

THE ELECTRIC DOUCHE.

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At page 281 of his book on Electro-therapeutics Erb mentions the electric douche. No information, however, is given beyond a reference to a paper by Trautwein. I have not been able to get access to this article, nor am I aware whether the subject has any other literature. It is therefore because it may possibly interest those who are in the same position that I venture to put together the few following points, which are the outcome of an experimental inquiry recently undertaken for my own information. The action of electrised water by means of the electric bath has long been recognised as by far the least painful way of applying the current to the body. But the efficacy of this procedure depends in most cases on a general and distributed action rather than on any strictly localised effects. The electric douche therefore seems to have been devised as a means of retaining the advantages of the electro-hydriatic method and at the same time presenting facilities for strict localisation and accurate dosage, and securing the advantages of a labile as well as a stabile action. The method of application, apart from certain non-essential details, is much of the nature of what would be known in hydrotherapeutics as the "movable jet douche" (douche mobile), and the nozzle is so arranged that the electrised stream escapes in the form of a more or less condensed jet or jets, which, with a certain minimum of pressure, remain unbroken and continuous for a reasonable distance after emerging from the pipe, and therefore for that distance retain their electric conductivity. (Of course there ought to be a means of regulating temperature and pressure.) With this arrangement one pole may be placed in contact with some indifferent part of the patient's body, while the other is connected to the internal metal of the douche, with the result that when the douche is set in action the second pole is brought to the patient by and in the fluid, and may be concentrated as a single jet or distributed as many small jets. The fluid is, in fact, the second electrode.

Let us inquire, then, by direct experiment, how much current this water conductor carries, and how much enters the body of the patient. The following experiments are necessarily only a selected few, but a sufficient number of results are quoted to give some general ideas. Details of the apparatus are also as much as possible omitted. It need only be mentioned that, permanent water pressure not being available, a hand pump drawing from a suitable vessel was used for the douche, which was fitted with a nozzle or rose (having its outer edge insulated with india-rubber) of the size mentioned below. The electric apparatus consisted of a Leclanché battery of seventy-four cells (with a milliampère meter in circuit) and a fair-sized induction coil. One pole was attached to a large electrode on which the patient sat, and the other connected with the metal of the nozzle or rose, well insulated wire being used for the connexions. The following results were obtained:—

TABLE A.

Plain water at 98° F., continuous current.

Nozzle.	E. M. F.	Pole to douche.	Distance of nozzle from body.	Current passing.
1. 1 in. jet (single).	75	—	1·5 in.	5 milliampères.
2. Do. do.	"	"	0·5 in.	15 milliampères.
3. Rose 2 in. dia., forty-nine perforations.	"	"	1 in.	5 milliampères.
4. Single jet.	"	+	18 in.	Deflection (taken on reflecting galvanometer) right off scale. Probably quite 100 microampères.

TABLE B.

Salt water (½ lb. to 7 gal.), temperature 98° F., continuous current.

Nozzle.	E. M. F.	Pole to douche.	Distance of nozzle from body.	Current passing.
1. Rose.	75	—	1·5 in.	7·5 milliampères.
2. Single jet.	40	+	18 in.	20 milliampères.

TABLE C.

Plain water, temperature 98° F., alternating current.

Nozzle.	E. M. F.	Pole to douche.	Distance of nozzle from body.	Current passing.
1. Rose.	x	+	1·5 in.	Subject cried out "Stop." Milliampère meter (alternating current) in circuit did not register.
2. Single jet.	"	+	12 in.	Noise marked in telephone. Subject felt current.

Several readings were taken with alternating current and salt water, all showing that the effect was much stronger with salt water than with plain. These experiments seem to show that electricity can be imparted to the human body by means of the electric douche, provided that sufficient electro-motive force be used and the stream of fluid be continuous. Table B shows that when salt water is used strong currents may be passed over considerable distances with a very moderate electro-motive force. Table C shows that by using coil currents, which always possess a comparatively high electro-motive force, as much current as a patient can comfortably bear may be passed over many inches of space. Its current-carrying capacity being thus established, we may glance for a moment at its possible therapeutic effects.

There was a time in the days of "brutal hydrotherapeutic empiricism," when both physician and patient had a (not altogether inexplicable) dread of the "hydrostatic douche." This, however, has given way before a more enlightened method of administration, and the douche is acknowledged to possess stimulating and alterative properties of no mean order. It seems not unreasonable, therefore, to suppose that in the combined electric and hydriatic procedure we may have a therapeutic agent of considerable power. It claims that, according to variations in temperature, force, and duration, it may be resorted to as an agent more gentle and adaptable than even the "electric hand" of the physician, or may be made to become so potent and concentrated as to prove a veritable electro-hydriatic moxa. It presents itself as a means of general electrification by bringing the various parts of the body successively under its influence; it claims an action that may be strictly localised; and, further, offers itself as a means of producing, through various motor inhibitory and secretory reflexes, those influences on nervous centres and glands which can undoubtedly be brought about by other and more painful methods of peripheral electrical excitation. If it can establish claims of this kind, a field of usefulness seems to lie before it in a class of cases which readily suggest themselves.

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AN INQUIRY INTO THE RELATION THAT EXISTS BETWEEN MILD AND SEVERE FORMS OF SOME DISEASES.

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IN the different departments of science well-marked phenomena lead us to look for or infer the existence of less striking examples of the same or similar phenomena. Prof. Jevons, in his "Principles of Science" (p. 549), writes: "We must regard those changes which we can observe as the comparatively rare aggregates of minuter changes. On a little reflection we must allow that no object known to us remains for two instants of exactly the same temperature. If so, the dimensions of objects must be in a perpetual state of variation." He quotes Prof. Tyndall, as follows: "An upright iron stone influenced by the earth's magnetism becomes a magnet with its bottom a north and its top a south pole. Doubtless, though in an immensely feebler degree, every erect marble statue is a true diamagnet, with its head a north pole and its feet a south pole. The same is certainly true of man as he stands upon the earth's surface, for all the tissues of the human body are diamagnetic." He further illustrates this truth: "The sun's light produces a very quick and perceptible effect upon the photographic plate; in all probability it has a less effect upon a great variety of substances. We may regard every phenomenon as an exaggerated and conspicuous case of a