Einhorn (Max)

Further Experiences with Direct Electrization of the Stomach.

BY

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In my paper,* A New Method for Direct Electrization of the Stomach, I put much stress on the necessity of applying the electric current within the stomach—a fact which has been previously recognized by different authors. At the same time I devised a new method of direct electrization, which frees it of all the difficulties with which it has hitherto been connected. The novelty consists in that I employ a deglutable electrode. There is no need of my lingering on the *modus operandi*. The same is known to all of you, and is fully described in the paper mentioned.

About a year later I published another article, entitled Therapeutic Results of Direct Electrization of the Stomach;† the same contained several experimental investigations upon the effect of direct gastro-electrization on the gastric secretion in man, and besides a detailed description

* Max Einhorn. *Medical Record*, May 9, 1891.

† *Ibid.*, Jan. 30 and Feb. 6, 1892.

of all the cases I had treated by direct electrization of the stomach during eighteen months.

There were twenty-nine cases in which direct gastro-faradization had been applied, five in which first direct faradization and afterward direct galvanization of the stomach were administered, and one in which the galvanic current was given alone. The *résumé* of this paper was as follows:

"Direct gastrofaradization proves to be useful in many ways in most chronic diseases of the stomach. The favorable results appear very clearly and pretty quickly in those cases of stomach dilatation which are not caused by any obstruction of the pylorus, but merely by the relaxation of the muscular coat of the stomach. Here the gastrofaradization is beneficial, no matter whether in these cases there is hyperacidity or subacidity of the stomach contents. Cases of relaxation of the cardia (eructations), and also of relaxation of the pylorus (presence of bile secretion in the stomach), were very favorably influenced by faradization. Here the result was most markedly pronounced, inasmuch as, besides the subjective amelioration of the patient, the objective examination showed at the same time the absence of bile in the stomach contents (there was, however, only one case of relaxation of the pylorus under observation).

Direct gastrogalvanization was administered with very good results in cases of obstinate gastralgia; several of them had resisted every therapeutic means, but yielded to the influence of galvanization."

As I have mentioned in the above-quoted papers, the literature on the efficacy of direct gastro electrization is very scanty—*i. e.*, very few have been treated by this method. Stockton * is the only author who has treated a larger series of cases by direct gastrofaradization.

Since the publication of the two papers referred to on

* Charles G. Stockton. *American Journal of the Medical Sciences*, 1890, p. 20.

direct electrization of the stomach no experiences by other authors have thus far been communicated. Ewald * only mentions that he had very good results with direct gastro-faradization in two cases of ructus. This author recommends the same treatment in all those cases where the musculature of the stomach has to be strengthened. Ewald approves of the shape and form of my electrode, but mentions that he finds it difficult to get down into the patient's stomach. For this reason Ewald has modified my electrode by using a thicker rubber tubing around the wire; the tubing corresponds to No. 13 Charrière, and is about a millimetre and a half thick.

J. Ravé † has treated two cases of dyspepsia by direct gastrogalvanization, and speaks in favor of the deglutable electrode.

I must say that the insertion into the stomach of the deglutable electrode offers no difficulties. The principal point is to put the electrode far back into the pharynx and to let the patient meanwhile drink something. It is advisable to have the patient drink slowly about a glassful of water, and to have a talk with him, in order to detract his attention from the procedure. The electrode usually soon reaches the stomach, and it seldom happens that it remains lying in the fauces. If this does happen, the patient must eat a small piece of bread and drink some water; the electrode will then find its way into the stomach with the bread.

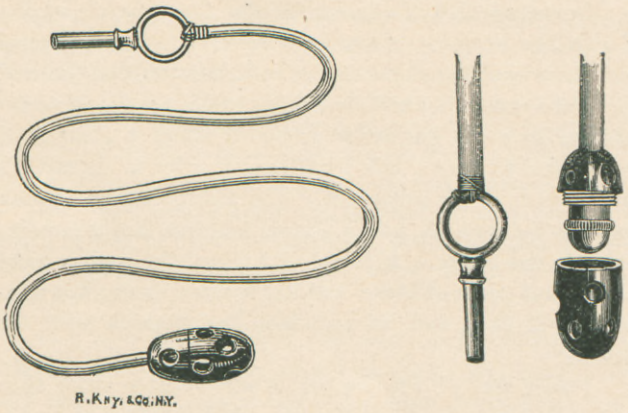
I have applied the deglutable electrode to more than a hundred people, and met with only one who was unable

* C. A. Ewald. *Berliner klinische Wochenschrift*, 1892, Nos. 26 and 27.

† J. Ravé. *Contribution à l'étude du traitement des dyspepsies par l'électricité*, Paris, 1893. (Henri Jouve, Imprimeur de la Faculté de Médecine.)

to swallow it. In this patient I had to use an electrode with a thicker rubber tubing (analogous to Ewald's modification) which could be pushed into the stomach. He, however, was a timid man, without any will power, who did not believe in his being able to do anything spontaneously. When told to swallow, his reply was, "I can not." In all other cases the deglutable electrode has been successfully applied. After the first application its insertion is much easier, the patient being accustomed to the procedure.

The principal advantage of the deglutable electrode consists, firstly, in that we are able to apply the method in people not used to the stomach tube, and, secondly, in that the thin cord does not cause any uncomfortable feeling to



the patient during the entire electric sitting and does not provoke salivation. Another advantage lies in the circumstance that the deglutable electrode can be administered even in those cases in which ulcer of the stomach is sus-

pected, whereas the old stomach electrode could not be introduced in them for fear of causing perforation.

By means of the deglutable electrode * a regular course of electric treatment of the stomach becomes possible in many cases and is facilitated in all.

After these introductory remarks permit me to report my further experiences of direct electrization of the stomach gathered during the past year.

A. *In Reference to the Physiological Effect of Direct Gastro-electrization.*—In my previous papers I have proved by experiments that direct gastrofaradization ordinarily increases the secretion of gastric juice—*i. e.*, there is found in the stomach a higher degree of acidity (caused by HCl) during electrization than at other times. The question arose whether this increased secretion of the stomach under the influence of electricity continues for some time after the application of the current. In order to decide this point the following experiments were made:

Case I.—S. H., twenty years old.

1. *December 17, 1892.*—When fasting, drinks a glassful of water and swallows the electrode, which is left in the stomach for ten minutes and withdrawn, electricity *not* being applied. After forty minutes the stomach contents are obtained by means of a tube and examined: HCl +, acidity = 42.

2. *22d.*—When fasting, drinks a glassful of water and is gastrofaradized directly for ten minutes. Forty minutes after the drinking of the water the stomach contents are obtained and examined: HCl +, acidity = 52.

3. *25th.*—When fasting, drinks a glassful of water and is gastrogalvanized for ten minutes (negative pole in the stomach).

* The attachment of the cord to the capsule of the deglutable electrode has been accomplished by Richard King & Co. (17 Park Place, New York), the manufacturers of the instrument, in an excellent way. The cord is screwed into the capsule. The size and form of the electrode correspond with the accompanying figure.

Forty minutes after the partaking of the water the stomach contents are obtained and analyzed: HCl +, acidity = 20.

Case II.—T. M., twenty four years old.

1. *January 10, 1893.*—When fasting, swallows the deglutable electrode and drinks a glassful of water. After ten minutes the electrode is withdrawn, electricity not having been applied. After half an hour the stomach contents are obtained and examined: HCl +, acidity = 14.

2. *12th.*—When fasting, drinks a glassful of water and is gastrofaradized (the deglutable electrode within the stomach) for ten minutes. Half an hour later the stomach contents are obtained and examined: HCl +, acidity = 18.

3. *24th.*—When fasting, drinks a glassful of water and is gastrogalvanized directly for eight minutes (the negative pole being in the stomach). After half an hour the stomach contents are obtained and examined: HCl +, acidity = 20.

Case III.—C. H, twenty-three years old.

1. *February 4, 1893.*—When fasting, swallows the deglutable electrode and drinks a glassful of water. After ten minutes the electrode is withdrawn, electricity not having been applied. After thirty-five minutes the stomach contents are obtained and examined: HCl +, acidity = 46.

2. *5th.*—When fasting, drinks a glassful of water and is gastrofaradized directly for ten minutes. Thirty-five minutes later the stomach contents are obtained and examined: HCl +, acidity = 72.

From these experiments it seems that the electric action ordinarily increases the HCl secretion even during the first period after faradization.

How does the absorbent faculty of the stomach act immediately after electrization?

You all know that we are able to examine the absorbent faculty of the stomach by means of potassium iodide. The patient takes 0·2 of iodide of potassium in a gelatin capsule. The saliva is then tested by means of starch paper and nitric acid every minute or two. If the starch paper moistened

in the saliva shows a slight violet or blue discoloration after the addition of a drop of nitric acid, then it indicates that the potassium iodide had been meanwhile partly absorbed from the stomach and eliminated through the saliva.

In order to see whether direct electrization of the stomach hastens the absorbent power of the same, the following experiment was conducted in like manner on several people: Firstly, the individual drank while fasting a glassful of water. After the lapse of ten minutes iodide of potassium 0·2 in a gelatin capsule and 20 c. c. of water were given. The saliva was examined every minute with starch paper and nitric acid and the result carefully noted. Secondly, about a week later the same individual while fasting drank a glassful of water and was treated with direct electrization of the stomach. After this iodide of potassium 0·2 in a gelatin capsule and 20 c. c. of water were given and the saliva examined as before. The results obtained in both trials (one without, the second with, electricity) can thus be compared and the influence of direct electrization studied.

Of the many uniform experiments made in this respect I shall report three as examples:

Case I.—L. T., twenty-four years old.

1. *August 23, 1892.*—While fasting, drinks a glassful of water; ten minutes later he takes iodide of potassium 0·2 with 20 c. c. of water.

After 1 minute = no reaction.
" 2 minutes = " "
" 3 " = " "
" 4 " = " "
" 5 " = " "
" 6 " = " "
" 7 " = " "
" 8 " = + violet coloration.

2. *30th.*—When fasting, drinks a glassful of water and is gastrofaradized for ten minutes. He then takes iodide of potassium 0·2 with 20 c. c. of water.

After 1 minute = no reaction.
" 2 minutes = " "
" 3 " = " "
" 4 " = " "
" 5 " = " "
" 6 " = + traces.
" 7 " = + violet discoloration

CASE II.—Th. S., forty-four years old.

1. *December 19, 1892.*—When fasting, drinks a glassful of water. Ten minutes later he takes iodide of potassium 0·2 with 20 c. c. of water.

After 5 minutes = no reaction.
" 6 " = " "
" 7 " = " "
" 8 " = " "
" 9 " = " "
" 10 " = + traces.
" 11 " = + "
" 12 " = + clearly.

2. *26th.*—When fasting, drinks a glassful of water and is gastrofaradized for ten minutes. Then he takes iodide of potassium 0·2 with 20 c. c. of water.

After 2 minutes = no reaction.
" 3 " = " "
" 4 " = " "
" 5 " = " "
" 6 " = " "
" 7 " = " "
" 8 " = + traces.
" 9 " = + clearly.
" 10 " = + strong reaction.

3. *January 2, 1893.*—When fasting, drinks a glassful of water and is gastrogalvanized (negative pole within the stomach) for eight minutes. He then takes iodide of potassium 0·2 with 20 c. c. of water.

After 3 minutes = no reaction.
" 4 " = " "
" 5 " = " "

After 6 minutes = no reaction.
" 7 " = + traces.
" 8 " = + "
" 9 " = + much.

CASE III.—Samuel H., twenty-four years old.

1. *January 8, 1893.*—When fasting, drinks a glassful of water. Ten minutes later he takes iodide of potassium 0·2 with 20 c. c. of water.

After 2 minutes = no reaction.
" 3 " = " "
" 4 " = " "
" 5 " = " "
" 6 " = " "
" 7 " = " "
" 8 " = + traces.
" 9 " = + "
" 10 " = + clearly.

2. *15th.*—While fasting, drinks a glassful of water, and is directly gastrofaradized for ten minutes. He then takes iodide of potassium 0·2 with 20 c. c. of water.

After 2 minutes = no reaction.
" 3 " = " "
" 4 " = " "
" 5 " = " "
" 6 " = " "
" 7 " = + traces.
" 8 " = + clearly.
" 9 " = + much.

3. *22d.*—While fasting, drinks a glassful of water and is gastrogalvanized (the negative pole within the stomach) for eight minutes. He then takes iodide of potassium 0·2 with 20 c. c. of water. After 3 minutes = no reaction.
" 4 " = " "
" 5 " = " "
" 6 " = + traces.
" 7 " = + "
" 8 " = + much.

From these experiments it appears that the absorbent faculty of the stomach is increased by direct gastro-electrization (faradization or galvanization), a fact which hitherto, as far as I am aware, has not been experimentally proved by others.

B. *Experiences of the Therapeutic Effect of Direct Electrization of the Stomach.*—As I have already fully described in my last paper a large number of cases treated by direct gastro-electrization, I shall now refrain from a detailed description of different cases and shall limit myself to a brief report, giving in tables all the cases recently treated by this method.

All cases contained in the accompanying tables are those of private patients of mine who were treated by direct gastro-electrization with the deglutable electrode in the course of thirteen months (from the beginning of December, 1891, to the end of December, 1892). The time of electric treatment for each patient and all other necessary points are given in the tables.

Table I contains thirty-one cases treated by direct gastrofaradization. In eighteen all subjective symptoms of sickness disappeared; in seven there was a great amelioration—*i. e.*, a subsidence of nearly all the symptoms; in four there was a noticeable improvement, and in the remaining two the condition of the patient remained unchanged.

Tables II and III contain merely cases with complaints of severe pains in the gastric region (gastralgia).

On Table II will be found those cases which were treated first by the faradaic and thereafter by the galvanic current. The galvanization was administered in these cases for the reason that faradization in some of them effected an improvement only, but no cure, and in some again no change whatever. The final results were very good. In six the gastralgia, as well as all other symp-

toms of disease, totally disappeared, and in the remaining two, in which the galvanic current had not been applied ong enough (each of them had only three galvanic sittings), there was a marked amelioration.

In Table III three cases are reported in which galvanization alone was applied. In all these three cases the gastralgia was of an intense nature, and in two of them complicated with slight heart trouble. In all three cases the gastralgia disappeared.

Summary.—Thus there were forty-two patients treated by direct electrization of the stomach. Only in two no amelioration of the condition could be noticed; in all others there was either a complete disappearance of the subjective symptoms or at least a great amelioration of the same. Besides the subjective sensation of amelioration in the patients, in many cases there could be noticed at the same time a better appearance of the patient; in several cases an increase in weight was noticed and will be found reported in the tables. In those cases in which no mention is made of the weight in the tables, either the weight was the same as in the beginning of the treatment or the patients did not keep a record of it. In several cases an amelioration of the objective symptoms could be noticed—*i. e.*, the chemical analysis of the stomach contents showed an improvement of the condition. The references to these points will be found on the tables under the heading "Remarks."

After having discussed the main characteristics of the tables I would like to mention a few points in reference to the electric treatment. I gave to my patients the usual necessary drugs; a few only partook of no medicines whatever. I modified and prescribed diet only when necessary, and advised suitable hygienic measures accordingly.

I ordinarily applied the electrization every other day

during the beginning of treatment; afterward—*i. e.*, after the lapse of two to three weeks—twice weekly for about three weeks, and thereafter once a week for some time. As a rule, I begin to decrease the frequency of the sittings when I notice a decided improvement in the condition of the patient. Even after a complete disappearance of the symptoms it is advisable to continue the electrization (once a week) for some time.

According to my belief, it is of importance to apply gastro-electrization upon a certain plan. Thus it will not appear superfluous to give a detailed description of the electric application I generally employ.

The patient, when having the deglutable electrode within the stomach, opens his clothes, so that the abdomen is accessible. The key of the deglutable electrode is connected with the cord (negative pole) running to the battery.

Gastrofaradization.—Sitting, ten minutes; at first large plate electrode at the gastric and epigastric region for five minutes, then a small ordinary sponge electrode. The electrode is at first moved up and down from left to right in the gastric region (sometimes, principally when there is constipation, one goes with the electrode over the region of the colon—ascendens, transversum, and descendens—always beginning in the right iliac region and stopping at the left iliac region (duration, two minutes)); thereafter one proceeds from the gastric region from right to left to the back, and remains at the left side of the seventh dorsal vertebra for one minute. [At this place the current can be applied quite strongly, and most of the patients then experience a slight sensation within the stomach; the patients find it difficult to describe this sensation; some assert that they experience a dragging feeling, others a feeling of weight, and others again of pinching. All of them place this feeling within the stomach and locate it opposite different

heights of the abdominal wall.] One then returns to the front, moving the electrode gently up and down over the gastric region for two minutes, gradually decreasing the current, and thus ends the sitting. The strength of the current has to be of such a nature that it causes distinct contractions of the abdominal walls; but it is not well to have the current so strong that the patient experiences pains.

Gastrogalvanization.—Negative pole within the stomach; small sponge electrode. Duration, eight minutes. First, two minutes below the ensiform process (during the first minute the current is gradually increased to its necessary strength); then for three minutes moving the electrode up and down the gastric region. After this, one then goes to the back and remains one minute at the left side of the seventh dorsal vertebra, returns to the front, moves the electrode around the gastric region for one minute, and remains then quietly for one minute below the ensiform process. During this time the current is gradually weakened and the sitting ended, the strength of the current being ordinarily fifteen to twenty milliampères.

Before concluding this paper I should yet like to discuss a few points with regard to galvanization. I have already in my previous paper emphasized how effective this current is in gastralgia. Tables II and III seem to confirm this. The amelioration ordinarily appears by degrees and not suddenly. First, the pains are somewhat less severe, thereafter they begin to remain away for some time, and at the end they disappear completely. This gradual disappearance of the gastralgic pains seems to indicate that the beneficial effect must be ascribed to the galvanic current and not to mere suggestion.

Among the five cases of severe gastralgia, fully de-

scribed in my previous article,* there were two with vitium cordis (cases Auguste K. and Th. G. H.). Among the eleven cases treated by galvanization, reported in this paper, there are six with more or less distinct heart trouble. In all of them the galvanic current exerted a highly beneficial effect. Not only did the gastralgic pains disappear, but very frequently the heart action of the patient took a decided turn for the better. Thus, for instance, Patient Paul W. (Table III, 3), when beginning the galvanic treatment, had an accelerated and intermittent pulse; later on the same became normal as regards frequency and rhythm. Morris S. (Table II, 8) previous to treatment used frequently to suffer from fainting spells after meals; afterward these spells ceased.

It seems, therefore, that the galvanic treatment not only exerts a favorable influence upon the stomach, but that it has a tonic effect upon the heart. According to my opinion, it would be justifiable to give the galvanic treatment a trial in some affections of the heart, even if they are not complicated with gastric disorders. Perhaps they could be treated by the same method of galvanization—*i. e.*, having the negative pole within the stomach. Under all circumstances, however, I would advise administering the galvanic current in every case of gastralgia complicated with affections of the heart.

As a *résumé* of this paper permit me to submit the following conclusions:

A. *Regarding Physiology.*—1. Direct gastrofaradization ordinarily increases gastric secretion, even during the first period after electrization.

2. The absorbent faculty of the stomach is considerably accelerated directly after the gastro-electrization (faradization and galvanization).

* *Loc. cit.*

B. *Therapeutically.*—1. Direct gastro-electrization is a potent agent in the field of chronic (non-malignant) diseases of the stomach.

2. Gastrofaradization appears especially useful in most cases of dilatation of the stomach and enteroptosis; further, in atonic conditions of the cardia (ructus) and pylorus (presence of larger amounts of bile in the stomach), and in chronic gastric catarrh (gastritis chronica glandularis).

3. Gastrogalvanization is almost a sovereign means for combating severe and most obstinate gastralgias, no matter whether their origin is of a nervous nature or caused by a cicatrized ulcer of the stomach.

4. Gastrogalvanization exerts also a favorable influence on several affections of the heart complicated with gastralgia.

107 East Sixty-fifth Street.

I. TABLE OF CASES TREATED BY DIRECT GASTROFARADIZATION.

(From December, 1891, to December, 1892.)

No.	Name.	Age.	Disease.	Principal complaint.	How long sick before electrization.	How long treated.	Result of treatment.	Remarks.
1	Robert P.	28 yrs.	Dilatation of the stomach, combined with hyperacidity.	Fullness, belching, crampy pains, diarrhœa.	About 3 yrs.	4 mos.	Disappearance of all symptoms.	
2	Murray F.	19 yrs.	Do.	Fullness, belching, pains, constipation, despondency.	About 3 yrs.	4 mos.	Greatly improved.	
3	Josef F.	27 yrs.	Do.	Bad taste, pains in the epigastrium, constipation.	About 2 yrs., with free intervals.	1 mo.	Disappearance of symptoms.	
4	Edward K.	63 yrs.	Do.	Belching, crampy pains, diarrhœa, weakness.	About 12 yrs.	3 mos.	Greatly improved.	
5	Aron L.	36 yrs.	Do.	Complete anorexia, weak feeling, constipation.	6 yrs.	3 mos.	Do.	
6	James G.	43 yrs.	Do.	Anorexia, pains after each meal, constipation.	5 yrs.	3 mos.	Disappearance of symptoms.	Eight pounds gained during treatment.
7	Benjamin B. W.	23 yrs.	Do.	Anorexia, pains, constipation.	1 yr.	3 mos.	Do.	Eleven pounds gained during treatment.
8	Johann St.	33 yrs.	Do.	Belching, constipation, burning sensation in the scorbiculum.	12 yrs.	1 mo.	Improved.	
9	Morris G.	24 yrs.	Do. Mitral insufficiency.	Anorexia, belching, pains, constipation.	2 yrs.	1 mo.	Greatly improved.	
10	Gustav K.	26 yrs.	Do. Mitral insufficiency.	Anorexia, belching, pains, weakness.	4 to 5 mos.	1 mo.	Do.	
11	Mrs. S. M.	About 30 yrs.	Hyperacidity.	Burning sensation in the scrobiculus, belching.	4 to 5 mos.	1 mo.	Disappearance of symptoms.	
12	Miss Stella B.	About 34 yrs.	Enteroptosis combined with hyperacidity.	Do.	4 yrs.	6 wks.	Do.	There was real gastroptosis. *Ren mobilis dexter.* Patient before coming under my treatment had undergone for three months the meat and hot-water *régime*. She looked like a skeleton. After four weeks of the electric treatment, gained nineteen pounds.
13	Mrs. Pauline F.	43 yrs.	Do.	Inability to eat, burning sensation after meals, weakness.	2 yrs.	6 wks.	Do.	The gastrodiaphane shows the situation of the stomach between the navel (small curvature) and the symphysis pubis. *Ren mobilis dexter.*
14	Mrs. Henrietta C.	45 yrs.	Enteroptosis combined with hyperacidity.	Anorexia, belching, constipation.	12 yrs.	.....	Improved.	Real gastroptosis.
15	Mrs. Antonia B.	36 yrs.	Enteroptosis, gast. gland. chr.	Anorexia, burning sensation after meals, constipation.	5 yrs.	3 mos.	Disappearance of symptoms.	Eight pounds gained during treatment.
16	Mrs. Gussie W.	34 yrs.	Do.	Do.	4 yrs., with free intervals.	2 mos.	Do.	
17	Mrs. Editha Sch.	35 yrs.	Do.	Anorexia, uncomfortable after meals.	6 yrs.	2 mos.	Do.	
18	Carl Sch.	36 yrs.	Do.	Anorexia, burning sensation in the scrobiculus.	1 yr.	1 mo.	Do.	The examination of the stomach contents revealed after Ewald's test breakfast before undergoing the electric treatment *no* free HCl; two weeks later free HCl was present.
19	Walter C.	28 yrs.	Do.	Poor appetite, belching, bloated feeling in the abdomen.	8 mos.	2 mos.	Do.	Real gastroptosis (gastrodiaphany). *Ren mobilis dexter.* Has gained twelve pounds during treatment. First, no free HCl; afterward, HCl+.
20	Miss Meta Z.	About 30 yrs.	Gast. gland. chr.	Anorexia, heavy feeling in the chest after meals.	5 yrs.	3 mos.	Do.	The gastrodiaphane shows the stomach one finger-width above the navel (small curvature), extending to about two to three finger-widths above the symphysis pubis. *Ren mobilis dexter.* In the beginning, no free HCl; afterward, HCl present.
21	Mrs. L. L. G.	About 40 yrs.	Do.	Anorexia, bad taste, belching, bloated feeling.	2 yrs.	3 mos.	Do.	Ten pounds gained.
22	Chs. H. Alb.	About 44 yrs.	Do.	Poor appetite, epigastric pains after meals.	1 yr.	2 mos.	Do.	
23	Mrs. Cora A.	32 yrs.	Repeating; gast. gland. chr.	Aggravated belching, anorexia, pains.	5 yrs.	2 mos.	Do.	
24	Marx D.	43 yrs.	Do.	Aggravated belching, bulimia, vertigo.	3 mos.	3 wks.	Do.	
25	Aron L.	50 yrs.	Atonia cardiæ et pylori; dilat. ventriculi.	Vomiting, belching, severe gastralgia.	5 yrs.	5 wks.	Do.	When fasting, the stomach contained at the beginning gastric juice and bile; after a while there was no admixture of bile, and later on no fluid, in the stomach when fasting. HCl was present all along.
26	Alfred K.	28 yrs.	Atonia gastro-intestinalis.	Belching, bloated feeling, diarrhœa.	About 1 yr.	2 mos.	Greatly improved.	In the beginning of the treatment one hour after the test breakfast there was no free HCl; after two weeks' treatment HCl was present in normal amount. Patient has gained four pounds.
27	Miss Jennie F.	30 yrs.	Dilatatio ventriculi.	Anorexia, gastralgia.	5 yrs.	3 mos.	Do.	
28	Johann C.	32 yrs.	Dilatatio ventriculi, hyperaciditas.	Belching, poor appetite, often diarrhœa.	3 yrs.	6 wks.	Not much improved.	
29	Henry R.	40 yrs.	Dilatatio ventriculi, gast. gland. chr. Beginning atrophy.	Absolute anorexia, pains after meals.	4 yrs.	3 mos.	Improved.	Besides the stomach trouble there was a vitium cordis. One hour after the test breakfast there was never found free HCl; rennet was present.
30	Harris B.	32 yrs.	Do.	Belching of a very offensive gas, occasionally vomiting.	6 yrs.	6 wks.	Do.	There was no free HCl present one hour after the test breakfast, although the acidity was high, caused by the presence of organic acids. After three weeks' treatment the belching disappeared, the organic acids were less, but free HCl could be detected only after faradization. Upon my advice the patient went South for further recreation.
31	George W. St.	62 yrs.	Anæmia perniciosa? Gastralgia.	Constant pain in the scrobiculus.	1 yr.	3 wks.	Not improved.	

II. TABLE OF CASES FIRST TREATED BY DIRECT FARADIZATION, AND THEN BY DIRECT GALVANIZATION OF THE STOMACH.

(*From December, 1891, to December, 1892.*)

No.	Name.	Age.	Disease.	Principal complaints.	How long sick before undergoing electric treatment.	How long gastro-faradized.	With what result.	How long gastro-galvanized.	Number of galvanic sittings.	Result of treatment.	Remarks.
1	Theodor L.	19 yrs.	Dilatation of the stomach, hyperaciditas, mitral insufficiency.	Belching, severe pains after meals.	6 mos.	1 wk.	Belching disappeared, but the pains persisted.	16 d.	5	Disappearance of symptoms.	
2	Paul F.	33 yrs.	Dilatation of the stomach, erosions of the gastric mucosa; first heart sound not clear.	Continual severe pains in the epigastric region, vertigo occasionally.	1 yr.	2 wks.	Slight amelioration.	25 d.	7	Do.	The examination of the stomach contents one hour after the test breakfast before the electric treatment revealed *no free HCl*, and the acidity was only = 12. In the middle of the treatment free HCl was present, and the acidity = 28.
3	George V. Sk.	About 35 yrs.	Dilatation of the stomach, hyperacidity.	Severe pains, weak feeling, inability to do much mental work.	2 yrs.	6 wks.	Greatly improved, but pains once in a while.	2 mos.	6	Do.	In the beginning of treatment, one hour after the test breakfast: HCl+, acidity = 104; at the end of treatment: HCl+, acidity = 88.
4	David H. H.	42 yrs.	Dilatation of the stomach, hyperacidity, tabes dorsualis incipiens.	Severe gastralgia, poor appetite, weak feeling.	1 yr.	2 wks. and a half.	Improved very little.	2 wks.	3	The pains were less severe.	
5	Adolf F.	33 yrs.	Hypersecretio gastrica continua periodica, dilatation of the stomach, hyperaciditas.	Severe gastralgia, nausea and vomiting spells in the morning, sleeplessness.	2 yrs., with free intervals.	3 wks.	Greatly improved, no vomiting, pains less severe.	6 wks.	5	Disappearance of all symptoms.	The stomach contained when fasting, in the beginning of treatment, about 50 to 60 c. c. of gastric juice. After the third week of treatment it was empty in the fasting condition of the patient.
6	Charles D.	24 yrs.	Hyperaciditas, ructus.	Severe gastralgia, belching, burning sensation in the scrobiculus.	8 mos.	2 wks.	Improved, belching disappeared, less pains.	1 wk.	3	Improved, burning sensation less, only once in a while.	(The patient had to go back, on account of business, to his native city, New Orleans, and was obliged to stop the treatment.)
7	Edwin N. D.	32 yrs.	Gast. gland. chr., with beginning atrophy; dilatation of the stomach, mitral insufficiency.	Gastralgia, belching, weak feeling.	5 yrs.	1 wk.	Less belching, pains same as before.	4 wks.	8	Disappearance of all symptoms.	
8	Morris S.	43 yrs.	Hyperacidity, weak heart, arteriosclerosis.	Fainting spells after meals, constant burning sensation in the epigastric region, gastralgia occasionally, constipation.	5 yrs.	4 d.	No effect whatever.	3 mos.	27	Disappearance of all symptoms.	

III. TABLE OF CASES TREATED ONLY BY DIRECT GALVANIZATION OF THE STOMACH.

(*From December, 1891, to December, 1892.*)

No.	Name.	Age.	Disease.	Principal complaint.	How long sick before the electrization.	How long galvanized.	Number of sittings.	Result of treatment.	Remarks.
1	Albert M.	34 yrs.	Enteroptosis, *ren mobilis dexter*, hyperaciditas, heart sounds not clear.	Severe gastralgia, fainting spells occasionally, constipation.	2 yrs., with free intervals.	2 mos.	12	Disappearance of all symptoms.	Six pounds gained during treatment.
2	Leonard S. R.	30 yrs.	Hyperaciditas.	Severe gastralgia.	3 mos.	5 wks.	12	Do.	Patient had undergone the galvanic treatment with very good result about a year previous to this attack. During last summer patient had much mental strain, and this was probably the cause of relapse.
3	Paul W.	42 yrs.	Gast. gland. chr., dilatation of the stomach, mitral insufficiency, dilatation and hypertrophy of the heart.	Gastralgia, palpitations of the heart, poor appetite, weakness.	About 2 yrs.	2 mos.	16	Do.	When beginning treatment, the pulse was intermittent; two weeks later, regular. The result of examination of stomach contents was previous to galvanic treatment: HCl ?, acidity = 24; one month later: HCl+, acidity = 80.