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### LOCKE'S THEORY OF PERCEPTION

**J**OHAN LOCKE, born three hundred years ago last August, was interested primarily in the problem of knowledge. Therefore, I propose to honor him here, not so much by a biographical account of his intellectual life, as by a clear statement of certain epistemological propositions he believed to be important and true. Such commemoration Locke himself would have preferred, who often declared while he lived that the Truth, not John Locke, should be our concern.

The propositions that I shall select for presentation have to do with perception. Perception, in Locke's usage, is a term with a wide application. It is not only "the most general name for all the operations of the understanding"<sup>1</sup> or the mind, such as sensing, remembering, thinking, imagining, but also for the immediate objects of these mental operations, such as a sensed patch of blue, a remembered yesterday, a thought square root of two, or an imagined unicorn. Thus, a theory of perception in this wide sense would be an exhaustive analysis of all the ways of knowing, and this is precisely what Locke attempts in the *Essay*. We shall not, however, take perception in this wide sense as the topic for our discussion here. Perception, in twentieth-century theory of knowledge, usually means sense-perception. In Locke's own terminology, I am going to present, with an eye for merits and difficulties, his theory of *sensation*, which claims to describe some of the physical and mental processes involved

<sup>1</sup>J. Gibson, *Locke's Theory of Knowledge*, p. 21. "Perception" is synonymous with "idea."

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in the traditional five ways of sensing, together with the status of the qualities that are sensed.

Locke names the subject-matter of his Essay—a part of which is sensation—the “Science of Signs,”<sup>1</sup> because all perception makes use of various elements which signify others beyond them. Even colors and odors “mean” the presence of certain kinds of bodies in the external world. Hence it is clear that such a science, being in part a description of how mind communicates with matter, must overlap the science of mind on the one hand, and the science of material existence on the other. I shall begin with Locke's view of physical existence, then straddle the borderland between matter and mind, and, from the vantage-point of this great divide, survey briefly the realm of mind. First, however, I shall perform an experiment to create in us a keen sense for the problem of perception, and for the apparent inevitability of Locke's general conclusions in this regard.

Imagine here before us a small white marble attached to the end of a slender steel rod. Now suppose by mechanical means we cause the end of the rod that bears the white object to oscillate rapidly between two points about six inches apart. What will you then see? If your line of vision is at right angles to the rod's plane of oscillation, you will see a curved, white, *motionless* line about six inches long. That is, you will see with your eyes a color *apparently* qualifying a region of space that it does not *really* qualify. Thus the argument collapses that colors must surely be where they seem to be from the standpoint of animal perception. But consider now the white marble as itself a stationary object lying in the palm of your hand. Is it not a solid object, its whiteness really existing in the region of space occupied by the marble? The answer of physics is a curt negative. As Russell says,

<sup>1</sup> Essay, iv, 21, 4.

“Much the greater part of the volume that seems to be filled . . . is really unoccupied.”<sup>1</sup> What you really hold in the palm of your hand is a universe of particles in rapid vibratory motion. At this point, therefore, commonsense is invited to extend the concept of apparent-but-not-real qualification to the white of the marble itself, and for seemingly the same reasons as in the case of the rapidly oscillating marble. I say “seemingly” the same reasons. The reasons are not all really the same. In the first case, we pointed to the existence of a white marble in motion to explain the appearance of white throughout a region of space larger than the marble itself, and we believed that the apparent white was never more than six inches away from the real white. In the second case, however, we can no longer speak of *white* particles moving rapidly to produce the appearance of a continuous white patch. The ultimate particles of matter are colorless, such that it would be false to say that a blade of grass is green because its atoms are green. So now we discover that the perceived white is not even in the general region of the marble at all, be it in motion or at rest. Locke would love this conclusion, which contains by implication the denial that white exists *anywhere* in the physical world, and which reveals sharply the *problem* of perception. If qualities may appear in normal circumstances to inhere in material bodies without, as we have seen, really doing so, how are we to distinguish the real properties from the unreal, and where are we to locate such as have no physical existence? The answer to this question can be developed best by turning now to Locke’s own views on matter, mind, and the relation between them. We shall take material existence first.

Our illustration of the oscillating particle has indicated the content of what Locke called the “corpuscularian”<sup>2</sup> hy-

<sup>1</sup>*ABC of Atoms*, p. 8.

<sup>2</sup> iv, 3, 16.

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pothesis, which is the one he believes to be true of matter. It is not Locke's business, he says in the *Essay*, to make an exhaustive analysis of physical objects and events in themselves, but only so much as will disclose their rôles as terms of the perceptual relation. What he does say however of the ultimate particles of matter reveals them as minute solid bits, with definite and unalterable outlines, capable of acquiring motion only through the impact of other moving particles and of lending this borrowed motion to other particles by impact. In this hypothesis there is no trace of what, in the slang of modern physics, is called the "smear" theory of particles, according to which particles do not have definite, solid surfaces, but are more like radiations of energy outward from an insubstantial nucleus. Locke's atoms show no signs of being energetic or smudgy. The causal efficacy they possess is described as "passive power," which they exert by being hurtled through an empty space and bumping into clear-cut opposition, such motion affecting neither the nature of the moving particle nor the nature of the space travelled through. This billiard-ball conception of the atom is old and simple enough, but its simplicity becomes treacherous when he who entertains it is called upon to explain the firm cohesion of the parts of a body and the gravitational attraction between bodies. Because it ignores the intricate properties of electro-magnetic fields, it is totally at a loss to show why, for example, a steel spring—supposedly made up of small marble-like atoms—should resist disintegration any more than a sand heap, which is very easily dispersed. About such matters, Locke is frankly ignorant. The cohesion of ultimate particles to form bodies, the attraction between bodies—the law of which his friend Newton discovered—and even the details of the process of imparting motion by impact: these three factors constitute, according to Locke, a triple mystery,

the bottom of which will probably never be probed by the human mind.<sup>1</sup>

Bodies, which are aggregates of cohering atoms, possess all the properties exhibited by atoms save one. They have shape and size, they move and are numerable, but they are not solid in the same absolute sense that atoms are, since they are for the most part compressible. These properties of "physical substances" are called "primary," and are such that no matter what alteration the body undergoes, it possesses them in some form or other as long as it is body at all. Likewise, bodies have the passive power to be causally affected by other bodies, by the collision of parts.

Now that we have described bodily existence, let us indicate in a word the nature of the space which is the possibility of bodily motion. Though Locke held successively three fairly distinct views of space,<sup>2</sup> in the end he completely abandoned the first two and adhered to the theory of absolute space, as it was propounded in his day by the Cambridge Platonist More and by Newton. This is the view he expressed in the *Essay*. As there described, space is "uniform and boundless," itself unmoved and unalterable by the motion of bodies in it. The material universe in space has limits, but space itself has none. Take the extreme opposite of solidity, which is the characteristic of body, and you have a characteristic of space.

Now it was necessary to present for our comprehension Locke's conception of this great spatial receptacle, together with his conception of the bodies it contains. We must understand clearly the atomic and spatial constitution of *our*

<sup>1</sup> ii, 23, 24, *passim*. See also *Elements of Natural Philosophy*. Wks. Vol. III, p. 281.

<sup>2</sup> J. Gibson, *op. cit.* pp. 248-250.

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bodies, from this physical point of view, if we are to understand how they communicate with one another, and why something more than just matter must be present before *perception* of, and by means of, bodies can occur.

Suppose then we take an enormous number of the ultimate particles of matter and, with the skill of a god, put them together to form a human body. Now just as putting together the same enormous number of *marbles* would not form a *living* colossus, so we cannot hope by this kind of juxtaposition of parts to form a living body, but we shall, by hypothesis, construct one similar in every *physical* detail to a living model. Atom by atom we build it up, till before us lies the finished product, trunk, head, and limbs, the whole equipped with the five or more sense-organs. The eyes and the ears are open, and are being stimulated by particles and vibrations from other bodies in the neighborhood. As a result, minute motions of the particles in these organs of sense are caused which, by impact on impact, are communicated to the brain. As yet, however, the causal sequence differs not a whit from the bump-and-rebound type that occurs say among the particles of a stone, and even the last term of the sequence—the effect in the brain—is simply a borrowed motion through space. Briefly, we do indeed have before us a *physical* organism, exhibiting extension in space, shape, motion, and numerous parts, but we plainly do not have before us a *living* organism. In Locke's words, "whatever impressions are made on the outward parts, if they are not taken notice of within, there is no perception."<sup>1</sup> And there is nothing as yet within the organism to note what goes on there or anywhere else. An atom or a group of atoms cannot *perceive* another, be this other either at a distance from it or in spatially im-

<sup>1</sup> ii, 9, 3.

mediate contact. Our marvelously intricate complex of atoms is equipped for perceiving, but is as yet totally incapable of perception.

Our survey, beginning in the middle of the field of inanimate nature, has at this point brought us to its edge. We discover that, *as physicists*, we cannot step over the borderline without sinking into a veritable quagmire of a queer sort of *immaterial* substance. Indeed, even in probing into the constitution of the human organism, we could not help feeling that our purely physical analysis had banished something quite essential from its natural habitat. Permeating what we call a living organism is a subtle something which, under physical analysis, slips away and escapes detection, leaving behind a machine-like structure, capable of operating but actually inoperative.

This, for Locke, is mind or "immaterial substance." He calls it substance, though it is nothing material, partly because it was the custom in his day to call anything real a substance or a property of substance, and partly because mind is, in Locke's conception, something that is really localized and spread out in the same space through which matter moves. Hence it is legitimately called substance, a "stuff" capable of having distinctive properties of its own which distinguish it from the stuff of matter. Just what these properties are we shall see as the discussion proceeds, but let us first attempt to understand clearly the relation between a mind and the body it animates. This will keep us to the proposed line of investigation.

Locke, showing his fine commonsense, says quite definitely that the mind is where the body is. Whether this is true or not, such a conception at least makes it possible to have fairly "clear and distinct" ideas about the body-mind relation. To some of us, it may seem unnecessary to argue the point, for

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it is all too obvious that, as Locke himself naïvely asserted, when one's body moves say from London to Oxford, it does not leave its mind behind in London. And if it does not, then the mind accompanies the body, and is wherever it is, at least as long as the body continues to live—that is, be animated by the mind. But Locke was unorthodox in believing this to be the case. On the one hand, Descartes had taught that mind is in all respects what matter is *not*, so that if matter is localizable and has spatial properties, mind has none of them. On the other hand, there was a Scholastic dogma to the effect that mind is *ubi*, or everywhere, hence can have no circles drawn around it to give it definite position *in* space. What is more, both the Cartesian and the Scholastic doctrines are supported by much evidence. There seem to be many things in the mind to which spatial characteristics simply cannot be attached without making sheer nonsense. Such questions as, what is the shape and velocity of your idea of a billiard ball? are meaningless; yet they ought not to be meaningless if the mind which contains such ideas itself has spatial dimensions. Moreover, it seems that one can be *in thought* in many places that the body is not occupying or can never occupy, hence the apparent reasonableness of the view that mind is everywhere. Be that as it may, Locke assigns a place in space to mind, and that place is primarily the position of the body that has that mind.<sup>1</sup>

But though the mind is "immersed in flesh,"<sup>2</sup> and hence is where the body is, Locke never says definitely that it has the body's shape. I mean to say that Locke's intention is not to outline a mind in space as definitely as he outlines its body in space, but only to locate it in the general region of the organism *so as to insure its commerce with the sense-organs.*

<sup>1</sup> ii, 23, 19–20.

<sup>2</sup> iii, 11, 23.



Locke rightly believed that the Cartesian doctrine of the “nowhereness” of the mind made it impossible to conceive how the mind communicates with the body, which obviously is somewhere. In other words, one might say that Locke holds to what we have called a “smear” theory, not of the atom, but of the mind, which argues that though mind is in space and moves through it, no clear-cut boundaries can reasonably be assigned it, as they can be attributed to material objects. I think we could say that the mind accompanies and is in the body much in the same way that the sound of a racing car accompanies and is in it. Though this sound seems to move with the car and is generally where it is, yet, like the mind, it cannot be said to have a shape. The mind cannot be definitely circumscribed, because it is a kind of ethereal substance capable of subtle dilations as when it expands into all parts of the organism flooding it with warm feelings and sensitizing its peripheries, and also capable, as when one sleeps, of “retiring from the senses, out of reach of those motions in the organs of sense.”<sup>1</sup> Hence Locke would endorse the statement that the more incorporated or embodied a mind becomes, the more definite become its position and shape in space; whereas the more purely mental it becomes in retirement from bodily existence, the less definite become its spatial properties; such that God, for example, who according to Locke is pure incorporeal mind, is simply everywhere at once, without delimited position or date.

Though it is true that many of Locke’s teachings in this regard seem to locate the human mind within—or near—the organism *as a whole*, yet most of his description tends toward concentrating it, if not confining it, in the brain, which he calls the “presence room” or audience chamber of the mind. Into it, messengers from the external world of matter

<sup>1</sup> ii, 19, 4.

are introduced to signify to mind the nature of the objects and events in that outer world. Indeed, some of his descriptions can easily be construed to mean that the mind is the interior region of the skull, as for example his statement that the mind is a dark room into which knowledge of the external world is introduced through the windows of the sense-organs. Despite such contentions, however, we must not allow ourselves to believe that Locke ever identified the mind with parts of the body. Though mind is capable of fusion with an organism, it remains nevertheless a distinct substance, such that if we held two great magnets on opposite sides of a living organism, the one magnet attracting mind and the other matter, then all the life of the organism would be drawn out one way, and its material substance the other. Soul would fly to one magnet, body to the other.

Having indicated briefly the relation of the mind to the body, I shall now describe in a word or two the main properties of mind that distinguish it from matter, all of which will have prepared us for the examination of the "what" and the "how" of perception itself.

Perhaps the chief distinguishing trait is the kind of "power" that mind exhibits. Locke calls it "active" power, and contrasts it with the passive power of matter. Mind is active, because it possesses the power to *initiate* movement, whereas matter has only the power to be moved and to impart motion. Hence, if all matter is actually in motion, the *first* cause of this cosmic motion must have been some cosmic mind, and this is a part of Locke's proof for the existence of a deity. Matter could not originally have moved itself. Mind, then, is peculiarly that kind of thing which can operate upon another thing without itself having been mechanically caused to do so, though even mind may have moments of passivity during which, as we shall see, matter operates upon

it to give rise to sensations within it. Another distinguishing trait of mind is the elastic continuity<sup>1</sup> and insolidity of its elements. Matter is divisible into solid, discontinuous parts. Mind is not. Both substances are to us alike in that the inner essence or ultimate constitution of each is unknowable. . . .

Finally we are in a position to narrow down our analysis to sense-perception, which is the transaction of the mind with physical existence by means of the sense-organs. In order to keep the situation clearly before us, let us return to the human body we built up out of atoms and which lies here inanimate before us. This is not at all Locke's method of exposition, but I think he could not complain that it misrepresents the essentials of his view, and it obviously simplifies the task of describing how the mind gets its store of "ideas." Now to animate our hand-made organism, we say presto! and behold in its open eyes not only the hard glitter of mechanically reflected light, but also the softer light of—shall we say—something that looks out upon you and sees you. Physically speaking, no change has occurred in the object before us, save perhaps a quickened motion of minute parts. In another sense, though, something additional now pervades the organism, capacitating it for experience of its own, whereas previously not even the shock of the most powerful stimulus could have aroused it to become *aware* of the existence of things. This awareness is a property of mind, as motion is of matter.

However, though in a sense this mind is in the body, there is as yet nothing in the mind, for we have just now, by hypothesis, joined it to the body. It has not yet any *experience*, hence it is a *tabula rasa*, a blank sheet, a dark room into

<sup>1</sup> This does not deny Locke's "composition" theory of mind, but indicates rather the "faculties" of the mind, whose "innateness" he asserted, as for example in his note on the margin of Burnet's *Remarks on the Essay*.

which light is just at this moment beginning to be introduced through the avenues of the sense-organs. Until the mind has a body, no sensations can be *caused* in the mind, and until it has sensory materials to work upon, it lacks the very foundation of knowledge and experience. Locke's whole Essay is intended to drive this truth home, and to undermine the opposite well-known doctrine of "innate" ideas, according to which knowledge blossoms forth from a source within the mind itself, independent of sense-perception. The fountains of knowledge are, according to Locke, in things themselves, such that the mind's point of contact with the whole of physical reality lies narrowly in the sense-organs of the body. For the rationalists Descartes and the Cambridge Platonists, the mind contacts ultimate reality only on an intellectual level far above—indeed out of the reach of—sensation. Unless we get the force of this distinction between a sensory and a purely intellectual point of contact with reality, we shall miss much of the peculiar significance of Locke. To know nature truly, one must, if Locke is right, get down as it were into his bodily senses and perceive out through them the nature of things. He then *contacts* the real material world. Subsequently, he may turn inwards to reflect upon the operations of his own mind, thus making acquaintance with mental substance. But even the most abstract and universal bit of knowledge about the material world stands flat-footedly on sensation.

Well, having supplied our body with a mind and the mind with a body, sensation occurs, and the hitherto empty mind begins to get a store of ideas. Let us see how these ideas are produced and exactly what they are, on the level of perception.

Our animated organism sits up and looks at the marble we used to perform a visual experiment. It sees a patch of white

color. What precisely is happening in the marble, in the eye, in the mind, and also between these terms, to produce this effect? Here is Locke's answer:<sup>1</sup> globules of light strike the surface of the marble and rebound from it. The marble's surface has a texture which gives the rebounding light-particles two kinds of motion, rotational and progressive. The progressive motion of certain of these light-particles carries them forward to penetrate the lense of the eye and "to paint the image"<sup>2</sup> of the marble on the retina of the eye. Let us for the moment construe this so-called "painting" not in the literal sense but only in the sense of setting up a colorless vibratory response among the material particles of the eye. Now to this purely physical motion in the visual organ—which may include parts of the brain—a "sensation is annexed." This is the white patch that is actually and directly seen, and it is *in the mind* of the percipient. Of course, if the sensing part of the mind is in the body, as it seems natural to suppose, then it would appear that our patch of white should be discoverable somewhere in the body of the observer, as well as in his mind. And Locke is not at all loath to speak at times as though colors are literally painted on the retina and as though it is these retinal images that we directly see in ordinary perception of bodies. In one disastrous place—not in the Essay—after describing how a retinal image is produced by the bombardment of particles, he states that *this image* is seen. But Locke simply dare not mean that the color white becomes a literal property of the retina, since the retina is every bit as much a material object as the marble, and Locke's whole concern here is to show that colors are never immediate qualities in bodies, but only in minds. We therefore shall ignore this careless statement of his,

<sup>1</sup> iv, 2, 11–13.

<sup>2</sup> Examination of Malebranche, Wks. Vol. IX, pp. 217–218.

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especially since on the same page he goes on to write that the *motions* effected in the retina are continued to the brain and that this chain of intra-organic motions produces sensations *in our minds*. Thus Locke remains unscathed by the demonstrations of modern experimental psychology which prove, by the relative sizes of retinal images, that the retinal image is itself not seen, but rather the shape and size of something else.

Now why is it that when the above-mentioned particles rebounding from the marble strike the eye, we see white rather than green or blue? The color that is actually produced in any given circumstance depends primarily, according to Locke, on the joint rotational and progressive motions of the particles of light. That is, the velocity of approach to the eye and the rate of rotation of the particle determine what particular color is to occur, and that color becomes more intense as the number of such particles, moving thus, increases. To all this let it be added in fairness to Locke, that the color white is not to be simply *identified* with certain kinds of motion and texture of parts. Colors stand to such motions and physical textures only as mental effects to material causes. And Locke does not even pretend to have detailed knowledge of the way in which the material causes produce color-sensations. One thing however he is sure about, and that is that sensations are caused in the mind by the impact of material particles against the organism, whatever their motions or ultimate natures may be. This is called the "causal" theory of perception, and in itself is reasonable enough both to common and to scientific sense, though certain of its consequences—which we are about to trace—are not nearly so congenial.

So far we have limited our discussion to the class of visual sensations. This was not at all necessary to drive home

Locke's argument on behalf of the causal theory of perception. Indeed, it was beginning with that phase of perception which is *least* likely to prove his point.<sup>1</sup> For example, you are much more likely to get away with the assertion that the taste of an apple is just a sensation in you, than with the assertion that the red apparently on its surface is just a sensation in you. There is something objective about color which is wanting in sounds, smells, tastes, and sensations of temperature and pain. A pain or a taste may pretty safely be said to be where the body is, but are not colors at a distance from the eye? It is fairly reasonable to say that an apple is sweet and cool only in contact with some palate, but is it as reasonable to say that the apple is red only *in contact with* some eye? Certainly, Locke would answer, and it is reasonable *for the same reasons*, because in both cases there are in the real apple only certain atoms and aggregates of atoms in motion which directly or indirectly strike upon the sense-organs to produce sensations *in the mind*. Red is a sensation, like taste or pain. If a steel wedge were driven into the palm of your hand, would you say that the resultant pain is in the steel, a quality of the steel, like its solidity? If not, why say that the gray-blue sensation you experience when the wedge operates upon your eye is in the steel? There is, if you will, a slight difference in the two cases, for in the case of pain, the actual bulk of the object is pressed against the tactual organs, whereas in the case of gray-blue, the bulk of the object is not pressed up against the eye. But it is none the less in indirect physical *contact* with the eye, for from its surface a thin regular sequence of light-particles is being emitted to the retina, whence rises the gray-blue sensation in the mind of the observer. In short, Locke interprets

<sup>1</sup>Locke himself wrote ". . . visible species are the most difficult to be explained by material causes." *Wks.* Vol. IX, p. 215.

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*all* perception on the analogy of *contact experience*. If the external body is neither directly nor indirectly in contact with the sense-organ, there is no perception; and if the mind is not *in some sense* in contact with the stimulated sense-organ, as when in sleep or death it is "retired from the senses," then again there is no perception. The mind perceives physical objects only when, from their side, they send representatives of themselves to where the sense-organ is, *and* when, from its side, the mind extends itself to be in some way or other where that sense-organ is. Then there is contact—and experience. There is no such thing as perception at a distance. What the mind directly perceives must be immediately in the mind, that is, where the mind is.

But when of an evening I look out on Jupiter, is not the bright orb that I see really millions of miles away from my observant self and identical with the real Jupiter? This could hardly be the case, since as we well know the real Jupiter could suddenly cease to exist and still the duped observer would go on seeing his own little yellow luminary for more than half an hour. Locke knew of his Danish contemporary Römer, and of his discovery of the finite velocity of light, made by observations of the satellites of Jupiter. On this basis he criticized the opinion of Paul Malebranche that an object millions of leagues away is perceived the moment it is uncovered or begins to emit light.<sup>1</sup>

This argument, from the space-time interval between the perceiver and the external event causing his perception, is perhaps the best available one when it comes to proving that what you apprehend in sensation is when and where the sensation occurs, *not* when and where the remote external object is. It is the argument that certain modern epistemologists rely on most to establish such a dualistic theory of perception

<sup>1</sup> Wks. loc. cit.



as we have been describing, and it simply states that there is a space-time interval between cause and effect, such that the yellow sensation one has on looking at Jupiter cannot be Jupiter itself, since the sensation is effect and Jupiter cause. Admit causation between external object and sensation, and thereafter you cannot say that what is directly sensed is identical with its cause in another part of the universe.

We seem now, with Locke, to have shown that a sensation is one thing, and the outer cause of it another. This establishes, on a causal basis, the dualistic or indirect theory of perception. But, having revealed the width and depth of the mote between sensation and outer cause, we find ourselves faced with the necessity of explaining how experience bridges this gap. After all, to show that all immediate sensations are in the mind, is *not* to show how knowledge occurs about things outside the mind. Merely seeing a thing in the mind is not *knowing* anything of the nature of say a real chair or table, such that if we *do* know things like real chairs and tables, we have yet to explain the nature of this knowledge. This brings us to another important aspect of Locke's view, namely, what is called the representative theory of perception. The kernel of this thesis is well brought out by turning to Locke's definitions of "idea" and "quality."

We have seen how, though the characteristic of the mind is to be active or to operate upon things, it can allow itself to be passively operated upon by things. It is at this point of the mind's lending itself to be operated upon that sensation occurs. The part of the mind that is most intimately united to the body is itself capable of being causally affected by the motions in the sense-organs. One might almost say that in thus becoming passive, the mind acquires a kind of materiality in order to become capable of being moved by matter. That is, if mind did not here tend towards becoming

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something that a moving particle could bump into, how could the said motion cause anything to happen to mind?<sup>1</sup> The only way an atom can cause anything is by collision, Locke himself has told us. And since the contact of matter with mind occurs in the region of the sense-organ, the sense-organ might be described either as matter blossoming forth into mind or as mind congealing into matter, to make causation between them possible. Now let us examine this "dense" region of the mind "immersed in flesh" as it is being stimulated by say the organ of sight. In this mental region a colored patch appears as the effect of the physical stimulation, and this is what Locke calls a "simple" sensory idea, or idea of sensation. Likewise, there are simple sensory ideas resulting in the mind from touch or smell or taste or hearing. Locke attempts no further definition of these simple sensory units, on the ground that what is so simple cannot be defined. Only what is complex is susceptible of definition. Let him who would have acquaintance with the simple ideas of sense open his eyes and unstop his ears. If he is blind or deaf, he cannot know colors or sounds.

Now the ideas of sense are perceived to have certain qualities, and this at last brings us to the means of escape from the realm of mind into the realm of matter. *Some* of these qualities *resemble* the qualities of real physical objects, such that by knowing them in the mind, we shall, indirectly, obtain knowledge of the properties of bodies. For example, the properties of being extended and moving in space, of being solid and numerable, are exhibited by the tactual and visual sensations. In having *direct* acquaintance with these properties in the mind, we have *indirect* knowledge, according to Locke, of the nature of physical objects, since such properties

<sup>1</sup> Strictly speaking, a moving particle does not "bump into" mind; when the particles of a sense organ move, a sensation is "annexed" to the motion.

in the mind are *like* those in nature. These are called the “primary” qualities, because they resemble what they stand for.

But our sensations or sensory ideas have other properties besides the primary. For example, anything clearly seen not only has the primary quality shape, but also color. Anything touched not only suggests the primary quality solidity, but also warmth or cold. In short, there seems to be another class of properties which do not *resemble* anything in bodies in the same straight-forward way that the primary qualities do. A sensed red is not like any property of a body. Nevertheless Locke calls them qualities of bodies in a rather queer sense. White, for example, may properly be called a property of our marble, in the sense that the particular order and motions of the atoms of the marble are such as to produce in the mind the sensation of white when particles of light are reflected from the marble to the eye. We see, then, how indirectly the white qualifies the marble—not at all in the same direct way that say the shape of the marble qualifies it. Consequently, Locke calls it a “secondary” quality, and classes under this head all such as have real being only in the mind. Sounds, odors, tastes, pains, and sensations of temperature all share along with colors the same mind-bound existence. Except in the presence of some mind, there is nothing warm or sweet or colorful in the universe. And even in the presence of some mind, nothing in the universe is warm or sweet or colorful in the same simple way in which it is solid or extended in space.<sup>1</sup>

We have seen how the escape out of our minds into nature is accomplished by means of a relation of resemblance between certain qualities of the contents of our minds and the

<sup>1</sup> Hence Cousin remarks that Locke inclines toward materialism, despite the admission of immaterial substance or mind. *Philosophie de Locke*, p. 361.

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qualities of objects in nature. And this view, that certain elements in the mind signify or stand for elements in nature, is the representative theory of perception. Besides resemblance, however, Locke must mention something else to answer the question, why did it ever occur to the mind that there is, entirely outside it, a world of objects which in certain respects are like its ideas? After all, if everything directly experienced is in the mind, what could have ever suggested to this mind that there is a whole real world outside it, even though there may be resemblance? A good part of our belief in the existence of an external world, Locke answers, rises out of the feeling we have of "actually receiving"<sup>1</sup> stimuli from an external non-mental source. That is to say, over and above merely having ideas that happen to resemble material properties in certain respects, we also have an indefeasible sense that something is continually approaching the mind from without, to make contact with it, and to cause or produce in it its sensations. Our sensations are experienced as *effects*, and that is sufficient in itself to prove the existence of their external *causes*. It is a feeling that if we could *really* get outside of our minds and follow this causal sequence back out into nature, we would eventually arrive at the material object which is the source of stimulation. The inference of its extramental existence is not a blind or irrational one. Locke says we have unquestionable sensory evidence at least of the *existence* of things outside our minds, though of the precise nature of these things we may be comparatively ignorant. That such sensory evidence however is really quite questionable, contrary to Locke's belief, is shown by the sceptical development his theory of knowledge underwent in the hands of Berkely and Hume, who concluded that, for all we *know*, nothing exists outside of mind.

<sup>1</sup> iv, 2, 14, and iv, 11, 2.

In conclusion, I shall comment briefly on the present-day status of the dualistic theory of perception. It is safe and just to say that no other theory of perception has as yet been formulated which, by its sheer adequacy, could rule out the dualistic theory as improbable. If you deal in all fairness with space, time, and causality, it almost seems that the dualistic theory is the only one you can arrive at. Broad, one of the most prominent and scientific of living philosophers, writes that the direct theory of perception has for all time been demonstrated false.<sup>1</sup> And physicist Planck believes that the whole structure of physical science rests on the proposition that "the real outer world is not directly knowable."<sup>2</sup> Finally, among our American epistemologists, there is Lovejoy, whose powerful arguments for an out-and-out dualism have as yet received no refutation.

Aside from such evidence, however, which clearly shows that Locke is perhaps even more alive now than when, three hundred years ago, his fingers could push pen over paper in defense of dualism, it seems to me that a dualistic theory of perception will not stand forever. My reason for this belief is what I shall call its "natural" inadequacy. As long as there are human organisms who live and think simply, there will be the conviction that objects are directly perceived. Dick will continue to believe that when he looks at Harry, it is the real Harry that he sees with his eyes, and not some ghostly substitute for Harry in Dick's own mind. This will in the end, by sheer persistence, give birth to a theory of perception which, without ignoring the facts of physical science, will explain how Tom, Dick, and Harry *directly* perceive one another. Such a theory, should it ever arise, will however give mankind no occasion to put up a black

<sup>1</sup> *Mind and Its Place in Nature*, pp. 184-185.

<sup>2</sup> *Where Is Science Going?* p. 82.

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mark beside the name of Locke. For Locke's own clear naïve statement of the *problem* of perception will have contributed largely to the final non-dualistic solution. It is evident that Locke himself never pretended to have explained the details of the perceptual process. He avowedly had no *theory* of perception, when it came for example to showing how a sensation is "annexed" to the motion of particles in the stimulated sense-organ. Consequently, our purpose here has been to clarify for ourselves, as Locke did for himself, the *problem* of perception. Let him who has the wit pass on to its solution. Before he can, however, he must first have the wit to see the problem as clearly as Locke did. There is a way of recognizing a difficulty so intimately that, of this very intimacy with the problem, the solution is born.

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