by quoting first Sir Walter Foster, and then Dr. Hilton Fagge. Sir Walter Foster⁷ says, speaking on digitalis in heart disease: "There is one condition in aortic insufficiency which warrants its use—that of over-compensation. This is marked by violent action of the heart, vibratory arteries visible all over the body, almost constant headache, flushed face, noises in the ears, occasional epistaxis, etc." Dr. Fagge⁸ says: In aortic regurgitation, when the hypertrophied ventricle is carrying on the circulation vigorously, digitalis often aggravates all the symptoms: "When there is dilatation of the heart (rather than hypertrophy), and the pulse is feeble, frequent, fluttering, and above all irregular, it may be given with a fair expectation that it will afford relief." What action will digitalis have on this case according to Sir Walter Foster? It would augment the ill effects of the insufficiency by slowing the action of the heart. The diminution in the frequency of the heart's beats under digitalis always means an increase of the period of the dilatation of the ventricles. "The low arterial tension may require increasing, the heart's strength may want reinforcing, but these two indications cannot be fulfilled by any remedy which, like digitalis, adds to the prime evil. The more forcibly the heart beats, and the greater the arterial tension, the greater, *ceteris paribus*, will be the reflux through the imperfect valves, and while the valvular lesion remains a constant quantity, digitalis will multiply its effects by increasing the period of its action." I have quoted Sir Walter Foster at length, not only because he is, as we see, diametrically opposed to such a high authority as Dr. Fagge is admitted to be, but also because I believe that it was mainly due to his writings in 1874 that the teachings of Corrigan on this subject were revived.

The argument against the use of digitalis in aortic disease usually takes this form. "Digitalis prolongs the diastolic phase of the ventricular cycle and so tends to exaggerate the one condition in aortic disease which is dangerous to the patient. But digitalis cannot be held to act in one way in the case of one cavity and in another way in the case of another cavity of the heart. If it prolongs the diastole of the left ventricle in aortic disease it must also prolong the diastole of the right ventricle and the left auricle in mitral disease, but, if what is generally held in regard to the condition of the right ventricle in that disease and the effect of digitalis upon it is true, this cannot be so. In short, whatever the action of digitalis is in mitral disease, it must have the same action in aortic disease. And if the dangers are the same in nature in the one case as in the other, and digitalis removes them in the one case, it must do so in the other. What we have to deal with in any case of valvular disease is, I contend, failure of the circulation from falling blood pressure, which fall is brought about by the inability of the cardiac muscle to overcome the obstacle introduced by the diseased valve, no matter whether it be in the right or the left side of the heart, aortic or mitral, or both; and for this failing circulation digitalis is the most efficient remedy at our disposal.

I will state my conclusions in the following propositions:—

1. In all cases of valvular disease the chief desideratum in regard to the heart itself is the condition of the cardiac chambers in respect to dilatation and hypertrophy.
2. That the presence of symptoms in cardiac disease means always failure of compensation.
3. That the condition described as over-hypertrophy or over-compensation does not exist.
4. That the dangers in aortic disease arise from the same cause as the dangers in mitral disease, namely, failure of the compensation, that is, failure of the ventricular muscle to overcome the ever-increasing work put upon it.
5. That if digitalis is safe and beneficial in mitral disease, it is equally so in aortic disease.

⁷ *Clinical Medicine*, 1874, p. 87.

⁸ *A System of Medicine*, ed. by Russell Reynolds, vol. iv, p. 684.

A PEDIATRIC SOCIETY has recently been formed at Moscow, of which Professor N. Filatow has been elected president; Dr. L. Alexandrow, vice-president; Dr. L. Hippus, secretary; and Dr. W. Dreyer, treasurer. The rules have received the approval of the Russian Government. The number of original members is 30. The first meeting was held on February 18th.

A CASE OF MYXŒDEMA SUCCESSFULLY TREATED BY MASSAGE AND HYPO- DERMIC INJECTIONS OF THE THYROID GLAND OF A SHEEP.

By WALLACE BEATTY, M.D.,

Senior Assistant Physician to the Adelaide Hospital, Dublin.

On October 7th, 1891, a married lady, aged 45, the mother of several children, came to consult me. I had heard a few days previously from a friend of hers that her ill-health had existed for about five or six years, and that the symptoms had been steadily progressive. Naturally an active, bright, sweet-tempered woman, quick in articulation, and possessed of an excellent memory, she became gradually more and more easily tired, and suffered from lassitude; her speech became slow; her memory impaired; her temper irritable and easily ruffled by trivial causes; she found walking difficult; constipation, which had always been a trouble, became more so; she suffered much from cold.

On examination of the patient it was quite clear that she was suffering from myxœdema. Her face was swollen, waxy-looking, and anæmic; there was a well-marked and circumscribed pink flush on her cheeks, contrasting markedly with the pale swollen skin of the rest of the face. The eyelids were swollen, and looked œdematous. The *alæ nasi* were thickened and the nose broadened. The lips were thickened, and the tongue seemed too large for her mouth, and evidently interfered somewhat with articulation. The mucous membrane of the oral cavity had a pale swollen appearance. The hands were enlarged and clumsy; her rings, which at one time had been loose, were now too tight for her finger, and could not be removed. The feet were enlarged; the skin of the feet and legs seemed thickened, and there was some œdema present. No trace of the thyroid gland could be made out. There was no fulness above the outer half of each clavicle, such as is often present in myxœdema. Her heart sounds were normal; the pulse was slow and feeble. The urine was free from albumen and sugar. Her hair had become thin. Menstruation had become irregular, having occurred only three times since October, 1890, the last period having come about a week before I saw her. The account she gave of herself was very much the same as that given to me by her friend. She told me that she had taken various tonics, and had been at Homburg, where she had taken steel "both inside and outside."

I need hardly say that I could not hold out much hope that any treatment would succeed; still, as I had read that some cases of myxœdema were fairly curable by massage, I suggested that a consultation should be held with a view to the consideration of this treatment. Dr. Head was asked to see her. He confirmed my diagnosis, and considered that a thorough course of massage ought to be tried. Accordingly, on October 21st she went into a private hospital, and treatment was commenced. On October 24th I asked Dr. Purser to see her and to examine her blood. He agreed with Dr. Head and me that there could be no doubt as to the nature of the case. He examined her blood, and found the percentage of hæmoglobin to be 70 per cent. of the normal. Dr. Head, Dr. Purser, and I, about this time, discussed the advisability of adopting the treatment which had been used by Dr. George R. Murray, of Newcastle-on-Tyne, with considerable success, namely, the hypodermic injection of an extract of the thyroid gland of a sheep.¹ We decided to pursue the treatment by massage alone for five or six weeks, and then, if no decided improvement had taken place in her condition, to adopt Dr. Murray's treatment.

Dr. Purser made a second examination of the blood on November 27th—that is, five weeks after his first examination; he found the percentage of hæmoglobin to be 75. In the second week of December there was no doubt that an improvement had taken place in the patient's condition—the face was less swollen, the hands were somewhat less clumsy, the rings were looser, the pulse had improved, menstruation

¹ BRITISH MEDICAL JOURNAL, October 10th, 1891.

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.