able to walk about, using one crutch to steady herself, but is able to bear full weight upon the affected limb.

In cases where the deformity has not been of long standing, even of a pronounced type, a light extension applied without regard to the line of deformity is sufficient to gain the result.

CASE V. M. C., aged eight years; hip disease of six months' duration. The patient's limb was flexed at a right angle with the line of the body. The patient had but little pain or tenderness. A light extension by weight and pulley was applied, the patient being fixed in bed, and the limb in two weeks became perfectly straight. Several months later an abscess formed and in a year the patient died with disease of the liver and kidney.

CASE VI. M., patient aged five, hip disease of four months' duration; flexion of the left thigh to 40° . The child was confined and fixed in bed, a light extension by weight and pulley applied without regard to the direction of the deformity; in two weeks the limbs were perfectly parallel and no deformity remained. The patient was kept in bed for several months. At the present time, six months later, the child is allowed to walk about, wearing an extension splint.

The following is a case of deformity of hip disease complicated by actual dislocation, as was discovered on etherization:—

CASE VII. C. W., five years old, a patient at the Children's Hospital, was admitted suffering from hip disease of right side of eighteen months' duration, with an acute exacerbation. The limb was extremely tender, was flexed and adducted. The hip was swollen, hot, and tender. The patient was etherized, and in extending the limb in the manipulation for correction of the deformity the head of the femur was felt to slip into the acetabulum. No bony grating was detected. The correction of the deformity was not complete, as some flexion remained. An extension of eight pounds in two weeks' time brought the limb to the normal position. The patient was relieved of pain and improved in general condition. An abscess, however, formed three months later, and shortly afterwards the child was attacked by diphtheria and died.

As is well known, deformities at the hip joint can in many cases be overcome by the methods of securing by bandages the patient to a frame which embraces the trunk and extends along the affected limb. The frame at first is bent according to the amount of distortion, but it is gradually straightened and the limb bandaged in the straightened position.

The following case, one of periarticular disease, illustrates this method:—

CASE VIII. Agnes Powers, a child three years old, entered the Children's Hospital with a right angled contraction at the left hip. Tenderness over the sacro-iliac synchondrosis was marked, and the usual symptoms of hip disease being absent a diagnosis of sacro-iliac disease suggested itself. An abscess, however, formed and on incision no diseased bone could be detected, and the incision healed after thorough drainage. The patient was placed upon a wire frame which reached from the axilla to below the left foot, this was bent according to the amount of flexion, but was straightened from day to day. At the end of three weeks the limb was entirely straight.

It would be too much to assume that the correction of a deformity of this sort was the cure of it. As long as any inflammation remains at the hip joint, or as long as from timidity or habit of disuse the patient is accustomed to hold the limb in an unnatural position, a recurrence of the deformity, to a certain degree, may be considered possible or probable.

To prevent this recurrence either the continued use for a longer or shorter time of the measures taken for the correction of the deformity is necessary, or the treatment of the latent disease at the joint, a description of which does not fall within the scope of this paper, the object of which is to indicate that in certain cases of this class of deformity correction can take place without the usually mentioned methods of procedure.

PARAPLEGIA (PARAPARESIS) FROM FUNCTIONAL WEAKNESS.¹

BY S. G. WEBBER, M. D.

I WILL describe three cases which illustrate three varieties of the affection to which I wish to call attention.

M. J. F., widow, aged twenty-six, entered the City Hospital August 27, 1879. Diagnosis endocervicitis. She had a miscarriage eight years before, followed by inflammation of the womb; this seems to have been unimportant, as she soon recovered from it, and was transferred to nervous and renal service September 24th.

The patient had never been strong; had had all the usual diseases of childhood, lung fever two or three times, typhus fever when a child, rheumatic fever nine years ago, and intermittent fever, typhoid fever twice, the last time March, 1878, complicated with spinal meningitis. When thirteen years old she fell on the ice upon her spine; again, at fifteen years of age, fell down a flight of stone steps, striking upon lower part of spine; was laid up by this for three months, having great difficulty in walking and sitting. After the typhoid fever and spinal meningitis in 1878 she was confined to the house till January 1, 1879. She had had pain in her back for a year, pain in right leg, more than in left, for a year; pricking sensations in legs with numbness for a year past; had had a sense of a girdle about waist; some para-æsthesia in legs and back, hyper-æsthesia of back, the weight of the bed-clothes lying on her back causing pain; micturition rather difficult, sometimes only once in forty-eight hours; vision defective; diplopia; tremor of hands during voluntary action for the past six months.

¹ Read before Boston Society for Medical Improvement, January 9, 1882.

On examination there was found to be tenderness over the whole spine, varying in degree, most marked over coccyx; tenderness over upper part of abdomen, especially over the epigastrium; slight tremor of hands, increased in right hand during voluntary motion, not in the left; no ankle clonus; patella tendon reflex very much increased on the left, somewhat increased on the right; she walked very feebly, and with eyes shut fell; urine was normal, without albumen, no casts.

She left the hospital October 29th.

She was treated in the hospital with iodide of potassium, two and one half to five grains three times a day, and dry cups to the back. After she left the hospital she was rather worse for a while, could not walk, had attacks of severe pain in the back. The cupping was continued daily, with much relief after each cup, until the close of winter, then less frequently. She slowly gained, and March 1, 1880, she had no pain in her back, walked firmly without assistance. In the winter of 1880-81 she was keeping a boarding-house.

Here was a history of long-continued ill health, during which the nervous system must have suffered in common with the system in general. Whether she really had spinal meningitis with the typhoid fever or simply severe backache I cannot tell, and not knowing who her physician was at that time, it is not possible to judge from any knowledge of his skill. Muscular weakness after typhoid is not unusual.

When first seen there was very great weakness, and this continued for several weeks. The great tenderness in the back was the chief symptom leading to a diagnosis of functional weakness. Pain in the back in organic lesions of the spinal cord or envelopes is present, as a rule, only in spinal meningitis; the other symptoms of that affection were wanting in this case. It was not difficult to diagnosticate the real nature of the affection.

Helen F. S., aged thirteen, was delicate and weak all her life. When five years old she had scarlet fever, and had not been well since. Catamenia had not appeared. For one or two years she had been growing feeble, and gradually losing power to walk. The most marked loss of power appeared after taking a long walk, whether this was at the beginning of the loss of strength or subsequently is not known, but it was just before an aggravation of her complaint. About five months before entrance she was entirely unable to walk, though she could still make the motions of walking when supported by her father, and he required this exercise daily. There had been no pain or numbness in feet, but sometimes a sensation as if they were asleep. There had been no spasm nor twitching of legs, no swelling of feet. There was pain in back, but not enough to disturb sleep, and sometimes she had headache, eyes also ached at times.

On examination it was found that she could move her limbs, but in a very languid way, and without force; could not stand, nor even sit up, and was unable to hold her head up; there was one spot in the middle dorsal region which was slightly tender over the spinous process, and one spot in lumbar region where there was tenderness to the right of the spine; the spine was perfectly straight; the capillary circulation was very sluggish in the legs. All the muscles reacted to the faradic current. Sensation was very slightly if at all affected. The urine acid, 1014, albumen, about one fourth per cent. granular casts and

hyaline casts, some with granules; amount during the first fortnight six to thirty ounces daily.

She had iron, massage, electricity, and steam baths, and the urine increased in amount to from forty-eight to sixty-six ounces daily. November 12th and 13th there was retention of urine which hot bath or fomentation relieved, and the amount was temporarily diminished, but immediately after increased again to above fifty ounces. On October 23d there was no albumen, but a few hyaline casts could still be found. November 25th both albumen and casts had disappeared.

She slowly gained strength, and in January, 1878, began to sit up; she was able to walk nearly across the ward by the 1st of February, and was discharged April 3d, well. Since that date she has been several times heard from; she continued to gain strength, and more than two years after leaving the hospital she was well, and able to walk at least a mile without unusual fatigue. She has just been heard from, and is still gaining in strength, and remains healthy.

This seems to have been simply a case of overtaxing of the muscular and nervous system by a patient naturally weak, and not fully recovered from the debilitating effects of scarlet fever. Whether the albuminuria was cause or effect of the weakness I don't know. The lesions to be excluded in forming a diagnosis were caries of the vertebræ, in common with which there were scarcely any symptoms; myelitis could not be excluded so summarily, though the retained reaction to the faradic current would exclude poliomyelitis. An ordinary case of chronic myelitis has most of the features present in this case, but it would be extremely rare for myelitis to continue between one and two years, extending so as to affect the arms and the muscles which support the head, and yet the patient have power to move the legs so freely in bed. However, there was so much similarity to myelitis that it was not possible at first to say positively it was not that disease, but a short observation showed that it was probably functional. There was not sufficient tenderness over the spine to classify it as a case of spinal irritation. The result shows that it was simply functional weakness.

Annie W., aged twenty-nine, married, was sent into the City Hospital by Dr. Lyman; she had had four children, the youngest four years previously. For twelve years she ran a sewing machine, by foot most of the time. Two years before admission she had pain in both knees lasting about two months, otherwise no trouble till four months preceding entrance, then her head felt dizzy, memory failed, but she had no headache; her feet felt numb and cold as if ice water was running over them, the numbness extended, on admission, six or eight inches above the knees; she walked with difficulty, and said she had to watch the floor to tell when her feet touched it. For a few days before admission her hands felt numb.

On examination it was found that sensation was only diminished, not lost, was slightly retarded in legs and feet; the cutaneous reflex on tickling the soles of the feet was absent, patella tendon reflex was also absent; there was considerable impairment of motor power, she walked with difficulty, which was increased when her eyes were closed; hot water gave no unnatural sensation on the back; there was no tenderness on pressure over the back; there were a few crackling râles at the left apex, no difference on percussion.

Iodide of potassium was given, and after that had

been taken some time her urine was examined by Dr. Wood, who found no lead in it. The treatment consisted in the use of galvanism to the back, dry cupping of the back, and strychnia, increased up to one fifteenth of a grain. These remedies were used at different times, and changed according to the patient's condition. She slowly gained in strength, and when discharged was able to walk better, had less numbness.

She was seen two or three months after her discharge, and said she had no numbness in her legs, no stiffness, her arms were all right, and she walked perfectly well.

One element in the etiology does not appear in the record, — she had taken care of her sick children before the commencement of her illness.

I was in much doubt as to the nature of the affection in this case. I thought it possible that there was simply functional weakness, but was rather inclined to believe there was inflammation of the spinal cord. It is of course possible that lead had been present, and caused the symptoms, but was all eliminated before the urine was examined. I am willing to let the case stand as doubtful, but am rather inclined to look upon it as functional.

These three cases differ in some respects, yet closely resemble each other. The first case is clearly one of spinal irritation, but there was more loss of motor power than is usually seen in that affection. It may serve to illustrate those cases of muscular weakness, possibly due to lesion of the muscular fibres, which are seen after acute fevers, more especially after typhoid. It is rather doubtful whether there was really spinal meningitis during the typhoid attack.

The second case seems to have been one of real nervous exhaustion following over-exertion. Perhaps the effects of this would have passed off soon, if she had not been kept on her feet as long as she could stand, and even longer. The albuminuria may have been simply a result of this weakness.

The third case was one of those doubtful cases where the symptoms might lead to a diagnosis of inflammation of the cord, yet it was probably functional disturbance.

One point in regard to etiology not yet noticed is deserving mention. In these, and in other cases, before the patients finally break down, there is usually some factor exerting an influence to lower the general health of the patient. This was so in the cases just reported. Two patients now under treatment suffered from sore throat just before the weakness appeared; in one of these at least it was not diphtheritic, as he was seen by a doctor fully qualified to judge.

The immediate cause of the occurrence of such functional weakness is sufficiently evident from the above histories; but besides bodily exertion, mental overwork is said also to be a cause.

The seat of the disorder may be either the muscles or the nervous system. Muscular fibres may be so overtaxed as not to recover their normal condition in the short time allowed for rest; they then undergo degeneration, or not being sufficiently recovered from fatigue are easily fatigued again.

When the nervous system is the seat of the affection, it is probably the cord which suffers, rather than the nerves. Erb says, in regard to these cases: "The most obvious view is that which supposes that the physiological fatigue of the nervous elements, which always occurs after severe and protracted irritation, becomes exag-

gerated and assumes a fixed form. In such a case we may suppose that the fatigue of the nervous elements does not become repaired in the prompt manner which is usual under physiological conditions."

The diagnosis between these cases of functional weakness and myelitis in its early stages is not always easy but is very important.

When there is great tenderness upon pressure over the spinous processes it is almost certain that the weakness is functional. The case is one of spinal irritation with accompanying weakness. I do not mean tenderness developed only by strong pressure, but where comparatively slight pressure evidently causes pain. Such patients may not readily recover, but there is no inflammatory change in the spinal cord rendering recovery impossible. I have seen several of these patients besides the one whose history I have reported, who have regained the power to walk, and are now walking about, some enjoying a very reasonable share of health.

The chief difficulty in diagnosis is to be found rather with the other variety of cases, where there is little or no tenderness of the spinous processes.

There will be a chance of mistaking these cases for incipient myelitis or for congestion of the cord; and it will sometimes be very difficult to come to a satisfactory conclusion. The principal diagnostic points to be noticed are that in functional weakness sensation is as a rule much less affected than in myelitis. There may be abnormal subjective sensations, as tingling or a sleepy feeling, but when tested it will be seen that the various sensations are at most only slightly affected. After quiet in bed or after ceasing active exertion the numbness of which many of these patients at first complain is very much diminished or wholly disappears. There is not real paralysis but motor weakness and the muscles are easily exhausted, and the patient may even sink to the ground from fatigue after a very short walk, and then the limbs may feel tired and heavy or may even ache hard. It is not often that so great weakness is seen as was present in the second case I have read.

The condition of the bowels and bladder cannot be depended upon for aid in diagnosis, as even in myelitis in the earlier stages these may not be affected, and in nervous exhaustion there may be slight disturbance.

The fact that there is no wasting of the muscles and that they retain their power of reacting to the faradic current will conclusively exclude an affection of the anterior cornua.

Though the patients may stagger some in walking from weakness and be unable to walk steadily with their eyes shut, generally, however, there is no difference in their power of walking whether the eyes are open or shut, yet there are no symptoms properly belonging to locomotor ataxia. The legs may ache, but there are no shooting pains in them, the tendon reflex is rather exaggerated than diminished if it is affected at all.

In some of the patients, even where there is no spinal irritation, the nervous system is so exhausted that the emotional element is prominent and the patients easily shed tears. This was especially so with a young girl whom I have lately seen, who overtaxed herself by walking to and from school.

As to treatment, it has been mentioned in the cases which I have reported, rest, electricity, massage, cupping to the back or perhaps actual cautery, iron, quinine,

and strychnia. I have thought in one case, as might be expected, that ergot was of disadvantage and the patient did not do well under it. It might be well to combine with other remedies systematic bathing, especially if it is not convenient to use massage.

It is well to take into account that recovery of strength is very slow, and treatment of severe cases must extend over months.

Erb, in Ziemssen's *Cyclopaedia*, describes spinal nervous weakness, which comes as near to the cases I have reported as possible. I have not seen exactly the same grouping of symptoms in any other author, except Ross, who, with condensation, copies almost word for word from Erb.

C. H. Jones mentions several cases closely resembling these.

Other authors have described somewhat similar symptoms under spinal irritation, but these cases cannot all be classified under that title.

RECENT PROGRESS IN CHILDREN'S DISEASES.

BY T. M. ROTCH, M. D.

RHEUMATISM.

HIRSCHSPRUNG¹ reports a series of cases where there was a peculiar localization of acute rheumatism in children, characterized by swelling of the sheaths of the tendons, appearing outwardly as very pronounced little lumps, and he concludes his article by describing two cases. Case I. was a girl eight years old, who, after three weeks' complaint of pain in the knees and back, sometimes also in the other joints, accompanied by slight fever, presented, besides a slight left-sided pleuritic effusion, small hardish deposits arranged in a row along the tendon of the palmaris longus muscle, and also similar prominences, excepting that they were larger, where the tendon of the extensor communis muscle and extensor longus pollicis pass over the wrist. They were bilateral, symmetrical, and moved with the tendons. Similar swellings appeared on the outer sides of both ankles, and also on the tendons of the left peroneus, extensor communis, and extensor hallucis longus; also numerous rings around the knee-joints, where they were as large as peas; they were also found near the spinous processes of the vertebrae. In the course of a month, during which several of the finger-joints were slightly swollen and heart murmurs developed, these swellings retrograded and disappeared entirely. One and a half years later the child was again seen, and found to have mitral insufficiency and pericarditis. A few days afterwards swellings of the same character as before observed appeared on the spinous processes, and later on the tendons of the hands and feet. Then fever developed, and after several days, improvement and retrogression of all the appearances, even to the systolic apex murmur.

Case II. was a girl three and a half years old, who was attacked with fever, wandering pains, passing finally into swelling of the backs of both feet, but without swelling of the joints, and after two weeks getting well. Soon, however, the little patient again complained of pains, became feverish, developed swelling of different finger-joints, and during this relapse an endo-pericarditis. She was then pretty well, excepting that the heart trouble continued, for two

months, when she left the hospital, but returned in five months with the valvular disease much increased, and on the points of both olecranons a cartilaginous spur-like body, not painful, and movable under the skin. The child soon died. The autopsy showed old and fresh pericarditis, myocarditis fibrosa, traces of fatty degeneration, pigment atrophy, and old and fresh endocarditis. On either side of the olecranons were found bodies the size of a pea, directly upon the triceps tendon, and consisting of connective tissue, with flat and spindle-shaped cells, and here and there round, large, nucleated cells, besides richly distributed and partially dilated vessels, of which individual arteries at times showed a most striking thickening of their muscular coats.

The writer also speaks of similar observations made on a girl twelve years old and a boy nine years old.

INCUBATION PERIODS.

The incubation of infectious diseases is a subject of interest and importance, which is rendered difficult to determine definitely by the exceedingly few opportunities which physicians have for making personal observations, not dependent on the usually untrustworthy reports received from the laity; the investigations of Dr. Clement Dukes,² physician to Rugby School and Hospital, are therefore especially noticeable from the unusual means at his disposal of ascertaining the incubation period of scarlatina, varicella, mumps, and röteln. Dr. Dukes reports his observations as follows, prefacing his remarks by the statement that the incubation cannot always be accurately calculated within twenty-four hours, from the first case not being seen at the very beginning, or from its being seen on the evening of one day, and the next case in the morning. He also states that the immediate isolation of each patient made it impossible for that patient to be a source of infection after the first few hours.

SCARLATINA.

He first speaks of scarlatina, epidemics of which occurred during the years 1877, 1879, and 1881. The number of cases in each epidemic was necessarily small, from the fact that early isolation was immediately resorted to, but there were fifteen cases in all, and the following table represents the number of days of the period of incubation:—

Cases.	Days.
1	1
3	2
2	3
4	4
2	5
1	6
1	9

The report of the manner in which B. S., one of the cases where the time of incubation was four days, was infected it may perhaps be interesting to note. The school assembled May 2, 1879; A. W. was attacked with scarlet fever (probably caught on the journey from home) May 7th, and was isolated almost immediately. B. S. (just before A. W. was removed) had some hot words and "head in chancery" with A. W., because the former had hit A. W.'s little brother. Otherwise they never had had any communication with each other, either in bed-room, school-room, or dining-room. Two of the cases of scarlatina had varicella

¹ Jahrb. für Kinderheilk., N. F. xvi., S. 324.

² The Lancet, October 29, 1881.