

on a former occasion. Are stimulants, as a class, used too indiscriminately? I think they are. It seems a very general impression that if they are to be used, it matters little of what kind they are: hence, brandy, wine, and beef tea, are constantly spoken of as being given to the same patient. Now I do not deny that all may be required at the same time. But I do say that in numerous instances judgment is to be exercised; for most assuredly the effects are not the same; and when their different composition is considered this need not excite wonder. Thus, if we compare wine and beef tea, the former, contrary to what might at first be thought, may be given with much less risk than the latter; and I am sure I have seen cases where secondary inflammations—in the chest amongst other parts—have been lighted up by want of attention to the very point of which I speak. Though much more might be said on this subject, enough has been advanced for my present purpose.

In conclusion, I would observe, that the class of mixed cases, as they may be well called, require even more than the ordinary amount of attention. The fever becomes so heavy in many of them that the abdominal symptoms are very apt to be masked, and so may readily be overlooked. In such cases too, it may be requisite to direct our treatment at one time to the chest, or again, to the brain; and, in some of the cases given, a combined treatment had to be adopted.

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ART. VIII.—*On Galvanism as a Therapeutic Agent*. By HARRY LOBB, M.R.C.S.E., &c., &c.

THANKS to the labours of the medical profession at home and abroad, galvanism, as a therapeutic agent, is at length taking its legitimate position in the science of medicine. Rescued from the ignorant and unscientific administrator, into whose hands it had almost entirely fallen, some of the most eminent men in the ranks of our profession have turned their attention to its study, and with the aid of the sister sciences, anatomy, physiology, and pathology, have elicited some most remarkable results. The late Dr. Golding Bird, a far-seeing and most intelligent physician, stated his belief that it was to galvanism the profession must look for some of its future triumphs. This opinion has been fully endorsed by a large

number of observers; the list of names of those who recommend and employ galvanism in the treatment of disease would be so great as to require far more space than I can afford for such a purpose; still, I cannot pass over in silence the name of one who has done more than any man in this country to obtain for galvanism the recognition of the profession and the public as a therapeutic agent of great value in many forms of disease. I speak of Sir Charles Locock, to whom I am myself indebted for much kindly support and aid in the prosecution of my investigations; and who, from his eminent position in the profession, and his well-known integrity, is enabled, by the weight of his great name, at once to stifle the clamour, usually arising against the employment of any novel method of treatment however valuable it may eventually prove to be.

Galvanism, as a therapeutic agent, has passed safely through this primary stage of neglect, and is now being earnestly studied by numerous observers of first-rate ability; and the profession are naturally desirous to become acquainted with the results of the practice of those who have devoted their time and attention to the subject. The following cases I have selected from the practice of a public institution, established recently in London, for the purpose of testing, in a larger field than can be obtained in private, the real value of galvanism in the treatment of disease; and I shall endeavour to explain the practical working of the apparatus in each case, as by this means those who are ignorant of the subject can more readily carry out the treatment should they desire to test its value; and I may at once state that the observations made by Dr. Golding Bird in the electrical ward he established in Guy's Hospital under his own special supervision, since followed out by Dr. Gull, namely, that rheumatic paralysis yielded most readily and in a remarkable manner to the electrical stimulus, has been most fully borne out in my own practice.

To commence, then, with a case of muscular rheumatic paralysis, limited to the fore arm, and recently induced.

No. 61.—George Jones, aged 63, surgeon, 14, Polygon-street, St. Pancras, rheumatic paralysis of the left lower arm, with fixed claw-like contraction of the fingers, of 10 days' duration, brought on by exposure to cold and wet; the skin of the arm was peculiarly dry and scaly, and the muscles, both flexors and extensors, hard and contracted.

In rheumatic paralysis the custom is always first to excite the skin with a sharp current, using a dry flat metallic conductor; the

positive pole of a 120 element galvanic battery is applied, by means of a wet sponge, upon the skin at the bend of the arm, and the operator, taking the flat metallic conductor, attached to the negative pole of the battery, in his hand, applies it sharply over the skin of the arm, front and back, for five minutes, producing redness of the surface, with sharp stinging pain; upon retaining the conductor upon the belly of a muscle, for a few seconds, trembling and twitching in the muscle shortly commences; this shows that the paralysis will rapidly yield; this was done over all the principal muscles for a few seconds each; the conductor was then changed to a moist one, and each muscle was stimulated to contraction. The whole operation took 12 minutes, at the end of which time the patient could open and close the hand freely, without any pain. On attending two days afterwards, he had had no relapse, and was discharged cured.

No. 58.—Henry Hall, aged 45, Duke-street, Portland-place, two months previously had been laid up with rheumatic fever, leaving behind rheumatic paralysis of the deltoid, and muscles of the shoulder of the left arm; for this he was recommended by Mr. Kelly, surgeon, of Fetter-lane, to attend the hospital. The treatment was the same as in the last case; and after two operations of a quarter of an hour each, he was discharged cured.

No. 38.—William Pratt, aged 54, bookbinder, 5, Buckingham-street, Pimlico, rheumatic paralysis of the right leg; great stiffness in walking, so that the leg dragged, the foot being fixed. Two winters ago he had stood constantly in a draught of cold air at work, and this had gradually induced paralysis of the limb with coldness and numbness; he had been in this state for 20 months; he had been treated by Dr. Griffiths, of the Belgrave-road, who had succeeded, in a great measure, in removing the numbness, but not the paralysis, he therefore recommended Pratt to attend the hospital. The treatment was the same as in the former cases. After the first operation the foot felt warm and comfortable, and loosened; and after six operations the paralysis was quite cured.

These three cases will be sufficient to prove the immense power galvanism, where scientifically applied, has in curing rheumatic paralysis. As far as my experience goes, I have never yet met with a case which has not completely and rapidly yielded to galvanism; the current restores the circulation in the part, causing warmth and redness where previously there had been palor and cold; the muscles, also, which were stiff and hard after contraction,

become soft and elastic to the touch. I could relate many more cases, some of long standing; but, as the treatment is the same in all, it is useless to multiply examples, especially as I am desirous only to refer to those treated at a public institution. The following cases are uncommon, but from their extreme interest are well worthy of mention. They contrast with the previous ones in the time required to effect a cure.

No. 20.—Catherine Lee, aged two years, 6, Great Crown-street, St. James', four months previously, whilst teething, lost, during the night, the entire use of the right upper arm, followed by gradual and complete wasting of the deltoid, biceps, and triceps; the arm hung by the side powerless; there was no wasting of the muscles of the lower arm, and their movements were but little less active than those of the left arm; the head of the humerus, by the loss of the tonicity of the deltoid, had fallen away from the scapula, leaving an indentation in which the finger might be laid; the tissues around the humerus had so wasted that there was little besides the skin to cover it. Upon applying the interrupted current of galvanism there was not the faintest contraction, there being no muscle to contract. This was a serious state of things, but having had cases previously that had done well, I did not despair. The treatment consisted in the application of a galvanic chain from the spine, winding round the atrophied muscles to the bend of the arm; the positive pole upon the spine, the negative on the arm; this increases the circulation in the part, and tends to stimulate nutrition. Thrice weekly the child (a remarkably healthy well-grown one) attended to have an interrupted galvanic current applied to the arm to stimulate to contraction any muscular fibres there might be remaining, to increase nutrition, and to take advantage of any fibres generated by the chain. Some weeks elapsed before any change was observed, when it was considered that the head of the humerus was not quite so far from the socket, and that the arm was filling out; there was, however, no muscular contraction. At the end of two months there were some faint contractions in the triceps, and the arm was much fuller and firmer; the improvement was slow, but steady; and at the present time, nine months after the first operation, complete muscular contractility, under the galvanic stimulus, has been recovered in all the muscles; voluntary power in the triceps and biceps has returned, but as yet there is no voluntary power of contraction in the deltoid.

I have little doubt but that the child will entirely recover the

use of the arm; the probable time is from two to three months; if so, the case may be well considered a triumph to the science of medicine, or rather medical galvanism.

No. 32.—Master Richard Bennett, aged six years and a-half, 8, Gloucester-crescent, Regent's-park, suffered, some three years ago, from low fever, followed by partial atrophy and paralysis of the left leg. From the knee to the heel the leg is nearly an inch shorter than the right, the gastrocnemius has entirely disappeared, and under galvanism there is not the least contraction in it. There is a great hollow above the heel and flaccidity of the tendo-Achillis; the foot is mis-shaped and atrophied; the muscles in front of the leg have shrunk, and do not actively contract under galvanism—probably from want of use, as he has worn an orthopedic instrument which has enabled him to walk, but has, at the same time, weakened those muscles which were healthy, so that he walks entirely from the upper leg; the thigh is smaller than the opposite one, but is not atrophied. This case somewhat resembles the last, although the atrophy does not affect so many muscles, and there is, consequently, less paralysis. The walk is clumsy, and he has not the slightest power of rising on the toes; still he can walk after a fashion.

*Treatment.*—A galvanic chain from the spine to the foot, to increase circulation; the debilitated muscles stimulated, by the interrupted galvanic current, to contraction, so as to give them tone, that the orthopedic apparatus may be discontinued; this was done, and the machine was dispensed with after a month's treatment. He could, at the end of that time, walk much better, the debilitated muscles were much stronger, the foot more shapely, the thigh fuller and firmer, and he was altogether much improved. Now was the time to commence with the gastrocnemius, and I find that when the atrophy is extreme, the continuous galvanic current is the most useful, with a wet positive pole; and, if the patient can bear it, a dry negative metal conductor over the atrophied muscles, if not, a wet one. After several applications, a trembling was observed beneath the skin: this was the first faint contraction of the returning muscular fibres. This gradually increased in force until the tendon was affected by it, and the heel drawn up. This, however, took time, and at the present moment, five months after the commencement of the treatment, much remains to be done. I have no doubt, however, of eventual and complete recovery. The case, except under treatment by galvanism, would terminate in confirmed atrophy and paralysis; the leg, from the knee downwards, would cease

to increase in the same ratio as the other, and, upon his arriving at man's estate, the left leg would be probably three or four inches shorter than the right. These cases of paralysis and atrophy, occurring during teething, and as a sequela of fever, although rare, are far more common than are generally supposed. Since having turned my attention to the treatment of paralysis, I have met with a large number, and, although taking a considerable time to cure, still my experience leads me to affirm, that they are decidedly curable, and that if the patient will only give the time and attention, galvanism will do all that is necessary.

The next group are the neuralgiæ, generally yielding very rapidly to the continuous galvanic current. Of these there have been many examples, but I shall pass them all over with one exception, as it is remarkably instructive :—

No. 10.—Ann Wilson, aged 50, 11, Caledonia Terrace, King's Cross, has suffered with pain along the course of the sciatic nerve, for the last twelve months, sometimes bad enough to cause great difficulty in walking. The pain is chiefly in the hip and about the foot, and is sometimes very acute; she is never entirely free from it; otherwise she is quite well. I recommended her to wear a galvanic chain (direct current), and to have the skin over the painful parts stimulated with the dry conductor (direct current). This gave but very slight and evanescent relief, but was persisted with for some weeks. I then thought of trying the inverse current, seldom, although occasionally, beneficial in neuralgia; the poles of the chain were changed, also the battery current. This gave immediate relief, and after five applications she was quite cured, and has had no return since, now more than two months. I have noticed now in many cases, that in all uterine affections, where that organ or any of its appendages are primarily affected, that the inverse current is the one required and not the direct, which is seldom of any advantage. I therefore conclude that this case of sciatica was the result of some uterine affection, as the arrest of the menses, or ovarian congestion. I have already recorded, in the *Lancet*, a case of most severe neuralgia of the face, cured by the continuous galvanic current, inducing the menstrual flux, which had ceased for some time.

And now we must enter upon the more severe forms of paralysis, of which we have had some very bad cases—many that have been under every form of treatment; in fact the majority of cases attend the Hospital as a last resource, and the more easily curable affections

do not come at all, so that the patients are a long time under treatment.

No. 42.—James Mallison, aged 53, 7, James-street, Blackfriars Road, is a blacksmith, has been gradually losing the use of his hands, and upon application had entirely done so. The hands are dropped, with complete paralysis of the extensors, which are completely atrophied on the right side, and almost completely on the left. There is not the faintest contraction under the highest power of the galvanic current; the hands and arms are thin, and of a purple colour. There can be little doubt that the paralysis is the result of poisoning by lead, as he had previously suffered from colic. There is, however, no history of any introduction of lead into the system. The gums are in a very bad state, also the teeth; complexion blue and pallid.

*Treatment.*—To wear a galvanic chain round the arms, from the elbow to the wrist (direct current). Three times a week to have a powerful continuous current passed through the arms, a dry metallic conductor attached to the negative pole, passing over the skin covering the atrophied muscles. By degrees faint contractions might be discovered under the skin, more particularly in the left arm, and the arms began to increase in size. At the present time, three months after commencing the treatment, he has quite recovered the use of his hands, and has returned to his work.

Of the number of cases applying for relief at the Hospital, there have been very few refused as being unadapted for treatment by galvanism, but there have been many that have yielded but slowly; of these, I select the following as being the one that has taken the most time with the least result:—

No. 12.—Henry Stanard, aged 48, Sherborne-street, Islington, hemiplegia, three years' duration. The paralysis came on gradually, with a series of fits, not of a very severe nature, and only partial loss of consciousness; his memory is a good deal affected, and his speech is a little thick; he has what he calls his attacks, even now occasionally; he describes them as a giddy feeling, lasting but a short time, but incapacitating him from any motion or use of the will during the time. I have never seen him in one. On applying to the hospital last July, there was stiffness in the leg, with some ability of walking. The arm, the right, was, however, entirely powerless, with contraction of the pectorales, biceps, and flexors of the hand, so that the arm could not be straightened, or the hand opened, even by using great force; he had no power in it at all.

The treatment commenced with the use of the direct continuous current to the paralyzed muscles. At that time I was not practically aware of the power of the inverse current to remove the contraction of muscles, the result of disease within the brain, the treatment with the direct continuous current was persevered in for six months, with benefit, sufficient to satisfy the patient he was deriving advantage—but not of a very marked nature—during this time I had discovered the virtue of the inverse current in overcoming muscular contractions—consequently in February I applied the inverse continuous current to Stanard—by placing the wet conductor, attached to the positive pole, upon the bellies of the contracted muscles, the wet conductor of the negative pole over the left temple, and in twenty minutes the arm became perfectly flaccid, the previously contracted muscles quite soft, the hand could now be opened without any resistance; he had, as yet, no voluntary power in the arm to extend it, or open the hand. On each visit there was less contraction, and now, after being galvanized, he can stretch out the arm fully, and can open the hand. I look upon the use of the inverse continuous galvanic current as giving to therapeutics a vast power hitherto unthought of, and likely to be almost as useful as the direct continuous galvanic current, the one now more generally applied. To the physiologist these facts cannot but be of the greatest interest. I believe that the wonderful difference in the effect of the direct and inverse galvanic current has not at all been recognised by authors, and as it is of the greatest interest to the physiologist as well as the physician, I should be only too glad if these remarks should excite in some inquiring mind a desire to become better acquainted with it; should this be the case I shall be most glad to demonstrate to any inquirer, who may wish it, the experiments I have instituted for the purpose.

Now is the right time for investigators to enter upon the study of galvanism as a therapeutic agent, as most of the real difficulties that had impeded the path of progress have been swept away by the unremitting labours of those who have gone before. The apparatus is now compact, portable, cleanly, easily excited and applied. Electro-physiology has been ardently studied by Matteucci, Dubois Reymond, and Radeliffe. Electro-therapeutics, by Remak, Becquerel, Duchenne, and numerous others, so that the field, although not entirely fallow, is by no means occupied, and is ready to yield a rich harvest to the ardent and faithful student.