

point out these districts as being the peculiar focal centres of functional and psychical life. If this theory be correct, it can explain all the phenomena manifested by experiments made, and pathological conditions found, on the cortical substance, without resorting to the chart made out by such shifting, incomplete, and changeable boundaries as the sulci of the convolutions afford. The "bumpologist" conveniently locates all mental centres in the cortical substance nearest to his manipulations, and ignores all the similar surfaces at the base and between the hemispheres, because this *terra incognita* is not convenient to map out. He cannot reach these parts; therefore they must be useless appendages. He forgets nature has no lumber room. In somewhat the same way the Ferrier school of investigators find certain functional disturbances following the abrasion, excision, or galvanism of definite cortical parts, with a considerable degree of uniformity. Based on these manifestations, already, with considerable confidence, it is said nearly all the functions of the body are located on the exterior part of the nerve mass, which is within reach of experiment, and somewhat hasty conclusions are drawn from the results. All the rest of the brain mass, which has a substance exactly similar in structure to the external grey matter, is practically ignored, in spite of its paramount importance, which is evident from the complexity of the structure, and from the fatal results which flow from injury to these central parts. It seems to be overlooked that any injury to the cortical substance must necessarily affect the lower ganglia, to which it lies in juxtaposition, and to which it stands so nearly related. The periphery of the brain doubtless has much to do in stimulating to action these centres. In the latter are found the distinctive seats of functional activity, and in the superimposed mass the residuary power to impel, but not to direct—to give additional vitality, but not to indicate the mode and direction this force is to take. This discriminative power is left to be performed by these central glands, which are safely situated in the centre of these sympathetic and active auxiliaries. Not only is this true in respect to function, but it is equally

true as respects sensation. Sensation and function have a community of interests, and are *focalized* together. Dr. Symonds, in the Gulstonian lectures, says: "Pain does not seem to be in the nervous matter, whether vesicular or tubular, of the cerebral hemispheres, or of the cerebellum. No evidence of feeling has been obtained by vivisectioners till they approached the sensory ganglia—the *thalami optici* and *corpora quadrigemina*. But these are the centres of sensation to all parts of the body as well as to the head."

It is satisfactory to see that recent investigators are paying more attention to the central organs. Their researches go to show that very important functions are likely to be found having their excito-motor centres in the internal parts of the brain. These experiments, as far as they go, point to the probabilities of my theory of localization. Richet, in speaking of cerebral excitation by means of electricity, is forced to say in explanation of certain phenomena, "Known facts demonstrate that excitation of the convolutions which surround the sigmoid gyrus act with extreme energy upon the ganglionic centres of the brain (opto-striated bodies). It is possible that such excitation culminated in the cerebral centres, and that these centres thus surcharged discharge to the muscles." Charcot says, in speaking of the lenticular nucleus of the *corpus striatum*: "These grey nuclei are possibly so many centres endowed with distinct properties and functions." This is a germ idea of the theory which I propounded several years ago in the following words: "Large portions of the cerebrum and cerebellum may be taken away from the living body without immediate danger of death; but the organs in the base of the brain, from which spring the numerous nerves so essential to life, cannot be touched in vivisection or by disease with impunity. From this central region nerve influence radiates to every part of the body, making its connections with the depositories of nerve power in the spinal cord and with the ganglia of the sympathetic system."—(*Vide* "An Animated Molecule," p. 38.) If Charcot had added to his hypothesis the probability that the base and central ganglia were the true and

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