THESIS

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I hereby certify that this thesis is a result of careful compilation and that my own clinical experience and observation combined with the study of the following works are incorporated in it:

On Diseases of the abdomen, by S.O. Habershon, M.D. etc.

A Manual of Medical Treatment, by I. Burney Yeo, M.D. F.R.C.P.

Functional and Organic Diseases of the Stomach, by Sidney Martin, M.D. etc.
Pentland, 1895.

Diseases of the Digestive Organs, C.O. Ewald,
(Vol II, Stomach)
London, 1892.

Cyclopaedia of Diseases of Children J.M. Keating, M.D., Vol. III
Pentland, 1890.

Medical Society's Proceedings, Vol XI.

Principles and Practice of Medicine, Churchill, 1891.
(Vol. II)

Hilton Fagge

Broadbent, Practitioner, January, 1898.

Allbutt, System of Medicine, London, 1897. (Vol III)

Frederick Taylor (Text Book of Medicine.

Twentieth Century Practice, Vol VIII

The Lygnet, British Medical Journal Vol III

April 20, 1898
Dilatation of the stomach as a disease or the accompaniment or sequel of disease requires definition. Stomachs in normal condition vary enormously in size even in persons of the same size and weight. Herr V. Ziemssen and others are referred to by Ewald (p. 318) as having made moulds, casts and models to demonstrate this fact. The size and shape, then, of the stomach like that of the nose and ears vary in healthy subjects so that there is no absolute standard of size. Habit also determines the size of the stomach in persons of normal health. Gross-feeders who may take per diem, according to Trousseau, as much as 60 to 80 lbs. of food would naturally have a relatively large stomach; so also do those whose food is bulky (potatoes, etc.) in proportion to its nutrient value bring about a considerable development of the stomach. But such a stomach is best described by the term megalogastria. Such a stomach may exist without any functional fault.
or dyspeptic symptom. Its secretory and motor functions may do all that is required of them—the gastric juices being poured out in abundant quantities, the movement of the walls sufficing for mixing the same with the ingesta, the walls absorbing in proper time, the process of digestion being stopped ere pathological fermentation sets in and the ingesta finally passed on into the intestine within normal time. In gasrectasia however, this is not the case. There is deranged activity as well as abnormal dimension. The organ is insufficient for its duties; the process of digestion is delayed and imperfect; fermentation is not checked; absorption is diminished. The organ is anatomically and physiologically at fault.

HISTORICALLY—Clifford Allbutt states in a work published last year—"System of Medicine, Vol. 3—"not a dozen years since, a London physician of almost singular eminence said to me that of dilatation of the stomach, apart from pyloric obstruction he knew nothing", and that is enough to shew that the careful observation of non-obstructive dilatation of the stomach is of comparatively recent date. Bristowe's "Medicine" in its fifth edition, 1884, did not deem it of sufficient definiteness to receive a separate heading whereas by 1893 the smaller work by Frederick Taylor gives the subject a separate heading.
Still, during the last 250 years, from 1625, when Fabricius ab Aquapendente refers to it, onwards the fact of dilated stomach occurring was repeatedly mentioned, though possibly more as a scientific fact than as a clinical one, and the cases mentioned before 1743 were attributed to excessive eating and drinking. In that year Widman mentions Stenosis as a cause of gastric dilatation. Various causes were afterwards recognised before the end of the Eighteenth century by Morgagni, J. Peter Frank etc. In 1833 Duplau (père) discussed the causation and symptoms of the disease, but not until after Kussmaul first used the stomach pump in 1867 and published his famous work in 1869, followed by Penzoldt in 1875 and in this country by Allbutt in 1887 etc. in his paper published among the proceedings of the London Medical Society did the subject receive universal attention from the profession.

CAUSATION - As to the causation of gastric dilatation the authorities are practically agreed but as the causes are many, the classification of them varies considerably. Ewald (p.327) gives two main causes, viz., "Mechanical contraction of the pyloric opening; and absolute or relative weakness of the expulsive power." Broadbent (Practitioner, 1898) gives three main causes (1) obstruction (2) the amount and kind of food taken, together with
the results of imperfect digestion, and (3) atony of the muscular coat of the organ. Habershon (p. 145) makes the following division (1) obstruction, (2) paralysis of the nervous supply—pneumogastric (as mentioned by Traube) and also Vaso—motor nerve, and (3) paralysis of simple over distension. Allbutt (p. 437) gives (1) obstruction, (2) enfeeblement of the function of stomach, chiefly of its motor functions. Under these various headings practically all the various causes are enumerated. Taking a general view of the causes, we might state most if not all of them as follows:

A. Obstructive causes.

1. Stenosis of pylorus.
   (1) Cancerous
   (2) Cicatricial puckering after an old ulcer or after corrosives;
   (3) Fibrous thickening of the pylorus;
   (4) Polypoidal;
   (5) Kinking due to adhesion to gall bladder—
      (British Medical Journal, Jan, 1897)
   (6) Pressure due to tumours of liver, pancreas, etc etc.
   (7) Spasm of pylorus in painful ulcer as referred to by Ewald

2. Stenosis of duodenum due to growths, cicatrix after ulcer, twisting in displacement of stomach, pressure of tumours from
without. Moveable right kidney has been mentioned as a cause, but this is much more likely to be coexistent rather than causal in lax abdomen.

B. NON-OBSTRUCTIVE CAUSES.

1. Due to enfeeblement of muscular coat.

   (1) By ulceration and cancerous infiltration
   (2) By inflammation as in peritonitis, catarrhal gastritis etc.
   (3) Various degenerations, (fatty, colloid, waxy, etc.)
   (4) Venous congestions in liver and heart disease.
   (5) Adhesions due to old peritoneal inflammatory bands,
   (6) Involvement in ascites.
   (5) and (6) act by impairing the free movement of the stomach

   (7) In general constitutional diseases- anaemia, chlorosis, acute rheumatism, pulmonary tuberculosis, influenza, infectious diseases, etc. etc. These cause atony of muscular walls by inducing general weakness, and possibly by their toxic effects.

   (8) Through impairment of the nerves supplying as seen possibly in hysteria and various nervous affections.
2. Due to faults in Contents. Excessive in quantity, or indigestible in quality, or unsuitable in form, for instance, not masticated.

3. Due to faulty chemistry (1) scarcity of one or more of the juices or according to some excess of them especially hyperchlorhydria, (2) stagnation and consequent fermentation of contents leading to formation of gases and acids (lactic, butyric, etc) which weaken and distend the wall.

No matter what may be the primary cause of the dilatation, there will be found a combination of causes aggravating and causing the persistence of the condition in any given case. Whatever tends to the prolongation of the stay of the food in the stomach tends to dilatation. Theoretically, says Allbutt, "atony means dilatation." He is not sure whether, after stenosis, catarrh or primary atony is the commonest cause of dilatation. Since attention has been called to the disease, it is surprising how frequently it is discovered as a factor in delaying convalescence after acute illnesses such as pleurisy, septicaemia, etc, and as a complication in chronic and exhausting illnesses such as phthisis diabetes etc. Bouchard goes the length of saying that it is to be observed in 30% of all such cases and in 80% of chlorotic women, although Ewald thinks he is exaggerating.
Dilatation of the stomach has been observed in patients of all ages, from a few weeks old, to extreme old age. Comby gives 43 cases from ten weeks upwards, Widerhofer gives a girl of 12½ years; Lafage one at 10 and 16 years; Demme at 6½ years; Pauli one at the same age; Allbutt one at 4 and one at 10; Pepper one at 18 months. Naturally in children improper feeding (rachitis) is the chief cause. Towards middle life stenosis is the chief cause. Atonic dilatation is commonest between 30 and 40 years of age. The greatest degree of dilatation is to be observed in stenosis, the stomach then frequently coming right down to the pubes and covering the whole abdomen. The commoner forms of the disease are gradual in their onset, and chronic in their course. Mention, however, should be made of the rare form described by Hilton Fagge (Guy's Hospital Reports, 1872-3) under another name of acute dilatation of the stomach but better termed according to Fagge himself in the third edition (1891) of his text book of Medicine "acute paralytic distension". His cases were those of men of 30 and 20 years of age respectively in both of whom the stomach became suddenly overwhelmed and filled with fluid probably from its own walls. Vomiting, pain, anuria, collapse, were the leading symptoms in both. One died unrelieved, and the other four hours after
removal of seven pints of fluid from the stomach by means of the stomach pump. In both the stomach P.M. shrank to its original size, and shewed lines like lineae gravidarum. This form is probably very rare, but Allbutt states that Andral, Endmann, Kundrat, Oser, Boas, Peebles, etc., report somewhat similar cases. As such a form supervenes upon other diseases, such as acute rheumatism, etc., Allbutt naturally asks if it be a toxic neuritis or myositis that brings it about? Pagge himself gives the following physical characters which indicate acute paralytic distension of the stomach during life—"(1) A rapidly increasing distension of the abdomen, which is unsymmetrical, the left hypochondrium being full, while the right is comparatively flattened. (2) The presence of a surface marking which descends obliquely from the left hypochondrium towards the umbilicus, and which corresponds with the lesser curvature of the stomach. This seems to move up and down each time the patient breathes. (3) Dulness and fluctuation in the pubic region with resonance over the front of the abdomen. (4) The production of a splashing sound on manipulation. It is to be observed, however, that in one of my cases the first two of these signs were absent." (p.158).

The chronic form therefore is more common. If it
be due to constitutional debility as after or during an exhausting illness, the fault lies in muscular force, but if it be due to a local condition, for instance, catarrh, then the secretory function is mainly at fault. In the former the ingesta are delayed in the stomach until organic acids of an irritating character are formed, and these further weaken an already weakened muscular wall, and gases are formed which further develop the condition by distending the enfeebled muscular coat beyond its power of recovery. In the latter the imperfections of the secretions allow of fermentation which leads to dilatation by distension. Catarrh may cause dilatation and be caused by dilatation, or as Allbutt aptly puts it "dilatation, then is variously associated with catarrh as cause, concomitant or consequent". In dealing with the SYMPTOMS of dilatation, one must not forget the symptoms of the original disease which leads to it. The patient may complain of no characteristic symptom, physical examination alone gives one certainty in his diagnosis. There will generally be the usual dyspeptic symptoms—fickleness or feebleness of appetite, dulness, tired feeling, pallor, thirst, chilliness, vomiting, etc. etc., We may deal more minutely with symptoms:

**VOMITING** is a frequent but not constant symptom. The more advanced the dilatation, the less
frequent the vomiting. Several meals may be taken or even several days may elapse between the attacks of vomiting. Of course the less often it occurs the larger its volume. Constant vomiting in small quantities of acid eructations is not in favour of a diagnosis of dilatation. In dilatation the irritation must be very considerable to excite the reflexes of the apathetic and impaired stomach. The vomiting occurs when the acidity due to organic acids - the products of fermentation - becomes so intense that the reflexes are excited. The abdominal wall does most of the work in vomiting. The quantity is often enormous; 16 lbs. in the case of Blumenthal. The presence in the vomit of bits of food taken some time before is very characteristic of dilatation, for instance, Broadbent (p.13) relates how a piece of ginger eaten three months previously was discovered; Ritter states that cherry stones eaten a year before were ejected from a case of his.

The vomited matter is generally fermented, if allowed to stand it settles in three layers, the upper frothy, the middle brownish or turbid fluid, and the lower alimentary fragments. It smells offensive, its reaction is acid, due to hydrochloric acid (in non-cancerous cases), lactic, acetic, and butyric acids, Sarcinae, yeast-fungus- spores, and
other bacteria are present; probably also "certain poisonous products" (Allbutt). If the stenosis be in the duodenum there may be bile present, and if due to cancer, or ulcer, blood may be discovered.

**PAIN** may be due to painful cause of dilatation, such as cancer, and is not often due in a severe form to dilatation itself. In dilatation there is a sense of fullness and weight in the epigastrium rather than pain of the ordinary kind that is felt. When a burning pain precedes vomiting, it is due to the products of fermentation (Sidney Martin). When the stomach is sunk, the pain is felt round the umbilicus.

**THIRST** is generally present because absorption from the stomach is practically at a standstill.

**URINE** is scanty, and the specific gravity high, for the same reason as thirst is severe. Usually it is deficient in chlorides (Allbutt), it contains ethereal hydrogen sulphates (Sidney Martin), is often alkaline, and contains triple phosphates.

**BOWELS** are usually persistently constipated for the same reason that the urine is scanty, and also through the absence of the usual reflex stimulus which the stomach exerts upon the intestine during digestion. Broadbent (p.12) mentions a case of diarrhoea in a lady of 36 years of age whose stomach was dilated owing to pyloric thickening.
In the upright position the stomach could not empty itself, but in the horizontal position it could and did pour its contents into the intestine and thus bring on nightly attacks of diarrhoea. The upright position caused a curving of the PULSE is slow; TEMPERATURE low, though Penzoldt saw an evening rise in two cases; EMACIATION marked, and all because digestion and absorption are impaired.

NERVOUS SYMPTOMS are specially dwelt upon by Allbutt (p.501-2), these being depression, gloom, fretfulness, sleeplessness, headaches, nightmares, syncope, tetany, convulsions, - more or less of these occur in most cases. Broadbent (p.143) mentions a case occurring after eating an ice on an empty stomach. There was violent epigastric pain and severe tetany, especially of the flexor muscles. Kussmaul was the first to point this tetany out, and he thought it was due to a drying of the tissues similar to that which occurs in cholera, but Boushard followed by Allbutt and others refers it to auto-infection due either to poisonous products produced in the stomach or unneutralised by the stomach in its inefficient condition. Experiments in dogs (e.g. Zerhany-Kaiser), shew that when the stomach is removed foul flesh placed in the intestine poisons the animals probably because of the loss of the neutralising work of the stomach. Bungar's view that the stomach protects
and the intestine digests supports this view. Alcohol either helps to form these poisons or facilitates their absorption, and therefore should not be prescribed in this condition. Lavage ends disastrously in some of these cases possibly by facilitating absorption when the pressure within the stomach is reduced. However, there is no certain knowledge as yet as to how these nervous phenomena are caused in dilatation of the stomach. Bouchard describes an ARTHRITIS and Broadbent an nettle rash which sometimes occurs in these cases. These probably are due to the same cause as the nervous phenomena. Will they be analogous to those which the writer and others have experienced after the injection of anti-toxin in diphtheria—a kind of neuritis due to some impurity in the anti-toxin?

INDIRECT SYMPTOMS are observed, such as (1) palpitation of the heart due to disturbance of that organ by the enlarged stomach. Broadbent gives several cases (p.19-20) in which gastric dilatation brought a feeble heart to an untimely standstill for ever; (2) Anginoid pain coming on during repose and not during exercise as in true angina. The pulse is full and soft between these attacks (Broadbent, p.17); (3) Sleeplessness after the first sleep is disturbed by nightmare or palpitation; (4) Vertigo in rising, etc., etc.,
PHYSICAL SIGNS of dilatation of the stomach are of the utmost importance in the diagnosis of the condition. The diagnosis is never proved to be right, except when confirmed by physical signs.

1. INSPECTION.

The prominence of the organ will depend on the degree of the distension caused by its contents whether gaseous, liquid, or solid. This is best seen in persons with a thin abdominal wall. The position of the prominence will depend upon the degree of the dilatation and also upon the amount of the distension of the dilated organ at the time the examination is made; for instance, “in moderate degrees of dilatation there is a prominence in the lower epigastric and upper umbilical regions, rounded and ill-defined; but when the dilatation is great, the stomach sinks somewhat and the upper edge of the prominence is sometimes well defined by a groove extending from just above the umbilicus and upwards towards the left hypochondrium. This groove marks the lesser curvature. The lower limit of the swelling is often not so well defined, gradually fading off into the hypogastrium, but in most cases it is also well marked by a groove which is situated transversely below the umbilicus and midway between this and the pubes. This marks the
greater curvature. It is not a straight transverse
groove, but towards the left lumbar region turns
upwards to the left hypochondrium" (Sidney Martin,
p.387). In a largely dilated stomach which contains
but a small amount of fluid at the time of
inspection, a swelling may be observed at the most
dependent part of the greater curvature, and
often even in the right iliac fossa, and this
can be made to change its position by rolling
the patient over to the other side, thus shewing
that the liquid is in a free space.

Movements caused by peristalsis are frequently
observed or they may be induced by pressure etc.
from without, "peristaltic waves in regular succes-
sion are caused by mechanical irritation from
without, may pass across the stomach from left
to right, while anti-peristaltic movements, too,
may make their appearance (Bamberger, Cahn, Glax)"
(Ewald, p.320) As first pointed out by J.F.
Frank this peristalsis is more or less pathogno-
monic of stenotic dilatation and is thus of value
to differentiate between it and the artonic form.

As AIDS to inspection various methods have been
adopted to make the outline of the dilated
organ more distinct. This is more necessary in
persons with thick abdominal walls. Leube used a
sound which he has since discarded. Frerichs sugges-
ted and Von. Ziemssen etc.etc. used carbonic
acid gas produced in the stomach by administering ten to twenty grains of bi-carbonate of soda and the corresponding amount of tartaric acid. Allbutt (p. 504) has "found it a simpler and better plan to pump air into the stomach by means of the syphon tube". Oser and Rüebner recommend it. If there be no stenosis the gas or air may escape without causing the distension sought, or the air pumped in may escape along the tube. Similarly liquids may be introduced for the same purpose. There is need of caution with gas, air, and fluid, as a sudden embarrassment of the heart may occur, and in view of this, a method (pump) that permits of the withdrawal of the gas or water is preferable to that of evolving the gas by administering an alkali and an acid.

2. PALPATION may succeed if skilfully applied where the eye fails. The organ may give a cushion-like sensation; peristaltic waves may be detected. When there is fluid present and the abdominal wall is slack fluctuation may be detected and its lowest level gives the lowest margin of the stomach. But the chief use of palpation is to produce the characteristic splashing sound (bruit de clapotement). The horizontal position is best suited to bring this out. It requires lax abdomen, and the presence of fluid and
gas before it can be brought out. These, however, are conditions found even in health. Its persistence, however, and its presence long after any food has been taken aid in our diagnosis, "Practice alone will enable the physician to distinguish between mimic squelches (of normal stomach and colon) and the unmistakeable splash (Allbutt, p. 505). Ewald (p. 324) mentions the use Leube made of the point of the stomach sound as an aid to palpation. But in the stout it can scarcely be felt, and in the lean it is not necessary.

3. **PERCUSSION** is often of value, but frequently does not help even skilled observers as it is no easy matter to distinguish the stomach note from that of the adjacent intestine. The note is usually tympanitic, sometimes somewhat metallic in character. If the patient stands up, a dull note is given over the most dependent part where the fluid gravitates. This dull area may be increased by giving water to drink or reduced by withdrawing the same by means of the stomach tube. Pumping in air will aid us considerably in percussion. A large spleen in fevers or an enlargement of the liver may cover the stomach and conceal it from us in percussing. In Allbutt's (p. 506) opinion "there is little to be learned from percussion of the stomach which is not better learned from inspection and manipulation? Percussion
of the upper limit is often useful in cases where the diaphragm is pushed upwards and cardiac irregularity etc. may be due to that cause, and in cases where a degree of downward displacement of the organ is suspected.

4. **AUSCULTATION.** A dilated organ when distended with gas may give the cardiac sounds a metallic character. There may be heard a fine bubbling sound over the stomach like that of a newly opened aerated water bottle, as was first pointed out by Pauli (Ewald, p.325), the bubbling being presumably due to fermentation. But Auscultation according to Allbutt (p.506) and Sidney Martin (p.389) is of little value in the recognition of dilated stomach. Splashing may be heard by auscultation or the falling of water into the dilated organ upon the patient drinking (Martin). In the upright position. Unless special methods be adopted to guard against attributing to the stomach what is heard in the intestines through the stethoscope, there will be danger of diagnosing dilatation in most dyspeptics, and in 30% of those suffering from all other diseases as was done by Bouchard. Broadbent (p.24) mentions the fact that there is a characteristic tympanitic resonance which accompanies the second sound of the heart, and is heard over the whole area of resonance, but is lost as soon as you cross from the stomach to
the colon. This I have not been able to verify.

**DIAGNOSIS** is accomplished by comparing the results obtained from (1) the symptoms and history, (2) the physical signs and characteristics, and (3) an examination of the contents of the stomach at different times, especially for portions of meals long since taken, and for organic acids produced by fermentation. (4) Testing the rate of absorption by means of iodide of potassium and salol.

The vomiting long after meals, and after long intervals, of enormous quantities of matter as already described, is the most prominent symptom. The physical signs, etc., have already been dwelt upon, and when they shew a stomach that extends upwards to the fifth space or higher and downwards beyond the umbilicus, there can be no doubt of the condition existing especially if there can be withdrawn from the organ food that ought to have (under normal conditions) been digested hours before.

"Gastro-diaphany as practised by Einhorn, Reichmann, and Hering, does not seem to promise much so far" (Allbutt, p. 508). I have never seen it tried.

The differential diagnosis of the causation of the dilatation while it must be acknowledged to be of supreme importance both from the point of view of prognosis and that of treatment — more es-
pecially surgical treatment, we must leave undisussed in this thesis and only state that very extensive dilatation is usually due to stenosis; whether malignant or non-malignant has further to be determined by the absence or presence of Hydrochloric acid, the presence or absence of blood, a tumour, character of pain, etc. etc. whereas the \textit{a}otic dilatation is generally not so extensive. An exploratory incision under anaesthetic conditions is becoming more and more common for diagnostic purposes.

\textbf{THE PROGNOSIS} depends upon the (1) primary cause,—of the stenotic forms the noncancerous being more hopeful than the cancerous; (2) the degree of the dilatation,—the very extensive forms being very obstinate and usually incurable; (3) the time when the disease is discovered, the early diagnosis of the non-malignant forms, especially the \textit{a}otic forms being much more hopeful that treatment will prove beneficial.

\textbf{TREATMENT}

Prophylactic treatment should be directed towards attending to the teeth so as to facilitate mastication, to avoid overeating and drinking, to the early treatment of gastric catarrh, etc. As to the treatment of the disease when already fully developed Ewald (p.357) states that one should have two objects in view :—

"(1) By a carefully chosen diet and appropriate
medication to facilitate and promote the gastric digestion so far as possible and at times to supply the organism with nourishment in other ways.

(2) To prevent the stagnation of the contents of the stomach, to cause them to pass in either an upward or downward direction, and to check the fermentative processes which are developed in the stomach.

Burney Yeo (p.102) gives the indications for treatment under four heads, which are practically included under Ewald's comprehensive two

"(1) to remove the decomposing residue of food and to cleanse the stomach,

(2) To prevent putrid fermentation by antiseptics and by other means, such as careful dieting,

(3) To impart tone to the feeble muscular walls of the stomach, to promote gastric digestion, and to supply nourishment if necessary, in other ways,

(4) To remove constipation.

We will begin with the DIET. Allbutt (p.510) advocates the use of the syphon after test meals of cold meat and bread for diagnostic purposes, so as to enable one to judge of the rate of digestion (and thus to decide upon the frequency of meals), the activity and efficiency of the gastric juice (and thus determine the amount and kind of
food) and finally the presence and amount of catarrh (and thus settle the character of the diet, the method of feeding and the prescribing of drugs).

The diet should be as dry, concentrated, digestible, and nutritious as possible, so as to get the maximum of good with the minimum of expenditure of energy. "Fluids should be restricted as much as possible" says Ewald (p.357) and wisely so for they dilute gastric juice and delay digestion both in that manner and by their weight. If the thirst be great, the rectum can be utilised for absorbing the water required without taxing the impaired organ; or small quantities, 3 to 4 ozs. of warm water may be taken about one hour before meals, or alkaline mineral waters such as Vichy, Vals, or Apollinaris may be taken. These are especially useful if there be catarrh present. Milk is well borne by some patients, though not as a rule, and therefore Ewald (p.357) says "I only allow a small quantity of milk, from a tea to a table spoonful taken at short intervals".

As to frequency of meals the time allowed to elapse between them should be largely determined by the rate of digestion. Certainly they should not be too often.

What foods are best? Ewald, Allbutt and Yeo speak well of unsweetened condensed milk, meat juices,
and essences, fresh meat, tender and not over cooked, the more delicate fish and eggs. The greater the tendency to fermentation the less the amount of carbo-hydrates and, as in most kinds of dyspepsia, one kind of vegetable at the time agrees best, Ewald allows some wine, Allbutt old spirits, but Yeo while recommending pure water, allows a little weak diluted red wine. But after what was said under "nervous symptoms" no alcohol at all would appear to be best. If stenosis be well marked, nitrogenous food should be the sole food (Ewald, p 104) because it can be absorbed by the stomach.
Yeo advocates the taking of animal food at separate meals from vegetables. The rectum can be used to aid the system by means of nutrient enemata, and in atonic cases, at the commencement of treatment this method of feeding should be adopted to give the stomach absolute rest. Of sugar, fat, butter, fruits, vegetables, etc., on account of their tendency to fermentation and their bulk, for the amount of nourishment they contain, the less the better.
Burney Yeo gives the following dietary:
7-30 a.m. - a small teacup full of hot water.
8 a.m. Breakfast. Two poached eggs, or a small grilled sole, flavoured with lemon juice, 1 oz. of thin toast, followed by two to four ozs. of beverage, water, or hot milk and water if milk
agrees.

1.30 p.m. and 7.30 p.m. the same as 7.30 a.m.

2 p.m. Luncheon - Four ozs. of boiled rice, or tapioca or sago, with a little milk jelly; or macaroni with a little grated cheese; four ozs. of water, or weak brandy and water (A little cream may be used in preparing luncheon)

8 p.m. The lean of a mutton-chop, or a slice of the lean of roast or boiled mutton, or chicken, or roast beef (not more than three ozs.); one oz. of purée of potatoes, one oz. of dry toast; four ozs. of water, or weak brandy and water.

11 p.m. Half a tumbler full of Vichy water.

A cup of milk and water (Vichy) or of cold beef tea may be taken during the night, if the need for food be felt.

This dietary admits of obvious variations in accordance with the principles laid down.

DRUGS are used for various purposes in this condition. (1) to empty the stomach and counteract constipation. Dr. Hare (London Medical Society's Trans., Vol. 11, p. 20) used 24 grains of ipecac, but when the muscular tone of the organ is affected it is better to give for that purpose Carlsbad water every half hour early in the morning, until there is some movement of the bowel. Ewald (p. 359) states that Panzoldt demonstrated the usefulness of this and Yeo in approving it adds that it is af
special service in catarrh. Ewald has given aloine hypodermically for this purpose, and he mentions (p.359) Kussmaul's drastic pills of colocynth, rhei, aloes, and scammony.

(2) To improve the tone of the muscular coat of the stomach and promote secretion. Ergotin, nux vomica, and best of all, strychnia, are useful.

(3) To aid digestion and for partially checking fermentation hydrochloric acid has been commended by Ewald (p.358) in cases which do not proceed from atony. Combined with pepsin, this drug has many advocates (Yeo,p.107).

(4) To check fermentation. Ewald recommends salicylate of bismuth, creasote "a remedy used by Mannikopff as early as 1861. Carboolic acid was MINKOUSKI'S favourite (vide Ewald), and salicylate of soda Dr. Mc.Naught's (vide Ewald). Thymol, chloroform, sod. sulpho-carbolate (Broadbant), small doses of calomel (Carter) and a host of other antiseptics have been recommended. Thymol sulphite and sodum 5 the drug I have found most serviceable.

ELECTRICITY especially the faradics has been of use according to Yeo, but Allbutt has yet to be convinced that it has been serviceable whatever may be the case in the future. Ewald claims (p.362) that the experiments with salol made by Sievers and himself and by Einhorn have proved that the passage of the gastric contents into the intestines is much accelerated by energetic external faradisation.
in the region of the stomach and Brunner has supported this. Ewald is of opinion that when the electrodes are applied one in the stomach and one on the abdominal wall even better results will be obtained.

**MASSAGE** is well spoken of by Allbutt (p.514) "In two cases he witnessed something like a cure by its means". Whether it pulls the organs together, or aids in evacuating it as claimed by Zabludowski is not demonstrated to Allbutt's satisfaction. Yeo (p.106), believes that it does all this. Ewald says that he regards massage and faradisation as useful adjuncts to lavage (p.361)

**LAVAGE** or syphonage or washing out the stomach by the stomach pump or syphon is a method too well known to require description. Ewald (p.360) says and all the authorities join in the chorus, "that the advantages resulting from this method are evident and the only wonder is that it was not made use of earlier". Zeube quoted by Yeo says that "all other remedies sink by comparison into the second and third rank". Yeo states "this radical measure when it is well tolerated by the patient is no doubt one of the most efficacious of curative processes". Ebstein has used it even to infants under a year old. Allbutt was its chief advocate in England at the start, and
his tribute to it in his latest essay is "both from the point of view of treatment and of diagnosis lavage of the stomach is a most valuable agent (p.511)

The instrument. The pump was first used, but soon after the syphon followed. The eye of the syphon is not so readily cleared as that of the pump, but that of the pump is more likely by suction to injure the lining membrane of the stomach.

"The syphon is a much safer and convenient weapon than the pump" (Allbutt,p.512).

The fluid used should be luke warm—a final dash of cold water might be useful to incite contraction of the organ. Allbutt has all but given up the use of disinfectants in the water. "Salicylic acid, hypho sulphite of sodium, borax, naphthaline, resorcin, permanganate of potash, chloroform water, etc. are mentioned by Ewald (p.360). A slightly alkaline fluid (say two grains per oz. of sod. bicarb. Yeo) is very useful, especially if there be much catarrh and slimy mucus to remove.

The object of it is to remove accumulations, check fermentation, cleanse the mucous membrane, stimulate muscular contraction.

Precautions. Care should be taken less the tube is swallowed—an accident which has repeatedly occurred. Gentleness should be used in the passing of the tube.
Frequency. Once a day will generally be found adequate, and after a while, every three or four days.

Time. The first thing in the morning is most approved of, because by that time the stomach will have absorbed or driven into the intestines all that it can, and it is a suitable time to give the organ a cleansing before facing another day's work.

Dangers. Absorption of toxic contents may take place and end fatally upon removal of the tension, although Ewald has not accepted as being propter hoc.

The patient relying on the tube may become more careless as to his diet.

Counter indications. it should be discontinued if its introduction causes distress, vomiting, etc., of an aggravated character; also in great debility, ulcer, recent haematemesis, cancer of cardiac end, or of oesophagus, aortic aneurism, etc. etc.

Results. "In some immediate relief and ultimate cure are observed, in others we find more or less speedy relief, but frequent relapses, requiring re-application of the treatment; there are other cases in which recovery is slow and gradual and the treatment necessarily prolonged and tedious; others in which benefit attends the application of this method but it has to be continued for the
remainder of the patient's life; and others in which no benefit is obtained" (Yeo, p.116).

"But this much is certain, that in no other branch of the entire treatment of gastric diseases may such brilliant results be obtained, as in the treatment of protracted dilatation of the stomach. The disgusting vomiting, the feeling of oppression, eructation, dyspeptic difficulties, and cerebral symptoms all disappear or are much diminished. Unfortunately in cases of dilatation proper these are only palliative results." (Ewald p.360-1)

**Surgical Treatment** does not come within our scope, and we will only mention a few facts. Ewald (p.362) refers to Hubert's account of Loreta's forcible digital dilatation of cicatricial stricture of the pylorus which were said to have completely cured the condition and also too Heinecke's and Mikalicz method of cutting the stricture lengthways and stitching it up crossways which has been done with good effect.

Gastro-enterostomy has also been performed for simple dilatation of the stomach and in malignant disease of the pylorus and in both with results temporarily at any rate—several cases having done well for years. In 1887 Dr. Ewart and Mr. Bennett gave an account of their taking in a reef in a large stomach—an operation prophesied by Ewald (p.363) as being a very likely one.