THE THIRTIETH MAUDSLEY LECTURE: PERCEPTION AND IMPERCEPTION

By

Sir W. RUSSELL BRAIN, Bt., D.M., LL.D., D.C.L., P.R.C.P.

Physician to The London Hospital and to
The Maida Vale Hospital for Nervous Diseases

I VALUE very much the honour of giving the Maudsley Lecture. Henry Maudsley was a pioneer in the study of the physiological basis of mind, and hence of the physiological interpretation of mental disorder. In the preface to his book, *The Physiology of Mind* (Maudsley, 1876), he said with a blend of optimism and modesty: "The current of psychological thought having set so strongly in physiological channels, it is pretty certain that the reflections which one person has had, however original they may seem to him, some other person has had, has now, or will very soon have." But half a century was to pass before physiology and psychiatry began to develop techniques which could illuminate the physiological basis of mind, and even now we are only entering the era which Maudsley would have found the fulfilment of his hopes and anticipations. Though intolerant of the idea that metaphysical speculation about mind could take the place of scientific study, he was nevertheless a philosopher, and my aim in this lecture is to try to use a philosophy of perception to interpret the clinical observations of perceptual disorder.

I have chosen as the subject of my lecture "Perception and Imperception". You will probably think that the meaning of perception is fairly clear, at any rate until psychologists explain what it means. I have taken the term "imperception" from Hughlings Jackson (1932). He first used it for a disability which he described as follows: "The first symptoms were those of what I call imperception. She often did not know objects, persons and places. To the statement that there was only 'confusion of mind', I do not object, for I should say that her mental confusion showed itself in inability to recognize objects, persons and places. Nor do I object to its being called 'only loss or defect of memory'; it was a loss or defect of memory for persons, objects and places. Nor do I mind it being said that there was 'only imbecility'; imbecility, like confusion of thought and defect of memory, is nearly always a matter of defect in perceiving things (persons, objects and places)." I shall use the term "imperception" in the most comprehensive Jacksonian sense, to refer to a "defect in perceiving things (persons, objects and places)".

Disturbances of perception play so large a part in the work of the neurologist and the psychiatrist, that a full description of them would occupy a lecture in itself. The main categories are:

1. Imperception of objects by different sensory channels—the agnosias.
2. The wide range of disturbances of awareness of the body itself, from the phantom limb, through imperception of one half of the body, to unawareness of disease, reduplication of parts of the body, and reduplication of the body itself in autoscopy. There are also the peculiar sensations which many patients describe in some part of the body, most frequently the head, or characterizing

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press

the whole body, and the whole puzzling category of pain which seems to have no organic basis.

3. Awareness of space outside the body may be disordered.

4. The vast and varied range of hallucinatory states must be considered.

5. There is the experience common to a number of different types of mental disorder, in which an object, otherwise normally perceived, seems to the percipient to be endowed with some unusual emotional power, attractive, sinister, or terrifying. In this field no sharp borderline can be drawn between the pathological and the normal, since social and cultural factors may endow certain objects with these characteristics for normal people.

Psychiatry and the Philosophy of Perception

What light does the philosophy of perception throw upon these conditions? The average man, if he ever considered the matter at all, would no doubt express the view of a naive realist on perception. The sensory qualities of an object, such as the colour of the table, he would say, are parts of the physical object, and seeing and touching are the modes, amongst others, by which we become aware of the characteristics residing in objects. Many considerations combine to make this view untenable (Broad, 1927; Brain, 1951). Briefly, these are (1) that nerve-impulses are unlike the physical stimuli which evoke them, (2) that it is necessary only that stimulations of the appropriate cortical areas should occur in order that sensations may be experienced, (3) that by the time a nerve-impulse reaches the cortex the physical stimulus which originated it is always past, and in the case of astronomical events often long past. I see a flash, not when the light-waves leave their source, but when the resulting nerve-impulses reach my brain. An event which I witness in my perceptual world is therefore always contemporaneous with the event in my brain which leads me to perceive it. "Hence, when we are aware of an object, the sensations by means of which we perceive it can't be part of a physical object, for their physical basis in the brain is the sole necessary condition of their occurrence, and this is physically unlike, and occurs later in time than, the physical events in the object which make me aware of it" (Brain, 1951).

Thoughtful people, aware of the facts of neurophysiology, soon realized that sensory qualities could not be parts of physical objects, but, if they are in some way generated by the brain of the person who experiences them, this gives rise to the question how they appear to be located in objects outside his body. This led to the idea of the "projection" of sensory qualities from the brain on to the external world.

This view is much nearer the truth than naïve realism, but it is unsatisfactory, because "projection" is an imaginary process which has no counterpart in either physiology or psychology. It arises from a confusion between perceptual and physical space, a point which has been stressed during recent years independently by a number of writers (Köhler, 1938; Russell, 1948; Hutton, 1950; Brain, 1951; and Smythies, 1954). Let me quote Russell's (1948) summary of the true position. "When I say that something is 'outside' me, there are two different things that I may mean. I may mean that I have a percept which is outside the percept of my body in perceptual space, or I may mean that there is a physical object which is outside my body as a physical object in the space of physics . . . One of the difficulties which have led to confusion was failure to distinguish between perceptual and physical space. Perceptual space consists of perceptible relations between parts of percepts, whereas physical space

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press

consists of inferred relations between inferred physical things. What I see may be outside my percept of my body, but not outside my body as a physical thing." I have not time today to do more than draw attention to the semantic aspect of this question which has recently been discussed by Woodger (1952).

What happens, then, in perception? Each of us possesses a physical body existing in physical space. Various kinds of physical impulses reach its sense-organs from without, or originate within the body itself. Their arrival at the sensory areas of the brain leads to the creation by each individual of his own perceptual world, including his perceptual body, and extending outwards from it; and presenting all the sensory characteristics and spatial organization with which we are familiar. This world is private to each of us, but since each of our private perceptual worlds *represents* the same common physical world, and since all our brains are organized on fundamentally the same pattern, our private perceptual worlds resemble each other closely. Since moreover we have means of communicating with each other and sharing experiences, we habitually speak of them as though they were identical with the common physical world which they represent.

I am not now concerned with the philosophical or semantic puzzles created by the idea of a perceptual and a physical space, but merely to see what follows from the fact that the perceptual space of each of us is a private construct. The main distinction in the perceptual space of each person is that between his body and everything outside it. I am identified with my body in a way in which I am not identified with the table, for example, yet the perceptual features of both are the products of the activity of my physical brain, and in that sense both are subjective.

It might be thought that from the causal point of view there is a clear distinction between the objective and the subjective parts of the perceptual world, namely, that what I call the objective part is all the product of stimuli coming from the physical world outside my physical body and evoking responses from what Sherrington calls the "exteroceptors", while what is subjective is derived from stimuli originating within my physical body. But this is not so. The stone in my hand feels cold, but the coldness *of the stone* is identical with a fall of temperature in the skin of my fingers. Similarly the perceptual quality of solidity *in the stone* is the product of nervous impulses from the skin, joints and tendons of the hand, which are felt, not as such, but as characteristics of the stone. In the same way impulses from the proprioceptors of the eye-muscles contribute to our ideas of visual distance. We call them "unconscious" afferents, which means that we do not recognize them as giving information about the eye-muscles: they are, however, ingredients in the *gestalt* comprised in a visual perception. Labyrinthine impulses are an even more obvious example. We do not recognize them as contributing to our visual space until they become disturbed. Vertigo results, and "the room goes round". The following principles emerge from this survey of normal perception.

1. The perceptual world is not identical with the physical world, but is a representation of it.

2. The perceptual world is a construction of the brain of each individual and is private to him.

3. Within the perceptual world there is a distinction between the body and percepts outside the body, but this does not correspond to the distinction between the physical body and events outside it in physical space, for bodily sense-data contribute to the sensory characteristics of the external world of perception.

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press

4. The external world of perception is thus doubly subjective. (*i*) It is a construct of the subject's brain and (*ii*) it incorporates sensory experience derived from the subject's body.

Perception and Hallucination

These ideas illuminate both what may be called the perceptual status of hallucinations, and their spatial characteristics. The term hallucination, of course, covers a wide range of phenomena, associated with various states of consciousness. The perceptual status of hallucinations is illustrated most clearly by those which occur without clouding of consciousness in psychotic states or after the ingestion of hallucinogenic drugs. In the broadest sense, the mode of production of hallucinations is clear. Normally, the sensory experiences which we call perceptions do not occur unless they are initiated by physical stimuli arising outside the body, or, in the case of perception of the body, within the body but outside the brain. Consequently they include nothing but representations of the external world, and representations of, or feelings located in, our bodies. Abnormally, however, the parts of our brain which are concerned with perception may be aroused into action by some stimulus which does not come from the external world, and does not reach them by the passage of normal nerve-impulses from the body. In such cases the part of the brain abnormally stimulated responds either by causing the subject to experience whatever sensations or combination of sensations it is its function in ordinary circumstances to produce, or in a more complicated way by arousing images and memories. And since it is the function of the brain in perception to represent objects in perceptual space, it will tend to do this with these abnormal experiences. The result will be that the subject will perceive in his perceptual space things which, unlike the objects normally there, do not represent objects existing in physical space. If the subject sees a hallucinatory cat on a real table, the perceptual status of the cat is the same as that of the table, and the sense data connected with seeing the cat are as real as the sense-data connected with seeing the table. Moreover, the sense-data connected with seeing the cat are where they appear to be, just as the sense-data connected with seeing the table are where they appear to be, namely, in his private perceptual space. The only difference between the perception of the cat and the perception of the table is that the cat does not represent an object in physical space, whereas the table does. There is thus no justification for the belief that there is something *perceptually* unreal about hallucinations. Wicksteed (1953) expresses this idea very well in the explanation which he gives of Blake's Visions: "In all his latest and greatest works," he says, "it is therefore as necessary to understand the peculiar idea of his Vision as it is to understand that of his Verse. His own peculiar Vision was something that no one else could see, but was flashed as it were upon a screen that *everyone* else could see and of which he too was acutely conscious." Hughlings Jackson (1932) makes a similar point when he describes a patient who was a cabman and who thought that his bed was a cab. The fact that Jackson uses the terminology of projection does not invalidate his main point. He said: "This patient saw a cab, had that image strongly 'projected', his objective state, at a time when I saw a bed, when I had that image strongly 'projected', my objective state. It is of no avail for trustworthy witnesses to assert that the patient '*could not have seen*' a cab, because there is no cab present, and therefore, that the patient 'only fancied', etc. that he saw one. Something, not himself, 'got out of' himself the image cab, 'out of' the

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press

bystander the image bed. It might be said that this doctrine confuses reality and unreality. But what reality and whose reality? The image cab was the patient's reality; the image bed was the healthy bystander's reality."

The occurrence of hallucinations, which blend in this way with the perception of the external world, implies that the hallucinogenesis is superimposed upon an otherwise normal distinction in perception between the subjective and the objective, the hallucination taking its place among the objective elements. But the disorder of function which leads to the hallucination may disturb space-perception in a variety of ways. For example, the perceptual space of a dream differs from that of waking life. The hallucinatory experiences evoked by Penfield (Penfield and Jasper, 1954) by stimulation of the temporal lobe often took place in a space of their own, which co-existed, but was not identical, with the perceptual space of the operating theatre. A patient's consciousness may alternate between a hallucinated space and the space of his normal perception, as occurred in a patient of mine with a right parieto-occipital vascular lesion, who from time to time saw buses coming towards him on the left side, but when he looked towards them they were no longer there. They appeared real while he saw them, but as soon as they vanished he knew they had been unreal. In many cases the normal distinction between subjective and objective disappears, and then the hallucination, which is objective in the sense that it is regarded as emanating from outside the ego, is nevertheless located somehow *within* the subject, inside the head, for example, or has some other subjective signature.

Perception and the Body

When we realize that the normal perception of the body is, like our perception of the external world, a subjective construction of the physical brain, it illuminates a number of bodily symptoms which otherwise seem odd, or even inexplicable. In speaking of hallucinations I have drawn a distinction between the sense-data of normal perception, which are evoked by stimuli reaching the body from the external world, and the alien sense-data causing the hallucinations, which originate within the brain. A somewhat similar distinction exists in the perception of the body itself. The normal awareness of the body is derived from sense-data arising from the skin, the proprioceptors, including the labyrinths, to some extent the viscera, and vision. It is intimately related to awareness of the external world, since it forms a constant background to our actions. Though I have spoken of "awareness" of the body most of this information is at any one time unconscious, only that part to which attention is momentarily directed being conscious knowledge.

It is perhaps even more difficult to realize that our perceptual bodies are not identical with our physical bodies than it is to make this distinction between the external world of perception and the physical world. The phantom limb, however, is an excellent example. The experience of a phantom limb may occur, of course, not only after the amputation of a limb, but also after a lesion which interrupts in the appropriate manner the afferent pathways from the limb to the relevant sensory areas of the brain. The patient feels as though the phantom limb is still in existence after its amputation, or, when the phenomenon is the result of a lesion of the nervous system, he feels as though he has a limb in a different position from that occupied by the actual limb, and this constitutes one form of reduplication of parts of the body. The phantom limb, of course, is present to certain sensory modalities, but not to others: it *feels* as though

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press

it is there and the patient may say that he is able to move it, but he cannot see it, nor can he touch it. Where, then does the phantom limb exist? The answer surely is that it exists in the patient's private perceptual space, and its characteristics throw light upon our awareness of perceptual space, and illustrates the fact that objects in perceptual space are not identical with physical objects. A man can both feel and see his own physical arm, but a phantom arm can have the characteristics of being felt but not seen. Thus, our awareness of objects in perceptual space, even of parts of our body, is the result of a summation of sensations derived from different sensory channels, and if a part of the body is removed, but impulses continue to reach the nervous system through one sensory channel previously excited by it, that part of the body is still experienced in perceptual space, but in an incomplete fashion.

A phantom limb may feel as though it passes through solid objects in the environment. A patient of mine with a severe lesion of the spinal cord felt as though he had two phantom legs which were always experienced as extended in line with the trunk. When he was sat up in bed, although his trunk became flexed on his hips, his phantom legs remained in their extended position and felt, therefore, as though they moved through a right angle through the bed. Thus, the phantom limb, which does not represent a physical limb, does not obey the physical laws to which physical limbs are subject, but it is intermingled in the perceptual world with perceptual objects which do represent physical objects, and which therefore behave in accordance with their laws, with the bizarre result which I have just described.

The converse of the phantom limb is that form of imperception in which the patient ceases to be aware of one half of his body, denies its existence, and if, as commonly happens, it is paralysed, denies the paralysis also. And just as the patient with a phantom limb feels as though his limb were there, although he cannot see it, so, conversely, the patient with autotopagnosia, or anosognosia, denies the existence of his limbs or disowns them although he can still see them. These limbs continue to exist in the physical world, but they have dropped out of the patient's perceptual world. It would seem that impulses derived from the limb itself are prepotent over visual sensations in establishing a perceptual representation of the limb, for they maintain the phantom limb in perceptual space, although vision denies its existence, and vision alone is not sufficient to preserve the patient's awareness of his limb. Such a patient may be said to have visual agnosia for some of his own limbs.

Perhaps one of the most striking features of imperception of one half of the body is that the patient should have lost not merely his awareness of it, but also apparently his memory of it, so that it can drop out of consciousness without leaving a noticeable gap. And yet, perhaps, on reflection it is not so surprising, since the two must be closely related: it is difficult to see how a patient could now be unaware of his arm and leg if he remembered that he had ever been aware of them.

Delusional, or perhaps it would be better to say, hallucinatory reduplication of parts of the body has recently been the subject of a paper by Weinstein and his colleagues (1954). I have already given instances of such reduplication owing to the presence of phantom limbs, one pair of which can be seen and not felt, while the other pair can be felt but not seen. Weinstein and his fellow authors come to the conclusion that it is "difficult to explain the phenomenon as a disturbance of the body-schema in the usual sense of a three-dimensional image of the body", because reduplication occurred not only with parts of the body, but temporally and spatially as well, and they also stress the importance of

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press

psychological motivation. Reduplication in time introduces another dimension into the phenomenon. If a patient were to fail to distinguish his memory of the position of a limb at one time from his actual awareness of it at another, he would inevitably experience a reduplication comparable with the reduplication of space produced in Penfield's patients, which led to their experiencing at the same time a dream-space, or a memory-space, and the space of the actual present in the operating theatre.

Reduplication of the body itself, or autoscopy, is a phenomenon which also occurs in more than one form. Usually the subject sees himself as though he were looking at himself in a mirror, and the image imitates, like a mirror-image, the subject's own movements. Less commonly he feels that he is disembodied and looks from outside upon his own body which seems usually to be unconscious either in sleep, in anaesthesia or in a severe illness. This was described by a patient of mine who suffered from narcolepsy and hypnagogic hallucinations. She would fall asleep in a chair and then seem to be outside her body looking down upon her sleeping form. The condition described by Lhermitte (1951) as negative autoscopy consists of a failure on the part of a subject to recognize his own features when seen in a mirror.

Autoscopy, as Lhermitte points out, can occur under a variety of conditions, in dreams, in epilepsy, in states of delirium, and as the result of organic disease of the brain. A number of writers have described their own experience of it. Closing the eyes, and even loss of vision, does not interfere with it. Lhermitte offers this explanation of it. "If one looks at autoscopy purely from the phenomenological point of view there is no doubt that this strange manifestation of the double is linked with the objectification, the projection outside oneself, of the body image which each of us carries in himself." Lhermitte is here using the language of projection. Translated into the language of the representationalist view of perception, it means that the subject includes in his perceptual construction of the external world a visual representation of himself. The two principal varieties of autoscopy then appear complementary to each other: in the one, the subject identifies itself with his normal perceptual body; the double then has a somewhat phantasmal character. In the other, he identifies himself with the phantom and looks upon his normal body, i.e. its perceptual representation, which, since he is no longer identified with it, is unconscious.

I have chosen to speak first of the more bizarre disturbances of perception of the body in order to make clear the subjective character of all those sensory characteristics which compose our awareness of our bodies. It then becomes much easier to understand the minor disturbances which consist of peculiar sensations experienced in various parts of the body, but for which we are apt to say there is no organic basis, which, of course, cannot mean that such peculiar feelings have no anatomical and physiological basis in the brain: it is merely a kind of shorthand for saying that they differ from the other common type of sensory disturbance which is produced either by abnormal stimuli reaching the sensory nerves as a result of bodily disease, or through the effect of disease upon these pathways themselves. These peculiar sensations are so familiar that I need not try to enumerate them, indeed it would be impossible to do so. They may affect a part of the body, or the parts in relation to one another, or the body as a whole, particularly, perhaps, in its spatial relations to the environment. They may occur either in normal people, while falling asleep or during sleep, or in patients with minor or major mental disorders. Let me quote one typical example described by a patient suffering from an anxiety-state after a minor head-injury.

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press

"My feet feel large and sizzling, like elephant's pads . . . As soon as I settle in bed, my feet would start with pins and needles which would creep over the entire body. Then head would appear to enlarge to immense proportions and body would shrink to nothing. This would then sometimes alternate."

All such symptoms become readily comprehensible if we regard them as the result either of the intrusion into the perceptual body of abnormal feelings which have their origin elsewhere than in the stimuli which normally lead to its construction or of disorders of the integration or presentation to consciousness of the body-image.

Among all such abnormal feelings pain occupies a position of special clinical importance. The term psychogenic pain has been used to differentiate such pain from pain produced by organic disease. In this difficult field we encounter a number of problems. The first is to be sure that no organic cause for the pain exists, and this I find grows more difficult the greater one's experience of these patients. The absence of familiar signs of disorder of the pain pathways does not entirely exclude it, as we see in the case of trigeminal neuralgia. Nevertheless, let us accept as a fact that patients do complain of persistent and distressing pain in the absence of any organic disease. The next problem is to know what the patient means when he says that he has pain. We cannot experience his pain, and whereas we all have experience of the pain produced by organic disease, and therefore know to some extent what it is like when it is described by someone else, we have not had experience of a pain which has no organic basis. We cannot, therefore, know that when a patient speaks of such a pain he means by the word "pain" the same kind of experience which we should be having if we said that we were in pain. And, of course, it has frequently been pointed out that psychogenic pain is often unaccompanied by the physical concomitants of a pain of organic origin. Nevertheless, we must, I think, believe that the perceptual bodies of these patients have been modified by the intrusion of these painful elements, in other words that the unpleasant sensations are real and that they are experienced in that part of the perceptual body in which the patient describes them.

Art as the Representation of Feeling

The theory of perception which I have been discussing throws some light upon the nature of art, which is of value for the interpretation of a much wider sphere of mental life. Susanne Langer (1953) has devoted her recent book *Feeling and Form* to a development of the idea that "art is the creation of forms symbolic of human feeling". The relationship between art and feeling is obvious enough, but the sentence I have quoted gives rise to two questions: Is the relationship one of symbolization, and by what means is it brought about? I suppose that the ordinary explanation of the relationship between art and feeling is a causal one. A work of art is said to cause feelings in the person who contemplates it, and "beauty is in the eye of the beholder". This, however, is again to confuse the physical and the perceptual worlds. Undoubtedly the physical object which constitutes the work of art, operating through its own particular physical medium, so influences the physical brain of the percipient that he experiences the feelings associated with its contemplation. The physical object which is a work of art is one thing and the feelings which it evokes are another. But this is not true of the world of perception, where, as we have seen, a perceptual object is itself subjective. In the perceptual world feelings can be embodied in concrete form, as we have just seen so vividly in the case of the

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press

perceptual body. So the artist, when creating a work of art in his own perceptual world, constructs it of his own *feelings* as well as his own visual, tactile or auditory sense-data. It is therefore a mistake to suppose that the feelings associated with perceiving a work of art are subjective in some way in which the sense-data composing it are not. On this view a work of art is not symbolic of human feelings: it is literally an embodiment of them. A physical object is modified by the artist until it assumes in his perceptual world the form which embodies his feelings, so far as his competence as an artist allows. This physical object is then available to form representations in the perceptual worlds of other observers, where, in so far as their senses are acute and their minds attuned by nature and experience to the mind of the artist, they will find similar feelings of their own embodied. In this way art is the communication of feelings.

Of course the feelings are only one element in the artistic object. In many instances art involves also the communication of ideas; or its communication of feelings may pre-suppose the existence of the appropriate ideas in the percipient. There are many sources for such ideas, including a common social or cultural heritage. Religious art, for example, pre-supposes the whole system of ideas which form the content of the religion. A social or cultural system of beliefs may confer feeling-qualities upon objects or persons independently of their artistic value.

The process of the embodiment of feelings in perceptual objects may, however, be purely an individual one. This is the explanation of the attribution of emotional qualities of various kinds to persons or objects by patients suffering from major or minor mental disorders. Fetishism is an example of this. An object in the perceptual world of the patient acquires abnormal emotional qualities. This neurosis might be described as a private work of art. The emotional quality, however, is conferred upon an existing type of object and not upon one created for the purpose, and therefore it exists only in the subject's perceptual world and is incommunicable. If, however, such a patient has artistic capacity, he may succeed in embodying his feelings in a work of art, and so communicating them to such other people as are predisposed to share them. Conversely, the feelings which a true artist embodies in a work of art may be so private that the work of art remains for others merely a collection of sense-data, and fails to convey any feelings to them. All of us, then, embody our feelings in perceptual objects. The artist does so to communicate his own satisfactions to others; the psychotic patient in the unshared solitude of his private universe.

The Anatomy of Perceptual Disorders

What are the principal anatomical facts concerning the perceptual disorders that we have been considering?

1. Lesions of the upper part of the brain-stem may cause hallucinatory states, Lhermitte's "peduncular hallucinosis".

2. Lesions of the right parieto-occipital region are especially likely to cause states of imperception of the opposite half of the body, autotopagnosia and anosognosia.

3. Disorders of the temporal lobe, especially epileptic attacks originating there, are prone to disturb perceptual awareness both of the external world and of the body, and to cause illusions and hallucinations, as Penfield has shown (Penfield and Jasper, 1954). Temporal lobe lesions tend to disturb awareness of the body as a whole, or of its relation to the environment, but sometimes of only one of its parts.

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press

4. Weinstein and Kahn (1955) in their recent book on *Denial of Illness* state that which cortical area is damaged is unimportant for the production of this symptom, provided that the deeper structures are involved; they have found that it may occur with lesions of the third ventricle, diencephalon and mid-brain. They believe that the body-schema cannot be localized in any part of the brain as an anatomical representation.

5. Similarly, Lhermitte points out that the relationship of hallucinations to a lesion of a particular sensory pathway is often indirect. For example, when a patient with homonymous hemianopia has visual hallucinations, they may be localized in either the blind or the seeing half-fields.

Here we encounter the difficult question of the relations between cerebral structure and function, one aspect of which is the meaning of the term "cerebral representation". Let me take the visual cortex as a simple illustration. If the visual cortex is stimulated electrically, visual sensations are experienced; if it is destroyed, blindness results. At first sight, this might suggest that the visual cortex plays some exclusive part in visual consciousness—that, neurologically, vision, as it were, ends at the visual cortex. But this does not follow and is probably untrue. We know that visual impulses arriving at the visual cortex cause a widespread irradiation of neural impulses through the brain, which can be picked up electroencephalographically. Let us suppose that beyond the visual cortex vision is an electrophysiological pattern to which large areas of the brain, or perhaps the whole brain, resonate. Then the visual cortex would be merely the last point at which the visual functions of the brain are sufficiently concentrated in space and time to be disturbed by the local effects of disease or elicitable by electrical stimulation. Elsewhere vision would be so much a function of the whole brain as to be unaffected by focal lesions. I believe this to be true of perception as a whole. The selective agnosias—visual, auditory, tactile, etc.—raise physiological and psychological problems which are still unsolved, and which I shall not discuss here. In contrast with these are the more general disturbances of consciousness characterized by hallucinations and illusions, and often, though not invariably, by clouding of consciousness, i.e. by some degree of imperception of the environment. It is significant that such disturbances are often associated with lesions of the upper part of the brain-stem, the diencephalon and the anterior part of the temporal lobe, all of which are now believed to be concerned with the regulation of consciousness, a subject which also bristles with unsolved problems.

It is in conformity with the holistic view of nervous activity which I am proposing that a satisfying explanation of hallucinations must take account of many things besides the lesions, in particular the patients' perceptual psychology, emotional background and past experiences. Thus the neurological account requires the psychological for its completion. Disorders of the body-image provide two examples of this. Weinstein and his colleagues (1954) point out that reduplication of parts of the body cannot be explained merely as the result of the cerebral lesion: it reflects the patient's emotional attitude to his illness. And the common neurotic pains, dysaesthesiae, and sensory distortions of the body can be understood only in the light of their psychological interpretation. Here, as so often in psychiatry, we encounter the mind-brain relationship which challenges us in the very title of Maudsley's work *The Physiology of Mind*.

Let me in conclusion spend a few moments in examining his philosophy, as he states it in the first chapter of *The Physiology of Mind*. He begins by pointing out the inadequacy of limiting the study of mind to the study of consciousness,

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press

since the brain has "mental" functions which do not reach consciousness, which is "but an incidental accompaniment of mind". Maudsley was a monist. "Mind, used in the sense of substance or essence, and brain, used in the sense of organ of mental function, are at bottom two names for the same substance . . . He who should insist on keeping these different symbols of the same substance or process punctiliously distinct on every occasion, and should scrupulously shrink from ever translating one into terms of the other, makes an abrupt and arbitrary division in knowledge where there is continuity in nature." This is well-recognized today, and even the greatest devotee of the neurophysiological approach to psychiatry will often admit that speaking to the patient is in some circumstances the best method of treatment. Nor is it in the least unphysiological, for it is merely employing the most delicate method of changing the electrical activity of the cortex. In any case it is most unlikely that psychiatry will ever be able to dispense with either physical or psychological methods. There is, however, a subtle danger in what I believe to be the erroneous idea that the physiological approach to mind is more fundamental than the psychological, that theoretically at least physiology can somehow *explain* mind, because what goes on in the brain is the *cause* of the thoughts, feelings and other phenomena we call mental. I have not time to discuss the difficult question fully now. If we adopt either Maudsley's monistic view or some form of psychophysical parallelism, a brain-state cannot be the cause of its corresponding mind-state; because either they are two aspects of the same thing, or they are simultaneous. But it is widely believed that, on either view, the physical laws, which are held to regulate the nervous system, must apply to the mind. I believe that this is an error in semantics. As Woodger (1952) put it, "causal laws in physics are not between physical objects and sensible objects, but between physical objects only", and Dingle (1952) says: "In any rational argument one must proceed from premises—from evidence—to conclusion, and not from conclusion to premises, and in the practical, commonsense philosophy it is the latter course that is taken. Experience is interpreted as a consequence of the action of the world of material objects on the sensitive body. But what we know immediately is experience; the world of material objects is what we (rightly or wrongly) infer from it, and a scheme which attributes the data to the action of an inference from the data thereby declares itself as essentially irrational. In the same breath we say there must be a world of matter because we have experiences, and we have experiences because there is a world of matter which causes them. On such a basis it is not to be expected that great systems of rational thought will be erected."

The fundamental problem here is the logic of the translation of the language of physiology into that of psychology, and conversely. And we should never forget that mind and brain are both abstractions—abstractions from persons, with whom, we, as doctors, are ultimately concerned.

References

BRAIN, W. R., *Mind, Perception and Science*, 1951, pp. 61–63. Oxford.
BROAD, C. D., *Scientific Thought*, 1927. London.
DINGLE, H., *The Scientific Adventure*, 1952. London.
HUTTON, E. L., in *Perspectives in Neuropsychiatry*, 1950. Edited by C. Richter. London.
JACKSON, J. H., *Selected Writings*, 1932, **2**, 147. London.
KÖHLER, W., *The Place of Value in a World of Facts*, 1938. New York and London.
LANGER, S., *Feeling and Form*, 1953. London.
LHERMITTE, J., *Les Hallucinations*, 1951. Paris.
MAUDSLEY, H., *The Physiology of Mind*, 1876. London.
PENFIELD, W., and JASPER, H., *Epilepsy and the Functional Anatomy of the Human Brain*, 1954. London.

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press

RUSSELL, B., *Human Knowledge, its Scope and Limits*, 1948, pp. 218–225. London.
SMYTHIES, J. R., *British Journal of Philosophy of Science*, 1954, **5**, 120.
WEINSTEIN, E. A., KAHN, R. L., MALITZ, S., and ROZANSKI, J., *Brain*, 1954, **77**, 45.
WEINSTEIN, E. A., and KAHN, R. L., *Denial of Illness*, 1955. Springfield.
WICKSTEED, J., *William Blake's Jerusalem*, 1953. London.
WOODGER, G. H., *Biology and Language*, 1952. Cambridge.

https://doi.org/10.1192/bjp.102.427.221 Published online by Cambridge University Press