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basing them, ultimately, upon the experience which concepts themselves pre-suppose. Endless and fruitless logomachies may be expected to follow from such a method. But on this, of course, I cannot now enlarge.

But here I must say, that I know not whether or not Mr. Waterlow, the reader of the present paper, is to be classed among those logicians who hold, or who would, on occasion arising, seek to show, that Philosophy is Logic. It may be that it is only in the present paper that he adopts the method of arguing on the basis of concepts, in order to meet Mr. Russell on his own ground. At any rate, in the concluding sentence of his paper he reminds us that he has proved the "abstract possibility of a whole composed of an infinite number of parts, no one of which is indivisible"; which is like a crumb of comfort let fall from his table for the behoof of the humble experientialist, to whom it seems obvious that, so long as we take anything whatever to be perceivable, we *ipso facto* suppose it to be divisible *by thought*.

IX.—ARE SECONDARY QUALITIES INDEPENDENT OF PERCEPTION?

A Discussion opened by T. PERCY NUNN and F. C. S. SCHILLER.

I. By T. PERCY NUNN.

It is important to make as clear as possible the sense in which I give an affirmative answer to this question. I will, therefore, begin by contrasting with certain well-known views the view which I wish to defend.

(a) The first of these is the Lockean view, which not only has great historical importance, but is still the creed of the average physicist and physiologist. It has its most condensed and vigorous expression in the following passage of the *Essay*: "The particular bulk, number, figure, and motion of the parts of fire or snow are really in them, whether any one's senses perceive them or no; and therefore they may be called *real* qualities, because they really exist in those bodies. But light, heat, whiteness, or coldness, are no more really in them than sickness or pain in manna. Take away the sensation of them; let not the eyes see light or colours, nor the ears hear sounds; let the palate not taste, nor the nose smell; and all colours, tastes, odours, and sounds, as they are such particular ideas, vanish and cease, and are reduced to their causes, *i.e.*, bulk, figure, and motion of parts." To which pronouncement it must be added that "the ideas of primary qualities of bodies are resemblances of them, and their patterns do really exist in the bodies themselves; but the ideas produced in us by these secondary qualities have no resemblance of them at all."

(b) The next is the Berkeleyan view that "those arguments which are thought manifestly to prove that colours and tastes exist only in the mind . . . may with equal force be brought to prove the same thing of extension, figure, and motion"; and

that "the absolute existence of unthinking things without any relation to their being perceived . . . is . . . perfectly unintelligible. Their *esse* is *percipi*, nor is it possible that they should have any existence out of the mind or thinking things which perceive them."

(c) The third is the view which may be collected from two valuable papers for which this Society is indebted to Professor Stout.* Mr. Stout accepts Berkeley's contention that our "simple ideas" of primary and secondary qualities are psychical existents and as such have exactly the same status; but he also agrees with Locke in holding that they have a relation to extra-mental realities. These extra-mental or "physical" existents include the secondary equally with the primary attributes of matter, which are in each case "correlated but not identical with intrinsic characters of sensation." "The correlation is essentially of the same kind for both. Sensation enters into the constitution of the . . . attributes only in so far as certain features of sense-experience represent something other than themselves, and it is only because this representative function is logically independent of the actual occurrence and fluctuation of sense-affections that the primary qualities can be validly thought of as existing in the absence of percipients. We are justified in thinking of matter as extended and movable in space before the existence of sentient being. But we have exactly the same justification for thinking of it as hot or coloured. Finally, the positive and specific nature of the primary qualities no less than that of the secondary is derived from corresponding sensations."† There is, however, a real and important difference between the two kinds of attributes: "The executive order of the material world can be expressed only in terms of the primary and not in terms of the secondary qualities of matter. . . . The system of

* *Proceedings of the Aristotelian Society*, 1903-4 and 1908-9. They will be quoted as "first paper" and "second paper" respectively.

† First paper, p. 147.

uniformities of co-existence and sequence and of quantitative equivalences and correspondences which constitutes the order of physical nature in its causal aspect can be formulated only in terms of extension, motion, and tension."*

As against these views I propose to maintain (1) that both primary and secondary qualities of material bodies "are really in them, whether any one's senses perceive them or no"; (2) that they exist as they are perceived; by which I mean that although (in Mr. Bradley's phrase) "the qualities impart themselves never except under conditions," yet these conditions do not affect the character of the qualities perceived; and (3) that sensations as mental entities exercising a "representative function" need not, therefore, be postulated.†

The Arguments for the Psychical Nature of Sensations.

The assumption of mental or psychical existents (as distinguished from the psychical processes whose occurrence constitutes a cognition) is the fundamentally important element in each of the doctrines which I have quoted. It will be well, therefore, to examine briefly the chief grounds for this assumption. They are to be found expressed most clearly in Mr. Stout's papers.

The first and most inclusive ground is that there are (apart from conation, attention, etc.) elements in experience whose being consists "only in being experienced."‡ A tooth-

* First paper, p. 153.

† In two notable Presidential Addresses Professor Alexander has lent his great ability and prestige to the defence of these same positions. Some of the following arguments can hardly fail to recall those which he has used with so much effect. For this reason it may be advisable to point out that I have an independent right to use them. They will be found to be either abstracts or obvious extensions of arguments brought forward in papers which I read to this Society in 1906 and 1908, and in a book (now out of print) on the *Aims of Scientific Method* (1907), all written before I was aware that Mr. Alexander was a supporter of similar views.

‡ Second paper, pp. 231-6.

ache is regarded by Mr. Stout as so obviously a case of this kind that it is sufficient merely to call attention to it. "If our existence as conscious beings were annihilated it would *eo ipso* disappear, whatever might happen to our body." Dream apparitions and hallucinations are almost equally easily disposed of. "Their beginning to appear to [the subject] and ceasing to appear to him are the beginning and cessation of their existence. If he were annihilated they would *eo ipso* be annihilated." Such cases as the yellowness of buttercups or the greenness of grass are less obvious and demand argument. The proof that here also we are concerned with elements that exist only in being experienced is (in brief) that "the immediately experienced quality may vary when things seen remain unaltered." For example, I do not impute to the buttercup the changes produced by contrast of colours or by the oncoming of twilight.

In this first group of cases, the elements of experience under consideration "belong to the objective rather than the subjective side of the subject-object relation,"* and, as we have seen, the proof that they are psychical lies in the supposed fact that they "exist only in being experienced." In another group of cases Mr. Stout bids us observe that sensations "are capable of being mentally presented without being objects at all."† Thus I may be "quite inattentive to words as articulate sounds . . . [and] attend only to the meaning they convey." Or the "sympathetic excitement" involving a whole complex of sensations of which he is "entirely heedless" may yet be the means by which the spectator of a football match enters into the experience of the players. "Sensations, then, may be in the proper sense *subjective*." On the other hand, pleasure and pain, which are normally subjective, may, on occasion, be objective. Thus Ferdinand experienced (subjectively) delight

* Second paper, p. 231.

† Second paper, pp. 243-6.

in the (objective) painfulness of carrying logs in the service of Miranda. Painfulness and sensations of sound, pressure, etc., may, then, alike appear either on the subjective or the objective side of the subject-object relation. We must assign them, therefore, to the same ontological status. "But no one . . . will maintain that pain is ever . . . anything but a mental fact." It follows that sensations are mental facts also.

A discussion of these arguments will be the best introduction to an alternative doctrine. They all appear to involve the same major premise: "Anything which exists only in being experienced must be psychical." It is true that in the second argument we are not told why nobody would maintain pain to be anything but a mental fact, but there seems to be no reason available except that its existence is dependent upon its being experienced. For Mr. Stout admits that a thing need not be psychical simply because it is not physical, and the form of his argument shows that he cannot here mean to maintain that a thing must be psychical if it can once be found on the subjective side of the subject-object relation. If, then, for the sake of argument, we grant this major premise, everything turns upon the truth of the minor premise: "Pain, sensations of colour, etc., exist only in being experienced."

It has already been noted that Mr. Stout offers no evidence for this statement in the case of pain. Yet to me, at any rate, it is by no means self-evident, and there seem to be considerations to urge against it. In the first place the painfulness of a toothache may present itself as a thing to be *reckoned with* as much as St. Paul's Cathedral, although my experience of it, like my experience of St. Paul's, may be transferred to the subject side of the subject-object relation if (for example) my interest is engrossed by the utterances of an eloquent preacher in the pulpit. It seems as fair to deduce from this that the pain is, like St. Paul's, something outside my mind, with which my mind may come into various relations, as it is to deduce that the sensations due to the presence of St. Paul's have, like the pain,

merely a fleeting psychological existence. Again, experience of the toothache and of the cathedral depend in each case upon the fulfilment of certain physical conditions, and I am no more bound to suppose that the pain is snuffed out of being when I cease to feel it than I am to suppose that St. Paul's is annihilated when I cease to see it. Indeed, there are occasions when the presence of the appropriate physical conditions gives me a positive reason for supposing that the toothache was "there all the time" though I did not feel it. When these physical conditions are, after an interval, restored, the "same pain" returns. On comparing notes with an acquaintance in whose body the same physical conditions exist, I find reason to believe that we both suffer the "same pain." It is conceivable that the pains in these cases are the "same" in a sense identical with the sense in which one person at two different times, or two different persons at the same time may be seeing the "same" cathedral. The pain may from time to time be drawn into individual experience from the kind of "cosmic reservoir" that has been suggested* as a possible source of the abnormal knowledge present to the trance-consciousness of Mrs. Piper. Hallucinations of pain—that is, experiences of a certain pain in the absence of the lesion which normally conditions them—could, on such a hypothesis, be explained, like telepathy and the other forms of teleesthesia that are believed to occur, as direct experiences of the object unmediated by the ordinary physical machinery. This explanation is easier than one which assumes a pain to be a psychological element normally called into existence only by the existence of certain physical conditions.

I can see only one positive argument against the continued being of a pain outside experience. It might be contended that the pain of a toothache and sensations of colour and extension are of the same order of existence; that the latter are psychological because they are merely fleeting "representatives" of abiding

physical realities like St. Paul's Cathedral; and that the former must, therefore, be a fleeting psychological existent. It is obvious that this argument would have no cogency for one who did not accept Mr. Stout's view of the representative function of sensations. Moreover, it would from any point of view destroy the force of the contention that sensations of colour, extension, etc., must be psychological existents because they are on the same footing as pains which are undoubtedly psychological. The argument cannot be worked both ways at once.

It would be impertinent to suggest that Mr. Stout's thought has followed this circular course. But in the absence of any reasoned support of the statement that pains exist only in being experienced I feel that the case of the "presentations of special sense" is the keystone of the deductive bridge over which Mr. Stout would lead us to the recognition of these psychological existents. His argument here is, as we have already noted, a modification of the one used by Locke to prove that secondary qualities are psychological and by Berkeley to prove that both primary and secondary qualities are purely psychological. A hot body yields different sensations of hotness at different distances; a buttercup gives different colour sensations when viewed by the margin of the retina instead of by the centre, or by twilight instead of by full daylight. But these differences do not imply changes in the hot body or in the buttercup. The sensations must, therefore, be psychological entities which exist only in being experienced.

The validity of this conclusion obviously rests upon the truth of a definite assumption: that the hot body cannot at the same time own all the hotnesses that can be experienced around it, nor the buttercup at different times the various colour qualities that may be "existentially present to consciousness when some one observes it." Of this proposition, as of the proposition that pains exist only in being experienced, I venture to say that it is not self-evident, that certain considerations weigh against it, and that Mr. Stout has adduced no counterbalancing

* By Professor James, *Proc. S.P.R.*, LVIII, p. 4.

considerations in its favour. Upon Mr. Stout's theory there are extra-mental qualities of the buttercup "correlated but not identical with" the various sensations. These sensations, each under a specific set of conditions of perception, "represent, express, or stand for something other than themselves"* which is the actual extra-mental secondary quality of temperature or colour. Mr. Stout is emphatic that in exercising their representative function the sensations really mediate knowledge of the extra-mental realities. The plain man "is convinced and rightly convinced that these objects are physical not mental."† But when we inquire into the nature of the qualities which the sensations represent and the grounds for the conviction that they are physical Mr. Stout's reply is disappointing. It would seem that the reason why I say that I see a yellow buttercup when as a matter of fact the quality immediately presented is not yellow is that this quality represents to me the quality that would be presented under certain normal or standard conditions of perception. But, unless this normal presentation is identical with the physical secondary quality, how can it be said that the latter is "represented" by the actually occurring quality? For if one thing is to stand for or to represent another we must have direct knowledge both of the thing represented and of the symbol. But we are told that "what we call the colour of the external thing cannot be simply identified with any quality which is existentially present to consciousness when someone looks at it."‡ It is true that we are also told, both of primary and of secondary qualities, that they are "derived" from the corresponding sensations; but, in face of the statement quoted in the last sentence, this "derivation" cannot mean such a relation between the physical attribute and a sensation that to have the latter immediately present to consciousness is *ipso facto* to know the former. One is bound to conclude that the only

* First paper, p. 144.

† Second paper, p. 229.

‡ Second paper, p. 232.

representation which Mr. Stout has exhibited to us is the mutual representation of sensations. Any one of these may not only be itself experienced but in that experience may stand for, express or represent a definite series of others. But if at the same time we hold that a given sensation by this representation mediates knowledge of an extra-mental thing then it seems impossible to avoid identifying with this thing at least one member of the series for which the given sensation stands. That is, there is in each of these series at least one member that cannot be thought of as a fleeting psychical existent. Since there is no evidence to attach this prerogative to one rather than to another of the series it is safest to identify the physical attribute with the whole of them.

Origin of the Belief in Psychical Sensations.

It is not difficult to point to motives that have done much to secure for the belief in the psychical nature of sensations the position of an orthodoxy. The first is the motive of "economy of thought." For practical purposes it is necessary to simplify in thought the limitless complexity of actual phenomena. Thus we come to think of one of the innumerable hotnesses that can be perceived in and about it as the real "temperature" of a warm body; the sensation which a buttercup yields under certain standard conditions of perception becomes "the colour" of the flower. Other hotnesses and other colours tend to lose their substantive character and are reduced to the status of signs of these. This process of simplification is not confined to common thought. The progress of science, while it reveals wider and deeper complexities in Nature at every stage, shews also that a conceptual simplification of its data is constantly becoming a more essential condition of theoretic success. The existence and importance of this tendency in physical science has no doubt had great influence in determining the philosopher's cultivation of the same tendency in his department. Allied to this inveterate pragmatic habit is a prejudice not unlike the

prejudice that has led some people to reject the idea of immortality on account of the appalling number of souls that would share it! Under its influence we are concerned at the enormous number of qualities with which Realism would endow the commonest body. By supposing these qualities to enjoy only a temporary existence in the mind of an observer we seem to effect a great economy of material and to clear Nature of the suspicion of reckless prodigality.

In the next place there are certain experiences—my pains and pleasures, my memories and imaginations—which in some sense often belong to me alone and are not, like my perceptions of the physical environment, shared with other people. The objects of these experiences come, therefore, to be thought of as psychical, as part of my mind. But error and illusion in the province of sense offer other examples of experiences whose essence it is to belong to me alone. When reflexion begins to work upon these experiences it readily follows the same method as in the province of physical phenomena. Just as the physicist seeks to reduce the whole of his universe to matter in motion, and to carry out this purpose feigns "concealed masses" in movement where no movement is, in fact, verifiable; so the psychologist, starting with the belief that he has good reason to consider the objects of his errors as well as his feelings and images as parts of his "mind," comes eventually to think of all the facts of experience in terms of hypostatised "states of consciousness," even in cases where there is no pretence that these pieces of consciousness which have extra-mental objects are verifiable. In other words, the "mind" as we have it in orthodox psychology is largely a methodological postulate—an expression of the need which a special science feels to reduce all its data for theoretical purposes to a common denominator.

The Alternative View.

The upshot of the foregoing discussion is that the premises upon which the proof of the psychical nature of sensations rests

are merely plausible assumptions or pragmatically useful postulates. They present, therefore, no insurmountable barrier to those who feel impelled to take another road than the one they mark out.

This road starts from the recognition that in perception the object announces itself as having a certain priority to and independence of our act and that this announcement is itself the sufficient certificate of the object's extra-mental status. It is important to observe that Mr. Stout also admits,* under the name "immediate inference," an element in sensational experience which guarantees that we are dealing with extra-mental realities. This element is, in fact, implied by the statement that sensational qualities are the data of perception. If our sensations "could be known in pure isolation from aught else they would not be data." "An isolated datum is a contradiction in terms." There is no difficulty in accepting this principle. Divergence appears only in its application. For Realism as here conceived, the further truth which the sensation "reveals" is its own extra-mental existence. For Mr. Stout the further truth is the existence of an extra-mental reality correlated but *not* identical with the sensational quality. No doubt sensational experience often guarantees the extra-mental existence of something more than the qualities which appeal to the special senses. Through sensational experience the subject may be brought into cognitive relations with the "thinghood" or real extra-mental nexus that unites the sensational qualities. But I can find no warrant for the statement that while the sensational experience gives adequate data for immediately inferring the extra-mental existence of "thinghood" it gives no reason for inferring also the extra-mental existence of the sensations themselves. It is apparently because Mr. Stout holds the opposite opinion that he feels entitled to object to Mr. Alexander's appeal to the facts as irrelevant to the problem

* First paper, p. 159.

under discussion.* To meet this objection I urge that the character of extra-mentality announces itself in and with reference to "that which is existentially present to my mind in perceiving physical things" as well as in the physical things which it is the means of my perceiving. It announces itself in the colour of the buttercup even when my eye has become so trained that the colour quality actually presented is no longer accepted as merely a symbol for a normal quality; it announces itself in all the hotnesses that I can feel at different distances from a fire, though in this case there is no normal quality of which they can be the symbols. In neither of these cases, nor in any comparable case, can I find in the experience itself any indication that I am dealing with temporary existents in my mind which "represent" the physical thing outside my mind.

The path which I propose to follow from this starting point is determined by a postulate offered as a substitute for the postulates of the orthodox view. That in the perception of a physical thing the subject is in relation with no psychical intermediary "on the object side" but with the thing or certain features of the thing itself—this seems not only to be a datum of the experience, but also to be part of the plain man's view. *Mutatis mutandis*, the same can be said when the object of the cognitive relation is an isolated quality—such as a smell or a colour—which is not a representation of a thing in the ordinary sense of the word at all. Careful introspection and the plain man agree in pronouncing the object to be extra-mental—to be an entity capable of entering into the subject-object relation, but to be in its own character unaffected by the presence or absence of that relation. The postulate in question lays down that in philosophising, though I may rectify and add to the plain man's view, I must not contradict or explain away any essential positive features of it. I venture to make it clear (repeating what I have said elsewhere) that by the plain man I

do not mean any particular species or variety of the genus *Homo*, but a being included in the wider self of each of us. The plain man is the original stock upon which the psychologist, the physicist or the metaphysician is grafted; and it is he who, while he supports and nourishes this more or less desirable parasitic growth, still conducts those activities that form the common core of human life from China to Peru. To say that the positive features of his view of the world must be preserved is to express the belief that his vitality supplies everywhere the data upon which departmental activities—such as those of science and philosophy—operate, and that if those activities lead to results contradictory to the plain character of the data from which they start, they are pursuing a course which must end in futility if not unintelligibility.

The systematic application of the principle that what is existentially present to the mind in perception is something extra-mental—something that would be as it is in perception even if it were not perceived—soon leads to results which do not form part of the plain man's view, simply because they are matters of departmental interest. These may be approached by other results which probably do form part of his view. Thus every one holds that there are things which "have" one colour by day and another by artificial light. In such cases neither colour is taken as a symbol of the other; they are accepted as co-ordinate substantive features of the thing, each presented to perception in the appropriate circumstances. It is easy to see that the yellow buttercup is simply a pragmatically simplified case of the same kind. The buttercup actually owns all the colours that may be presented under different conditions, though in actual experience most of them are liable to be degraded to the position of symbols of those presented under normal conditions.

But more difficult cases soon present themselves. Imagine a number of persons spread along the circumference of a large semicircle while a motor car from which a whistle of constant

* Second paper, p. 229.

pitch is sounded moves rapidly along the road which forms the diameter. Then, as is well known, not only will each person at a given moment hear a note different from the notes heard by his companions, but the note heard by each is different for different positions of the car. Moreover the occupants of the car will hear all the time a steady note which, except momentarily, is heard by none of the bystanders. Are we to maintain that all these diverse notes are being simultaneously "emitted" by the whistle? With a proper interpretation of the word "emitted" I believe that we can and must answer, Yes. The experience of hearing a note seems to me to contain as part of itself the announcement that the note is extramental—that it is, so to speak, *there to be heard*. Since this is true of each of the notes—none of which presents itself with a certificate of superiority over the others—I accept the conclusion that the creation of this multiplicity of notes to be heard is part of the phenomenon which is called blowing the whistle. If, for example, the note happens to be so high in pitch that it lies outside the limits of A's audition, while B, who is standing beside him, continues to hear it, then it seems to me just as certain that the note is really there for A to hear if he could but hear it as it might be in another case that there was a pin on the floor for him to see if only (like the sharper-sighted B) he could distinguish it.

I have said that in connexion with this case the word "emitted" must receive a proper interpretation. It refers naturally to the pragmatically simplified view in which the whistle is thought of as yielding its note under certain standard conditions—namely when whistle and hearer are both stationary. This view must be rectified by the aid of the science of acoustics. The thing that is really sounding is the air, the whistle being concerned merely in setting up a definite type of aerial wave-motion. (If we substitute a bell for the whistle, bell and air together constitute the sounding thing.) If at any point a given number of "air waves" reach the ear

in a second then there is correlated with that "frequency" a definite note to be heard. The air vibrations do not constitute the "reality" of which the note heard is merely an appearance or mental effect. The same thing can be said of the phenomena that occur along the line from the tympanum to the cortex of the brain. Both kinds of phenomena are undoubtedly events that happen, but they happen *as well as* the occurrence of the note, and are merely the ordinary accompaniments of its perception. I insert the word "ordinary" here because I hold that hallucinations can be interpreted quite as fairly as evidence of the independent status of sounds as of their psychical character. As in the case of hallucinations of pain auditory hallucinations may at least in some cases be due to the setting up of cognitive relations directly between the subject and a sound without the intervention of the usual physical and physiological machinery. If (as seems possible) auditory hallucinations are occasionally veridical this evidence would, I think, be a good deal strengthened. Moreover, as we shall see later, normal psychology has been thought to give evidence for the view that we may have sensations unmediated by material events of the ordinarily appropriate kind or by stimulus of the ordinarily appropriate organ.

The case of the hotnesses perceived round a body of high temperature is still more complicated, for here the condition of the part of the body that acts as perceiving organ partly determines the object to be perceived. As the condition of this organ changes during the observation the hotnesses observed will change also. These facts are not to be interpreted as proving that the hotnesses existentially present to the mind are psychical, but they do show that the plain man's view of a hot thing requires rectifying and supplementing. Not only must the thing be thought of as owning an indefinite number of hotnesses disposed spatially about it; it must also be recognised that the disposition of these hotnesses depends in part upon the hotnesses belonging at every moment to

neighbouring bodies. Both of these ideas are in principle familiar to physical science as well as to metaphysics. Physical bodies are not isolated reals, each wearing its own qualities without any regard to the condition of any other body. In certain cases, capable of empirical determination, bodies reciprocally "take note" (in Lotze's phrase) of one another's condition, and express this notice in their own states. Again a thing must not be thought of as limited by a precise spatial boundary. It may be necessary to think of it as filling an indefinite part of the material universe. The thing need not on that account cease to be a definite real complex of primary and secondary qualities which could be conceived to be withdrawn from the universe as a whole.

With this corrected view of the scope of the word "thing" we can attack the interpretation of other cases of perception. If I look at a distant ship through a telescope or at an insect through a microscope I "see" the objects by means of sensations that I could not acquire by the naked eye. No special question of the relation of the sensations is thought to be raised here, because the information given is congruent with information afforded to other senses or to the naked eye under other conditions. But if I look at a straight stick in water I obtain sensations which are not congruent with those given to another sense or to the visual sense in the absence of the water.

All these cases are really in equal need of the application of the wider concept of the "thing." There are relations between the ship or the insect and the lenses of the instrument which, on a sufficiently strict view, must be thought of as making a difference to the object observed. It just happens that the difference is perceptible only from the point of view of the observer at the eye-piece. In this respect the case differs from what would happen if we directed a rod of iron towards a coil conveying an electric current: for the difference here would be observable from many points of view. There is,

nevertheless, in the cases considered, an equally genuine difference made in the thing; for the disposition of its visual characters is changed. The case of the stick in water is complicated by the fact that the change in the disposition of the visual characters produces effects which in normal cases would belong to a bent stick. There is, however, no reason on this account to doubt the pronouncement of the experience that the visual qualities characteristic of the modified thing before us have a real extra-mental status.

Error and Illusion.

At this point it will be convenient to direct the discussion to the question of Error, which is generally supposed to offer peculiar difficulties to such a theory as the one here outlined. If in sensational experience you are merely reading off the facts about extra-mental realities, how (it is asked) can sensations ever lead you astray? Yet the existence of error and illusion is a fact that we constantly have occasion to acknowledge.

Without professing to have a completely satisfactory answer to this objection, we may do much, upon the view I am defending, to limit the field of its application. Many of the stock examples can be shown not to be cases of error or illusion in any sense that constitutes a stumbling block to a realist theory. Thus, if I identify the note of an engine whistle as upper C when the note "really" emitted is C sharp, my "error" may be due either to my ignorance that the engine was moving away from me at the rate of 44 miles per hour, or to my ignorance that this circumstance would make any difference to the sound heard. But although, owing to my having insufficient data before me, or to my lack of knowledge of their relevance, I may entertain a wrong belief about the whistle, my failure does not falsify the guarantee of extra-mental reality that my perception of the sound gives. We may deal similarly with the mistakes in matching colours

made by a normal person in artificial light or by a colour-blind person in daylight. There is no error or illusion here, in the sense of an attribution to the things of colours that they do not really own. The full extent of the mistake consists in ignorance that the colours which agree when seen under the given conditions of perception would not agree under other conditions of perception. In the case of the colour-blind person there is the additional circumstance that physiological conditions may never permit perception of the colour which in the pragmatically simplified concept of the thing is thought of as its "true" colour. In the same way there is no difficulty in the case of the water which appears warm to A and cold to B. To me it seems true, not only that both the warmth and the coldness are really experienced, but also that, under the appropriate conditions, both are *there to be experienced*. Error need consist in no more than one observer's ignorance that the other observer is not necessarily in cognitive relations with the same extra-mental reality as himself. Unlike Mr. Stout, I can find no more "contradiction" in the simultaneous attribution of the warmth and coldness to the same water* than in the simultaneous attribution to it of warmth and acidity. Only empirical experience can decide what qualities it is possible, and what it is impossible, for a body to wear together, and we must admit that experience shows that warmth and coldness simply are not among the qualities which exclude one another. It is true that I may not think of the same part of the water as having more than one "temperature." But the temperature, thought of as the "real" state of hotness or coldness of the body, is a concept of merely pragmatic validity. It is a symbol for the totality of the experiences of hotness and coldness obtainable from the water at the moment in question, each under its proper conditions of perception. Obviously there would be a contradic-

* Second paper, p. 238.

tion in supposing this totality to have simultaneously two different expressions, but there is no contradiction in supposing its single expression to consist in a variety of details. It may be added that the use of a thermometer to determine temperatures rests upon the fact that with some substances (though not with all) there is a one-one correlation between their volumes under a given pressure and the totalities which are properly to be thought of as the temperatures of the substance.

In the case of the "straight staff bent in a pool" there is, again, no illusion with regard to the visual appearance. It does not merely appear to be bent: it is bent. Error here can only take the form of inferring a correlation between visual and tactual and other experiences which does not exist. This error may spring either from ignorance that the staff is partly in water, or from ignorance of the visual aspects belonging to a straight staff in these circumstances. The staff in water is (as was said before) not really the same thing as it was out of the water. Certain characters of the new thing are identical with those of the old, but its visual characters are changed. They are not reduced to a chaos, but a fresh set of experiences would be necessary to give a *posteriori* knowledge of the correlation between them and the other characters. I can see only one serious objection to this account. It is that the visual characters of the staff under water are not in the same place as the tactual characters. At first sight this fact is undoubtedly a difficulty to a realist who believes—as a realist probably must do—that even if there are divers mutually exclusive spaces, yet the visual and tactual characters of a physical thing must be in one and the same space. It is, however, not insurmountable. There are many familiar instances in which different characters of a body occupy different parts of the same space. For example, the magnetic characters of a piece of iron are not all found in the same place as its chemical characters. We may thus legitimately

suppose that in the case of another special form of physical thing—a straight staff in water—the visual characters and the tactual occupy different positions. This explanation covers also the important cases of the object seen through a magnifying glass or telescope, and the still more common case of an object seen by reflexion in an ordinary mirror. In all these we have visual characters which are undoubtedly correlated with tactual characters but occupy different parts of the same physical space.

It is pertinent to note in this connexion that it has been thought possible to explain some well-evidenced cases of apparitions only on the hypothesis that the visual unaccompanied by the tactual and other characters of a dead or absent person were really occupying a definite position in space before the observer.* Whatever value such an explanation has in these cases it is instructive to find it proffered from the point of view of empirical science by a thinker whose aim is, not to construct a metaphysical system, but merely to understand a certain group of facts.

More Difficult Cases of Illusion.

The foregoing cases of error and illusion offer, I think, no real difficulty to the theory of this paper, because, though they imply incomplete knowledge and (therefore) false inferences, they do not involve internal discrepancy in the content guaranteed by perception. There is no evidence to contradict the statement which the facts give us about themselves. Any such evidence consists merely in deductions from presumptions for which no proof has been offered—presumptions which may, like Euclid's last axiom, be denied without resulting inconsistency. Our theory has a harder task when it faces genuine cases of perceptual illusion—that is, cases where sensational experience seems to guarantee the existence of things that nevertheless can

* Myers, *Human Personality*, Chap. VI.

be proved not to exist. A realistic theory cannot live upon the principle that there is an element in sensational experience which pronounces authoritatively that we are dealing with extra-mental data, but that sometimes when this pronouncement is given the data are not extra-mental after all. The demonstration of the occurrence of such cases would necessitate either the withdrawal or the radical modification of the theory.

Before examining instances which threaten the realist with these unpleasant alternatives I wish to draw attention to certain considerations of importance. The first is the consideration pressed by Mr. Bradley when he was entering upon the discussion of the same problem. Realism is not bound to explain the whole of the facts of error and illusion. "A general doctrine is not destroyed by what we fail to understand. It is destroyed only by what we actually do understand, and can show to be inconsistent with the theory adopted."* Why error and illusion are "permitted" (to use the old phrase) is a problem that no system of philosophy has solved. It must suffice if we can show that their phenomena can be described in terms that do not imply a contradiction of our main theory.

The second consideration is that although the full explanation of error and illusion is more interesting to Realism it is not actually more important than in other philosophies. No matter what form a system gives to the concept of Reality the specific quality of perceptual experience is an element which it is illegitimate to disregard. We may minimise its value, but an explanation of its existence and distribution is an indispensable part of a theory of experience which promises to cover, even in outline, all the ground. But such an explanation of the distribution of the sensational quality demands a better account of error than is given (for example) by either of the prevailing philosophies. In Absolutism as represented by Mr. Bradley we learn that the existence of error and illusion

* *Appearance and Reality*, Chap. XVI.

causes no difficulty, because every affirmation made by a finite mind about a finite subject suffers from the need of supplementing and rearrangement in which error consists. But although in this way Absolutism avoids the necessity of treating error it has not explained it. The difference between the relations to reality of the judgment "It is raining" when in one case it *is* raining, and in another it is *not*, is the specific difference that calls for explanation. To show that the two judgments merely represent different degrees of untruth is to avoid, not to proffer an explanation of this difference.

Similarly with Pragmatism. The sensational quality has become attached (we may suppose) to certain types of presentations as the mark of a peculiar relevance to universal human purposes. I may act successfully upon the perception that a friend is approaching in a way and for purposes not possible if I merely called up a visual image of his approach. If my reaction to the perception does not lead to the normal satisfactory results the perception was erroneous. This idea, when expanded, leads to a very illuminating psychological description of error and illusion, but it leaves quite unexplained how a feature of such immense epistemological importance as the sensational quality can be misplaced, and attempts no estimate of the metaphysical significance of the misplacement. It is impossible to judge of the adequacy of a system of first principles before it has come to grips with this dangerous and treacherous problem. The special disadvantage from which Realism suffers is not that success here is more vital to it than to its rivals, but that it must be gained at an earlier moment in its career.

It may be added that perceptual error seems to offer in Mr. Stout's theory precisely the same difficulties that it offers to the theory proposed in this paper. The *differentia* of sensational experience is that it presents me with data from which I may infer immediately the presence of an extra-mental existent or physical body. But how can this account

be true if sometimes (as in hallucination) when sensational data are given the inference is incorrect? It would be equivalent to an admission that although "Some Q's are P's" is an immediate inference from "All P's are Q's," yet in certain cases the conclusion does not follow. Either the immediate inference must always hold good or else there is no inference at all, but merely such a "coefficient of correlation" between the presence of certain sensations in my mind and the spatial presence of certain physical things, that in most cases, when I have the sensations, it is a safe shot to guess that the physical thing is at hand. But if there is merely this external relation between sensation and thing we are obviously brought back to the old puzzle of how we know anything about the thing at all.

It is clear, again, that Mr. Stout's theory does not escape the difficulties presented by illusion (as distinguished from hallucination). He does not maintain that my immediate inference from sensational data assures me merely that an extra-mental reality is present. He conceives it as going at least some way towards the specification of that reality. That is clear from the statement that we know (*i.e.*, immediately infer) the circular body to remain unchanged, though we may have a vast number of different views of it. If, then, Mr. Stout "recognises" a person as a friend, and subsequently finds that he has addressed an entire stranger, he is confronted with exactly the same difficulty as the realist who rejects intra-mental sensations. The very being of sensations is to yield immediate inferences of a certain class—a class which must be taken to include the recognition of different human forms when we meet them. Nevertheless, here is a case in which the immediate inference is wrong. How can this result be reconciled with the original view of the relation between sensation and extra-mental reality?

A large number of ordinary cases of perceptual error can be brought in part under the heading of *inadequate discrimina-*

tion. It is universally known that attention, and above all practice, may make an immense difference to the number of data which I can discriminate from one another in any sense-field. We must infer from this fact that, although the experience guarantees the extra-mentality of the data as far as discrimination goes, it always fails to discriminate, and so leaves unasserted, some features of the object which (we may believe) are yet there to be sensed. The difficulty of discrimination is greater as the intensity of the sense-qualities diminishes, until at length it may become impossible to recognise with certainty that the sense-quality is really present. It becomes impossible, for example, to discriminate between a very feeble illumination and a visual image. It is probably untrue to say here that the experience's pronouncement of its own character is illusory; it is the nature of the pronouncement itself which is in doubt. When in this case there is a strong external bias in favour of one pronouncement rather than the other a genuine illusion may occur. This was the case, for example, with M. Blondlot and the N-rays. In such cases the observer does not really ascertain the verdict of the experience at all; he substitutes for the actual data a construction more or less different from the data, but either wholly or in part suggested by them. He proceeds to *use* this substituted experience without further inquiry, just as if he had consulted its verdict upon the character of its contents. There are in normal psychology many instances of this tendency which approach illusion more or less closely. As is well known, a young child, in drawing a profile picture of a man on horseback, will not only give the animal credit for all the limbs which he knows it to possess, but will treat the rider with equal generosity in respect of his eyes and his legs. Yet the intention of the artist was to picture man and beast as he actually saw them. It is by no means uncommon to find unsophisticated children of a considerably greater age who, if they have a tendency to left-handedness, will produce of an animal with his

head towards the right a picture showing the head turned to the left. They mean to draw the animal as they see it, and, until the discrepancy is pointed out, are not aware of its existence. Doubtless they have constantly substituted for the sensational data an imaginary construction suggested by them, a construction better adapted than the original to guide the work of the pencil. Through the very fact that it is used as the guide to action it is temporarily believed in, though careful inspection at once shows that it is only a substitute for the real sensational data. Most of the common cases of perceptual misinterpretation receive a similar explanation. The sensational data actually guarantee the presence of certain extra-mental characters, but before these have been adequately discriminated the object is replaced by a mental construction whose elements are more or less congruent with the actual data, and whose connexion with our previous experience and our interests qualifies it to direct action effectively. The details of this construction are not examined from the point of view of their character, but it is assumed that they have the sensational character attached to the original data until the results that follow from this unconscious assumption cease to be compatible with it. A more careful examination of the data follows and at once dispels the illusion. It should be noticed that this tendency to replace original sense data by a mental construction (or "hypothesis") which forms a readier guide to practical or theoretical activity is in another form the characteristic of physical science. In the opinion of some critics of science the practical success of the mental construction here also leads to something very much like illusion.

Hallucinations form a more difficult subject of inquiry, but it is possible that the difficulty arises largely from our lack of reliable introspective knowledge of them. In some cases, for example, the sensational quality may be absent from the data, and we may have merely another case of a construction of intra-mental origin which comes to determine action as if it had been

based upon sensational data. In other cases—such as many well-attested apparitions and hallucinations of sound (*e.g.*, the daemon of Socrates and the “voices” of Joan of Arc)—the evidence at least warrants the speculation that real sensational visual and auditory characters are directly cognised without the help of the ordinary mediating machinery. In yet other cases the theory of Dr. Boris Sidis* may prove a way of escape from the difficulties of the situation. Upon this theory we must distinguish in normal perception between the primary sensations which result from the actual stimulus of a sense-organ, and form the core of the perceptual experience, and the fringe of secondary sensations, reminiscent of former experiences, which form the “complication” of the former. In an hallucination there is no primary sensation, but a fringe of secondary sensations is excited, and therefore gives the whole abnormal experience a character which is taken as sensational. If Dr. Sidis’ distinction between primary and secondary sensations can be maintained, it would follow that only the former could be regarded as evidencing the physical presence of a quality. The latter, though nearer in quality to primary sensations than to images, must yet, no doubt, be distinguished from the former by careful discrimination. They may, for example, be somewhat analogous to after-images and the light seen on pressing the eyeball—phenomena which are quasi-sensational in character, and may by inadvertence be thought to give the guarantees of genuine sensation, yet can with attention be easily discriminated from such sensations.

There are other forms of illusion and error which in a complete review would demand treatment. Possibly, enough has been said to indicate ways in which in the most important cases the existence of error can be reconciled with the theory that sensational experience carries with it a guarantee of

the extra-mentality of its content. A more detailed consideration would probably prejudice the case for this view by the importation of elements of weakness due not to the nature of the view itself but to the inadequacy of the apologist.

The Difference between Primary and Secondary Qualities.

In conclusion, I should like to speak very briefly about the view expressed by Mr. Stout that the important difference between primary and secondary qualities is that “the executive order of the material world can be expressed only in terms of the primary and not in terms of the secondary properties of matter.” While, on the whole, this statement is no doubt true, and does correctly describe the difference between primary and secondary qualities, yet it is not true absolutely, and the recognition of exceptions should do much to rehabilitate the reputation of secondary qualities in the eyes of those who tend to regard them as merely subjective consequences of the causal action of the primary qualities. As I have tried elsewhere to show*—following the most competent critics—no attempt to present all physical phenomena as cases of matter in motion has been really successful, and the concept of temperature and the properties of temperature are still essential elements in the description which science gives of the executive order of the world. This consideration taken with others suggests that the real source of the supremacy of the primary qualities in physical science is the readiness with which their determinations submit to correlation with the number series, and to the peculiarity which makes it possible in their case to adopt the device called measurement. Only in the case of temperature has it hitherto been found possible to submit to numbering and measurement concepts based upon secondary qualities. Hence it follows that among these

* *Psychological Review*, Vol. 15, pp. 44 and 106.

* *Aims of Scientific Method*, Chap. IV, esp. pp. 112-122.

qualities temperature alone enters into the formulation of the executive order of the world.

II. By F. C. S. SCHILLER.

Little did I anticipate a year ago that my incautious willingness to be second to Dr. Nunn would commit me to a discussion of all the fundamental issues which are raised in his most lucid and forcible paper, which impresses me as the most effective presentment of the case for Realism which I know. I feel keenly, therefore, that the proper respondent in this discussion was indubitably Professor Stout,* and not one to whom the terms idealism and realism have long ceased to convey any definite meaning, the first because it has become too ambiguous, and the second because its champions have not yet succeeded in expressing what it means, though it is clear that of late they have really been thinking furiously, in a way that contrasts most pleasingly with the intellectual paralysis of idealism. And I am the more reluctant to act as the antithesis to Dr. Nunn's thesis that I have really no quarrel with Realism as such. I am quite willing to believe it, if in any of its forms it will only tell me clearly what precisely it wants me to believe. Hitherto I have not been told; but Dr. Nunn is so clear-headed that a discussion with him may go far to clear up my perplexities as to what Realism really means.

I.

Let me begin therefore with a string of questions, and ask him to tell us what he means by his terms, especially those he has not defined.

(1) First of all, what does *independent* mean to a realist? Until its meaning is ascertained, the meaning of Dr. Nunn's

* Who, however, may I hope be present to deal with that part of Dr. Nunn's paper which is addressed to him.

thesis must remain conjectural. I hope, therefore, that the question is not as unanswerable as it has proved to be to the idealists, to whom I have now for some years addressed it in vain.* The question moreover is particularly pertinent to Realism and indeed even vital. For unless an intelligible sense can be assigned to *independent*, it collapses on the threshold of its career.

More particularly it would be instructive to elicit Dr. Nunn's answer to the question whether *independence* does, or does not, exclude *relation*. If (a) it does, does not the *independent* inevitably become unthinkable? If (b) it does not, how are relations which destroy *independence* to be distinguished from those that do not, and will Realism kindly publish a list of relations which are compatible with *independence*? I should venture to anticipate that the second alternative will have to be the one adopted, but that the distinction between the two sorts of relations may not be altogether easy to establish.

Still greater difficulties, however, seem to lurk in the question of the relation of *independence* to *cognitive activity*. Of course the crudest form of realism will at once answer that it denies all cognitive activity. Reality imposes itself on the mind (if there is a mind) *vi et armis*. But Dr. Nunn's realism is by no means crude, and his opinion is the more valuable to elicit. Let me ask him, therefore, whether he thinks it possible to hold that into what can properly be called *independent* "fact" there has entered any human contribution or construction, due *e.g.* to attention, habituation, discrimination, selection, etc. If (a) he answers *No*, he will have to give us an example of such an absolutely independent fact; and I fear that so skilled a psychologist may find it extremely difficult to find a fact wholly purged

* Cf. *Studies in Humanism*, p. 95; *Arist. Soc. Proc.*, 1909, p. 87 f. Mr. O. C. Quick (*Mind*, No. 74, p. 223) quite rightly notices the popular use of the term, and admits its ambiguity, but goes on using it. Surely as soon as an ambiguity has been detected, technical philosophy should insist on discrimination.