

78 Mr. Hamilton's *Account of Acupuncture with Galvanism.*

26th to 30th. Seven pints daily.

31st.

Omitte Medicamenta.

3rd January, 1834. Seven pints. No medicine since 31st.

Habt. Pulv. Doveri, gr. 100, et

Acidi Nitrici Diluti, gutt. 100 quotidie.

6th.

Augeatur Pulvis Doveri ad gr. 150.

12th. Six pints and a half.

13th.

Omitt. Med.

14th and 15th. Six pints. 18th. Five pints and a half.
22nd. Five pints. 27th. Four pints and a half. Urine, sp. gr.
1010; same composition as on admission. Patient's thirst is
much less, and he feels much stronger than on admission; his
weight is now eight stone five pounds.

ART. V.—*Account of a Trial of Acupuncture with Galvanism,
made by Dr. W. Stokes, one of the Physicians to the
Meath Hospital.* By JOHN HAMILTON, L. R. C. S. I.

WITH the expectation that the efficacy of acupuncture would be increased by passing galvanic shocks through the needles, such a combination was tried in France a few years since, and with apparently favourable results. But in this country, although the use of acupuncture is pretty generally known, and its efficacy admitted, I am not aware of any account of its having been tried with galvanism; the following sketch, therefore, of the result of some cases, in which such a trial was made by Dr. Stokes, in the Meath Hospital, will at least possess the merit of novelty.

The galvanic battery employed was a trough, with fifty-two inch zinc and copper plates, and the liquid, sulphuric

acid and water, in various proportions, most commonly three drachms of the acid to eight ounces of the water.

The application was as follows:—If a patient presented himself with paralysis of the deltoid muscle, from rheumatism or other cause, one needle was inserted tolerably deep into the upper fleshy part of the muscle, and a second at the lower part, so that on applying the wires from the ends of the battery to the needles, the shock was passed quite through. Two other needles were occasionally passed at the sides of the muscle. Nine or ten shocks were given at a time, and repeated daily as long as necessary. As the strength of the shock depended on the number of plates used to complete the galvanic circle, that number differed according to the part and the susceptibility of the patient. In sciatica, for instance, where the parts about the seat of the disease are chiefly muscular, the shock from the whole fifty was sometimes passed along the limb. The employment of so great a number, however, was rare, from the violence of the shock being far too great, and anything near that number, where the galvanic fluid had to pass through a delicate or important organ, such as the brain or eye, never used. The necessity of caution in this last respect is well shown in the following case:—A man, formerly a soldier in India, with some obscure chronic disease of the brain, which rendered both eyes amaurotic, was ordered to be subjected to this agent; more from a wish to give him every chance where all the usual remedies had been tried in vain, than with much hope of success. The left eye being the worst, one needle was inserted a little above the left eyebrow, another at the lower part of the occiput at the same side. It had been determined to commence with only eight or nine pair of plates, but from a feeling of caution, the circle of communication only included three pair. And yet, with this exceedingly small number, he was completely stunned for an instant, as if from the blow of a heavy stick, and felt a severe darting pain through the head, with a flash of light before the eyes. Now, where so severe a shock resulted from

so few plates, and as we know the severity is proportioned to the number, it does not appear unreasonable to suppose, that, had the number commenced with been twenty-five, which would have given a shock upwards of eight times as strong, some severe lesion of the brain, or even death itself, might have been the result. In all subsequent cases of amaurosis, to prevent the likelihood of any injury to the brain, the place of insertion of the needles was altered, and consequently, the course of the galvanic fluid.

The extent to which the impression of galvanism on the system is increased by the aid of needles, and how much can be done by a small battery, is very remarkable. On merely applying the ends of the wires to the skin, no effect is produced, the galvanic fluid appears diffused over the surface and lost; but the instant they touch the needles inserted into a part, a most violent shock is given, making the stoutest cry out from pain, powerfully convulsing the muscles, generally throwing the patient into a profuse sweat, and often followed by faintness and sickness of the stomach. Some, from its severity, would not submit to a second operation. In a case of amaurosis one needle was inserted into the nasal end of the eyebrow, the others into the temple, by which means the shock passed in a great measure through the orbit, engaging the brain only to a slight degree. The patient was sensible of a disagreeable stunning feel in the forehead, with pain, the brows were reddened and contracted, a flow of tears came from the eye, with the sensation of a flash of light; and in one person in whom it was used by the late Mr. Hewson, going as high as twenty-five pair of plates, the pupils were observed to be very much contracted after its use, and a stinging pain felt in the head the rest of the day. In another case also, where the application was to the side of the face for paralysis of the portio dura of the seventh nerve, rigors, with headach, and heat and prickling in the part, followed several times.

This great increase of power from the use of the needles

evidently depends on their conducting the galvanic fluid beneath the cuticle, the well known property of which is to resist its admission: They accomplish what Humboldt effected by removing the cuticle by blisters, but in a much simpler, more expeditious, and convenient manner; giving scarcely any pain, if rightly introduced, and leaving no lesion behind them. The following circumstance attending their extraction is curious. In simple acupuncture all the needles inserted are generally withdrawn with some degree of difficulty; this difficulty was always found to be greatly increased after the application of galvanism in one of the needles, while the other was exactly the reverse, being invariably withdrawn with unusual facility, greater even than the natural consistence of the flesh would seem to permit. Some idea may be formed of the degree of resistance occasionally met with in the extraction of one of the needles, when I mention, that one gentleman found it so great, that after exerting much force in vain, the needle still sticking tightly in the lumbar muscles, he expressed his conviction that it must by some means have got bent, and thus hooked in.

The needle difficult of extraction was always that to which the positive wire had been applied, the other, that touched by the wire from the copper or negative end of the battery.

This phenomenon appears to depend on the power which the positive end of the battery is known to possess of giving irritability, and that of the negative in taking it away. "If silver be applied to nerves and zinc to muscles, the irritability of the latter increases in proportion to the time they have remained in the chain. By this method the thighs of frogs have been revived in some degree, and afterwards become sensible to stimuli, that before had ceased to act on them. By distributing the metals in an inverse manner, applying zinc to nerves and silver to muscles, an effect absolutely the contrary is observed, and the muscles that possessed the most lively irritability, when placed in the chain, seem to be rendered en-

tirely paralytic." Applying these principles to the facts before us, we can readily conceive how the muscular fibres round the positive needle, endued with a tenfold degree of irritability, tightly grasp the needle, and resist its removal, while the exhausted and paralysed fibres round the negative needle yield it up to the slightest force.

Wishing to see how far these effects extended, I inserted the needles, scarcely a quarter of an inch apart, but still found the positive needle hard, the negative easy to extract. On changing the application of the wires, so that each needle was touched by both, both needles were equally resisting.

Between the needles there was generally a red blush, and the shock extended no farther; in one instance, however, where one needle was inserted on the outside, the second on the inside of the right ankle, a strong convulsive twitch was excited, extending up the leg and thigh, and slightly convulsing the right arm and temporal muscle, accompanied by pain in the same direction.

As a remedial agent, I regret to say, the cases in which this combination of acupuncture with galvanism has been tried leave little to be said in its favour. Even were its efficacy greater, the application is so severe as to preclude its use, except in cases of a hopeless character, and where milder means had been resorted to in vain. It was tried in the manner described above in numerous cases of chronic rheumatism, several of sciatica and lumbago, a few of amaurosis, and some of paralysis, two of which were from lead. A case of lumbago and paralysis from lead were certainly cured, after many other remedies had been tried in vain, and a case of rheumatism greatly relieved; the most striking instance, however, was a case of paralysis of the portio dura of the seventh nerve, which I think well worthy of giving at length, as presenting a very accurate picture of this very interesting and rather rare form of disease, as well as a full exemplification of Sir Charles Bell's views on this subject. It

was taken by my friend Mr. Ellison of Liverpool, who applied the galvanic shocks himself.*

Case of Paralysis of the Portio Dura of the Seventh Nerve.

Thomas Hogan, a bricklayer, ætat. 56, admitted on the 18th December, 1833, with remarkable distortion of the right side of the face: the cheeks being loose and pendulous, and the mouth dragged over to the left side. He states that he had been ill three weeks, and although of rather intemperate habits, had previously good health. Being employed in repairing a chimney, was exposed for several hours to a cold and piercing wind; felt considerable pain in the face at the time, but thought a glass of whiskey would cure it. In the evening, however, the pain increased, and he was attacked with pain in the head, giddiness on stooping, nausea, thirst, and loss of appetite: these symptoms were followed by erysipelas of the face, chiefly affecting the right side; relief followed bleeding and saline aperients. A fortnight ago, one of his friends noticed that his face was a little 'awry,' but he was quite unconscious of the deformity himself, till he looked in a glass. The deformity gradually increased, notwithstanding the most active treatment, and he presented himself at the hospital in the following state: The features on the right side of the face are blank, unmeaning, and motionless, the left retains its natural cast, excepting that the lines on that side are more strongly marked, and the angle of the mouth appears somewhat drawn upwards and to the left side. The skin upon the forehead on the right side is smooth, and presents no wrinkles, while the left is deeply furrowed. When he attempts to raise his eyebrows, the right one remains unmoved, but the left is drawn upwards, and the integuments covering the forehead on that side much

* This gentleman had the unusual distinction of obtaining Dr. Graves' and Stokes' first clinical prize, and Dr. Stokes' stethoscopic prize, the same year, at the Meath Hospital.

wrinkled. The eyelids of the right eye usually remain half closed, without the power of approximating the upper and lower lids. He can raise the upper lid by the action of the levator palpebræ, on relaxing which the lid returns to its semiclosed state. When an effort is made to close the lids, the eyeball rolls directly upwards, and carries the transparent cornea within the curtain of the upper lid. The lower lid is slightly everted, partially exposing the conjunctiva, and favouring the escape of the tears down the cheek. The superficial muscles of the right side of the face are flaccid, and when he speaks the cheek on that side is alternately puffed out, and then collapsed like a loose curtain. This is very remarkable when the patient coughs or pronounces most of the labial consonants. When blowing, the cheek is distended like a bag, the air at the same time escaping at the angle of the mouth. The same thing occurs with fluids, he cannot prevent their escaping at the right corner of mouth. On requesting him to draw the right angle of the mouth towards the right ear, there was not the slightest motion perceptible, excepting from the action of the muscles on the opposite side. Mastication not very perfectly performed on this side, owing to the morsel getting between the teeth and cheek, from whence he is obliged to dislodge it with his fingers. Complains of some stiffness in his jaws, and that he is not able to open his mouth wider than will admit a tea-spoon. In the space between the mastoid process and the ascending ramus of the jaw some degree of pain and tenderness was discovered, which was much increased on passing the fingers into the concha of the ear, and pressing downwards and forwards. Neither tumour nor swelling, however, could be detected in this situation. He can press hard substances as firmly between the teeth on one side as on the other; the temporal, pterygoid, and masseter muscles acting equally well on either side. The symphysis of the jaw can be directed to either side, but more perfectly to the left. There is some thickness of speech, but this is removed by supporting the paralyzed cheek with the hand, the patient

then being able to speak distinctly. There is no deafness nor alteration in taste, and sensation of the paralyzed parts is perfect. General health good; pulse 60, regular; bowels rather costive.

By Dr. Graves he was frequently leeches, cupped, blistered, and purged, without effect. Croton oil frictions, moxas, putting him under the influence of mercury, only gave slight and temporary relief; the report on the 5th of February, about six weeks after admission, being as follows: "excepting a very slight degree of motion in the occipito-frontalis muscle, he remains nearly in the same state as when he entered hospital. General health good, no pain or giddiness in the head; pulse regular; bowels free; appetite good."

Strychnine, $\frac{1}{12}$ of a grain four times a day was administered with considerable effect, and the excitement of much spasmodic twitching in various parts of the body, but particularly in the paralyzed part. After about twelve days' exhibition of this medicine, these effects became so powerful, along with pain and giddiness of the head, that its omission became necessary; and on a second trial, a few days after, it was finally given up; the disease remaining nearly in the same state as on admission.

March 5th. Dr. Stokes now determined on having this patient galvanized. He introduced two needles, one over the trunk of the portio dura nerve, the other near the ala nasi, in a line with the temporo-facial branch of the seventh nerve. The positive pole of the battery was applied to the latter, the negative to the former. The patient received eight shocks, and says that at each shock he felt as if he had received a smart blow on the cheek from a stick or a cane. On withdrawing the needles, the negative one came out with ease, but the positive required some degree of force to extract it. It was persevered in daily (with the exception of one day in consequence of headach) with manifest improvement.

March 15th. Two hours after the application of the galvanism yesterday, he was attacked with violent pain in the head

and a rigor, which lasted for nearly an hour and a half, then subsiding and leaving him as usual.

20th. Same sort of rigor.

21st. The rigor came on almost before the withdrawal of the needles, and lasted several hours, accompanied by headach, and heat and tingling in the affected cheek.

24th. Left hospital; little or no deformity can be noticed when the features are at rest; the forehead nearly as much wrinkled on the right as left side; voice not at all affected; mastication as well performed as on opposite side; in short, the only remains of the paralysis are in a slight difficulty in closing the eyelids, and the right not acting simultaneously with the left. Although, therefore, with the exceptions just named, much value cannot be attached to acupuncture with galvanism as a means of cure, there are occasions in which it appears reasonable to think it might be used with considerable benefit, as one of the most powerful excitants we possess; such, for instance, as cases of suspended animation, from drowning, or asphyxia from many causes, catalepsy, &c.; and, as a powerful stimulus in cases of poisoning by opium. The needles, if necessary, could be inserted in such a manner as to act on the muscles of respiration, without any preparatory dissection, and a very small battery, it is evident, would through them act most powerfully.

The end of these trials, that of ascertaining the value of the remedy, has at least been attained by Dr. Stokes, though contrary to what might have been wished; and next to the merit of having added a new power to our present means of combating disease, may surely be placed that of having reduced a pretended remedy to its proper level.