

regard to lunacy should, in different countries, be placed in so many different hands. In England the Lord Chancellor is the man who has all lunacy matters under his care. In another it is the Minister of the Interior, the Home Office in another. Sometimes the Minister of Commerce is the man who is to take care of the interests of the insane. There a real rational basis is also wanting.

I may be asked, "Who is the man who should propose and execute all these things?" I must reply freely and openly that I believe it is the medical profession themselves who should propose such things. If we are always silent, leaving things to go just as they are, fearing to be censured, we shall never make progress, and the governments will be very satisfied with our labours so far as they are not burdened. But, in my opinion, it is the sacred duty of every member of our profession to do his best to propagate sound and new principles, to urge those who have influence in such matters to make further progress, to make official propositions, and so by-and-by to come to a real and to a good law in lunacy, which, though it is the best in England, is even there defective, whilst in the other countries of Europe it needs a radical reform.

How the Extension of the Organism in three Dimensions is realised.

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The subjective character of sense-consciousness.—To the physiologist of the present day it must be clearly manifest that, in respect to what is revealed to us by the senses, we have no immediate knowledge of anything but sensation. Even according to Sir William Hamilton, perception proper takes note of nothing but the sentient organism. "All perception is a *sensitive* cognition; it therefore apprehends the existence of no object out of its organism, or not in immediate correlation to its organism, for thus only can an object exist *now* and *here* to sense."* An effect is produced upon the peripheral extremity of a nerve of sense; this is conveyed to the appropriate centre, and there calls forth a sensation.

In the first place, then, the only immediate object external to themselves which the intellectual organs can have to stimulate them into action is a sensation, there being no way discoverable in which a perceptive faculty can come, without the intervention of a sensation, face to face with any portion of the organism, much less with any external body. A man's members are existent to him only in so far as he is sentient of them; his only organism is his sentient organism, his

* 'Hamilton's Reid,' p. 879, par. 13.

only world his sentient world. The existence of a world other than the sentient may be thought possible, but it cannot exist for us; and some are to be found who, indeed, question its existence altogether, because internal causes are known to rouse sensations which appear to be extra-organic. Thus, congestion in the capillary vessels of the optic nerve, or a chemical agent exciting the nerve through the medium of the blood, causes visual sensations in the entire absence of their natural stimuli. Such disturbances, under the name of hallucinations, are quite familiar to the physiological psychologist, as affecting all the senses. Hallucinations sometimes exist indeed without involving insanity. "Thus, Andral, on entering his room, distinctly saw for a quarter of an hour the corpse of a child which he had dissected a short time before. Johnson, one day at Oxford, when he was turning the key of his chamber, heard his mother distinctly call 'Sam,' although she was then at Lichfield. Jerome Cardan, the physician, and Erhard, both believed that they were attended by a supernatural personage. Erhard's companion was always attired in a black cape. Napoleon was said to have interviews with a familiar spirit in the form of a little red man; and, on better authority, we are informed that he saw his star. 'I see it,' said he, 'in every great occurrence; it urges me onward, and is an unfailing omen of success.'"*

Some persons, while admitting that we have no knowledge of the external world, for our world consists exclusively of our so-called objective sensations, still maintain that there are, external to us, certain forces which rouse these sensations in us. But this is not so evident as not to have given rise to scepticism. Say we have an immediate cognition of an external force in electricity, but this immediate cognition, the idealist may hold, must be a sensation, and as such exists in us only. If to account for our sensations we infer an external stimulus and call it electricity, what is this but hypothesis, or, as Comte would call it, metaphysics?

In the second place, this view of the matter will be more evident if we consider that our sensations, whether objective or unemotional, subjective or pure feeling, are not cognized in the locality in which they apparently exist, but in the brain or sense-centres. For example, when we have, as we say, a pain in the foot, consciousness is not present face to face with the pain in the locality in which we place the foot, but in the locality in which we place the brain. It is just the same with our outward sensations. When I am conscious of this pen as being held in my hand, my various sensations are not *there* where they are felt to be, but in their respective sense-centres. Let us suppose, for the sake of illustration, that these centres, instead of being but a short distance from the locality apparently affected, were a long way off from them; let us imagine a giant a mile in length; now, a twinge in his big toe would be

* 'Psychological Medicine,' p. 143.

a sensation occurring in his brain, although in appearance at so great a distance from that organ. This shows plainly how impossible it is for us to be conscious of the organism, much less of the external world, presentatively or in themselves. We are not in the immediate presence of either of them. In the case of the giant, for instance, a line of nerve a mile long, a sense-centre, and the action of that centre resulting in a sensation, all intervene between his intellect and his foot. We are dependent upon the veracity of an inter-nuncio for the existence both of the body and its environment; and the grand question which has to be decided is, whether consciousness only possesses that amount of truthfulness accorded to it by the idealist, or that greater amount accorded to it by the thinking many.* But how does sensation appear to have its seat out of the brain?

Localised sensations.—Some of our sensations are apparently seated in various parts of the body. That this is the case with all sensations involving contact with, and resistance from, something which is felt to be external to the organism, none will deny. What we touch (felt also as touching us), what resists our pressure (felt also as being resisted by us), is always in some definite locality of the skin. But even our internal corporeal feelings are experienced as relatively out of each other in space. Some, however, contend that we should have no notion of the locality of a pain, for example, in the foot, were we not conscious of the foot as a tangible and visible object, and that we are aware of the seat of the pain because we associate with it our notion of the foot as a tangible object. But assigning a pain to a certain part which is known by an outward sense means this—although we had an internal cognition of the pain, unless we had an external perception of the foot as well, we should not be able to locate the pain by association in a place of which we know nothing. This is granted. What is contended for is, that although we could not locate a pain in the foot unless we were aware of the existence of the latter, we still should be perfectly certain that a pain, as in one foot, was quite distinct from a pain as in the other foot; that is, we should experience them in separate localities. “The opinions so generally prevalent,” says Sir William Hamilton, “that through touch, or touch and muscular feeling and sight—that through these senses exclusively we are percipient of extension, &c., I do not admit. On the contrary, I hold that all sensations whatsoever of which we are conscious as one out of another, *eo ipso*, afford us the condition of

* If this subject were more fully entered into, it would have to be shown that our outward sensations are apprehended as external in space to the whole field of internal sensation, that is, to the whole of the organism as the seat of emotion—pain or pleasure. Moreover, our outward sensations are distinguished from the other class by the entire absence of animate qualities. From these two causes, it is, they are cognized as *not-self*.

immediately and necessarily apprehending extension, for in the consciousness itself of such reciprocal outness is actually involved a perception of difference of place in space, and, consequently, of the extended."* Mr. Bain† contends against this view of the subject, and holds that we realise extension by means of the activity of our locomotive organs. But both physiology and reason are against him. If we are not in some sense conscious of a limb as extended and solid, how can we become aware that we move it at all? In chronological as in logical order, motion involves the existence of that which moves, but that which moves may be at rest. What is contended for, then, is, that a limb at rest is realised as an extended object by the outness from each other of all the sensitive minima which are then localised in it, and that the sensations which are felt and localised when the same limb is put in motion are an addition to the former, and presuppose them, *i. e.* the former sensations are a condition *sine quâ non* of the latter. Moreover, in order to realise a sense of motion there must be a comparison of two objects at least, the one changing its place in relation to the other, for the mere movement of a limb would not be realised as motion if there were not by means of comparison a perception of change of place in the limb relatively to other parts of the body and to other objects. Now all this implies that the objects compared must be already known as occupying space. Were a coast to glide along at the same rate, and in the same direction as a vessel which sailed along it, we should not know that either of them were in motion; and in like manner if, when one limb moved, every other portion of the body and every surrounding object kept in the same relation of space to it, how should we know that we moved the limb at all? The mere act of the will, followed by muscular effort and its attendant sensations, we should be fully conscious of, but since we detected no change of place in relation to other objects we should be at our wit's end, and believe that all was a dream. It seems to be manifest, then, that Mr. Bain is committing a *petitio principii*. In order to be conscious that a limb moves we must be conscious also of that limb in so far as it is the substratum both of rest and of motion, namely, conscious of it as possessed of extension.

Why certain of our sensations should be localised in the body, *i. e.* stand out in distinct isolation from each other in space, while others, such as those of hearing and smell, are not distinguishable in the same manner, *i. e.* do not stand out in distinct isolation from each other in space, can never, it is presumed, be accounted for; it is an ultimate fact, and, therefore, inexplicable. We can assign but one reason for thought being a function of the vesicular neurine of the brain, and for disease in this neurine being attended with insanity, namely, that such is the Creator's will; in like manner for

* 'Hamilton's Reid,' p. 861, note.

† 'The Senses and the Intellect,' Book II, Chap. 1st, § 37.

the fact that certain sensations reveal extension, we can offer, apparently, no other explanation. The perfect isolation from periphery to centre of nerve-filaments and their minuteness, do not account for their being revealers of extension, but simply afford ocular evidence that each nerve-filament has a separate message to convey to a distinct sensitive point. The reason why these points are felt in space can perhaps never be explained. The phenomenon, to all appearance, is primary, and, therefore, inexplicable; and, as inexplicable, incomprehensible.

How localised sensations are apparently present in a locality other than that in which they are generated.—How is it that a sensation which is aroused in the brain is seemingly present in one of the extremities of the body? Sir William Hamilton has written something on this point, which, if not affording a right explanation, strongly suggests one. “Be it observed, that it makes no essential difference in this doctrine, whether the mind be supposed proximally conscious of the reciprocal outness of sensations at the central extremity of the nerves, in an *extended sensorium commune*, where each distinct nervous filament has its separate locality, or at the peripheral extremity of the nerves, in the places themselves where sensations are excited and to which they are referred. From many pathological phenomena the former alternative might appear the more probable.* In this view, each several nerve, or rather each several nervous filament (for every such filament has its peculiar function, and runs isolated from every other), is to be regarded merely as one sentient *point*, which yields one indivisible sensation, out of and distinct from that of every other, by the side of which it is arranged; and not as a sentient *line*, each point of which, throughout its course, has for itself a separate local sensibility. For a stimulus applied to any intermediate part of a nerve is felt not as there, but as if applied to its peripheral extremity, a feeling which continues when that extremity itself, nay, when any portion of the nerve, however great, has been long cut off. Thus it is that a whole line of nerve affords, at all points, only the sensation of one determinate point. One point, therefore, physiologically speaking, it is to be considered.”† All that line of nerve which stretches between the brain and the foot is in consciousness null. A message is conveyed by a nerve from its remote to its central extremity, but the nerve being in itself incapable of experiencing any feeling, none is felt till it has excited the sense-centre, and there it is that the feeling first manifests itself. Each nervous filament is

* Pathology proves as clearly as physiology, that the brain alone can be the seat of normal and abnormal mental action; that the normal state of the mental process depends upon the integrity of this organ; and that both together are influenced by the state of the other organs in disease.—‘*Griesinger on Mental Diseases.*’ Translation by Dr. Robertson and Dr. Rutherford, p. 3.

† ‘Hamilton’s Reid,’ p. 861, note.

therefore not only not a sentient *line*, it is not even a sentient *point*, it merely serves to excite such a point in the sense-centre. But how, in that case, does the feeling seem as if it were in the foot? In this way—the sensorium, as such, is not itself localised in consciousness. We do not feel that thought and emotion are in any place in particular. What an easy task the phrenologist would have of it if he felt rage kindling above the ears, pride towards the crown of the head, benevolence in the upper part of the forehead, and the intellectual faculties working away like busy bees in their narrow cells below. We should never have had such expressions as “the thoughts and intents of the heart,” and “bowels of mercy,” if thought and emotion had a clearly defined habitation in consciousness.

In corroboration of the fact here stated, it is found that when any portion of the brain is laid bare it is not susceptible of the feeling of touch; if it were it would be conscious of the place which it occupies, and thought and emotion could never have been assigned to so many regions of the body by those who were so very slightly acquainted with it.* Indeed, if sensation were consciously localised in the spot in which it comes into being, the problem which it is now attempted to solve would never have had an existence. Sensation would be experienced as if it were in the sense-centre, and a pain, for instance, in such a place as the foot would never have to be endured, for how could a single feeling appear to be at one time in two distinct localities? The sensorium, therefore, must not be localised in consciousness, else our sensations would necessarily appear to have their seat in the sensorium, and not, as now, in various localities of the organism.

Now, in the sense-centres which we are considering each sensitive point is distinctly apprehended as separate in space from every other, and this not simply in two dimensions, but in three, that is, in solid or trinal extension. In consequence of the sense-centres, as such, being in consciousness unlocalised, while the sensitive points are cognised in trinal extension, these points are realised as if they were in various regions of the body, that is, in short, in the localities in which they are asserted by the many to be exclusively present.

In order to show how the various localised sensations, objective or unemotional and subjective or emotional, become associated together, we cannot do better than consider the curious phenomenon of a man who has had his leg amputated apparently feeling pain in the foot which he no longer possesses. This phenomenon is often cited as proof that pain is seated in the mind. The nerve-fibres which extend from the brain to the foot are in consciousness void,

* Certain feelings, such as vertigo, headache, sense of tightness, are of course consciously located in the head, but sensation, thought, and emotion, are not localised in their respective organs.

but they excite in the sense-centre the sensitive points with which they are severally connected. Now, the shortening of these fibres does not alter their connection with the brain, consequently the sensitive points are stimulated into action by the shortened nerves in the same manner as they previously were by the nerves in their full length. The sensations are therefore alike in both instances. But then, with these internal sensations, others of an objective character, namely, those derived from touch proper, the muscular sense, and sight, have become associated. Thus, with the internal feelings belonging to the foot have become linked its solidity, size, figure, colour, &c., consequently, the former call up thoughts or notions of the latter. For instance, when a man who has lost his leg feels pain in the stump, the pain occurs in the self-same points in which it occurred before the leg was amputated. Stored up in the man's memory, however, there are certain notions which have become firmly associated with this sort of pain; in physiological language, certain actions of the brain-cells have been in the habit of being set up whenever such pain is experienced. These have now been rendered faulty and need to be replaced by a new set of actions. The man must, in fact, learn to connect with certain feelings the notion of the stump instead of the lost foot.

Our localised sensations, then, have their real seat in the brain; they, nevertheless, appear to have their seat in various localities of the body. This is accounted for by the fact that they are apprehended in trinal extension, while, as the seat of thought and emotion, the brain has, in consciousness, no local habitation.

The Velocity of Nerve-Force.

(Abridged from the 'Revue des Deux Mondes,' August 1st, 1867.)

THE nerve-current which transmits sensations to the brain, and the orders of the will to the extremities of the body, requires a certain time to travel in. Impressions coming from without are not perceived at the instant they are produced, they travel along the nerves at the rate of 20 to 30 mètres (25 to 40 yards) in a second, which is the same speed as that of the carrier pigeon, of a hurricane, or of a locomotive engine at its quickest, but very much less than that of a cannon ball. For instance, we can only be conscious of an injury to one of our feet about one twentieth of a second after it has actually occurred, and the commands of the will proceed equally slowly from the centre to the peripheries of the nervous system. In the human body the time thus occupied is unimportant, but let us