had occurred twice since her admission to the hospital (on November 18th and on December 7th), and was natural in its character; the masseuse, who had found great difficulty in pinching up the thickened skin at the commencement of the treatment, had no longer this difficulty to deal with, at least, to the same extent. Still the improvement was not sufficient to lead us to hope that a prolonged course of massage would effect even a partial cure. Accordingly we determined, while continuing the massage treatment, to give hypodermic injections of a sheep's thyroid gland. Dr. Purser kindly made the first extract for me, and gave the first injection; this was given on December 11th, that is, on the fifty-first day of the massage treatment. The extract was made according to the directions given by Dr. Murray, with one or two unimportant modifications. The method adopted was as follows:

The lobes of the thyroid gland of a sheep were removed immediately after it was killed, the instruments used having been rendered aseptic. The surrounding fat and connective tissue were removed from the lobes. Each lobe was cut up into small pieces on a glass dish, the glass dish having been previously washed with a 1 in 20 solution of carbolic acid. The pieces were put into two sterilised test tubes, one for each gland, and over them was poured, in sufficient quantity to cover them, a solution containing a $\frac{1}{2}$ per cent. solution of carbolic acid and glycerine in equal part. The test tubes were left in a cool place for twenty-four hours. The contents were then strained through fine muslin into a glass-stoppered bottle, and the muslin squeezed so as to express as much liquid as possible; the muslin was previously placed for a few minutes in boiling distilled water, and the bottle was also previously disinfected.

The extract so prepared from the two lobes of one thyroid gland was given in three parts, with two days' interval between. The patient experienced no unpleasant sensations. I have continued the injections, and have given up to the present (February 13th, 1892) the extracts of five thyroid glands. Each extract I have given in three separate injections within a week after its preparation. The time between the administration of each set of injections has varied from four to ten days.

The effect of the injections has been really marvellous. A marked improvement in the patient's condition was noticeable within one week, so much so that her husband, who saw her on December 15th for the first time since her admission to the hospital, was delighted with the change in his wife's condition. He told me that he could not have believed the change possible. She left the hospital on December 16th, and returned home. Massage was continued for seven weeks longer, the patient, however, being permitted to go about the house, and to take short walks daily out-of-doors.

The improvement has steadily progressed. Now she is practically cured: the face looks natural, the skin of the face is now no longer thickened, but is thin and wrinkled; the eyelids are not swollen; the lips are natural; the tongue is of natural size; speech is rapid and easy; the hands are no longer clumsy, she can give a hearty and firm "shake-hands;" her rings are loose and easily removable; her movements are active; her hair, which had become thin, is now growing thickly; her memory has returned; menstruation is natural. No physician, seeing her now for the first time, could recognise the case as one of myxoedema.

NOTE TOWARD THE LOCALISATION OF THE KNEE-JERK.

By C. S. SHERRINGTON, M.A., M.B.

DR. HUGHLINGS JACKSON'S interesting note in the *BRITISH MEDICAL JOURNAL* of February 13th, with the illustration of its experimental side by Dr. Risien Russell, induces me to mention some experimental observations on the "jerk" which I made chiefly in the summer of 1890.

Of whatever nature the knee-jerk ultimately may prove to be, whether it be reflex, or whether it be direct, the phenomenon is admittedly in intimate dependence on the integrity of a reflex arc. The muscle concerned is well known to be the quadriceps extensor of the thigh; the motor nerve concerned to be the anterior crural,

I found that not the whole of the quadriceps extensor of the thigh or of the anterior crural nerve is necessary for the "jerk"—it depends upon the vastus internus muscle, and perhaps the subcrureus as well; and on the branches of the anterior crural nerve to those muscles.

If the branch given by the anterior crural nerve to the vastus internus and subcrureus be cut through, the knee-jerk disappears at once, although the nerves to the rectus femoris, the crureus and the vastus externus, all remain intact. If, on the other hand, all the branches given by the anterior crural nerve to the rectus femoris, crureus, and vastus externus are divided, the knee-jerk remains brisk so long as the branch to the vastus internus be left intact.

Tschiriew stated, in 1878, that destruction of the roots of origin of the sixth lumbar nerve of the rabbit abolishes the knee-jerk in that animal. Prévost, in 1881, showed that section of the posterior root of that nerve of the rabbit abolishes the knee-jerk. This observation, which has never been impugned, I have had frequent opportunity to confirm for myself; but I have found that section of the sixth root does not in all rabbits abolish the jerk, and occasionally in the rabbit section of the fifth does so.

In the cat I found that contemporaneous section of the spinal nerve-roots of the lumbo-sacral region, if the sixth be spared only, makes the knee-jerk brisk, but that section of the sixth root alone, all other roots being intact, abolishes the jerk. In the monkey the same fact holds, but the root on which the jerk depends, instead of being the sixth lumbar, is the fifth lumbar. The sixth lumbar of the cat corresponds in its anatomy and physiology with the fifth lumbar of the rhesus monkey; the fifth lumbar of the rhesus corresponds in like manner with the fourth lumbar of man.

The cutting across of the posterior root of the fifth lumbar nerve of rhesus abolishes the knee-jerk at once. The jerk is abolished not only by section of the posterior root, but also by section of the anterior root alone. Section of the whole posterior root is not necessary; section of a half of the posterior root or ganglion in like manner suffices to abolish it at once.

That the knee-jerk should be related to only one nerve-root is singular when one remembers that the limb muscles are for the most part supplied by more than one spinal nerve. In the case of rhesus I know, from my own observations, that the vastus internus receives motor fibres from the fourth and fifth and usually the sixth lumbar nerves. Yet the "knee-jerk" depends on one particular root only—that is, the fifth. In like manner, though one's experiments have shown one that the afferent nerve fibres from the vastus internus pass through two of the posterior roots of those three lumbar nerves, section of even a half of the posterior root of one particular nerve—the fifth—suffices to abolish the "jerk."

As to the effect of division of the spinal cord on the knee-jerk, in the cat and dog it is well known that the knee-jerk is rendered brisk by it, even immediately after the division of the cord. In rhesus I found the knee-jerks completely disappear in the course of a few minutes after complete division of the cord at the level of the ninth thoracic nerve root. The "knee-jerk" reappeared, however, at the end of three weeks, was slight at first, gradually became brisk, and was decidedly exaggerated at the end of four months' time.

After transverse division of the cord of the monkey at the level of the second lumbar nerve root, the "knee-jerk" disappeared in a similar manner, and did not reappear, although observations were continued for longer than three months.

I found that longitudinal section of the cord along the median line throughout the lumbo-sacral region did not obviously affect the knee-jerk of either side, right or left.

THE total number of medical practitioners in Vienna, according to the most recent official statistics, is 1,556. Of these, 1,490 are Doctors of Medicine, 4 Masters of Surgery, and 62 practitioners of a lower grade (*Wundärzte*, wound doctors).

FRENCH CONGRESS OF PSYCHOLOGICAL MEDICINE.—The third French Congress of Psychological Medicine will be held at Blois, the date of meeting being August 1st, 1892. The following questions are proposed for discussion: 1. Delirium of Denial—its diagnostic and prognostic value; 2. Medical Secrecy in Cases of Mental Disease; 3. Colonies of Lunatics.