

LECTURE VIII. SENSATIONS AND IMAGES

The dualism of mind and matter, if we have been right so far, cannot be allowed as metaphysically valid. Nevertheless, we seem to find a certain dualism, perhaps not ultimate, within the world as we observe it. The dualism is not primarily as to the stuff of the world, but as to causal laws. On this subject we may again quote William James. He points out that when, as we say, we merely "imagine" things, there are no such effects as would ensue if the things were what we call "real." He takes the case of imagining a fire.

"I make for myself an experience of blazing fire; I place it near my body; but it does not warm me in the least. I lay a stick upon it and the stick either burns or remains green, as I please. I call up water, and pour it on the fire, and absolutely no difference ensues. I account for all such facts by calling this whole train of experiences unreal, a mental train. Mental fire is what won't burn real sticks; mental water is what won't necessarily (though of course it may) put out even a mental fire.... With 'real' objects, on the contrary, consequences always accrue; and thus the real experiences get sifted from the mental ones, the things from our thoughts of them, fanciful or true, and precipitated together as the stable part of the whole experience--chaos, under the name of the physical world."*

* "Essays in Radical Empiricism," pp. 32-3.

In this passage James speaks, by mere inadvertence, as though the phenomena which he is describing as "mental" had NO effects. This is, of course, not the case: they have their effects, just as much as physical phenomena do, but their effects follow different laws. For example, dreams, as Freud has shown, are just as much subject to laws as are the motions of the planets. But the laws are different: in a dream you may be transported from one place to another in a moment, or one person may turn into another under your eyes. Such differences compel you to distinguish the world of dreams from the physical world.

If the two sorts of causal laws could be sharply distinguished, we could call an occurrence "physical" when it obeys causal laws appropriate to the physical world, and "mental" when it obeys causal laws appropriate to the mental world. Since the mental world and the physical world interact, there would be a boundary between the two: there would be events which would have physical causes and mental effects, while there would be others which would have mental causes and physical effects. Those that have physical causes and mental effects we should define as "sensations." Those that have mental causes and physical effects might perhaps be identified with what we call voluntary movements; but they do not concern us at present.

These definitions would have all the precision that could be desired if the distinction between physical and psychological causation were clear and sharp. As a matter of fact, however, this distinction is, as yet, by no means sharp. It is possible that, with fuller knowledge, it will be

found to be no more ultimate than the distinction between the laws of gases and the laws of rigid bodies. It also suffers from the fact that an event may be an effect of several causes according to several causal laws we cannot, in general, point to anything unique as THE cause of such-and-such an event. And finally it is by no means certain that the peculiar causal laws which govern mental events are not really physiological. The law of habit, which is one of the most distinctive, may be fully explicable in terms of the peculiarities of nervous tissue, and these peculiarities, in turn, may be explicable by the laws of physics. It seems, therefore, that we are driven to a different kind of definition. It is for this reason that it was necessary to develop the definition of perception. With this definition, we can define a sensation as the non-mnemic elements in a perception.

When, following our definition, we try to decide what elements in our experience are of the nature of sensations, we find more difficulty than might have been expected. *Prima facie*, everything is sensation that comes to us through the senses: the sights we see, the sounds we hear, the smells we smell, and so on; also such things as headache or the feeling of muscular strain. But in actual fact so much interpretation, so much of habitual correlation, is mixed with all such experiences, that the core of pure sensation is only to be extracted by careful investigation. To take a simple illustration: if you go to the theatre in your own country, you seem to hear equally well in the stalls or the dress circle; in either case you think you miss nothing. But if you go in a foreign country where you have a fair knowledge of the language,

you will seem to have grown partially deaf, and you will find it necessary to be much nearer the stage than you would need to be in your own country. The reason is that, in hearing our own language spoken, we quickly and unconsciously fill out what we really hear with inferences to what the man must be saying, and we never realize that we have not heard the words we have merely inferred. In a foreign language, these inferences are more difficult, and we are more dependent upon actual sensation. If we found ourselves in a foreign world, where tables looked like cushions and cushions like tables, we should similarly discover how much of what we think we see is really inference. Every fairly familiar sensation is to us a sign of the things that usually go with it, and many of these things will seem to form part of the sensation. I remember in the early days of motor-cars being with a friend when a tyre burst with a loud report. He thought it was a pistol, and supported his opinion by maintaining that he had seen the flash. But of course there had been no flash. Nowadays no one sees a flash when a tyre bursts.

In order, therefore, to arrive at what really is sensation in an occurrence which, at first sight, seems to contain nothing else, we have to pare away all that is due to habit or expectation or interpretation. This is a matter for the psychologist, and by no means an easy matter. For our purposes, it is not important to determine what exactly is the sensational core in any case; it is only important to notice that there certainly is a sensational core, since habit, expectation and interpretation are diversely aroused on diverse occasions, and the diversity is clearly due to differences in what is presented to

the senses. When you open your newspaper in the morning, the actual sensations of seeing the print form a very minute part of what goes on in you, but they are the starting-point of all the rest, and it is through them that the newspaper is a means of information or mis-information. Thus, although it may be difficult to determine what exactly is sensation in any given experience, it is clear that there is sensation, unless, like Leibniz, we deny all action of the outer world upon us.

Sensations are obviously the source of our knowledge of the world, including our own body. It might seem natural to regard a sensation as itself a cognition, and until lately I did so regard it. When, say, I see a person I know coming towards me in the street, it SEEMS as though the mere seeing were knowledge. It is of course undeniable that knowledge comes THROUGH the seeing, but I think it is a mistake to regard the mere seeing itself as knowledge. If we are so to regard it, we must distinguish the seeing from what is seen: we must say that, when we see a patch of colour of a certain shape, the patch of colour is one thing and our seeing of it is another. This view, however, demands the admission of the subject, or act, in the sense discussed in our first lecture. If there is a subject, it can have a relation to the patch of colour, namely, the sort of relation which we might call awareness. In that case the sensation, as a mental event, will consist of awareness of the colour, while the colour itself will remain wholly physical, and may be called the sense-datum, to distinguish it from the sensation. The subject, however, appears to be a logical fiction, like mathematical

points and instants. It is introduced, not because observation reveals it, but because it is linguistically convenient and apparently demanded by grammar. Nominal entities of this sort may or may not exist, but there is no good ground for assuming that they do. The functions that they appear to perform can always be performed by classes or series or other logical constructions, consisting of less dubious entities. If we are to avoid a perfectly gratuitous assumption, we must dispense with the subject as one of the actual ingredients of the world. But when we do this, the possibility of distinguishing the sensation from the sense-datum vanishes; at least I see no way of preserving the distinction. Accordingly the sensation that we have when we see a patch of colour simply is that patch of colour, an actual constituent of the physical world, and part of what physics is concerned with. A patch of colour is certainly not knowledge, and therefore we cannot say that pure sensation is cognitive. Through its psychological effects, it is the cause of cognitions, partly by being itself a sign of things that are correlated with it, as e.g. sensations of sight and touch are correlated, and partly by giving rise to images and memories after the sensation is faded. But in itself the pure sensation is not cognitive.

In the first lecture we considered the view of Brentano, that "we may define psychical phenomena by saying that they are phenomena which intentionally contain an object." We saw reasons to reject this view in general; we are now concerned to show that it must be rejected in the particular case of sensations. The kind of argument which formerly made me accept Brentano's view in this case was exceedingly simple. When I

see a patch of colour, it seemed to me that the colour is not psychical, but physical, while my seeing is not physical, but psychical. Hence I concluded that the colour is something other than my seeing of the colour. This argument, to me historically, was directed against idealism: the emphatic part of it was the assertion that the colour is physical, not psychical. I shall not trouble you now with the grounds for holding as against Berkeley that the patch of colour is physical; I have set them forth before, and I see no reason to modify them. But it does not follow that the patch of colour is not also psychical, unless we assume that the physical and the psychical cannot overlap, which I no longer consider a valid assumption. If we admit--as I think we should--that the patch of colour may be both physical and psychical, the reason for distinguishing the sense-datum from the sensation disappears, and we may say that the patch of colour and our sensation in seeing it are identical.

This is the view of William James, Professor Dewey, and the American realists. Perceptions, says Professor Dewey, are not per se cases of knowledge, but simply natural events with no more knowledge status than (say) a shower. "Let them [the realists] try the experiment of conceiving perceptions as pure natural events, not cases of awareness or apprehension, and they will be surprised to see how little they miss."* I think he is right in this, except in supposing that the realists will be surprised. Many of them already hold the view he is advocating, and others are very sympathetic to it. At any rate, it is the view which I shall adopt in these lectures.

* Dewey, "Essays in Experimental Logic," pp. 253, 262.

The stuff of the world, so far as we have experience of it, consists, on the view that I am advocating, of innumerable transient particulars such as occur in seeing, hearing, etc., together with images more or less resembling these, of which I shall speak shortly. If physics is true, there are, besides the particulars that we experience, others, probably equally (or almost equally) transient, which make up that part of the material world that does not come into the sort of contact with a living body that is required to turn it into a sensation. But this topic belongs to the philosophy of physics, and need not concern us in our present inquiry.

Sensations are what is common to the mental and physical worlds; they may be defined as the intersection of mind and matter. This is by no means a new view; it is advocated, not only by the American authors I have mentioned, but by Mach in his *Analysis of Sensations*, which was published in 1886. The essence of sensation, according to the view I am advocating, is its independence of past experience. It is a core in our actual experiences, never existing in isolation except possibly in very young infants. It is not itself knowledge, but it supplies the data for our knowledge of the physical world, including our own bodies.

There are some who believe that our mental life is built up out of sensations alone. This may be true; but in any case I think the only

ingredients required in addition to sensations are images. What images are, and how they are to be defined, we have now to inquire.

The distinction between images and sensations might seem at first sight by no means difficult. When we shut our eyes and call up pictures of familiar scenes, we usually have no difficulty, so long as we remain awake, in discriminating between what we are imagining and what is really seen. If we imagine some piece of music that we know, we can go through it in our mind from beginning to end without any discoverable tendency to suppose that we are really hearing it. But although such cases are so clear that no confusion seems possible, there are many others that are far more difficult, and the definition of images is by no means an easy problem.

To begin with: we do not always know whether what we are experiencing is a sensation or an image. The things we see in dreams when our eyes are shut must count as images, yet while we are dreaming they seem like sensations. Hallucinations often begin as persistent images, and only gradually acquire that influence over belief that makes the patient regard them as sensations. When we are listening for a faint sound--the striking of a distant clock, or a horse's hoofs on the road--we think we hear it many times before we really do, because expectation brings us the image, and we mistake it for sensation. The distinction between images and sensations is, therefore, by no means always obvious to inspection.*

* On the distinction between images and sensation, cf.
Semon, "Die mnemischen Empfindungen," pp. 19-20.

We may consider three different ways in which it has been sought to distinguish images from sensations, namely:

(1) By the less degree of vividness in images;

(2) By our absence of belief in their "physical reality";

(3) By the fact that their causes and effects are different from those of sensations.

I believe the third of these to be the only universally applicable criterion. The other two are applicable in very many cases, but cannot be used for purposes of definition because they are liable to exceptions. Nevertheless, they both deserve to be carefully considered.

(1) Hume, who gives the names "impressions" and "ideas" to what may, for present purposes, be identified with our "sensations" and "images," speaks of impressions as "those perceptions which enter with most force and violence" while he defines ideas as "the faint images of these (i.e. of impressions) in thinking and reasoning." His immediately following observations, however, show the inadequacy of his criteria of "force" and "faintness." He says:

"I believe it will not be very necessary to employ many words in explaining this distinction. Every one of himself will readily perceive the difference betwixt feeling and thinking. The common degrees of these are easily distinguished, though it is not impossible but in particular instances they may very nearly approach to each other. Thus in sleep, in a fever, in madness, or in any very violent emotions of soul, our ideas may approach to our impressions; as, on the other hand, it sometimes happens, that our impressions are so faint and low that we cannot distinguish them from our ideas. But notwithstanding this near resemblance in a few instances, they are in general so very different, that no one can make a scruple to rank them under distinct heads, and assign to each a peculiar name to mark the difference" ("Treatise of Human Nature," Part I, Section I).

I think Hume is right in holding that they should be ranked under distinct heads, with a peculiar name for each. But by his own confession in the above passage, his criterion for distinguishing them is not always adequate. A definition is not sound if it only applies in cases where the difference is glaring: the essential purpose of a definition is to provide a mark which is applicable even in marginal cases--except, of course, when we are dealing with a conception, like, e.g. baldness, which is one of degree and has no sharp boundaries. But so far we have seen no reason to think that the difference between sensations and images is only one of degree.

Professor Stout, in his "Manual of Psychology," after discussing various

ways of distinguishing sensations and images, arrives at a view which is a modification of Hume's. He says (I quote from the second edition):

"Our conclusion is that at bottom the distinction between image and percept, as respectively faint and vivid states, is based on a difference of quality. The percept has an aggressiveness which does not belong to the image. It strikes the mind with varying degrees of force or liveliness according to the varying intensity of the stimulus. This degree of force or liveliness is part of what we ordinarily mean by the intensity of a sensation. But this constituent of the intensity of sensations is absent in mental imagery"(p. 419).

This view allows for the fact that sensations may reach any degree of faintness--e.g. in the case of a just visible star or a just audible sound--without becoming images, and that therefore mere faintness cannot be the characteristic mark of images. After explaining the sudden shock of a flash of lightning or a steam-whistle, Stout says that "no mere image ever does strike the mind in this manner"(p. 417). But I believe that this criterion fails in very much the same instances as those in which Hume's criterion fails in its original form. Macbeth speaks of--

that suggestion

Whose horrid image doth unfix my hair
And make my seated heart knock at my ribs
Against the use of nature.

The whistle of a steam-engine could hardly have a stronger effect than this. A very intense emotion will often bring with it--especially where some future action or some undecided issue is involved--powerful compelling images which may determine the whole course of life, sweeping aside all contrary solicitations to the will by their capacity for exclusively possessing the mind. And in all cases where images, originally recognized as such, gradually pass into hallucinations, there must be just that "force or liveliness" which is supposed to be always absent from images. The cases of dreams and fever-delirium are as hard to adjust to Professor Stout's modified criterion as to Hume's. I conclude therefore that the test of liveliness, however applicable in ordinary instances, cannot be used to define the differences between sensations and images.

(2) We might attempt to distinguish images from sensations by our absence of belief in the "physical reality" of images. When we are aware that what we are experiencing is an image, we do not give it the kind of belief that we should give to a sensation: we do not think that it has the same power of producing knowledge of the "external world." Images are "imaginary"; in SOME sense they are "unreal." But this difference is hard to analyse or state correctly. What we call the "unreality" of images requires interpretation it cannot mean what would be expressed by saying "there's no such thing." Images are just as truly part of the actual world as sensations are. All that we really mean by calling an image "unreal" is that it does not have the concomitants which it would have if it were a sensation. When we call up a visual image of a chair,

we do not attempt to sit in it, because we know that, like Macbeth's dagger, it is not "sensible to feeling as to sight"--i.e. it does not have the correlations with tactile sensations which it would have if it were a visual sensation and not merely a visual image. But this means that the so-called "unreality" of images consists merely in their not obeying the laws of physics, and thus brings us back to the causal distinction between images and sensations.

This view is confirmed by the fact that we only feel images to be "unreal" when we already know them to be images. Images cannot be defined by the FEELING of unreality, because when we falsely believe an image to be a sensation, as in the case of dreams, it FEELS just as real as if it were a sensation. Our feeling of unreality results from our having already realized that we are dealing with an image, and cannot therefore be the definition of what we mean by an image. As soon as an image begins to deceive us as to its status, it also deceives us as to its correlations, which are what we mean by its "reality."

(3) This brings us to the third mode of distinguishing images from sensations, namely, by their causes and effects. I believe this to be the only valid ground of distinction. James, in the passage about the mental fire which won't burn real sticks, distinguishes images by their effects, but I think the more reliable distinction is by their causes. Professor Stout (*loc. cit.*, p. 127) says: "One characteristic mark of what we agree in calling sensation is its mode of production. It is caused by what we call a STIMULUS. A stimulus is always some condition

external to the nervous system itself and operating upon it." I think that this is the correct view, and that the distinction between images and sensations can only be made by taking account of their causation. Sensations come through sense-organs, while images do not. We cannot have visual sensations in the dark, or with our eyes shut, but we can very well have visual images under these circumstances. Accordingly images have been defined as "centrally excited sensations," i.e. sensations which have their physiological cause in the brain only, not also in the sense-organs and the nerves that run from the sense-organs to the brain. I think the phrase "centrally excited sensations" assumes more than is necessary, since it takes it for granted that an image must have a proximate physiological cause. This is probably true, but it is an hypothesis, and for our purposes an unnecessary one. It would seem to fit better with what we can immediately observe if we were to say that an image is occasioned, through association, by a sensation or another image, in other words that it has a mnemonic cause--which does not prevent it from also having a physical cause. And I think it will be found that the causation of an image always proceeds according to mnemonic laws, i.e. that it is governed by habit and past experience. If you listen to a man playing the pianola without looking at him, you will have images of his hands on the keys as if he were playing the piano; if you suddenly look at him while you are absorbed in the music, you will experience a shock of surprise when you notice that his hands are not touching the notes. Your image of his hands is due to the many times that you have heard similar sounds and at the same time seen the player's hands on the piano. When habit and past experience play this part, we are in the

region of mnemonic as opposed to ordinary physical causation. And I think that, if we could regard as ultimately valid the difference between physical and mnemonic causation, we could distinguish images from sensations as having mnemonic causes, though they may also have physical causes. Sensations, on the other hand, will only have physical causes.

However this may be, the practically effective distinction between sensations and images is that in the causation of sensations, but not of images, the stimulation of nerves carrying an effect into the brain, usually from the surface of the body, plays an essential part. And this accounts for the fact that images and sensations cannot always be distinguished by their intrinsic nature.

Images also differ from sensations as regards their effects. Sensations, as a rule, have both physical and mental effects. As you watch the train you meant to catch leaving the station, there are both the successive positions of the train (physical effects) and the successive waves of fury and disappointment (mental effects). Images, on the contrary, though they MAY produce bodily movements, do so according to mnemonic laws, not according to the laws of physics. All their effects, of whatever nature, follow mnemonic laws. But this difference is less suitable for definition than the difference as to causes.

Professor Watson, as a logical carrying-out of his behaviourist theory, denies altogether that there are any observable phenomena such as images are supposed to be. He replaces them all by faint sensations, and

especially by pronunciation of words sotto voce. When we "think" of a table (say), as opposed to seeing it, what happens, according to him, is usually that we are making small movements of the throat and tongue such as would lead to our uttering the word "table" if they were more pronounced. I shall consider his view again in connection with words; for the present I am only concerned to combat his denial of images. This denial is set forth both in his book on "Behavior" and in an article called "Image and Affection in Behavior" in the "Journal of Philosophy, Psychology and Scientific Methods," vol. x (July, 1913). It seems to me that in this matter he has been betrayed into denying plain facts in the interests of a theory, namely, the supposed impossibility of introspection. I dealt with the theory in Lecture VI; for the present I wish to reinforce the view that the facts are undeniable.

Images are of various sorts, according to the nature of the sensations which they copy. Images of bodily movements, such as we have when we imagine moving an arm or, on a smaller scale, pronouncing a word, might possibly be explained away on Professor Watson's lines, as really consisting in small incipient movements such as, if magnified and prolonged, would be the movements we are said to be imagining. Whether this is the case or not might even be decided experimentally. If there were a delicate instrument for recording small movements in the mouth and throat, we might place such an instrument in a person's mouth and then tell him to recite a poem to himself, as far as possible only in imagination. I should not be at all surprised if it were found that actual small movements take place while he is "mentally" saying over

the verses. The point is important, because what is called "thought" consists mainly (though I think not wholly) of inner speech. If Professor Watson is right as regards inner speech, this whole region is transferred from imagination to sensation. But since the question is capable of experimental decision, it would be gratuitous rashness to offer an opinion while that decision is lacking.

But visual and auditory images are much more difficult to deal with in this way, because they lack the connection with physical events in the outer world which belongs to visual and auditory sensations. Suppose, for example, that I am sitting in my room, in which there is an empty arm-chair. I shut my eyes, and call up a visual image of a friend sitting in the arm-chair. If I thrust my image into the world of physics, it contradicts all the usual physical laws. My friend reached the chair without coming in at the door in the usual way; subsequent inquiry will show that he was somewhere else at the moment. If regarded as a sensation, my image has all the marks of the supernatural. My image, therefore, is regarded as an event in me, not as having that position in the orderly happenings of the public world that belongs to sensations. By saying that it is an event in me, we leave it possible that it may be **PHYSIOLOGICALLY** caused: its privacy may be only due to its connection with my body. But in any case it is not a public event, like an actual person walking in at the door and sitting down in my chair. And it cannot, like inner speech, be regarded as a **SMALL** sensation, since it occupies just as large an area in my visual field as the actual sensation would do.

Professor Watson says: "I should throw out imagery altogether and attempt to show that all natural thought goes on in terms of sensori-motor processes in the larynx." This view seems to me flatly to contradict experience. If you try to persuade any uneducated person that she cannot call up a visual picture of a friend sitting in a chair, but can only use words describing what such an occurrence would be like, she will conclude that you are mad. (This statement is based upon experiment.) Galton, as every one knows, investigated visual imagery, and found that education tends to kill it: the Fellows of the Royal Society turned out to have much less of it than their wives. I see no reason to doubt his conclusion that the habit of abstract pursuits makes learned men much inferior to the average in power of visualizing, and much more exclusively occupied with words in their "thinking." And Professor Watson is a very learned man.

I shall henceforth assume that the existence of images is admitted, and that they are to be distinguished from sensations by their causes, as well as, in a lesser degree, by their effects. In their intrinsic nature, though they often differ from sensations by being more dim or vague or faint, yet they do not always or universally differ from sensations in any way that can be used for defining them. Their privacy need form no bar to the scientific study of them, any more than the privacy of bodily sensations does. Bodily sensations are admitted by even the most severe critics of introspection, although, like images, they can only be observed by one observer. It must be admitted, however,

that the laws of the appearance and disappearance of images are little known and difficult to discover, because we are not assisted, as in the case of sensations, by our knowledge of the physical world.

There remains one very important point concerning images, which will occupy us much hereafter, and that is, their resemblance to previous sensations. They are said to be "copies" of sensations, always as regards the simple qualities that enter into them, though not always as regards the manner in which these are put together. It is generally believed that we cannot imagine a shade of colour that we have never seen, or a sound that we have never heard. On this subject Hume is the classic. He says, in the definitions already quoted:

"Those perceptions, which enter with most force and violence, we may name IMPRESSIONS; and under this name I comprehend all our sensations, passions and emotions, as they make their first appearance in the soul. By IDEAS I mean the faint images of these in thinking and reasoning."

He next explains the difference between simple and complex ideas, and explains that a complex idea may occur without any similar complex impression. But as regards simple ideas, he states that "every simple idea has a simple impression, which resembles it, and every simple impression a correspondent idea." He goes on to enunciate the general principle "that all our simple ideas in their first appearance are derived from simple impressions, which are correspondent to them, and which they exactly represent" ("Treatise of Human Nature," Part I,

Section I).

It is this fact, that images resemble antecedent sensations, which enables us to call them images "of" this or that. For the understanding of memory, and of knowledge generally, the recognizable resemblance of images and sensations is of fundamental importance.

There are difficulties in establishing Hume's principles, and doubts as to whether it is exactly true. Indeed, he himself signaled an exception immediately after stating his maxim. Nevertheless, it is impossible to doubt that in the main simple images are copies of similar simple sensations which have occurred earlier, and that the same is true of complex images in all cases of memory as opposed to mere imagination. Our power of acting with reference to what is sensibly absent is largely due to this characteristic of images, although, as education advances, images tend to be more and more replaced by words. We shall have much to say in the next two lectures on the subject of images as copies of sensations. What has been said now is merely by way of reminder that this is their most notable characteristic.

I am by no means confident that the distinction between images and sensations is ultimately valid, and I should be glad to be convinced that images can be reduced to sensations of a peculiar kind. I think it is clear, however, that, at any rate in the case of auditory and visual images, they do differ from ordinary auditory and visual sensations, and therefore form a recognizable class of occurrences, even if it should

prove that they can be regarded as a sub-class of sensations. This is all that is necessary to validate the use of images to be made in the sequel.