

one finger flat above the patella and striking downward with a Déjérine hammer or the fingers of the other hand, when a perfect reflex contraction of the quadriceps will be obtained. Hence the mistake of terming this phenomenon a tendon reflex, an error which it is to be hoped will soon disappear. The facts above stated make it clear, I think, that the knee-jerk is a reflex phenomenon originating in the terminations of the sensory muscle nerves, and that the nerves of the tendon have nothing to do with it, nor is it a purely local manifestation.

From a clinical point of view we now come to another question, viz., the influence of a higher centre in modifying or increasing this reflex action. This influence of the brain is clearly shown in cases where in a lesion of the cord which cuts off this influence, an increased reflex action arises in all parts of the cord below the lesion, except such as will be presently mentioned. The modifying influence of the brain can be demonstrated in a frog by experiment. If the cerebral hemispheres of a frog be removed, the excess of reflex action in the legs can be easily modified by stimulating the optic lobes, showing clearly that impulses have descended from these parts through the cord which inhibit reflex action. Similar results are obtained in the dog by irritating the corpora quadrigemina. The path by which these impulses descend in man is definitely known, viz., the pyramidal tracts. From this we learn the important clinical fact that a lesion of this tract in any part of its course, or a complete transverse lesion of cord, cuts off the inhibitory influence, and as a consequence we have, other things being equal, an increase of muscular reflex action. But it will be said immediately after a sudden and complete transverse lesion of the cord the knee-jerk is often absent. This fact is due to the shock of the accident or operation, which may be looked upon as a very powerful stimulus, and which, partly by inhibition and partly by exhaustion, depresses or suspends the normal functions of the cord. In man the excess of muscular reflex action usually comes on in a week or ten days and gradually increases.

Having now considered the cause of the knee-jerk and the influence of the higher centres upon it, I would in conclusion like to add a few remarks on the clinical significance of its absence or excess in some diseases of the nervous system. In the first place, in regard to the absence of the knee-jerk. This must necessarily follow from any lesion which interrupts the reflex arc either in the afferent nerve, the centre, or the efferent nerve. In regard to the *afferent nerve* a peripheral neuritis which injures its peripheral termination in the muscle is a common cause, and in this disease the loss of knee-jerk may be