

expressly admits that they are efferent and convey motor impulses, he appears to me to admit all that is characteristic of the activity of motor centres. Just as the activity of the anterior horns of the severed spinal cord is displayed in response to stimuli proceeding from the posterior roots and horns, so the motor centres of the brain are thrown into activity by stimuli proceeding from the sensory centres—visual, auditory, tactile, &c. As the motor nerves convey stimuli to the contractile muscular fibres, so the pyramidal tracts convey impulses to the motor apparatus—not perhaps directly to the muscular fibre—but to the neuro-muscular mechanism by which actions are capable of being effected. As I have elsewhere ('The Functions of the Brain') discussed at some length the mechanism of volitional movements, the basis of our ideas of movement, and the relations of the motor centres to these and to motor acquisitions, I do not consider it necessary to discuss these questions further on the present occasion.

MR. SULLY.

Mr. Sully remarked that though he felt the force of the facts and arguments in favour of the view, that the muscular sense was, on its physiological side, essentially afferent, he could not accept this as a complete theory of the subject. Among other facts which seemed to conflict with this view were the hallucinations that were known to follow the loss of a limb. When in these circumstances a patient was able to give a certain degree of definiteness to his feeling of the (imagined) situation, and movements of the missing member, this appeared to point to the co-operation of the efferent nerve-process as a factor in the muscular sense. It is not unlikely that the so-called muscular sensations are highly complex psychical phenomena, in which afferent currents play a prominent part in giving the exact measure of direction, rapidity, and distance of movement, though an essential, and perhaps the most characteristic element, is supplied by the efferent process of innervation itself.

DR. ROSS.

Before entering on the general discussion, I shall endeavour in a few words to explain the difficulty started by Mr. Sully, so as to bring it into accord with the theory, that the sense of muscular movement is correlated with the activity of in-going and not of out-going currents. When a person suffering from a profound degree of hemianæsthesia, say of the left half of the