

the uterus, at the same time that the eggs are forming within the uterus. When the animal is about to produce a capsule, it fixes itself by the tail, and in the course of ten minutes is seen to become much distended in the region of the uterus, but contracted both above and below that part. The swelling at first has the ordinary dark colour of the animal, but in a few minutes a film is seen to separate, and become of a milky white colour, from the contents of the uterus, which are forcibly emitted into it. The animal itself, being thereby diminished, next loosens itself from the enveloping membrane by forcible elongation of the fore part of the body, and then withdraws its head backwards, as from a collar, leaving two openings in the capsule, which, after contraction, remain visible as dark specks, one at each end. These are the points at which the young ultimately make their escape, being apparently aided by the comparative weakness of these parts of the membrane. At the time that they are hatched the young are nearly colourless, and they continue so for several months with very little enlargement. While young they have the property of swimming at the surface of the water with their bellies uppermost, as has been noticed by Müller in the *Hirudo hippoglossi*, and as the author has also noticed in two other species of *Hirudo*.

On the Effects of Galvanism in restoring the due Action of the Lungs.
By A. P. Wilson Philip, Physician in Worcester. Communicated
by Sir Everard Home, Bart. V.P.R.S. Read November 21, 1816.
[*Phil. Trans.* 1817, p. 22.]

The author ascribes our having derived but little advantage hitherto from the employment of galvanism in the cure of disease, to want of discrimination with regard to the functions of the nervous system, which he considers as twofold, one properly nervous, the other purely sensorial.

Galvanism, he says, never did perform any of the functions of the sensorial system; it cannot restore hearing to the deaf, or sight to the blind; and yet these are the cases that have been blindly selected for its employment. On the muscles it acts purely as a stimulus, and is not to be expected to do more than other stimuli. But since it appears to have peculiar power over the nervous system, he was led to inquire what diseases depend on a failure of nervous influence; and from having observed the difficulty of breathing brought on by dividing the eighth pair of nerves, and the relief afforded in that case by sending a stream of galvanism through the lungs, he was induced to try the effects of galvanism in habitual asthma, or asthmatic dyspnoea, which he conceived to depend on some obstruction of nervous energy.

In such instances as have come under his own observation, the employment of galvanism has been almost uniformly attended with relief to the symptoms, and in many instances has proved a perfect cure. When it is applied as strong as the patient can well bear without complaint, the relief is often perceived in five minutes, and

generally in less than a quarter of an hour. The battery employed consisted of 4-inch plates, charged with a mixture of muriatic acid and water, in the proportion of one acid to twenty of water.

With regard to the number of plates, there are few persons who cannot bear so many as eight pair, and few who require more than twice that number. Dr. Philip generally begins with a very weak power, and gradually increases it till the patient begins to feel some degree of uneasiness, when it is easy to move the wire of communication backward a few divisions, and again return after a temporary remission of the excitement. The application was made through the medium of two thin plates of metal dipped in water and applied wet, one to the nape of the neck, and the other to the pit of the stomach, in order that the galvanic fluid might pass through the chest as nearly as possible in the direction of the nerves; and with respect to the position of the two ends of the battery, it was found expedient to place the positive wire to the nape of the neck, and the negative wire to the pit of the stomach. The operation was discontinued as soon as the patient felt his breathing become free; for it was not found that continuance for a greater length of time had any tendency to prevent a recurrence of the symptoms.

In those cases of spasmodic asthma in which galvanism has been applied by the author, it has failed to give relief; but where the spasmodic paroxysm has been succeeded by habitual difficulty of breathing, there galvanism did give immediate, but temporary relief. It appears, however, that most is to be expected from this remedy in those cases of habitual asthma which are the least complicated with any other disease.

In order to be assured that the effects above described, as apparently arising from galvanism, might not, in fact, be owing to an impression on the mind during its employment, Dr. Philip endeavoured in various instances to deceive his patients, by imitating the pricking sensation occasioned by the application of the wires to the surface of the skin without really completing the circuit; but they invariably received no relief from such experiments, and very soon felt the customary benefit after the communication with the trough had been established in the usual way.

In one instance the galvanic current was directed solely along the spine, by placing the second wire to the small of the back instead of the pit of the stomach; but the advantage derived from this application was far less than in the usual mode.

In confirmation of the truth of these observations, the author refers to various professional friends who have witnessed the trials, and especially the House Surgeon of the Worcester Infirmary, who is convinced that no other means are equally efficacious in the relief of this species of asthma.