

NEWMAN (R.)

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WITH THE COMPLIMENTS OF THE AUTHOR.

HYDRO-GALVANISM OF THE
URETHRA.

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BY ROBERT NEWMAN, M. D., NEW YORK.

Consulting Surgeon to Hackensack, Bayonne and McDonough
Memorial Hospitals, German Dispensary West Side, N. Y. and Home
in Yonkers, etc., etc.

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The instrument, which will be displayed here for the application of urethral hydro-galvanism has been so devised as means to apply galvanism to parts of the genito-urinary tract without bringing the instrument in actual contact with the parts to be benefited thereby.

The principle is that of an electric bath; the electrified water gravitates in the cavities, which are thereby expanded, so that the whole surface of the cavities is more completely electrified than it could be with, and without possibility of the irritation which might arise from the use of the metal electrode. The instrument being only a vehicle for conveying the electrified fluid.

As the electricity acts differently under different conditions and applications — it will be in order to give here some definitions of terms;

Voltaic Electricity (galvanic) of low potential difference and large current intensity; electricity such as produced by a galvanic battery; a current or dynamic electricity as opposed to static electricity.

Hydro-electric Pertaining to, employed in or produced by — the evolution of electricity by means of a battery in which liquids are used, (or by means of steam).

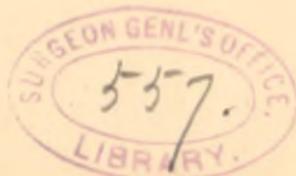
Hydro-galvanic produced by or consisting of electricity evolved by the action or use of fluids, as hydro-galvanic currents.

Electrolysis is the decomposition or the separation of a chemical compound into its constituent parts of elements by the galvanic current — Each pole has its peculiar action.

Cataphoresis a factor in electrolysis, can act by itself — and thus is an electric osmosis — a transfer (or rather a transmission) of substances in solution through porous membranes, under the influence probably of electrolysis, but without themselves being decomposed.

As an electro-therapeutic agent cataphoresis is used for the transmission of medicines through the cutaneous or mucous linings into the body of the patient.

Galvano-puncture or Electro-puncture is an electrolysis by needles, the current increased to a grade of destruction of tissues.



Galvano-Cautery is the short circuit of galvanism to heat a platinum wire or burner. It is used as an ecraseur, knife, cautery or simply as a rubefacient.

HYDRO-GALVANIC APPLICATIONS.

History.

All that has been said about the electric baths has reference to the origin of this method. Beard and Rockwell have called attention to hydro-electric applications. Boudet (of Paris,) methods have been written of by Dr. Larat in 1892. Dr. Max Einborn has used the direct applications through the fluids of the stomach. The writings of W. H. Hedley of Brighton, England and Newman Lawrence of London deserve mention. These last two have written on "Hydro-Electric Methods" and "The Electric Douche" and "Hydro-Electric Therapeutics of the constant current."

Clemens has written of "Die Galvanische Douche" Deutsche Klinik Berlin in 1859 and 1860. As far as I am aware, the first practical employment of hydro-electric applications was made by Dr. W. H. King of N. Y., who constructed in 1889 a rectal electrode for hydro-electricity. A drawing of that instrument appeared about the same time in Waite and Bartlett's catalogue.

The writer has used the principle of hydro-galvanism in the female bladder four years ago. The instruments used are described in Tieman's reprints number 10. The paper was read before the American Electro-Therapeutic Association in 1893 in Chicago.* A guarded electrode was used in the water which filled the female bladder.

Dr. Margaret A. Cleaves read a paper at the meeting of the American Electro-Therapeutic Association in New York in September 1894, on "Special Hydro-Electric Applications" in which she exhibited a series of her instruments for special parts of the body. The Urethral Hydro-galvanic instrument designed by the writer is new and does not infringe on any other appliance before presented.

Theory of Hydro-Galvanism.

The theory is to electrify the fluid used by the continuation of the current through the water to the platinum wire of the instrument, the same as in an electric bath. If a coin is placed in a dish of water, in which both poles of a battery are immersed and the current turned on, the water will be so strongly electrified, that the coin cannot be removed by the hand. The theory as a practical application is well expressed by Newman Lawrence. "All that is necessary, to insure, that the water or other

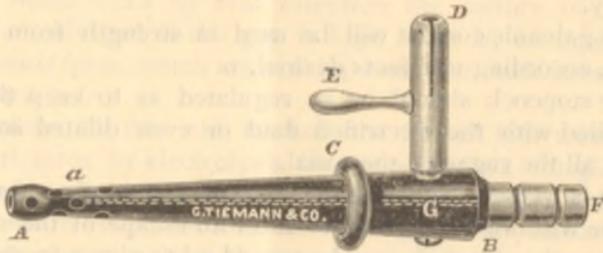
* (Times and Reg. Nov. 11th, 1893).

fluid is electrified when it reaches the patient, is to have the nozzle so constructed that the jet or jets of water form *continuous streams* for a reasonable distance after they leave the metal conductor within the nozzle." To electrify the fluid by the continuation of the current through the water to the platinum wire of the instrument, the same as in an electric bath.

Description of the instrument.

The instrument is a conical tube of hard rubber, which can be inserted into the urethra from one to two inches, a soft rubber ring pushed against the meatus prevents leakage. A stopcock regulates the supply of the fluid, the top of which is used as one binding post to attach the tip of one rheophore. The other end of the tube is used for the attachment of the rubber tube for the introduction of the fluid. The tube is lined with a platinum wire for the conduction of the electricity.

Urethral Hydro-Galvanic Instrument.



A. to B. A conical hard rubber tube.

A. Small holes for the passage of the fluid into the urethra.

C. Movable soft rubber ring.

D. For the attachment of one cord of the battery.

E. Stopcock.

B. to F. Corrugated metal tube for the attachment of the rubber tube for the introduction of the fluid.

G. Platinum wire lining the hard rubber tube for the conduction of the electricity.

Modus operandi—The fluid used may be simple salt water, bicarbonate of soda or any other medication as the symptoms may indicate. As a reservoir for this fluid the writer uses a glass cylinder so as to ascertain by sight the quantity of the fluid used. The lowest part of this cylinder and the portion of the instrument B. F., are connected by a rubber tube for the transmission of the fluid through the instrument. The glass reservoir is placed at such a height, that the fluid will, by its own gravity, enter the parts to be electrified without any undue pressure.

For the indifferent pole use either a pad placed on any part of the body or a sponge electrode in the hand—the latter is preferable. The active pole of the battery is connected with the instrument at D.

The end of the instrument at A. is slightly lubricated and is introduced into the meatus so far that the conical part fills up the orifice.

The instrument has been made conical in order that the orifice may be filled, as the sizes of the meatus and calibre of the urethras differ in different people. When the conical tube has been inserted as far as is intended, a rubber ring, C, is pressed against the outside of the meatus to prevent any leakage of the fluid. One hand only is needed to keep the instrument in place, while the other one is used to turn the stopcock "E" which allows and controls the afflux of the fluid to the parts) and also to regulate the current strength of the battery.

The galvanic current will be used in strength from 5 to 20 M. A., according to effects desired.

The stopcock should be so regulated as to keep the parts well filled with the electrified fluid or even dilated so that it enters all the rugae of the canal.

If it is wished to change the electrified fluid the instrument may be withdrawn, slightly, to allow an escape of the solution, and then the stopcock may be turned on to give a fresh supply.

The average time for a seance will be about ten minutes.

Before finishing the treatment the current of the battery should be slowly reduced to zero.

Experiment.

Action of a galvanic battery, six cells for six minutes. Instrument attached to positive pole; a platinum needle to negative pole in a solution of Iodide of Potassium, one drachm to one ounce of water.

Iodine at the positive pole and for a considerable distance towards the negative pole, manifested by a deep brownish yellow color proved the electrolytic action.

Therefore this instrument can be used in electrolysis just as well as for general galvanization. The most important part will be the stimulating of the mucous lining, healing of ulcerations, absorption of pathological conditions, restoring general debility, and improving chronic inflammations. If the fluid be properly medicated cataphoresis or electrolysis may be applied.

Methods in the treatment of genito-urinary diseases differ widely. The surgeon using the knife stands directly opposite the electro-therapeutics. This can only be fully understood by

a comparison of treatment with the knife against electro-therapeutics. About *strictures of the urethra* the author feels compelled to make some comparisons and mention different methods.

The general surgical practice in urethral strictures consists in :

(1)—*Gradual dilatation*, which cures in only small percentage of cases. As a rule it enlarges like the stretching of a rubber band, which contracts again after the stretching is left off. In suitable cases it is a rational method and will not injure if used with care and skill, but in most cases it does not cure.

(2)—*Divulsion* may also cure in some cases, but in the majority it is dangerous; caused by rupture, traumatism, and may produce death. At the present time it is abandoned by most surgeons.

(3)—*Urethrotomy* is the favorite operation of today, and in the opinion of many, nevertheless the most unrational method. If the cut made heals by first intention the calibre of the urethra is not enlarged; if the gap is kept apart by stretching cicatrices *must* form, which are nothing else than strictures of a worse character.

In opposition to this old method the writer has treated urethral strictures by electrolysis for 29 years, has compiled and reported in 1893—1755 successful cases by different operators, all of whom vouch for the correctness of their statistics. The writer's statistics have been examined during a whole year, by a committee, who reported the statistics correct.

However he cannot endorse other methods of so-called electrolysis, like "Forte's linear electrolysis," which is an operation consisting partly in forcible divulsion with a small dose of galvano-puncture, both objectionable features; nor the instrument of "Gautier," which principle has been abandoned by the writer more than 24 years ago.

The hydro-galvanic instrument may be used in tortuous urethral strictures of small calibre, in which it is difficult to pass a filiform guide and the urethra very sensitive, in order to dilate, to lessen the tortuosity, allay the irritability, and heal up any sore or bleeding point, and thus prepare the case for the regular electrolytic treatment. This is as a rule not necessary for the expert, but some operators may find the hydro-galvanism an aid in beginning the treatment, particularly when they find difficulty in introducing an electrode, or even a filiform guide.

Diseases of the *seminal vesicles* consist mostly in inflammations, sometimes being one of the causes of impotence, and, also connecting with the prostatitis.

The hydro-galvanism has been easily used in these cases with marked benefit, and has cured several cases, in which other methods only partly allayed the severe symptoms. If inflammation is present the introduction of instruments is generally very painful, and often causes derangements of the bladder. If the hydro-electric galvanism is, and undoubtedly does, pacify these parts, it will facilitate the treatment afterwards.

In genito-urinary surgery we are advised to keep the parts at rest, which is good treatment.

It may be a surprise for many that a recent publication teaches that the majority of sexual derangements in the male are caused by pathological processes in or about the seminal vessels, and that it takes extraordinary skill and long experience to make a correct diagnosis.

More plausible and rational methods for diagnosis and treatment of chronic inflammation of the seminal vesicles are stated by H. Feleki.

(1)—Centbts f.d. Krukhtn d. Harn and Sex organ, 1805, p. 467 and 512: For diagnosis he uses the "three glass test" with digital examination, and the treatment consists in massage, for which he has devised an instrument, for this purpose, as being less disagreeable to both physician and patient, and believes that results are more quickly obtained by its use than the finger massage.

Diseases of the Prostate consist mostly of inflammations and hypertrophies—what has been said about inflammation of the seminal vesicles may also be applied to prostatitis.

In hypertrophy of the prostate the surgeon goes from one extreme to the other. Formerly the advice was given to use the catheter always, and wait till death comes, as nothing else can be done. Recently enterprising surgeons have practised castration and ligation of the vas deferens. Dr. Mansell Moullin reports twelve cases of orchotomy of which two died after the operation, two died six months after, and two suffered from traumatic delirium. Dr. Moullin thinks that perhaps unilateral orchotomy or even resection of the vas deferens may be followed by good results.

Lallemand's method with his "Cache caustique" never became popular, notwithstanding it appeared very rational.

Galvano-cautery has also been used and the writer has made positive cures with his "galvano-cautery sound."

The passing of instruments through inflamed parts is generally very painful, and often causes derangements of the bladder. If the hydro-galvanic application will, and undoubtedly does pacify these parts, it will facilitate the treatment afterwards of other applications. It is a new field in prostatic diseases and the probability is that it will cure some maladies of the prostate gland, superseding the former, doing nothing plan, and the present tendency to cutting and mutilating operations. So far hydro-galvanism has allayed irritation, cured prostatitis, and some cases of impotence.

Urethritis.

The failure to abort urethritis has been due principally to the fact that the inflammation has caused such an irritable state and pain, which makes it impossible to introduce an instrument,

syringe or any medication. The important part is to make use of a certain stage in which the inflammation has assumed such a degree of irritability that the instrument under consideration can be used. This or a modification of it can be used with more ease than any other instrument. Simple water may be used with a weak current of five milliamperes and according to circumstances salt water or even any other medication indicated. Electrolysis given by a metallic electrode, or bulb, is apt to create more inflammation and possibly a degree of cauterization. The hydro-electric galvanism is milder and is better to abort the urethritis and even arrest inflammation.

Chronic Urethritis and all pathological discharges will be more safely cured by this method than by any other which dilates the calibre of the urethra and puts the mucous lining on a stretch, cleanses and washes all parts alike.

The electric current is equally divided in every part of its course, the milder application of electricity will be better tolerated by the patient and the curative process takes place which will not be accomplished by direct applications. It may be objected to that by an introduction of an instrument of two inches, the deeper portion of the urethra may not be electrified. By practical observation however, it has been found that any part of the urethra can be electrified and if the instrument be rightly handled the fluid will penetrate any depth of that organ. If any doubt arises we have two means to make a sure thing still more certain. First is to hang the reservoir containing the fluid higher, in order to increase the pressure from above: experience has shown that under such circumstances the fluid will even enter and fill up the bladder. The other is to have the instrument made longer. It has been found from experience, however, that the latter is not necessary.

Urethritis of the deep urethra.

As a subdivision of chronic urethritis may be mentioned the urethritis of the deep urethra in which generally the prostatic and even the neck of the bladder is involved. Celebrated specialists have been in the habit of treating such patients with injections of nitrate of silver, often so strong as to drive patients mad and the case has been made worse. It stands to reason that such severe measures are uncalled for and cannot cure, as the solution will diffuse itself all over alike diseased as normal tissue. A better treatment is the use of solid medications to the affected parts only, either by brush, ointment or prostatic bougies. An urethroscope may be used in order to have an ocular inspection, which will enable the operator to apply the remedies in site to the affected spots only.

The passage of instruments over inflamed surfaces of the mucous lining is often too painful and the patient will not endure the introduction of instruments or local medication. Such cases have been particularly benefitted by the application of the hydro-galvanization—in such manner, that the patients considered themselves cured. In some of these cases the inflammation is so great that the disease will be carried into the bladder and *diseases of the bladder* have been cured by hydro-galvanization in different ways of application—just as well in males as in females. A longer instrument is however desirable which can be introduced into the bladder, which has been filled with four to six ounces of either plain water or a

medicated solution. Then the catheter is placed inside the bladder in the water which indirectly galvanizes the whole viscus.

Excoriations and Ulcerations.

Excoriations and ulcerations, particularly the latter, are very hard to cure in the urethra by ordinary means. Our hydro-electro-galvanism will breach over the first part of the treatment in which the irritability of the parts prevents the application with direct electricity. After a few seances with this method, treatment of indirect electricity may be used.

Poles.

The operator must decide how the poles of the battery are used according to indications, and he must know what action he desires, what effect he wishes to produce, and accordingly selects the poles. As a rule the instrument will be used as the negative pole, but in cataphoresis certainly the positive pole has to be selected. In these cases the instrument is the active pole. The other indifferent pole is either a pad placed on any part of the body or a sponge electrode held in the hand by the patient. The latter plan is preferred in most cases. However if a more direct action is desired the indifferent pole may be applied nearer to the active pole.

The Current to be used is from 5 to 20 milliamperes. The writer prefers weak currents, say 5 M. A., which he has found sufficient in most cases, while stronger currents are apt to overstimulate and even cause inflammations and consequently discharges. The success depends on sound judgment, careful manipulation, and perfect understanding of the laws of electricity and the instruments.

The solution used is in many cases plain water, but salt water may be or any other medication as indicated.

Conclusions.

1—One proposition is that the present ways of genito-urinary surgery need reformation,

- (a) As they are too severe and painful
- (b) The failures are in too large a percentage comparatively with cures,
- (c) Some mutilations, as cures, appear barbarous
- (d) Some measures generally used are based on erroneous theories.

2—Electrolysis in the treatment of urethral strictures has proved a success in a practice of 30 years, after patients, methods, statistics and documentary evidence have been examined by an impartial committee.

3—Hydro-electric methods are nothing else than the electric bath localized to a certain part of the body, the current transmitted by pure or medicated water electrified.

4—The instrument devised by the writer is introduced to this society for what it is worth and for the good it has done, and solely for that; nothing more is claimed.

5—The hydro-galvanism by this instrument will not replace the direct electric current.

7—The hydro-galvanism in genito-urinary surgery wrongly applied by the tyro in electricity may do harm, but scientifically conducted is useful, and in many cases paves the way for other treatment or other applications of electricity.

