MASSAGE AND MOVEMENTS IN HEMIPLEGIA.

By DOUGLAS GRAHAM, M.D., *Boston, Mass., U.S.A.*

OF all the discouraging cases that come to us for relief, there are few more hopeless than the hemiplegics. And yet, when we are so fortunate as to see one recover under our care, we hope that we have had something at least to do in producing such a favourable result; for the patient is apt to give us all the credit, though we may be modestly and silently loth to accept much of it.

The benefits that may result from massage or any other remedial measure in disturbances arising from morbid changes in the central nervous system, or in any part of the body, will depend more on the nature of these changes than on the merits of the treatment, however appropriately and skilfully it may be employed. So many variations are seen in the course of paralyses of so-called organic origin, that the influence of massage in modifying these is difficult to determine, even if it were judicious to make use of this treatment from the commencement. When paralyses of central origin has come on suddenly, I prefer to abstain from the use of massage until the perturbation in general has subsided, and the patient has become somewhat accustomed to his unnatural condition. But, in the meantime, while thus waiting to spare the nerve centres any supposed extra commotion, the peripheral pathological changes are gaining ground, which later may only be imperfectly overcome. These are, interference with the supply and return of the circulation, owing to the accelerating influence of muscular contraction and relaxation being absent or diminished; and, as a result of this, variation of temperature, usually lowering, and passive hyperæmia or ischæmia; hypertrophy of interstitial connective tissue, with, in time, subsequent cicatricial retraction, giving rise to contractures and atrophy of the muscular fibres; formation of adipose tissue or fatty degeneration—in a word, vasomotor and trophic disturbances. These are all rational indications for the use of massage, either as a preventive of such changes, or as a palliative of them when they have taken place. But if the nerve centres are impaired beyond recovery, or secondary pathological changes have occurred, the prospect of benefit cannot be encouraged.

My own experience of massage in a number of cases of paralysis may be briefly stated by saying that, in the absence of severe pain, obstinate contracture, or tonic spasms, this agent has proved useful in improving the circulation, temperature, and comfort of the parts affected. When in paralysis of spinal or cerebral origin recovery follows under manipulation, we had previously supposed that the central disturbance had entirely passed away, and that the force of habit was the main factor that

continued the external manifestations of inaction; and thus massage would have served a useful purpose for diagnosis as well as treatment. But the more recent experiences and opinions of Professor Zabłudowski, and others well qualified to judge, teach us that it is possible, by means of massage and gymnastics, to educate other parts of the brain to take the place of the injured ones, by arousing psycho-motor impulses in the formation of new associations and combinations; so that we need no longer regard paralysis of either central or peripheral origin from the hopeless view that we formerly did.

However that may be, when the causative conditions have ceased, paralysed muscles will not at once resume their former natural condition. Massage, passive and resistive movements, restore them to a sense of existence, enable them to recognise the power they still possess, and educate this to a higher degree; and, at the same time, such treatment affords the *only* means of judging of the capabilities of the patient, and of telling him how to use them. Sometimes the patient will make better motion against the resistance than without it. This seems to give a sense of support and consciousness of power. Interlocking the fingers of one hand with the other, so that the well arm can raise the paralysed one, is a most excellent device, encourages the patient, and educates the unimpaired centres to supplement the deficiency of the injured ones. This should be repeated regularly—six to twelve times three times daily.

Massage, if used early in these cases, would diminish the evils of inactivity upon the circulation and nutrition, and keep the muscles in a state of readiness for voluntary contraction. It is when there is only partial impairment of motion that massage will be likely to lead to recovery; and, when improvement or recovery does follow, it will be difficult to determine whether the recent exciting cause of the trouble has passed away, or whether we have succeeded in training the other parts of the brain to do the work of the injured ones. In either event, we ought to give the patient the benefit of the doubt by a vigorous persistence and long continuance of the treatment by massage and gymnastics.

CASE 1.—Mr. L., æt. 58, had been a vigorous, healthy man. He had been much worried with reverses in business. While at breakfast one morning he had an uncomfortable sensation in his head, with slight loss of motion in the left arm, leg, and side, which gradually increased for two or three days. He kept in bed for four weeks, and for six weeks afterwards the affected parts were quite helpless, and his face was drawn to one side—the left. Improvement was gradual, and at the end of a year, when he came to me, there was a lack of control over the arm and leg, with stiffness and awkwardness in using them; but if he slipped on the side-walk he could use either with alacrity to regain his balance. The patient had massage nine times in three weeks, and the result was that he got rid of uneasy feelings in his head, his power of endurance

and freedom of motion greatly increased, his digestion, which was previously feeble, became strong, and he looked more robust, bowels became regular, and the urgent desire to urinate disappeared. The arm and leg could be used almost naturally. At first he felt remarkably well after the massage, as if moderately stimulated. Later, he experienced an agreeable languor from manipulation, and he thought he was being too much "mesmerised."

CASE 2.—Three months ago there came to my office a patient, æt. 36, and weighing 150 lbs. With the aid of a cane she walked rather awkwardly, in a manner characteristic of hemiplegia. Seven months before this I met her out walking, the picture of health, and two days later she was attacked with hemiplegia. It was about 4 o'clock in the afternoon, when she was sitting, and she tried to get up for something she wanted, and found that she could not stand. She was not unconscious, but somewhat dazed. She was put to bed, and later she discovered that the left leg was numb, and she had difficulty in moving it, and the arm and side. The attack was preceded by severe headache for a day or two, with boring and buzzing and feelings of pressure in the head, which lasted for four hours after the shock, and then disappeared. She got up the following morning, but soon went back to bed again, and stayed there for three months. A week after the attack, speech and deglutition became impaired for several days. Speech returned suddenly, but she stammered for several weeks. She did not lose control over the bowels and bladder, but the bowels had to be moved by injections, and she passed but little urine. For three days she was fed on liquid diet.

Before this attack she used to walk often in her sleep. Two years before it, she walked quite a long distance from home one night, and went out on the rocks at the sea-shore. A dog barked and woke her up, and then the rocks hurt her feet, so that she had difficulty in walking back upon them. One night during the three months that she was confined to bed, she read a long article aloud in the dark, and made uncomplimentary but thoughtful remarks upon it. Her husband and the nurse who heard her thought it was something that she had committed to memory and was reciting.

When she came to me she had headache nearly all the time on the left side in the parietal region, and a numb feeling on the right. She was also subject to nervous spells, which occurred from once a day to once in two weeks. In these the right leg would tremble so severely, that she thought it would dislocate itself at the hip-joint. If she did not succeed in getting asleep soon in one of these spells, her headache would increase, and she could read and write in the dark, though she had no recollection of what she had done. For two months there was almost complete loss of motion and sensation in the left leg.

She had been treated for some time by iodide of potash and strychnia, and had improved much. The strength and motion of hand and arm were little less than normal; of the thigh, for flexion and extension, abduction and adduction, only about one-fourth of normal; of leg below knee, for flexion and extension of foot, strong and natural, which was in marked contrast to the behaviour of the motion of the thigh. Sensation perfect everywhere, except a little dull on outside of the

thigh. Patella reflex exaggerated. Pupils normal to light and distance. Pulse 72, and heart sounds normal, though she reminded me that I found something the matter with her heart a year before, which disappeared while she was a subject for the class in massage, and with that disappeared also shortness of breath, and difficulty of going up stairs. She could go up stairs and down, one step at a time, not step about in the natural way, when she came to me.

The treatment I gave her was massage and resistive movements, and after two visits for this purpose she could push with the leg much more vigorously. After six visits in two weeks, she pushed and pulled the leg and thigh with vigour that seemed equal to normal; but there was a slight lack of endurance to the upward pull of the thigh, done by the psoas magnus and iliacus internus. Inversion and eversion of the thigh against resistance had also vastly improved. She walked naturally, and she no longer carried a cane for support. She visited me twice the following week, and at the end of the second visit this week she dressed herself in three minutes, and in twelve minutes more she got her train at the North Union Station, a feat that any of us might envy, for it meant crossing two streets, descending a flight of stairs, and a ride of a mile in the subway cars. Two visits more the following week seemed sufficient to confirm the improvement gained in motion, for she could then go up stairs two steps at a time, and run on a level. But as her head and neck were not yet comfortable, she came to me once a week, for three weeks longer, for special massage of these regions, which were tense and indurated. The tissues here became of natural suppleness and elasticity, and the headache entirely disappeared. Her whole period of treatment with me was seven weeks, and at the end of that time, and now also, she is so well, I trust, she will get over it.

This is a case that would doubtless delight the heart and mind of the modern neurologist, for he would probably find in it ample scope for the imagination to study and speculate upon somnambulism, hysteria, and paralysis: the causation and disappearance of these through the peculiar behaviour of the naughty neurons in forming illicit connections and disconnections without the knowledge or consent of their owner. Possibly this patient might have been cured by suggestion alone, but suggestion is much more effectual when accompanied by something tangible and sensible, whether it be massage and exercises for impaired motion, or a good spanking for a naughty child, or feeding the starving heathen before christianising them.

The theory by which one part of the brain can take the place of another when diseased, has been formulated by Broadbent somewhat as follows:—Movements are represented in the opposite hemisphere in proportion as they are unilateral, in both hemispheres in proportion as they are bilateral, in execution. Either hemisphere can excite the bilateral movements, but only the opposite can excite the unilateral ones. Movements rather than muscles are represented in the hemispheres, and are lost in disease. Lateral movements by muscles of both sides are represented in

both hemispheres, but in a normal state they are chiefly effected by the opposite hemispheres. When this is diseased, they are impaired until the hemisphere on the same side has acquired functional power over them, through mechanisms before existing but unused. We want more light on the manner and ways by which functional power may be acquired by means of mechanisms previously existing but unused in the brain. We know that a man can get along very well with one eye, one ear, or one testicle, and it would be rather remarkable if one side of such a vastly more important organ as the brain should not be capable of supplementing injury to the other, or doing the work of both. It would seem to be constructed with such an object in view, with its transverse, its association and longitudinal commissural fibres. It was a very wise man who said that we do not know how far one part of the brain may supplement another.

The most striking example of injury to the brain, with recovery, has never, to my knowledge, been thoroughly studied and analysed. It was that of the well-known case of the passage of a crowbar through the head, reported by Dr. Henry J. Bigelow.¹ While tamping a charge of powder, a spark caused an explosion, and drove a crowbar, weighing $13\frac{1}{4}$ lb., 3 ft. 7 in. long and $1\frac{1}{4}$ in. in diameter, through the skull of the patient. It traversed the cranium in a straight line from the left angle of the lower jaw below to the centre of the frontal bone above, near the sagittal suture, where it emerged. The patient quite recovered his faculties of body and mind, with only the loss of the sight of the left eye. A sort of anterior fontanelle or circular opening, of $3\frac{1}{4}$ in. in diameter, was left behind by the removal of portions of the anterior-superior angle of each parietal bone, and of the frontal bone.

A NUTRITIVE DRINK FOR FEBRILE AND WASTING DISEASES.

By R. W. LEFTWICH, M.D., *London*.

THE range of choice open to a patient who has been placed upon liquid diet is so restricted, that I feel sure the profession will welcome any suggestion which will have the effect of safely extending it. At present the selection is practically limited to milk, meat-tea (prepared either from fresh meat or from proprietary extracts), Benger's food, whey, and barley-water. The last may be said to have no nutritive value; whey is useful in cases of obstinate vomiting, as also is Benger's food, which, however, is too sweet to quench thirst. "On beef-tea alone the invalid will starve" (Brunton), and there is further a grave suspicion that its

¹ *Am. Journ. Med. Sc.*, Phila., 13th Sept. 1848.