assumed, it is difficult to see what meaning would have the correlation of private spaces and how correlation would be affected between the perceptions of different percipients. And it is a matter of fact that there is correlation between the perceptions of different percipients. Furthermore, if such an account is accepted, we need not assume, in the case of qualitative relativity associated with change in or of intervening media that a and b do not exist while they are not perceived: So long as a and b exist in different loci in the hypothetical space, they could be assumed to exist simultaneously without violating the law of contradiction. But since a is not being perceived when b is being perceived, and vice versa, to assume that they exist simultaneously means that they continue to exist while they are not being perceived. And such an assumption damages that form of dualism which holds that perceptual objects are mental, the form which I am concerned with in the present work.

Hence, to sum up, even if we assume (1) the conditionality of perceptual objects; or (2) the existence of perceptual

objects in private perceptual spaces; or (3) the numerical distinctness of the percept-spaces of different percipients, the difficulty of multiple inherence is not overcome. And furthermore, the difficulty persists even if the three assumptions are ~~made~~ together. Hence the dualist's conclusion (from the consideration of multiple inherence involved in the case of two or more percipients) that perceptual objects are existentially subjective, i.e. that they do not exist when they are not perceived, and that they are private (in the sense that they exist in numerically distinct perceptual spaces) is untenable.

It is seen from the above considerations that the only way of avoiding multiple inherence which is open to us is to reject the dualist's initial assumption, which was the cause of the generation of the above problems: the assumption that incompatible presentations are perceived simultaneously in the same regions of space. If this assumption is rejected, the dualist's argument based on it vanishes.

Apart from the above considerations, it may be asked what evidence we have for the inference that two or more mutually-exclusive characters are perceived in a single spatial locus; or in terms of a and b, that (a) b is located at the same distance from the observer as a; and (b) in the same direction as a from the observer? And when I say the same, I mean exactly the same, either as a whole or ~~in~~ part, and not only more or less in the same region. It is true that each observer perceives a and b at some distance from him: this is a fact of immediate experience. But the knowledge of the

measure of this perceived distance in each case is a matter involving past experience and training and inferential judgments. And the assignment of the same distance and position in space from the observer, to two or more presentations perceived successively and from different positions, or from the same position (in the case of change in intervening media), is again a matter involving inference. And such a complex process of inference, which however, because of its unconscious nature resulting from accumulated experience appears simple, is not infallible. That the assumption that a and b are in the same locus is not as obvious as it seems is seen by considering how much of our judgment of the distance of an object from the observer or from other objects is based on and acquired from tactual perception. A child is at first incapable of judging distances by sight, unlike an adult, although a child sees as much and in the same manner as an adult. We import tactual associations into our visual presentations, associations which are an important element in shaping the notion of a stable "object" in changing spatial relationships. And if we do not trust tactual experiences in associating them with visual experiences and experiences involving the other senses, we can neither form an adequate conception of things, nor estimate more correctly spatial and other relationships between them⁸.

Let us take the case involving the observation of what is supposed to be the same region by one observer moving about.

⁸

For a detailed discussion of these points see Chapter V.

As the observer moves about, the whole presentation-continuum is shifted. The configurations of all the spatial parts of the continuum alter correspondingly. With respect to what (fixed and unchanging) perceived character-complexes can the moving person define a place as "here", or "there", a region of space in which different character-complexes may be located? Places should be defined in terms of perceived character-complexes, and not character-complexes associated as constituting an "object" in terms of abstract space. If perceived character-complexes differ with changes in the observer's position, it means that they occupy different spatial regions. Positions in space should be defined in terms of the contents of space, and not the contents of space in terms of abstract positions. But the observer associates the various changing parts of the continuum with certain regions in space in which he assumes these parts to be located: (and similarly he assumes that the whole presentation-continuum is located in such a region). In other words, he assumes an absolute space, independent of any content. Speaking precisely, the observer associates a certain part of the presentation-continuum with certain visual presentations obtained at a maximum distance of an arm's length -- at a distance from which he can obtain tactual perceptions. Tactual presentations are in general much less variable than visual (and other) presentations. And therefore the visual (and other) characters associated with these (invariable) tactual characters come to be considered as the verifical inalienable or "essential" visual characters of the presentation-complex. The presentation-complex is thereby granted a stability which distinguishes it from other presentation-complexes; and generates, at least in

part, the notion of an "object".

It is seen from the above considerations that even if there are cases in which two or more mutually-exclusive characters occupy the same region, this state of affairs is not a fact of immediate experience and therefore does not have the certainty which immediate experience enjoys.

Let us now examine the dualist's arguments for the existential subjectivity of perceptual objects based on phenomena involving refraction and reflection of light. Let us consider the case of observing a spoon partly immersed in a glass of water. If what is perceived always lies in the direction from which the light-rays come to the eye⁹, since the light-rays coming from the sun are refracted as they pass through the earth's atmosphere, in which the spoon is partly immersed, what is perceived which we call the part of the spoon in air lies in a different place from the scientific object which reflected the light to our eyes and produced the percept of the "spoon" in air. The light-rays (already refracted) are again refracted as they pass through the water; and as they pass out again into the air they are further refracted by the glass of the cup containing the water and the spoon. Thus the spoon, the water and the glass perceived are in different places from their respective scientific causal objects. Part of the glass is seen by light-rays

⁹In cases of refraction and of ordinary transmission of light-rays. If the above is not assumed, why is it that we do not perceive an object where it is actually located in such cases in which refraction is involved?

reflected directly from its surface to our eyes, while the other part is seen by rays refracted by it (the rays passing through the water). But we say that the spoon appears bent, and therefore that the bent spoon is an appearance, thus assuming that the causal "spoon" is straight and not bent, otherwise the bentness would not be only apparent. Thus we assume (1) that the "real" part of the spoon under the water lies in the direction of the part seen above the water's surface, and is there although it is not perceived. And it is the same spoon which is perceivable outside the water, possessing the sensuous characters which we perceive it to possess then, that is meant here. It cannot be said that we are talking of the scientific object as it exists unperceived, because we know nothing of the characters which the causal "spoon" possesses, the place in which it is located, the direction in which it lies, its position from other scientific objects (the causal "water", "glass", etc.). Thus we are committed to a realistic assumption, without which we cannot speak of the spoon as apparently and not really bent when in water. (2) Speaking of scientific objects — how do we know that scientific objects possess such properties in virtue of which they change the direction of light-rays¹⁰? (or to reflect light-rays in cases of reflection). (3) Since the position of every part of the perceived apparatus used: the spoon above water, the spoon under water, the water, the glass container, differs from the position of its cause (scientific object), how can we relate

¹⁰It may be said that these things are known through scientific inquiry, and that science deals with "scientific objects". However, it will be seen in the next chapter that science does not deal with "scientific objects".

these distinct percepts to one or more scientific objects supposed to exist in positions corresponding to the positions of these percepts from each other? How do we know that we have one scientific object which is the cause of the straight part of the spoon and also of the bent part, and therefore that the causal spoon is straight, and lies in the direction in which the part of the spoon above the water lies?

Again, consider the dualist's argument from qualitative relativity associated with change in or of the intervening medium. In order that the light-rays may be causally affected by the intervening medium, the medium as a scientific object must lie (a) between the causal object and the percipient as a scientific object, and (b) on the straight line joining them. For these things to be the case, either (1) the object, the medium, and the percipient as causal objects must be situated where the perceived object, the perceived medium (assuming that it is a perceivable medium such as a lens, a coloured glass, etc), and the perceived observer are situated, respectively. For the perceived object, medium and percipient lie in a straight line. Or (2) the scientific objects involved in the causal transaction must lie in a straight line, and in positions corresponding to the positions of the perceived object, medium, and percipient from each other; i.e. the causal medium must be between the causal object and the causal percipient. Or (3) the perceived object, medium and percipient are themselves the causal objects. Now there is no evidence whatsoever that the scientific objects — the causal object, the medium, and the percipient, are situated either where the

perceived object, medium, and percipient are located, or that they occupy corresponding positions from each other in physical space. The dualist cannot say that there must be a spatial positions of the percepts from each other and the positions of their corresponding causes. For the validity of the generative causal theory of perception itself is now being examined. We do not have as yet the generative causal theory of perception as an established theory. The grounds of this theory itself are being examined. Hence, either we make an unwarranted assumption, or we are obliged to fall back upon (3) and regard the perceived object, the perceived medium, and the perceived percipient, as causal entities, and as the objects which are involved in the situation involving qualitative relativity with change in or of intervening medium. And such a view is unfavourable for dualism.

Again in the case of mirror-images the dualist makes the same assumption that he makes in cases of reflection and of changes due to intervening media. The causal "mirror" and the causal reflected object must lie either where the perceptual mirror and the perceptual "reflected" object lie, or in corresponding positions in physical space; or else the perceived object and the perceived mirror must be causally responsible for the reflected image. And as in the case of refraction and change due to intervening media, it is the perceptual objects which are (perceived to be) located in such a manner as to satisfy the conditions necessary for refraction, change due to media, and reflection, in accordance with the laws of optics, so that refraction, reflection, etc. ensues. Thus it seems to me that

in all dualistic arguments from reflection, refraction, and change due to intervening media, the dualist's method lies in utilizing perceptual objects as though they were the causal objects, so far as their positions from other perceptual objects are concerned, applies to them the laws of optics on the basis of that provisional numerical identification, and as a result the perceptual object is seen to be numerically distinct from the causal object, and therefore not the object which was all the time being considered, but merely a subjective effect of it;

This brings us to a fact which deserves attention in a discussion of the methodology of dualism. It is to be noted that ignorance of anything other than perceptual object, which as we saw, works against the dualist in such situations as involve refraction, reflection, etc., in his attempt to establish his position, becomes an asset to him once his position is established.

THE PERCEIVED WORLD AND
THE WORLD OF PHYSICAL SCIENCE

We have seen in Chapter Three, in analysing the assumptions and presuppositions of dualism concerning science, that dualism conceives the subject-matter of science to be the external world existing independently of its being perceived by sentient beings, as it is in itself. And since the world of "scientific objects" which dualism arrives at through analysis of immediate experience and through the Causal Theory of Perception is for it the world as it exists independently of perception, dualism identifies the subject-matter of science with the world of "scientific objects". And hence scientific knowledge is considered knowledge of "scientific objects".

In order to make clear at the outset the aim of the discussion in the present chapter, I shall put down what it does not propose to do. (1) I shall not attempt to discover whether the findings of physical science are independent of the percipient organism: either of his spatio-temporal standpoint, or of the methods of his observation, or of his physico-physiological make-up, or of his awareness¹; or whether they are conditioned by any or several or all of these factors. In other words, I shall not enter into the controversy between the dualist and the Objective Relativist². (2) Nor will I assume either that perceptual objects are conditioned by the percipient event or/

¹ Assuming for the above discussion that it is possible to find out whether anything exists independently of awareness or not.

² Cf. Lovejoy, A.O., The Revolt Against Dualism, ([N.p.], 1930), Chapters III and IV.

and by the percipient organism's spatio-temporal standpoint, or are not so conditioned. (3) Nor shall I attempt to discover the nature and status of the so-called entities of physical science. What I propose to do is to attempt to find out whether or not physical science goes beyond the perceptual world in actual practice, in the sense that it deals with (or more exactly discovers, or necessitates the existence of) entities which belong to another order of reality than the perceptual world; whether physical science is concerned with anything non-perceptual in the sense of something not continuous in nature with, anything different in kind from, the perceptual world. The discovery that the results of science are conditioned or are not conditioned by cognition or observation, etc. does not enable us to identify or to differentiate the order of existence which science deals with with the perceptual world, unless it is first held that perceptual objects are or are not conditioned by cognition or observation, etc. And I do not desire to assume in the present chapter either position. The discovery that the results of science are conditioned by cognition or observation, etc. does not prove, however, (assuming to begin with that perceptual objects are conditioned by cognition, observation, etc.) that there are no entities existing independently of cognition, observation, etc. Thus it does not prove that the "scientific objects" which dualism posits do not exist. What the above would prove is that if there are such entities, neither science nor anything else can tell us what their nature is. They must remain forever unknowable.

The basic issue in the present work being what it is,

and the inquiry in the present chapter being the discovery of the bearing of an investigation of science on this issue, I would be begging the question if I were to approach the present inquiry with a preconception one way or another. What this inquiry aims to discover is whether an investigation of science lends support to the dualistic contention, or weakens it, independently of any metaphysical viewpoint; i.e. on the strength of science qua science. It is apparent that starting from a specific metaphysical standpoint science itself can be interpreted in accordance with that metaphysical standpoint. But such a procedure is useless for my purpose.

The problem of the nature of the "entities" of science: electrons, protons, or electron waves and proton waves, photons, etc., is a central problem in the philosophy of science, and an answer to it is a central task of any interpretation of science. A complete account of the relationship of percept-objects to the "entities" of science should include an answer to this problem. But for the purpose of the present work such an attempt is not necessary; moreover, it will carry us beyond the scope of the present work. I shall not therefore enter into this question.

It is a commonplace that science starts from sense-data, that its hypotheses are based on these data, that these hypotheses are verified by reference to them by testing the capacity of the hypotheses to predict new sense-experiences in certain specific patterns (experimentation), that it discovers new facts again by the use of experiments and instrumental aids which terminate in sense-data, and that the results of science, and the principles discovered explain, or attempt

to explain, the world of sense-experience. But all these facts do not as such prove that science deals solely and exclusively with the world of experience. Nor does the conception that science deals with the problematic as against the unproblematic in experience, or that science is predictive of future experience for the guidance of action prove the above contention. All these facts can be interpreted dualistically as well as non-dualistically; moreover, as such they do not touch the crucial point in the problem.

In order to answer our question we have to discover the manner in which scientific entities and principles are arrived at: the various stages which are passed through from the concrete data of experience to these entities and principles. This will enable us to know the exact type of relationship holding between these entities (or the class of such entities) and principles on the one hand, and the data of experience on the other.

In seeking for the unifying principles of things science starts by significant observation, isolating certain characters of experienced things as relevant to a particular problem it is seeking the solve from other characters considered as irrelevant. Such an isolation of characters from the concrete manifold of experience is of two sorts, so far as this activity of science is concerned: (1) the abstraction of characters which are relevant for a particular problem in hand from characters not relevant for that purpose; and (2) abstraction of certain types of character as relevant to science qua science, from other types of character which are completely disregarded in science qua science.

The meaning of the first sort of abstraction may be clarified by an illustration. Suppose that we are interested in discovering the laws governing the periods of pendulums. We measure the periods of a number of pendulums of different lengths but with bobs of the same material, and of ones of the same length but with bobs of different material. We find that the periods of the first groups of pendulums vary from one to another, while they are the same for all of the second group. We infer from this that the length of the pendulum is an essential, determining, or relevant factor in the consideration of the period; but not the material of the bob. The material of the bob is therefore disregarded while the exact relation of the length to the period is investigated. And when the more exact relationship is found, this relationship connects length and period, but not period and the material which the bob is made of. In another instance length may be irrelevant, and other characters may become relevant. And so on.

The second sort of abstraction, which is what concerns us in the present chapter, is the complete disregard of colours, odours, tastes, sounds: in general the so-called secondary qualities, as irrelevant to scientific inquiry. It is true that optics and acoustics for instance speak respectively of certain wave-lengths of light rays as the physical causes of certain colours, and certain wave-lengths of sound vibrations as those of certain sounds. But this way of distinguishing wave-lengths is indulged in for purely human reasons: because these wave-lengths happen to be

ones appreciated by our sense-organs. But so far as optics and acoustics, and physical science in general are concerned, the secondary qualities are disregarded so far as investigation into the nature of the external world is concerned.

The disregard of secondary qualities by science may be thought of as due to the elimination of these qualities from the external world, since these qualities were explained — or believed to be explained — in terms of motion of extended particles of matter, in general, in terms of the primary qualities. But the latter can itself be considered as a consequence of the former, and not the cause of it. The logical common cause both for the disregard of the secondary qualities in science and for their elimination from the external world, seems to me to be possibly the common-sense conception that qualities are attributes inhering in a substratum. Interaction takes place between substrata and not between attributes. The attributes are modified or changed as a result of such interaction. But substrata interacted by virtue of their extension and motion and solidity in impinging upon one another. Objects are coloured extents, and not extended colours. This attribution of a superior status to the primary qualities, particularly extension, hardness, motion and size, as against the secondary qualities, is probably due to the fact that tactual perceptions give us (for common purposes) the criterion of the substantiality, the concreteness, the reality of things, and it is the primary qualities, as against the secondary qualities, which are tactually perceived. Thus it seems that there was no need for Galileo's and Newton's reduction of the secondary qualities in things to certain mo-

tions of particles (or for the same thing by Descartes and Locke in philosophy) for the secondary qualities to be disregarded in science.

Now although the notion of the interaction of bodies by virtue of their primary qualities puts the emphasis in the wrong place, namely on the primary qualities, and not on the interaction, it gives us a clue to the nature of scientific inquiry. The general problem in scientific inquiry is to understand all the properties of things (i.e. the nature of things) in terms of the dynamic relationships into which things enter, and not to account for certain qualities in terms of other qualities. Thus though the understanding of the properties of things is the end of scientific inquiry, this end, is reached through an understanding of the relationships between things. And for that purpose the secondary qualities as specific, individual characters, are disregarded. Science therefore is not interested, in the sense explained, in the characters of things qua characters. It is not interested even in the primary qualities as qualities. It turns to the behaviour of things. What science seeks primarily is to discover the causal relationship between things. And this relationship involves the study of things as interacting, behaving, and not simply as possessing stable characters. Characters are specific, individual; interaction involves relatedness, which is what is sought in science. Hence science comes to explain the characters of things in terms of their behaviour. It is not extension which accounts for colour, but the motion of particles which have extension. In the present century it has

been found that the primary qualities themselves: motion, extension, hardness, which still characterized the ultimate units of things up till the end of the nineteenth and the beginning of the twentieth centuries -- Dalton's hard billiard-ball agitated atom and even the (later) solar-system Bohr atom -- are not as primary as they were supposed to be, and they came to be considered as the effects of entities which are not extended in space. Extension -- whatever extension the electron waves have in wave mechanics³ -- motion, mass, and the other properties associated with matter become manifestations of energy, to which the so-called ultimate units are reduced. The point to note here is that this progressive elimination of sensible qualities from the entities of science is the logical conclusion of scientific procedure itself. Once science has started to account for the characters of things in terms of relations between the things possessing these characters, this procedure will result finally in accounting for all characters -- at least the sensible ones -- in terms of relations which, being relations, do not possess such characters themselves. This agrees with Dewey's conception that

...science by means of its operational conceptions

³The electron waves are not really waves spread in space. In quantum physics a wave denotes no more than the probability that a certain state exists. Thus an electron wave is the probability that an electron is present in a certain region. See Planck, M., The Philosophy of Physics, (New York, 1936), p.67; Jeans, J., The New Background Of Science, (New York, 1934), pp.226-227, 291. But of course the electron as a particle, or as exhibiting the properties of a particle, has some extension.

was instituting as its objects of thought things in a dimension different from any of the direct qualities of objects. It was not a question of getting rid of some immediate sense qualities; but of a treatment indifferent to any and all qualities⁴.

But the curious thing is that this "treatment indifferent to any and all qualities" did result in "getting rid of some immediate sense qualities" from the external world. The relegation of some sense qualities to the subjective realm, if valid, entails the subjectivity of the other sense qualities also. Locke's type of "half-way house", as Russell calls Locke's position, is not tenable. This criticism came from philosophy, basing itself on the premises of Locke's view and the view of the classical scientists. Berkeley accepted the relegation of the secondary qualities to the subjective realm, but held that the primary qualities also are subjective.

On the basis of the causal theory of perception this is simple. All the qualities which we perceive, whether "primary" or "secondary", are effects in us of external causes numerically distinct from the effects. Berkeley did not reach his conclusion in this manner, and therefore his relegation of the primary qualities to the subjective realm did not leave the possibility open — as did the causal theory of perception, for the existence of external physical causes which may be qualitatively similar to those characters in the subject, though they are numerically distinct from them. Indeed, Locke lends himself to being interpreted as expounding precisely this view. The contemporary dualists retain this general position though

⁴ Dewey, J., The Quest For Certainty, (London, 1929), p.117.

they do not necessarily subscribe to Locke's portioning of qualities between "ideas" and their external causes: the "secondary qualities" to the former and the "primary qualities" to the latter, respectively. And it is on the basis of this type of interpretation of the relationship between perceptual objects and their external causes, (and not on the type of interpretation embodied in the theory of psychic additions, as Whitehead calls it), that dualism maintains that science deals with objects which are numerically distinct from what we experience. I want to emphasize the fact that this conception of the objects of science seems to me to be confusing between the indifference of science to sensible characters by the nature of the task and by the nature of its understanding of the task it sets for itself and the elimination of sensible characters from the things which it deals with. The matter may be put as an Either/Or. Either science is conceived to be concerned in its operations with relations between things and not with objects as such, and then its disregard of sensible characters can be explained without subjectivizing these characters; or it is conceived to be concerned in its operations with objects and the sensible characters of objects as such, and then its disregard of sensible characters cannot be explained except by subjectivizing these characters. The curious thing about the latter attitude is that science sets out (as its end) to account for the sensible characters of and find out the relationships between things; and the consequence of its endeavours is to deny that the characters exist at all in the realm in which it operates! Science itself works in practice as though the secondary qualities are in the objects it investigates.

It was said before that the causal relationship is the basic relationship in terms of which science attempts to account for the characters and behaviour of things. Causal action itself is a non-sensible matter. We do not perceive the actual action of one body upon another; but we associate causal action with motion and qualitative and quantitative change which are perceivable. These happenings come to be considered as manifestations of causal action, believed to take place through the agency of forces. The notion of a force itself first arises from the awareness of muscular tension associated with the pull and push of things. But the notion of force is itself a concept, and soon becomes involved in the complexities of physical relations expressed in mathematical equations. And in the latest developments of physics even the classical conception of force is abandoned⁵. Hence from the start the investigations of physics lie outside the sensible aspect of experienced things, by which I mean that physics deals with the aspect of things not comprised simply by the sensible characters in which I include here the primary qualities. The realm of science includes the perceived but goes beyond it. Hence it is not to be expected that everything which science arrives at throughout its investigation of forces acting causally, and everything related to them as forces, or which comes up in the process of their analysis, must have a sensibly representable counterpart or itself be sensible. This is particularly true in the case of the mathematical expres-

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See Russell, B., The ABC Of Relativity, (New York, 1925), Chapter XIII.

sion of the relationships involved, where purely mathematical (not even physical) processes and relationships of derivation, transformation, etc. are concerned. But though these factors themselves are not sensible, and however abstract⁶ they may be in their formulation, those of them which comprise physical and not purely mathematical relations retain the same relationship they had to sensible things from the start. For it is in the order of discovery, logical derivation and knowledge that they become increasingly abstract as their ultimate and most exact formulation is more and more closely approximated, and not in their nature itself. Objects are the relata of the interacting forces; and the behaviour and states of objects are sensible manifestations of these forces. Scientific analysis of forces gives us the manner of and the factors involved in their operation, and the nature of the relationships of these factors to one another and to the total forces. The forces are specific, particular, in the sense of being relations holding between specific objects. But science is not interested in these forces as particular relations. It is interested in the class (and the classes of classes) of such relations and in the classes of objects between which these relations hold, Hence the behaviour of a particular object, which in accordance with certain (classes of) forces is said to be an instance exemplifying these (classes of) forces; and the specific forces involved in the behaviour of the object concerned an instance of the (classes of) forces. And in verifying the prin-

⁶In the sense in which concepts are said to be mathematically or logically abstract or more abstract than other concepts.

ciples discovered, science resorts ultimately to the sensible exemplification of these principles. It observes whether under the conditions specified as necessary for the presence of these relations, the sensible manifestations arise or not. Thus the procedure involved in the verification of principles (hypotheses) is the reverse of the procedure involved in discovering the principles, where the question, put in its ultimate form is:- "Given certain specific data of experience under certain conditions, what are the causal relationships involved?"

I have mentioned the concepts of length and force in my foregoing discussions. The other basic concepts of physics also are based on sense-experience; but as concepts, they stand for no specific sense-character in particular. Their universal, abstract and non-quantitative character enables them to be related to other concepts, while the specific instances which these concepts stand for are quantitatively specific. But the connection of these concepts with sense-experience is never lost, since translation — directly or indirectly ~~to~~ into a particular instance is possible.

From what has been said hitherto it is seen that the principles of science deal throughout with and are intended to explain the nature of perceptual objects, though for that purpose science investigates relationships between objects which are not sensible. The only perceived relation between objects is the spatial relation⁷, which does not, as spatial, account for

⁷Temporality is not a perceived character and relation. It is inferred from all forms of change, external (i.e. physical) and internal (flow of feelings and thoughts).

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the existential relationships between things. But the spatial (and also the temporal) framework becomes in science a framework within which causal relationships are placed, and the metrical aspect of space (and also of time) becomes a factor in determining the quantitative aspect of causal action. Thus spatial (and temporal) closeness and spatial (and temporal) separation determine the presence or absence and the intensity of causal action⁸. Note that nowhere in the analysis of the derivation of scientific principles a jump is involved from the perceptual world to another world. The laws of science are all intended to explain the observed phenomena of perceptual objects, whether these phenomena are observed under natural conditions or under artificially-devised ones. The astronomer identifies his heavenly bodies with the perceptual objects he observes through his telescope and calls "planets", "stars", "nebulae", etc. And to "explain" the behaviour of perceptual objects does not mean here the tracing out of the behaviour of another order of objects which are the causes of perceptual objects and of their apparent behaviour. The scientist takes the observed motion, interaction, etc. of perceptual objects as real, and not as apparent. If scientific laws are not the laws of the perceptual world, i.e. if perceptual objects do not behave as these laws specify, which follows if we accept a dualistic position, it follows either (1) that perceptual objects behave in accordance with other laws than the laws of science; or (2) that perceptual objects behave in accordance with no laws at all, simply because they do not be-

⁸See Chapter II, section on action at a distance.

have in any way at all. If we assume (1), it follows that the laws of science do not explain the phenomena of the perceptual world and are useless, therefore, while it is the purpose of science, even if it has other aims also, to explain the phenomena of the experienced world. Moreover, if these laws do not account for the phenomena of the experienced world, scientific objects (which behave in accordance with these laws) cannot account causally for the phenomena of the experienced world, and the experienced world would remain unexplained. If we take the other alternative (2), what grounds would we have for attributing to the world of scientific objects all the laws which science considers to be the laws of nature, if what occurs in the perceptual world is the generation of perceptual objects in specific regions of mental space, and the annihilation of these objects? What in these occurrences necessitates the attribution to scientific objects of all the various and numerous laws of the various physical sciences? If the observed behaviour of experienced things is only apparent, the laws inferred from this behaviour would also be apparent laws, fictitious laws applying to nothing existent. It may be said that this conclusion does not follow. Hallucinations are explained in terms of certain physiological and psychological principles, but these principles are not the principles according to which the objects in the hallucination appear to behave, which behaviour is of course non-existent. The pink rats in an hallucination may be seen by the alcoholic to crawl towards him, to jump about, perhaps to fly. In answer to this it may be said that even if phy-

biological and psychological principles can explain why and how an hallucination should occur, and why pink rats and not bats or serpents should be seen, and perhaps even why the rats should be seen to jump or crawl or fly, still these facts can be explained because we already have at our disposal the laws of physiology and psychology, derived not from the analysis of the content of hallucinations, but from other facts involving the alcoholic subject himself as an object of science. No amount of analysis of the behaviour of the rats in the alcoholic's hallucination without a knowledge of the behaviour and the laws governing the behaviour of any other existent things, things in the world of experience in the usual sense of the term "world of experience", can reveal anything of the physiological and psychological causes of that hallucination, nor even suggest to us that what is experienced is an hallucination. And the same is true in the case of the perceptual world: no amount of the analysis of the perceptual world can give us the laws governing scientific objects and thereby governing perceptual objects if the behaviour of perceptual objects is apparent and not real. And an analysis of the perceptual world is the only means of discovering these laws.

The dualist may reply that even if it is granted that the above would follow if change in the perceptual world is only apparent, this would be the case provided that we are analysing only the perceptual world itself. But that is where the error lies in the above argument. Science deals from the very start with "scientific objects" and discovers the laws which govern their behaviour. It is only because

"scientific objects" are unperceivable that science has to resort to perceptual objects and discover these laws through them. However, this does not seem to me to overcome the difficulty, since in order that the laws of the physical world may be discovered through an analysis of the perceptual world, the perceptual world should be really as it appears to be.

The dualist would answer that since there is a ~~one-one~~ causal correspondence between experienced things and scientific objects, to assume that scientific laws are the laws of the perceptual world comes to mean actually that these laws hold between scientific objects. There is no harm in considering provisionally that perceptual things are causally efficacious and their behaviour is real and not apparent, since by using perceptual objects we arrive at the laws governing the world of scientific objects. The dualist may add that the above may be objected to. It will be said that we do not know a priori whether there is one-one correspondence between causes and effects. Causality is discovered through an analysis of the perceptual world, and the nature of the relationship between cause and effect is discovered in the same way. If we assume provisionally that scientific laws deal with the experienced world, we have to assume the same concerning causality. But in scientific practice there is no such thing as this provisional examination of the experienced world, resulting in the recognition that the principles of science really apply to "scientific objects". The dualist would answer that this is true, but for a different reason. He will say that there is no such transfer of the scientist's ideas

because the scientist deals from the very start with scientific objects, whether he knows it or not. But this brings us back to the same objection against the dualist's contention which the dualist's above account is meant to overcome. The objection still remains, since even if science deals throughout with scientific objects, the perceptual world has to be what it appears to be in order that an analysis if it may yield knowledge of scientific objects.

It may be noted that the same methodology is used here by the dualist as elsewhere. Dualism utilizes the properties of the perceptual world, transfers these properties to scientific objects, and then denies these properties to perceptual things. Now what is the justification for such a procedure? Dualism denies objectivity to perceptual objects on the ground that their objectivity would involve a violation of the law of contradiction. But what logical absurdity follows if we assume that perceptual objects are causally efficacious, even if we assume that they are conditioned by awareness? The results of physics arise by direct inference based on statements involving sense-data, and not by inference based on reductionem absurdum from them. Hence if science (interpreted dualistically) makes the above-mentioned characters of perceptual objects mere appearances, it undermines itself, and not the reality of these characters of perceptual things. Thus Russell says:

An argument designed to prove that a proposition is false is not invalidated by having that proposition among its premisses. Hence if modern physics invalidates perception as a source of knowledge about the external

world, and yet depends upon perception, that is a valid argument against modern physics⁹.

And Whitehead says: "Our problem is, in fact, to fit the world to our perceptions, and not our perceptions to the world"¹⁰. The motion, the change we perceive in the perceptual world is an undeniable fact, whether appearance or no appearance. Any hypothesis concerning these facts is epistemologically posterior to these facts, and cannot have an equal or greater probability of being true than these facts. Russell, in the passage referred to above, continues:

I do not say that physics in fact has this defect, [i.e. "that it invalidates perception as a source of knowledge about the external world"] but I do say that a considerable labour of interpretation is necessary in order to show that it can be absolved in this respect. And it is because of the abstractness of physics, as developed by mathematicians, that this labour is required¹¹.

For Russell, percepts are physical entities existing in physical space: each percept is an event or a group of events which belong to one or more groups constituting an electron¹². These percepts are arranged in a pattern which physics finds¹³. They have an influence on other percepts ("appearances"), causing them to depart from what they would be if they followed the laws of perspective strictly¹⁴. Thus percepts are part of the physical world, and there is no ontological dichotomy

⁹Russell, B., The Analysis Of Matter, (London, 1927), p.137.

¹⁰Whitehead, A.N., The Aims Of Education And Other Essays, (New York, 1949), p.166.

¹¹Russell, B., The Analysis Of Matter, (London, 1927), pp.137-138.

¹²Ibid., p.320.

¹³See Russell, B., The ABC Of Relativity, (London, 1925), p.191.

¹⁴See Russell, B., The Analysis Of Matter, (London, 1927), pp.259-260.

between percepts and "scientific objects" so far as the order of existence to which they belong is concerned. And since we do not know the intrinsic nature of scientific objects, we do not know whether it is very different from that of percepts.

Thus to quote Russell again:

The gulf between percepts and physics is not a gulf as regards intrinsic quality, for we know nothing of the intrinsic quality of the physical world, and therefore do not know whether it is, or is not, very different from that of percepts. The gulf is as to what we know about the two realms. We know the quality of percepts, but we do not know their laws so well as we could wish. We know the laws of the physical world, in so far as these are mathematical, pretty well, but we know nothing else about it. If there is any intellectual difficulty in supposing that the physical world is intrinsically quite unlike that of percepts, this is a reason for supposing that there is not this complete unlikeness. And there is a certain ground for such a view, in the fact that percepts are part of the physical world, and are the only part that we can know without the help of rather elaborate and difficult inferences¹⁵.

Furthermore, Russell believes, with Whitehead, that the world of physics is a construction from the world of experience, and not an inference from it¹⁶. Thus in Russell we have an epistemological dualist who does not bifurcate nature into two orders as Lovejoy, for instance, does. Hence the criticism made on page seven does not

The whole foregoing discussion has been an attempt to prove that the laws of science are the laws of the experienced world. If this is true, it is more obvious of the laws governing comparatively large bodies than of those governing atomic and sub-atomic bodies. But if the principle is true in the

¹⁵Ibid., p.264.

¹⁶Russell, B., Our Knowledge Of The External World, (London, 1915), Preface, p.vi.

former case, it is also true in the latter case, since the laws governing the behaviour of comparatively large bodies are approximations to the laws governing atomic and sub-atomic bodies¹⁷.

This brings us to the second part and to the more crucial aspect of the problem in hand. If the laws of science, including the laws of the sub-atomic world, are concerned throughout with the experienced world, then the atomic and sub-atomic "entities" which physics deals with must have a place in the experienced world itself. But if this is the case, how shall we account for the essential differences between these entities and experienced things? In other words, how is it possible to fit in the electrons, protons and photons with patches of colour, odours, hardnesses, motions and sounds in a consistent scheme? How can we place such disparate entities in the same spatio-temporal and causal framework? The dualist answers these questions in the negative: they cannot be put within the same order of existence. The dualist puts the ultimate entities of science over against the perceived entities as cause to effect, as objective to subjective.

We have examined how scientific principles are reached starting from sense-data. I shall now proceed in the same way to trace out the path by which, starting from sense-data, the ultimate entities of physics are reached. Actually, the

¹⁷See Edington, A., The Philosophy Of Physical Science, (Cambridge, 1939), p.29;

¹⁸Whitehead, A. N., An Enquiry Concerning The Principles Of Natural Knowledge, (Cambridge, 1925), pp.17-18.

two issues were involved indiscriminately, scientific principles. I spoke in that connection of the reduction of objective reality to particles in motion in terms of which the so-called secondary qualities were explained, and of the attenuated forms which these particles have taken in contemporary scientific thought. But the interweaving of the two issues in the discussion is no accident. It is a result of the fact that the two issues are closely connected, as will be shown presently. If it is true that the immediate concern of scientific inquiry is to discover the ground for the behaviour of things in terms of universal principles, the fact that science posits certain entities as the ultimate constituents of reality is seen to be not the result of a belief on the part of science that the things we experience are not real, or are not ultimately real (whatever that may mean), and therefore the result of a desire to find something real or ultimately real in lieu of the things we experience. The positing of these ultimate entities results from the belief of science that the ultimate relationships underlying experienced things and their behaviour is better explainable if experienced things are regarded as composed of these ultimate entities, and that the relationships are determined with greater exactness and precision than otherwise. This is again seen by considering that it is experienced things themselves that are composed of these ultimate entities. The atoms and molecules of a perceived object are conceived to be located in the same region of space as the object itself. Science speaks of tables, chairs, books, men, air, etc. as "composed of" atoms and molecules, and it means literally the tables, chairs, books, men, air, etc. which we experience.

It does not put as distinct entities the atoms and molecules "composing" the table over against the perceptual table; the atoms and molecules as the causes of the perceived table. It is essential to keep this in mind, since it is important for the discussion which follows. The fact that science has altered and may alter again its conceptions of the nature of these ultimate entities is due to its discovery that these entities posited as of a given nature fail (as conceived) to fulfill perfectly the purpose for which they were posited, namely, to explain all the phenomena in the experienced world.

The desire of science to find unifying principles in terms of which all phenomena can be explained manifests itself also in its desire to find ultimate entities in terms of which the constitution of all the objects in the universe can be explained. Again, the investigation of the relationships between objects involves the investigation of the nature of these objects as entities possessing a certain nature, since relations constitute a part of the nature of what is related. Thus the two issues: the ultimate nature of things and their ultimate relations are seen to be interrelated. And these two aspects of scientific inquiry converge and are consummated in the discovery of ultimate constituents of all existent things between which the ultimate relations expressed in scientific laws hold. And this is actually what modern science has been doing, resulting in positing electrons, protons, and photons in terms of whose activities and interactions all the phenomena in the universe are believed to be explainable, though our knowledge of these entities is not final (nor can it ever be final) and therefore our ability to explain all the facts in the universe

is far from complete or perfect.

The breaking-down of things into increasingly smaller units serves the unifying aim of science by explaining the qualitative and quantitative heterogeneity and variety in things in terms of one or a few kinds of qualitatively and quantitatively homogenous units. The qualitative and quantitative heterogeneity of and variety in things and of their behaviour then becomes an effect of the various ways in which these homogenous units interact (the province of physics and chemistry primarily). Thus metaphysical heterogeneity, specificity, plurality become effects of metaphysical homogeneity, universality; and hence derivative and not ultimate. The qualitative and quantitative diversity manifested in a certain finite (though vast) number of actual instances which as specific and individual are brute irreducible facts, is translated into the behaviour of a much greater number of homogenous units of a few kinds. Thus science finds the universality and uniformity it seeks both in the nature of things and in their behaviour. But in this passage from the sensible things to their "constituents" by continuous sub-division, certain changes are introduced unnoticed into the picture which raise difficulties when made explicit. I said that science arrives at its ultimate units by a process of subdivision of perceptual objects. It is to be understood that by this I do not mean actual but conceptual subdivision. This means literally that the ultimate units are regarded as the constituents of things: These bodies are "composed of" the ultimate units, and in the process of arriving at these units there is no discontinuity in kind between them and

the bodies as a whole. As a matter of fact there is a direct qualitative similarity between the two: the particles are extended, impenetrable (or "solid", in Locke's sense of the term "solidity"). Sub-divide an extended body and you always get extended divisions¹⁸. Now since for science an object is the sum-total of its constituent atoms related in certain ways, the question as to what the object is in itself, considered as a unit, and not as a swarm of atoms has no meaning. But such a question is relevant in philosophy, because an object as perceived is not a swarm of atoms, but a certain coloured extent of a certain shape and size, hard or soft, sounding, odorous. And objects as perceived fall within the domain of metaphysical inquiry. And this discrepancy between the swarm of atoms and the perceived object gives rise to the conception that the perceived object is subjective (dualism). And here the exponents of such a conception seize upon another factor introduced by the scientific translation of an object into a swarm of atoms, namely, the causal relationship between the sensible object and "its" constituent atoms. The perceptual object, so long as it was not broken down into ultimate units, could be considered as causally efficacious, and interaction regarded as occurring between perceptual objects. But when perceptual objects are broken down into atoms, the causal efficacy of the perceptual objects is transferred to these atoms, precisely because these constituted the perceptual object. But this does not raise any difficulty in science itself, any more than does the regarding

¹⁸ See Locke, J., An Essay Concerning Human Understanding, (Oxford, 1894), Book II, Chapter VIII, 9.

atoms as constituting perceptual objects. But this introduces another complication in the metaphysical problem noted above: not only is the perceptual object an entity distinct from the atoms, but it is not causally efficacious. Dualism, seizing upon this assumption, declares that the perceptual object is the effect of the causal action of the atoms; and hence it is subjective: it is the effect of the action of these atoms on us. Thus in a curious manner the causal perceptual object which science starts with and tries to explain in terms of ultimate units becomes a derivative entity in the process and its own constituents are set over against it as the ultimately real entities, loses over its causal efficacy to them, and is ousted from the external world by being made a subjective effect — and all this as a result of the premise that these units constitute the perceptual object, and therefore it is they that give us the ultimate nature of the perceptual object; i.e. that they are numerically identical with the perceptual object.

The metaphysical cleavage between the sensible objects comprised by all their sensible characters and the swarm of constitutive atoms did not happen all at once, but in stages, historically speaking. The breaking-down of objects into atoms became a source of cleavage in two ways: the secondary qualities were eliminated from the external world by being accounted for in terms of the primary qualities; and the primary qualities themselves as perceived became distinguished numerically from the unperceived primary qualities of the constitutive atoms. The elimination of the secondary qualities

brought about the first stage of cleavage between perceptual objects and atoms; and the distinction between the primary qualities of perceptual objects and the primary qualities of atoms the second and final stage of cleavage, so far as philosophy is concerned. The theory of psychic additions, which science has held implicitly since Newton and Galileo, saved the situation for science (though not for philosophy) so far as the first stage of cleavage was concerned. The colour of a perceptual object is not possessed by the constitutive atoms, which is equivalent for science to saying that they are not in the object itself, but we perceive the colour as if it were in the object. I said that this saved the situation for science, but not for philosophy. This is because science could continue to work as though the secondary qualities were in the objects it deals with, since these qualities are irrelevant to it so far as its actual work is concerned. But for philosophy a chasm is already established between the secondary and the primary qualities of objects.

Similarly, the theory of psychic additions continues to preserve the continuity between perceptual objects and atoms, so far as science is concerned, even at the second stage of metaphysical cleavage between perceptual objects and atoms. The perceived object, so far as its primary qualities are concerned, is still considered the object science deals with so long as the differences between its qualities and the qualities of atoms are not considered (first stage). But when it is considered that the atoms are discontinuous, though extended, while perceived objects possess continuous surfaces,

perceptual objects are seen to be numerically distinct from atoms (second stage). And on the basis of the causal theory, all perceived characters become the subjective effects of the (objective) atoms. The reason why the theory of psychic additions continues to preserve, in science, the continuity between perceptual objects and scientific entities is due simply to the fact that science continues in actual practice to assume that the atoms constitute the perceptual object, without concerning itself with the philosophical implications of this assumption. And this continuity is not affected by the recent developments of physical theory (quantum physics) in which atoms become more disparate qualitatively than the atoms of classical physics. But this increasing disparity threatens to sever the causal link between the atoms and the perceptual objects — at least so far as the theory that "like causes like" is concerned — which dualism posits. The coloured extents of various sizes and shapes, hard or soft, sounding, warm or cold, odorous, are a far cry from their supposed causes, the electron and proton waves of wave mechanics.

It is said that science starts with the assumption that atoms are the constituents of experienced things; and the consequence of holding this view, when its metaphysical implications are drawn out, is the negation of the view itself: the atoms become numerically distinct entities from perceptual objects and no longer "constituents" of any such objects. The obvious inference to draw from this outcome is that the argument is a reductio ad absurdum argument, and undermines the premise from which it started: atoms are not the consti-

tuents of perceptual objects. But this does not demonstrate that there is a discontinuity in kind between atoms and perceptual objects. For even if atoms are not the constituents of perceptual objects, still they may exist in the same space and time as perceptual objects. The argument shows that the conception that atoms "compose" perceptual objects does not give the true relationship between the two. This seems to me to spring from a wrong conception of perceptual things and the entities of science, namely the common-sense conception of perceived things as stable objects — a way of looking at things which is applied to the entities of science also. The notion of an "object" is at bottom that of an entity enduring in an absolute time. The duration of objects is duration indifferent to duration. It thus amounts to conceiving things as existing instantaneously. In other words, an object is not a portion or a cross-section of space-time. Even to talk of existent things as constituted by characters which are spatio-temporally and qualitatively interrelated is still to cling to the conception of an existent whose essence is indifferent to duration. A character is a quality whose essence is considered to consist in its being that specific quality and in nothing else; and hence preserving its self-identity from moment to moment. Therefore, whether we hold substantialism or insubstantialism, the notion of an "object" still persists so long as the duration of an entity is not considered as constituting a determining factor in its nature during a given moment.

On the other hand, if things, including the entities of

of science, are conceived as series of interconnected events, i.e. as portions or cross-sections of space-time, then the events of series, or a series as a whole, will not be put over against another event or a series of interconnected events as objective to subjective, or as constitutive of the other event or series of events, though two or more series of events may be interconnected. Thus perceptual events may be considered on this theory as related causally and in nature to events involving instrumental aids to perception and scientific recording instruments, though having reference to different matrices of events. This preserves the continuity between perceptual events and non-perceptual events as arising in the same spatio-temporal and causal framework, and gives us a basis for acquiring knowledge of perceptual events from the analysis of these related events.

To conclude, science investigates the nature of and relations between perceptual objects, and operates wholly within the perceptual world. Hence if another order of existence is posited, as by dualism, this order of existence will be unknowable, so far as science is concerned. And since causality operates wholly within the perceptual world, no inference of any kind can be drawn concerning the nature of entities in the other realm based on causality¹⁹. Hence this order of existence will be unknowable — if posited — not only so far as science is concerned, but wholly and completely unknowable.

¹⁹ See further Chapter VII on the Causal Theory of Perception and on the causal relation between perceptual objects and scientific objects.

SUBJECTIVE AND OBJECTIVE SPACE AND TIME

In accordance with the assumption that there is a causal relation between perceptual objects and scientific objects, the dualist assumes that scientific objects are located in an objective space. But starting with scientific objects the question arises as to the manner in which scientific objects located in such a space cause perceptual objects to be located in a mental space and to be perceived to be located in a space, at various distances from each other. The laws of perspective assert that the perceived size of an object varies with the distance of the observer from the object. The rays of light converging from the ends of the object, whose size is fixed¹, make a certain angle at the retina, which determines the perceived size of the object. The angle made and therefore the size perceived varies as the distance of the observer from the object varies. The distance at which an object is judged to be located depends in part on the size which it is perceived to have, on the nature of its other sensible characters, which may be associated together so as to form an object familiar to the observer², and on the vividness with which

¹The laws of perspective assume that the object possesses a fixed size and volume; and that only its perceived size varies with distance from the observer.

²For instance, a house seen at a considerable distance is perceived to have a small size; and yet normally, we do not judge it to be located at the same distance as objects perceived to have the same size as it which are actually very close to us. The reason is that its sensible characters indicate that it is a "house", and we know from past experience that a house is of a certain minimum size. The house is seen from small distances, and its large size noted. That

these sensible qualities and the shape, are seen. If awareness of distance of objects were solely and wholly the result of unconscious judgments based on the perceived size, characters and vividness of what is perceived, the apprehended location of perceptual objects in a space and at certain distances from one another could be accounted for (and wholly so) in terms of the sizes and relative distances of the causal scientific objects, assuming that the perceived sizes of perceptual objects are a function of the sizes of the causal scientific objects and their distances from the percipient organism and from each other³. But since distance, or the externality of perceptual objects from us is a directly perceived datum, (though the more exact apprehension of the positions of objects is a result of experience, particularly of tactual experience⁴), and therefore are not inferred from the perceived relative size of objects, etc., the sizes and the distances of the causal scientific objects from the percipient organism do not account for the perceived distances of perceptual objects. Nor do I see any other way of accounting for perceived dis-

size is associated with the house as the "real" size of the house; and henceforth all perceived sizes of the houses are compared with that standard size; and the distances are judged by comparing the sizes.

³In other words, if we assume that the laws of perspective apply to scientific objects.

⁴In other words, the externality of perceptual objects from us, and the spatial distribution of these objects, is a direct perception. But the knowledge of the extent, particularly the more exact extent, of the externality, i.e. the measure of the distance of these objects from us, and of their exact distance from each other, depends on experience, and is developed by training. Past experience is utilized for the unaided estimation of distances partly by making

tances in terms of scientific objects.

The same difficulty arises in attempting to account for the actual distances of perceptual objects from one another, whether we assume that the perceived distances of perceptual objects are the same as their actual distances from one another, or not. For it is difficult to see how the directions in and the points at which a scientific object acts upon another scientific object (the percipient organism), and the particular intensity of the force with which it acts upon the latter object (the intensity of causal action being considered to vary inversely with the square of the distance), can be responsible for the locations of the generated perceptual objects in space.

It may be said that at least the extension which characterizes perceptual objects can be explained in terms of the extension characterizing scientific objects, and of their distances from the percipient organism. Assuming that the retina of the eye as a scientific object is extended, different rays of light will stimulate it at different points in a manner which corresponds to the different spatial parts of the scientific object from which the different light-rays come⁵.

Now even if we assume in addition to the above that the various rods and cones of the retina which are acted upon differ in certain respects, and that these differences are

Unconscious inferences from the perceived sizes, vividness, and sensible characters of what is perceived, as described in footnote 2, p. , for instance.

⁵ See Stout, G.F., The Groundwork Of Psychology, Revised by Thouless, R.H., with additions by Mellone, S.H., (London, 1943), p.80.

preserved in the nervous impulses sent to the brain (in other words if we assume the existence of "local signs"⁶), still such differences cannot, simply because they arise from spatially separated cones and rods, be responsible for the extension of the generated perceptual object. "Local signs" are "signs", i.e. they are responsible for our awareness of differences in spatial position of the parts of the perceived object. In the case in hand no such thing occurs, because in this connection if "local signs" are to be of any use, they should make us aware of differences in spatial position of parts of the scientific object stimulating the retina. And this cannot be the case, since according to dualism scientific objects are not and cannot be perceived. "Local signs" do not cause the production of entities characterized by extension; they make us aware of extension which is already existent. The above conclusion is also reached if we consider that the mind, which conditions perceptual objects, is itself unextended⁷.

Now if the perceived extension and the perceived and the actual relative spatial location of perceptual objects cannot be accounted for by scientific objects, it follows that (a) perceived relative location is not the effect of causal activity, but is an ultimate fact in the same sense in which the universe as a whole may be said to be ultimate; (b) assuming the absolutist conception of space, the space in which perceptual objects are actually located⁸ has no corres-

⁶ Ibid., p.81.

⁷ Whitehead considers this fact evidence against the view that scientific objects occupy space. See The Concept Of Nature, (Cambridge, 1926), pp.39-40.

⁸ Since as I showed before, the actual locality of perceptual

vidence to the space in which scientific objects are located;
 (c) that there is no correspondence between the locations of scientific objects in objective space and (i) the perceived, and (ii) the actual, location of perceptual objects.

Since (c) follows if we adopt a relativist theory of space, it agrees with Whitehead's conclusion that on the relativist theory

... there is no pointwise connection between causal space and apparent space and it is meaningless to say that the molecules of the grass are in any place which has a determinate spatial relation⁹ to the place occupied by the grass which we see.

We saw¹⁰ that Whitehead argues that there is no reason why causal nature should occupy volumes of space. And from that consideration, as well as from other considerations, Whitehead concludes that scientific objects are unknowable (except perhaps that they occupy time)¹¹. My point, following from the above considerations, is this:- whether scientific objects occupy space or not, scientific objects cannot account for the fact that perceptual objects are perceived to be located in space. Thus a fact of experience is cut out from the dualist's account, and violence is done to experience. On the other hand, starting from the fact that perceptual objects are perceived to be spatially located, we are not warranted in inferring that scientific objects also are located in space. But even if that is warranted, nothing concerning

objects assuming, as dualism does, that perceptual objects are actually located in space (since it does not distinguish between perceptual space and percept space) — is not a function of scientific objects and their spatial relations.

⁹Whitehead, A.N., The Concept Of Nature, (Cambridge, 1926), p.42.

¹⁰Page 92.

¹¹Ibid., p.40.

the location of scientific objects from one another can follow from the perceived location of perceptual objects from one another. Hence no arguments for dualism which assume a correspondence in spatial position between perceptual objects and the causal scientific objects¹² as a premise can arise validly. If such arguments are to have any validity, they have to assume that we are talking throughout about objects that we can perceive in such cases as those of refraction, reflection, change of or in the medium, etc.

The dualist argues that scientific objects occupy space because perceptual objects occupy space. But the perceptual object is conditioned by the percipient's mind as well as by the causal scientific object or objects. We are faced, therefore, with the problem of determining the contribution of the mind and of the scientific objects respectively in determining the characters of perceptual objects. Is the extension of perceptual objects contributed by the mind or by scientific objects? What about colour, taste, odour, a sound of a specific pitch and intensity; the intensity of colour? Are these characters contributed by the mind, or by scientific objects, or by the two jointly? If jointly, what is the share of each? In general, to quote Whitehead,

... what do we know about mind which would allow us to infer any particular characteristics of a cause which should influence mind to particular effects?¹³

It is not difficult to see that it cannot be argued va-

¹²See Chapter III.

¹³Op.cit., p.39.

lively that colour, taste, odour, sound are subjective because they vary under various conditions, and that extension, figure, size, and motion are objective because they are constant. Such an argument is invalid whether by extension, figure, size (and also colour, odour, taste, etc.) is meant individual extents, figures, sizes (and individual colours, odours, tastes, etc.), or extension, figure, size (and colour, odour, taste, etc.) in general. For it is not true that individual extents, figures, sizes do not vary. And as for extension, figure, size in general, the argument from the fact that objects are always perceived with some extent, possessing size and shape, is not valid, because objects are always perceived coloured as well as extended, etc.

But suppose we use this argument. If it were true that the Lockean so-called secondary qualities vary while the so-called primary qualities do not, would it not follow more naturally that the spatial constancy of perceptual objects is contributed by the mind, the constant factor in the causal transaction, while the variable characters are contributed by the differences in the causes (scientific objects)? — a strange reversal of Cartesian-Lockean reasoning from the same or similar premises, and of the conclusion drawn from that reasoning!

The above criticisms apply in respect to tactual percepts also. For though we do not perceive distances between tactual objects, still we tactually perceive things to be extended and to be variously located in space. As a matter of fact we associate tactual characters with visual characters and

locate the former in the same regions as those which the latter are perceived to occupy.

Speaking of the association of tactual and visual characters, we now come to the analysis of what is involved in such association. I have assumed in the foregoing discussions of visual and tactual characters that our colours and our touches are extended. And it is true, as Alexander holds, that if this is assumed, the problem arises as to the manner in which visual and tactual spaces are correlated, since in that case, visual and tactual spaces are distinct spaces¹⁴. But whether we hold that we apprehend an extended colour or a coloured extent, whether we perceive or we intuit extent¹⁵, so long as we see colours and have tactual presentations and we associate them together in the same regions of space, notwithstanding the fact that on dualistic premises visual and tactual characters are distinct percepts and exist independently of one another, we do correlate tactual and visual characters. And my task here is to discover what principles this correlation of characters involves. Again, we apprehend extent in relation to visual characters and also in relation to tactual characters. But visual characters may exist at moments when tactual characters referable to the same spatial locus do not exist (assuming dualism); and vice versa. Hence the extent apprehended in relation to colours is numerically distinct from extent apprehended in relation to touch; and therefore the problem of correlating

¹⁴Alexander, S., Space, Time, And Deity, (London, 1920), Vol. II, p.164.

¹⁵Ibid., p.164.

them arises.

In actual practice specific tactual characters are associated with specific visual characters. This association of characters is arrived at as a result of observing that when a part of the body (say the hand) or the body as a whole, is visually contiguous with certain patches of colour, specific tactual characters are perceived. These tactual characters become associated with the visual characters through the recurrence of tactual presentations of the same characters whenever visual presentations arise which are of a similar character to those perceived before. Since tactual presentations are more or less constant, while visual presentations vary under various conditions; all visual presentations associated with a specific tactual presentation become associated together. This is achieved by two stages of association. First those visual characters are associated together which are perceived under varying conditions, but are perceived throughout when they are at most at an arm's length from the observer, i.e. when tactual characters are perceived simultaneously. This association is then extended to include visual characters seen at distances greater than an arm's length.

The perception of tactual characters when a part or the whole of the body is visually contiguous with a coloured extent may be interpreted in the light of the causal theory of perception in either of two ways:- (a) the body or a part of it and the coloured extent are causally efficacious existents, and the tactual characters are generated as a result of the action of the "coloured extent" on the "body";

or (b) the "body" and the "coloured extent" are only apparently responsible for the generation of the tactual characters. Scientific objects which generate the perceptual objects "body" and the "coloured extent" act in such a manner as to produce tactual characters; the tactual characters are located in the same region as¹⁶ and are associated with specific visual characters because the causes (the scientific objects) of the visual and the tactual percepts are the same. If (a) is assumed, while holding that perceptual objects are subjective, we have the following:- the "coloured extent" acts upon the "body" and produces a tactual percept. The tactual percept produced is an effect of the causal action of the "coloured extent" and, in accordance with the generative theory of perception, is a distinct entity numerically other than the "coloured extent" and exists in a subjective space numerically distinct from the subjective space in which the "coloured extent" and the "body" are located. Dualism rejects the conception that perceptual

¹⁶ The tactual characters are not perceived to be located in the same region as certain visual characters. This is inferred from the process analysed above: the movement of the body, visual contiguity, etc. If the above process is not interpreted realistically, i.e. as '(a)' above, the dualist will have no ground for asserting that the scientific object which causes specific visual characters is the same object which causes the tactual (or other types of) characters associated with the visual characters; and hence that a scientific object is characterized by qualities which correspond to both visual, tactual, and other types of sensible qualities. It is possible that some scientific objects are characterized only by qualities corresponding to visual characters of perceptual objects; while others are characterized only by qualities corresponding to tactual characters. Dualism rejects the common-sense conception of an object as a substratum in which certain qualities inhere, so far as perceptual objects are concerned. But it retains the notion that sensible characters located together in a region of space are essentially connected. From this, through the causal link, it locates corresponding causal characters in scientific objects.

objects are causally efficacious¹⁷, Hence it rejects the position "(a)" above. The process described in '(a)' above may be interpreted realistically also. The "coloured extent" and the "body" are objective existent things characterized by tactual characters as well as by visual characters, the two objects allows for the action of the former contiguity object on the latter object, as a result of which the tactual characters are perceived in the sense that the percipient becomes aware of them.

If the position described in '(b)' above is held, the dualist assumes a spatial correspondence between the relative positions occupied by the "body" and the "coloured extent" when tactual characters are not perceived and the position of the causal scientific object or objects; and between the relative positions occupied by the "body" and the "coloured extent" when tactual characters are perceived, and the position of the scientific object or objects. Such that, when the scientific object occupies the former position relatively to the percipient organism no causal action takes place, but such action occurs when the scientific object occupies the latter position relatively to the percipient organism. But we have already seen in this chapter that there is no such spatial correspondence between scientific objects and perceptual objects. To sum up the above discussion, if the dualist assumes any correlation between the different types of sensible characters in our experience, he commits himself either to a

¹⁷ I mean by "dualism" here that form of the doctrine which holds that perceptual objects are psychic entities.

realistic interpretation of the process, or to an unwarranted and invalid assumption of one-one spatial correspondence between scientific objects and perceptual objects.

Let us now see what is involved in the correlation of the spaces of two (or more) percipients such that the percipients appear to be observing numerically the same perceptual object, and not two (or more) objects which are qualitatively very similar or identical. For this purpose I shall analyse the situation involved in visual perception. The correlation of tactual and other spaces follows on the same lines as the correlation of visual spaces.

Let us take two percipients, 'A' and 'B'. 'A' is observing an object 'Y', while 'B' is not perceiving 'Y' because his line of vision does not lie in the direction of 'Y' from him. Now suppose that 'B' wishes to observe 'Y'. He turns his eyes, head, or his whole body so that the line of his vision meets 'A''s line of vision at a certain point in space. 'B' does this by noting the direction in which 'A''s head and body are turned and in which his eyes are gazing, or by following the direction in which 'A' may be positing. It is a fact of experience that by such and other means a man perceives objects which appear to be perceived by other percipients also. It would be very difficult, if not impossible, to have anything in common with other men if correlation of spaces does not take place. Thus, correlation of spaces is a fact.

¹⁸The process described is correlation of spaces on dualistic premises, which are assumed here on realistic premises it would be "perception of one and the same object in the same space" by different observers.

Now in order that by the above-described process two qualitatively similar or identical objects be perceived by two observers, the perceptual spaces of the two observers have to overlap in a hypothetical common space such that the perceptual object in the one perceptual space coincides in position in the hypothetical space with the position of the other object (qualitatively very similar or identical) in the same hypothetical space. What happens is that when a percipient gazes in a certain direction in which he expects to perceive a certain object, a perceptual object is generated in that region: in that region in his perceptual space which coincides (at least approximately) with the position in the same space in which the perceptual object perceived by the other percipient would be located. The two qualitatively similar or identical perceptual objects in private spaces have a common cause: a scientific object located in objective space. Hence their locations in their private spaces correspond. From this it follows also that the positions of all objects, relatively to one another, located in a given perceptual space, correspond to the positions of all objects, relatively to one another, located in another perceptual space.

It is seen that the above account assumes that scientific objects are responsible for the perceived location of perceptual objects conditioned by them. And we have seen that this assumption is unwarranted. The same is true mutatis mutandis of the correlation of the other spaces of two or more percipients. Moreover, the correlation of the perceptual spaces of two or more percipients presupposes in fact the correlation of the perceptual spaces of a single percipient. And we

have seen in an earlier part of the chapter that this involves either realistic premises or else dualistic premises which are unwarranted.

It will be remembered that one of the arguments for the numerical distinctness of perceptual objects and scientific objects is based on the fact that the percipient event occurs later than the emission of light-rays from the cognoscendum. This argument assumes that scientific objects and perceptual objects exist either (a) in the same time-series, or (b) in time-series which have a correspondence of "simultaneity", "before", and "after".

The mind is commonly assumed to endure in time. But the time in which perceptual objects endure is not necessarily the time in which the mind itself endures. If we understand by the time in which the mind endures the time in which we experience our inner states and thoughts as enduring, the time in which the mind endures can be said to be the same time in which perceptual objects endure only if we assume an absolute theory of time¹⁹. On a relational or relativist theory of time, in which time is an expression of a relation

¹⁹

The absolute theory of time may be described by quoting from Whitehead's The Concept Of Nature, (Cambridge, 1926), p.33:- Time is the ordered succession of durationless instants; and these instants are known to us merely as the relata in the serial relation which is the time-ordering relation, and the time-ordering relation is merely known to us as relating the instants. Namely, the relation and the instants are jointly known to us in our apprehension of time, each implying the other".

between events as enduring²⁰, the two time-series will be numerically distinct. Again, the time in which the mind endures can be assumed to be the same time in which scientific objects endure if the absolute theory of time is assumed, but not if the relational theory of time is assumed. Thus if the relational theory is assumed, the time in which the mind endures and the time in which perceptual objects endure are different from one another and from causal time, and ~~no~~ correspondence can be said to exist at least between causal time on the one hand and mental time and percept-time²¹ on the other hand.

Hence on the relational theory of time there will be no temporal sequence of "before" and "after" between the causal activity of the scientific object on the percipient organism and the physico-physiological changes in the latter on the one hand, and the production of a perceptual object on the other hand, so that it cannot be maintained that perceptual objects exist after the causal activity of the scientific objects assumed to be responsible for their production, as is held in the dualist's argument from the finite velocity of light, for instance.

²⁰ See Whitehead, A.N., The Aims Of Education And Other Essays, (New York, 1949), p.159.

²¹ The time in which perceptual objects endure.

VI
CHANGE IN THE PERCEPTUAL WORLD

We now come to a discussion of change in the perceptual world: spatio-temporal change or motion, and qualitative and quantitative change.

In Chapter One it was mentioned that on dualistic grounds perceptual objects have no causal efficacy, neither are they nor can they be acted upon by scientific objects. A scientific object acts on the percipient organism; the generated effect of this action is the perceptual object. A perceptual object is temporally posterior to the causal interaction of the scientific object or objects (which are its causal antecedents), and the percipient organism. A perceptual object comes into existence as a result of this interaction, and therefore cannot be itself acted upon so far as this specific interaction is concerned. Now, since only a certain specific causal action of scientific objects on the percipient organism results in a percipient event, if a scientific object acts upon the percipient organism in another way, the result is purely physico-physiological change in the body and not perception. If change occurs in the scientific object, it produces a new effect on the percipient organism (as cognitive) and a new perceptual object is generated. In general, no scientific object can affect a perceptual object because there is no direct causal link between scientific objects and perceptual objects. It may be thought that the percipient organism can affect perceptual objects which exist in relation to it; and since it itself is a scientific object, at least one scientific object can

act upon perceptual objects. Further

act upon perceptual objects. Furthermore, if this is the case, scientific objects can affect perceptual objects mediate-ly through their action on the percipient organism. But the percipient organism can act upon the perceptual objects existing in relation to it only through its action on the mind via the physico-physiological changes involved in the percipient event. Such action will be mediate, and the resultant effect on the mind will not result in changes in the perceptual objects already existing in relation to the mind's awareness, but in the production of one or more new perceptual objects. Moreover, since perceptual objects are mental existents, no perceptual object can affect other perceptual objects. And so far as I know dualists who hold that perceptual objects are mental do not attribute causal efficacy to perceptual objects¹. Russell holds that perceptual objects affect one another²; but for him perceptual objects are physical, and not mental.

If what was said above is correct, it follows that change of any kind in the perceptual world is apparent. A perceptual object is always located in the same region of percept-space, and is always qualitatively and quantitatively changeless. The effect of motion of scientific objects (assuming that scientific objects move) is not motion (of perceptual objects), but the production, successively, of new perceptual objects, each in a slightly different position, in space, from the former, so that we seem to see one

¹See Lovejoy, A.O., The Revolt Against Dualism, ([N.p.], 1930), p.

²See Russell, B., The Analysis of Matter, (London, 1927), pp. 259-260.

and the same object changing its position continuously.

Now, it is difficult to understand how a change in position, even the slightest, can result in such changes in the percipient organism that a distinct object is generated, instead of the occurrence of changes in the perceptual object itself generated when the scientific object was in a difficult position. Moreover, it is difficult to understand that a perceptual object generated when the causal scientific object is in a certain position should cease to exist when the scientific object occupies another position. For if this does not happen we would perceive several perceptual objects, each located in a position corresponding to a particular location of the scientific object on the line of its motion (assuming a spatial correspondence between the scientific objects and perceptual objects: an assumption made by dualism). Similarly with tactual presentations. On the dualistic view we should get tactual presentations along a line corresponding to the line of motion of the scientific object, even if we identify spatially tactual and visual presentations³. But nothing of the sort is found in experience. Hence if we do not assume that a perceptual object ceases to exist when a scientific object changes its position, we are forced to admit that change in the

³ If we do not identify spatially the two types of presentations, there is no reason to assume that when we perceive a visual object moving in space, tactual presentations should be obtained at the various places which the visual object seems to occupy. And this is true even if the perceived change in the position of visual perceptual objects is real and not apparent. And we have already seen (Chapter V) what such an identification of spatial positions of visual and tactual presentations involves.

perceptual world must be real and not apparent.

Let us look at the problem of motion from another angle. Since scientific objects do not account for the specific loci which perceptual objects occupy in percept-space and in perceptual space⁴, they cannot account for the apparent change of the spatial loci of perceptual objects, i.e. the generation of perceptual objects in different spatial loci.

Now, it is undeniable that we perceive perceptual objects moving in space. But from dualistic grounds it follows that perceptual objects do not really change their position. This means that perceptual objects move in perceptual space, while they are motionless in percept-space. Similarly in the case of perceived changes in quality or quantity in perceptual objects, as when an explosion occurs: we perceive such changes occurring, while perceptual objects are supposed not to change. Thus it seems that perceptual objects in perceptual space differ from perceptual objects in percept-space. Hence perceptual space and percept-space cannot be identified⁵. Nor can perceptual objects in perceptual space be identified numerically with perceptual objects in percept-space. Since we perceive perceptual objects moving, changing, etc., though actually (on dualistic grounds) they do not move, change, etc., we do not perceive perceptual objects as they actually are and therefore we do not perceive them at all. What we perceive are distinct entities which resemble them

⁴ Chapter V.

⁵ Which means, among other things, that dualism has to assume an absolute theory of space.

in certain respects. Thus if we assume dualism, we have cropping before us a third order of existents, an order of unperceived and unperceivable, but private, causally inert mental entities!

Even if dualism explains why we perceive motion, and qualitative and quantitative change, while no such thing really occurs, it still remains that the two frameworks: percept-space and perceptual space, are numerically distinct. Even if change in the perceptual world is "apparent", it is a fact that explanation cannot do away with. Dualism might say that in the case of apparent change (spatio-temporal, etc.) distinct sense-impressions or sensations are produced in us, but that these sensations are fused together so as to result in the production of percepts which appear to move, or to change qualitatively or quantitatively. This is the way in which physiological psychology accounts for the perception of an extended surface while the individual sensations obtained in the case of sight (say) through the action of light on the rods and cones of the retina, can be considered as distinct⁶.

The physico-physiological basis of the perception of a moving body or of qualitative and quantitative change is the same as that of the perception of a surface. The physiological processes involved explain the fact that percepts appear extended, moving, etc. But it seems to me that these processes do not tell us whether percepts are actually ex-

⁶See Clarke, E., "Vision", Encyclopaedia Britannica (13th Edition), Vol. XXVIII, p.142.

tended or not. It is not obvious why the stimulation of the cones and rods of the retina, and the nervous impulses sent to the brain should result in an entity which is extended and extended continuously, even though these cones and rods are assumed to be distributed on a surface (the retina), considering these rods and cones and the retina itself scientific objects. The fact that nervous impulses sent from the various cones and rods may be different, as impulses, from one another, is not sufficient to account for the extension of percept~~ions~~. So far as the above considerations go, the extension of perceptual objects may be apparent. Similarly for motion and change.

If percepts as perceived differ in any respect from percepts as they are actually, which seems to follow from the foregoing considerations, the conclusion is forced on us (as mentioned before) that percepts as perceived (i.e. in perceptual space) are entities distinct from percepts as they are actually (i.e. in percept-space). The logic here is the same as that which dualism itself uses when it argues for the subjectivity of perceptual objects or the ground (say) that things, according to physical science are composed of a very large number of discrete atoms in continuous motion, with comparatively large interstices between them, while we perceive continuous and steady surfaces. Dualism considers the fusion of the sensations resulting from the impacts of these particles on the nervous mechanism of the percipient a sufficient ground for maintaining that the percept and the agitated atoms are numerically distinct. A thing is either perceived exactly as it is independently of the percipient, or what

is perceived is really a distinct entity. If the dualist rejects my conclusion he undermines the analogous arguments he uses. If he wishes to preserve his arguments, he has to accept the conclusion that percepts in percept-space are numerically distinct from percepts in perceptual space. Now two processes are involved in perception: the production of the perceptual object, and the awareness of that object. The awareness of a perceptual object may be stimulated either by the physico-physiological and psychic processes which are involved in the production of the perceptual object, or the physico-physiological process produces other physico-physiological changes which are not responsible for the production of the perceptual object, but for affecting awareness. If the former is what actually happens, it may be supposed that since both the content of the perceptual object and awareness are produced by the same causal processes, the mind becomes aware of the perceptual object as determined in content by the causal process. But if the latter be what actually happens, it is possible that the mind becomes aware of the perceptual object, not as determined in content by the causal processes, but in a different manner, since the physico-physiological changes conditioning awareness may affect it: although it is true that these changes are themselves conditioned by the physico-physiological changes which determine the production of the perceptual object.

It was said, in effect, that the apparent motion of one and the same perceptual object, i.e. spatio-temporal change, is actually only a temporal succession of discrete perceptual objects with different (fixed) spatial locations. Now if we

assume, as dualism does, that scientific objects are related causally to perceptual objects as they really are, we cannot infer that scientific objects move, since perceptual objects do not really move⁷. Hence we cannot account (among other things) for such perceived changes in the positions of certain perceptual objects, which are associated with perceived changes in the positions of other perceptual objects, as for instance that a billiard ball is seen to move when another ball "hits" it. Similarly for qualitative and quantitative change. On the other hand, if we attribute motion to scientific objects in order to account for the perceived motion of perceptual objects, it follows that an effect is not necessarily "like" its cause in the sense that there is a one-one correspondence between a character of the effect and a character of the cause⁸. Changes in the positions of scientific objects do not result in changes in the positions of perceptual objects, but in the generation of new perceptual objects in new loci in percept-space. Similarly in regard to other characters which belong to perceptual objects as perceived, but not as they really are.

On the other hand, if we assume that the motion of scientific objects results in the generation of perceptual objects,

⁷This argument is not a vicious circle, because the fact that perceptual objects do not move is not based on the assumption that scientific objects move. We perceive perceptual objects moving: this is a fact. At the same time we assume dualism: i.e. that perceptual objects are effects of scientific objects. Since scientific objects produce perceptual objects, they do not act on perceptual objects, nor do perceptual objects act upon one another: they are not causally efficacious. Hence perceived motion is apparent.

⁸An assumption made by the dualist in inferring the nature of scientific objects from the nature of perceptual objects.

we have to explain how one and the same cause can be responsible, in affecting one and the same object (the percipient organism) in a certain specific manner (the physico-physiological and psychic changes) for effects which are so disparate: changeless objects which appear to change, motionless objects which appear to move.

Dualism is thus caught in a dilemma: if it assumes that scientific objects move in space, and change qualitatively, etc., it is caught in the above-mentioned difficulty. If it assumes that scientific objects do not move, etc., it leaves unexplained the fact that we perceive perceptual objects moving, etc., which is a fact.

VII

SUMMARY AND CONCLUSION

In Chapter Three I have attempted to show that dualism does not arise necessarily (logically) from the immediate facts of experience; and that in order to prove that percepts are existentially conditioned by perception dualism has to assume as true realistic premises: not for the sake of proving its argument by a reductio ad absurdum, but as necessary premises for its position. These premises are (a) that two or more sense-characters of the same type cannot be spatio-temporally identical; (b) that of a group of qualitatively continuous presentations one presentation at least is numerically identical with an object as it is, independently of perception. If the attempt is successful, no scientific (or other) hypotheses, however widely accepted or well-established, can compel us to accept dualism. I have in mind here the causal theory of perception as interpreted by dualism (i.e. as generative). However, it is seen from Chapter Three in the discussion of the generative theory of perception that the rejection of dualism does not entail the rejection of the causal theory of perception, and therefore of causality in general, but only of the generative conception of causality. The generative theory is not part of the scientific causal theory and does not form an essential part of the causal theory of perception. It is granted that perception arises as a result of the causal action of objects on our sense-organs and neuro-cerebral structure and perhaps the mind also,

and that the nature of the physico-physiological and psychic changes involved in the percipient event are dependent in part on the nature of the causal action. But this as such does not decide for the causal subjectivity of the object of perception, the perceptual objects themselves, and therefore for their existential subjectivity. Of course a non-dualistic theory of perception has to show how the acceptance of the causal theory of perception is compatible with the existential objectivity of perceptual objects, their independence of the percipient event as existent things.

I shall not attempt here to formulate a theory which may realize the end mentioned above. I want to suggest only that if it can be shown that the perception, or more exactly the perceptibility, of a presentation-continuum composed of specific character-complexes under specific conditions affecting the percipient organism, is causally determined by these conditions, but that the character-complexes themselves which are perceived are not so determined, the causal theory is preserved without endangering the objectivity and existential independence of what is perceived.

It is perhaps apparent from the analysis of the experiential bases of dualism in Chapter Three that dualism as an attempt to explain the facts of immediate experience is to be distinguished from the form it takes when the causal theory of perception is applied to it. So far as the former is concerned, qualitative relativity

in all its forms entails — if it entails anything dualistic at all — that perceptual objects do not exist when not perceived. This avoids violation of the law of contradiction in those cases where one percipient, viewing apparently the same object under different conditions, is concerned. Also, that the perceptual objects perceived by different percipients are private in the sense that the perceptual objects which are perceived by each percipient are perceived only by him. This avoids violating the law of contradiction in the case of several percipients apparently perceiving the same object simultaneously from different spatial standpoints, or under other conditions. From the conclusion that perceptual objects do not exist when unperceived it can be inferred that perceptual objects are existentially conditioned by awareness, assuming that the existence of perceptual objects and the presence of awareness, and the non-existence of perceptual objects when awareness is absent, is not accidental. But nothing in the above requires (a) that another order of existent things be posited, and (b) that these existent things be considered as conditioning perceptual objects existentially. It may be said that the variability of sensible characters with variations in media or in the percipient, or in both, implies that these characters are existentially conditioned (at least in part) by the media, and the percipient. But this can mean that sensible characters are relational, and that perceived changes are real changes in objects, and not only apparent changes. And at any rate, if we introduce causality in order to account for the perceived changes in perceptual

objects, there will be no logical passage from the perceptual world to another world in which causality really operates, and to objects which condition perceptual objects existentially. The media and the percipient organism which causally condition the characters of perceptual objects are themselves perceptual objects. It is only when the generative causal theory is introduced that nature is bifurcated into an order of causal objects and an order of effects -- an order of effects only.

The generative theory of perception presupposes that the percipient organism himself is existentially independent of perception¹. The percipient as a causal object must exist prior to the generation of perceptual objects, including the perceptual object which we call the "body", in order that perceptual objects may be generated as a result of certain changes in it. The psychic act of awareness which conditions the perceptual object existentially arises only as a result of the physico-physiological changes in the percipient organism as a causal object, and they in turn occur only as a result of causal action on the percipient organism. Furthermore, the causal objects conditioning the percipient event cannot be themselves conditioned by awareness, except if we are to suppose that a perceptual object generated as a result of the causal action of the percipient organism upon itself can act upon

¹But not simply as a pure mind. Whatever possibility exists that causal objects may act upon a pure mind, dualism itself assumes that the percipient organism is an embodied mind.

the percipient organism to produce other perceptual objects; and so on.

Thus the generative theory presupposes the existence of certain entities (at least one entity) which exist independently of the percipient event, existents which are causally efficacious. The application of causality to perception by the generative theory results in the positing of existents of another order than the order of perceptual objects; or more exactly, in the exclusion of perceptual objects from that order of existents. Thus the theory that perceptual objects are caused by objects existing independently of the percipient event is arrived at by starting from an order of independently existing causal objects, and finding out (from an analysis of immediate experience) that what we perceive is conditioned by awareness, and (from the generative theory) that it is conditioned by the percipient event and by other factors. As a matter of fact dualism starts with the explicit assumption that there are entities in the universe which exist independently of perception, as the general realistic creed holds. It finds out that perceptual things are conditioned by perception: hence dualism.

The above analysis showed that if dualism starts from the perceptual world it cannot go beyond it to a world of causal scientific objects. Nor can it ever prove that such objects exist. It has to assume from the start that scientific objects exist. But what assures us that our realistic assumption is not wrong? What if nothing in the external world exists unperceived?²

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the external world exists unperceived?² If experienced nature is conditioned by awareness, shall we bifurcate nature in order to hold on to our realistic assumption?

But if dualism abandons its bifurcationism but retains its subjectivism (i.e. the position that perceptual objects are existentially subjective), it passes over into subjective idealism, or into phenomenism. And in doing so it involves itself in the traditional difficulties which the above positions entail.

It is interesting to note how the causal connection between scientific objects and perceptual objects is established. Dualism arises by excluding perceptual objects from the realm of entities existing independently of perception. Hence the causal efficacy which is attributed to the latter entities from the start as the entities existing objectively, is retained in their realm and not carried over to the perceptual world. But our perception that the objective world possesses a property called causality is derived from our knowledge of the perceptual world. The perceptual world supplies us with causality, which (among other properties) we come to consider as the characters which reality to be real must possess. Causality is then transferred to the world of scientific objects (as the objective world) and denied to the perceptual objects themselves. But what warrant is there in assuming that objective reality must be causal while it is the perceptual

² I am excluding the possibility of the existence of other minds.

world which is characterized by causality and the perceptual world itself is denied objective reality!

In Chapter Four the attempt has been made to show that science deals through and through with the perceptual world and is not concerned with another realm of existents known by inference from the perceptual world. If this is true, it follows that if such an order of objects is posited — as by dualism — these objects will be unknowable. It was said before that according to the discussion in Chapter Three dualism cannot arise necessarily from an examination of immediate experience, and that in its attempt to establish itself it is forced to assume realistic premises. That is to say, it is not possible to go validly beyond the perceptual world in the manner in which dualism attempts to go beyond it. Therefore even if an order of scientific objects is posited, nothing which dualism attributes to them as necessary in order to account for the characters possessed by perceptual objects can be really attributed to them. If science deals throughout with the perceptual world, the causality which science finds and utilizes characterizes the perceptual world. Hence a causal relationship between scientific objects and perceptual objects cannot be validly posited, at least not as operating in the manner which we know. And as we have seen, such a relationship is the epistemological connecting-bridge for dualism between perceptual objects and scientific objects.

This as much does not disprove dualism as a metaphy-

sical doctrine, as Lovejoy rightly points out³. But the unknowability of scientific objects can be used against dualism in another way. We have seen in Chapters Five and Six that it is problematical whether scientific objects can be said to be located in space and time, and if they are located in space and time, whether there is any correspondence between the space and time in which they are located and the space and time in which perceptual objects are (and appear to be) located. We have seen also that even if scientific objects are assumed to be so located, nothing in the nature of scientific objects can account causally for (a) the fact that perceptual objects are located in space, nor (b) for the localities of perceptual objects in space relatively to one another, nor (c) for perceived change in the relative spatial positions of perceptual objects, nor (d) for qualitative and quantitative change. Thus, the unknowability of scientific objects involves the fact that there is no evidence for assuming that scientific objects, if they exist, have the characters which dualism attributes to them in order to account for the characters of perceptual objects. Hence the characters possessed by the perceptual world are left unexplained. But we have seen that even if the characters

³ Lovejoy, A.O., The Revolt Against Dualism, ([N.p.], 1930). To use the threat of agnosticism as such as an argument against the truth-value of a doctrine may imply a preconceived judgment that ultimate reality is knowable to us, a judgment which, it seems to me, has no a priori warrant. For even if knowability involves a a priori element itself is not known a priori, but only through and after an analysis of the external world as an object of knowledge, and of ourselves as the knowing subjects or, the above

which dualism attributes to scientific objects are really possessed by them, the above-mentioned facts of immediate experience are still left unexplained.

If the bifurcation of nature into two orders is untenable, three alternative positions seem to remain as possible metaphysical positions so far as the problems in the theory of perception in hand are concerned:-

(1) Perceptual objects are conditioned by the percipient event⁴ involved in perceiving them by a sentient being; and there are no entities which exist independently of the percipient event⁵, or

(2) Perceptual objects are not conditioned by the percipient event, and perceptual objects are the only existing things so far as the external world is concerned, or

(3) Perceived objects are conditioned causally in one way or another⁶ by the percipient. But they are not conditioned by the percipient's awareness of them. Perceived objects, though conditioned by the percipient in the way specified, are existentially objective.

It is not the purpose of the present inquiry to expound a theory of perception. But there are certain general line

attitude may be the result of (2) an emotional and volitional egocentrism and wishful thinking. However, the foregoing criticisms do not exclude the use of agnostic implications of a doctrine in ways which are rationally legitimate. (See

⁴The percipient event may be considered either as (a) including awareness as a conditioning factor in addition to the Physico-physiological changes in the percipient's body; or (b) comprising only the physico-physiological changes.

⁵Excluding the possible existence of a plurality of human minds.

⁶Either by the percipient's spatio-temporal standpoint relative to the object, or by his physico-physiological make-up, or both, or possibly in other ways.

of thought which emerge from the inquiry undertaken in the present work. And it is important to state them explicitly. Thus first of all, it seems to me from the examination of dualism in the present work that any satisfactory theory of perception which is sought has to be a non-dualistic, in the sense of a non-bifurcationist, theory of perception.

Further, a theory of perception to be adequate has to take into consideration (among other things) the ~~psychological~~ psychological factors involved in perception due to past experience. The adult's perception⁷ of things is not primitive, in the sense that it differs from the perception of a newborn child. The perception of a human being is not a changeless affair but a process developing from childhood on. The adult's perception may not differ greatly from that of a child. As a matter of fact it differs probably only in respect to (a) the localization of presentations in space relatively to one another; (b) the perception of the extent of the distances between them; and (c) the perception of the presentation-continuum as a whole. The continuous Gestalt continuum which is originally perceived is broken up into discrete parts of qualitatively and spatio-temporally continuous character-complexes conceived to be located in a space in which these character-complexes

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The term "perception" is used here in a wider sense, with greater intension, than the term used as meaning "sheer awareness of a presentation". It includes in it designation unconscious interpretation of what is presented sensibly.

are externally related spatially⁸. This process of objectivization occurs through the transfer of tactual associations into the visual continuum. This transfer takes place in the active life of man in manipulating and acting on his environment. This role of man's active attitudes in shaping his mental view of his environment, and the role of his active responses in general should be taken into consideration in a theory of perception. It seems to me that an undue emphasis has been generally placed on visual perception to the neglect of tactual perception. Hence perception has too often been considered as a passive, receptive spectatorial affair, and the role of action in shaping what is perceived has been neglected to a great extent or even completely. But what is injected into visual presentations from tactual experience is unconsciously retained in the interpretation of visual presentations as constituting "objects", and in taking this to be what is actually perceived visually, we get the ground for the dualist's contention: apparent multiple inherence of sense-characters of the same type. It is doubtful whether a dualistic view of nature would arise in men's minds if they were fixed in their places, like plants, and could not come into

⁸The perception of a visual continuum as a Gestalt and its subsequent perception as composed of objects, occurring in adult life, is illustrated by a situation obtaining sometimes when one is viewing images on a cinema-screen. In that case images are seen simply as a pattern of dark and light, and the observer wonders what object is represented by it. Suddenly the images become clear to him and take for him the shape of familiar objects. The masses first seen two-dimensionally are now seen three-dimensionally. The images are seen protruding into the screen, so to speak.

contact with other things.

The transfer of tactual characters to the spatial locus of visual characters results in yet another attitude towards what is experienced, with further repercussion on our common-sense interpretation of what is experienced. The transfer of the stable tactual characters to the locus of the variable visual characters arrests for us the passage of nature⁹; i.e. makes the passage of time irrelevant to the characters perceived. The varying visual perceptions come to be viewed as distinct, atomic characters succeeding one another temporally, but each qualitatively stable. Change is conceived as the succession of unchanging characters, the passage from one to the other, and not as a qualitative passage of the characters themselves into others qualitatively continuous with them. This arrest of passage is a factor in generating the concept of a stable object, which, as I said before, is the experiential ground for the dualist's contention. Hence a theory of perception has to take into consideration the passage of nature, nature as it is experienced concretely, and not nature seen through the misleading implicit abstractions of our acquired attitudes.

Finally, a theory of perception should take into consideration the fact of man's parochial situation in the universe, his limitation in perception to one spatio-temporal framework, in determining the extent to which human perception as such can give us knowledge of the universe as a whole.

⁹I borrow the term from Whitehead.

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ABSTRACT OF THESIS: AN EXAMINATION OF THE DUALISM OF
SCIENTIFIC OBJECTS AND PERCEPTUAL OBJECTS

The work is divided into seven chapters and a preface. The preface introduces the subject-matter of the inquiry as a criticism of that form of dualism held in contemporary thought which assumes that perceptual objects are mental as well as causally subjective; and it indicates why Lovejoy's The Revolt Against Dualism is taken as foundational in the inquiry.

In order to understand the tenets of dualism for purposes of analysis the dualistic position is first stated by developing it logically from the apparent multiple inherence of mutually-exclusive characters in the same spatiotemporal locus, arising in the perception of what is supposed to be the same object, under different conditions. The dualist argues from this that (at least) all but one of the perceived characters attributed to the object are "appearances" of the object and do not inhere in it. The dualist then points out the implausibility of supposing that one of the perceived characters may be a direct disclosure of the object, and he maintains that no perceived characters inhere in the supposed perceived object. The object itself is therefore unperceived and unperceivable. The complex make-up of the human sensory mechanism and the variability of what is perceived with changes in the sensory mechanism is adduced as further ground for the dualist's contention. The dualist finds further support for his thesis in the Causal Theory of Perception which holds that perception takes place as a result of the causal action of physical objects on our sense organs. In all sensory perception there is a temporal lapse between the causal activity of the causal objects and the percipient event. Hence what is perceived cannot be numerically identical with the causal object or objects. Perceptual objects are further considered to be existentially subjective. Being causally subjective, they are considered attributively subjective. But since they are related in nature to scientific objects, they are considered to be epistemologically objective.

Since the aim of the inquiry is an internal criticism of dualism, no at-

tempt is made to criticize dualism by criticism of its fundamental metaphysical assumptions and presuppositions. But for clarifying the position, and for convenience of reference in the text to its presuppositions and assumptions, whenever necessary, these assumptions and presuppositions are outlined. The main ones are found to consist in a metaphysically realistic creed, in a belief in the relative stability of existent things, in the laws of contradiction, identity and excluded middle, in causal action at a distance, in the generative role of causal action on the percipient organism, in relatively distinct objects, and in the psychic nature of perceptual objects (Lovejoy's form of dualism).

It was mentioned that the ground for dualism in immediate experience is the perception of mutually-exclusive characters in what is supposed to be the same spatiotemporal locus. The exact manner in which dualism arises from this is by a reductio ad absurdum argument in which the difficulty is overcome by supposing that in the case of such apparent multiple inherence involving change in or of intervening media, the discordant characters do not exist simultaneously in the same spatial locus, so that only characters which are perceived at a given moment exist, and not in addition characters which were perceived in the same locus under different conditions of perception (and in former moments). In the case of the simultaneous perception by two or more observers of what is supposed to be the same object, dualism solved the difficulty by assuming that the objects perceived by the different observers are numerically distinct from one another and exist in numerically distinct spaces. Reflection of the validity of the dualist's solution of the difficulty (assuming that there is one) shows, however, that in the former type of situation above, the dualist's position does not follow (logically) necessarily from the premises. In the latter type of situation it is seen that the dualist's proposed solution does not really overcome the supposed difficulty because so long as it is assumed that the discordant characters are perceived simultaneously in loci believed to be the same, the numerical distinctness of

spaces does not change the situation essentially. Consequently, in order to avoid multiple inherence the dualist's assumption that mutually-exclusive characters are perceived simultaneously in the same region of space is rejected . With this the dualist's argument based on it disappears.

Apart from the above considerations, an analysis of the psychological and active attitudes involved in judgments concerning the positions of things in space, shows that such judgments involve complex inferences, and lack the certainty of immediate experience.

Passing to the dualist's argument from cases involving reflection and refraction of light and change in or of intervening media, it is seen that the validity of the dualist's arguments presupposes either a realistic conception of the situation, or unwarranted assumptions.

The basic conception in the foregoing discussion is the belief that dualism does not arise necessarily from a consideration of sense experience. This is followed by an analysis of the relationship between the perceived world and the world of physical science, in order to show that if scientific objects are posited(i.e. dualism is assumed), these objects will be unknowable (at least) so far as physical science is concerned. In order to demonstrate this thesis the manner is outlined in which (a) the laws, and (b) the so-called ultimate entities, of physical science are arrived at from an analysis of perceived things. The analysis attempts to show that physical laws are solely and wholly the laws of the perceptual world, which includes here the order of existence continuous and correlatable with perceived things. The entities of science also are in nature continuous and correlatable with perceived things and not existents in a distinct spatiotemporal and causal framework.

The discussion then passes to an analysis of the difficulties which dualism raises in respect to space and time and change in the perceptual world. Here it is shown that it is problematical whether scientific objects can be

said to be located in space and time, and if they are located in space and time, whether there is any correspondence between the space and time in which they are located and the space and time in which perceptual objects are (and appear to be) located. Furthermore, it is shown that nothing in the nature of scientific objects can account causally for (a) the fact that perceptual objects are located in space, nor (b), for the particular positions of perceptual objects in space, nor (c) for perceived change in the positions of objects, nor (d) for qualitative and quantitative change. A detailed analysis of perceived change shows that if that change is considered to be apparent (as is implied by dualism) even though it is a fact of experience, a third order of existents crops up: an order of existents which are subjective and yet are unperceived and unperceivable, located in a space numerically distinct from the space in which perceptual objects are perceived to be located.

Finally, the whole work is summarised and it is concluded that any adequate theory of perception has to be a non-dualistic theory of perception. The bifurcation of nature into two orders is untenable. Other requirements of an adequate theory of perception are then indicated: consideration of the psychological factors involved in perception due to past experience, and the objectivization of the primitive Gestalt presentation-continuum of the child; the passage of nature which in our active attitudes is arrested though actual experience; and finally, man's limitation in perception to one—the earth's—spatiotemporal framework.

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