Atonia gastrica (abdominal relaxation) / by Achilles Rose, M.D. and Robert Coleman Kemp, M.D.

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Rose, Achilles, 1839-1916.
Kemp, Robert Coleman, 1865-
Augustus Long Health Sciences Library

Publication/Creation

New York London : Funk & Wagnalls Company, 1905.

Persistent URL

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To Professor Frederick S. Lee

with the Compliments of

Robert Coleman Kemp

ATONIA GASTRICA

Atonia Gastrica

(*Abdominal Relaxation*)

By

ACHILLES ROSE, M.D.

and

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FUNK & WAGNALLS COMPANY

NEW YORK AND LONDON

1905

[Printed in the United States of America]
Published April, 1905

PREFACE

THE object of this book is to present facts which demonstrate the relations of abdominal relaxation to a number of pathological conditions, and to show the importance of these relations in regard to the etiology, pathology, and therapy of diseases of the stomach, the abdominal organs in general, the organs of respiration, of circulation, and the nervous system.

A new phase in the study of diseases of the stomach presented itself when the significance of the splashing sound was interpreted, and the results obtained by the method of relieving atonia gastrica by means of an adhesive plaster belt have been in many respects remarkable.

This belt is something more than such a support as is given by an ordinary abdominal supporter or bandage, for it exerts an effect on circulation and innervation which can only be

compared to that of a plaster-of-Paris dressing in cases of fracture or arthritis.

It is an established fact now that not only anomalous motoric functions, but also secretory disorders of the stomach may be corrected by this simple means. By its effect on circulation and innervation it will relieve dysmenorrhea and pain in cases of cholelithiasis.

During the short time the method has been adopted a number of indications for its employment have been discovered, and many more will be found by further observations, for there can be no doubt that it is most important to restore the tonus of the abdominal muscles in many gynecological affections, especially in cases of uterine hemorrhage, and for this purpose no better means can be imagined than the abdominal belt of adhesive plaster.

Again, the early treatment of gastroptosia by means of this belt may prove a prophylactic against the occurrence of different forms of abdominal or inguinal hernia, as it is certainly a most rational prophylactic against the formation of gall-stones.

For theoretical reasons it suggests itself as a prophylactic against perityphlitis, barbarously called by a horrible name.

Certain observations, not completed yet, point to its usefulness in some cases of acne rosacea and also of tachycardia.

Our medical onomatology is to a great extent corrupt, illiterate, ridiculous, absurd; and this condition has caused confusion, as we notice in the case of the wrong interpretation of the simple word atonia.

Well has Adamantios Korais said:

*Νομίζω ὅτι ἡ διαφθορὰ τῆς γλώσσης εἶναι συγγενὴς νόσος τῆς διαφθορᾶς τῶν ἠθῶν καὶ κατὰ τοὺς Ἱπποκρατικοὺς κανόνας ζητεῖ καὶ συγγενῆ καί παρομοίαν θεραπείαν.**

With the introduction of more and more new compounds, more and more irregularities came into our onomatology, because, so long as Greek was considered a dead language, no exact rules could be formulated to control the formation

* I consider that the corruption of language is a disease closely allied to corruption of manners and demands also, according to the Hippocratic canons, a similar course of curative treatment.

of the new compounds which have to be constructed. In the case of Latin there exists no authority, that is, no people, who can decide whether a new Latin compound is correct; and in the case of Greek, the Greeks who really could decide have not been and, as yet, are not considered. The Greeks do not adopt, with the constantly imported foreign ideas, the connotative words also of foreign peoples. They refuse to have a hybrid language. Their history, their national pride, lead them to exclude foreign words, and to take only such necessary elements from the ancient Greek as enable them to create new symbols for new ideas. When constructions and forms have been remodeled after the old Greek, incorrect elements, when discovered, are extirpated with ever-increasing strictness and tact. Before a new formation is introduced into the regular language it has to stand a severe test and criticism. Nothing will be accepted and grafted into the regular language which deviates in any way from the genius of the Attic tongue.

Comparing the active measures taken by the

Greeks against the corruption of their language with the wanton barbarisms of our nomenclators, we are forced to the conclusion that the only way to purify our onomatology is to consult our Greek colleagues of the University of Athens. We need not fear that any terms recommended by them will be contrary to the spirit and form of classical Attic.

The Greek of to-day, as taught in the schools throughout Greece, and employed as the official language of the Government of Greece, is pure Attic, as pure as ever was. It is the immortal Greek in all its youth and beauty, free from foreign elements.

It is necessary to emphasize this fact because our college professors, with the rare exception of some excellent college men and colleges in America, are bound, as in a conspiracy, to suppress this truth; and this conspiracy indeed is the cause of our corrupt onomatology.

CONTENTS

ILLUSTRATIONS

ATONIA GASTRICA

ATONIA GASTRICA

I

ON THE SIGNIFICANCE OF THE SPLASHING SOUND OF THE STOMACH

The splashing sounds of the stomach are produced when water and air are agitated together, when either the whole body or the stomach alone is shaken. The latter is done when we tap with the fingers on the relaxed abdominal walls over the stomach. To obtain the splashing sound by means of such tapping the patient must be in the recumbent position. The sound, however, can also be produced by shaking the whole body while the patient stands upright.

The phenomenon in question can be elicited in many people of ordinary good health shortly after they have taken liquids or fluid food. But,

notwithstanding the ordinary good health, a stomach from which this splashing sound can be produced is not in normal condition; for in normal condition we can not, even at the height of digestion, elicit a splashing sound, because the stomach closes concentrically about its contents, the organ being adapted to the volume of the ingesta. This peristole exists as long as the reflectory tonus of the gastric muscles remains intact.

Wherever we can elicit this splashing sound, we have before us relaxation or atony of the stomach.

In regard to those peculiar splashing, gurgling, or croaking noises of the stomach which some persons can develop by means of abdominal pressure, and which excite the attention of laymen, and even of some physicians, Kussmaul says: "There are many persons, whose stomachs are either of normal dimensions or dilated, who have attained great skill in causing such noises. By means of their abdominal muscles they make a horrid music with every contraction or expansion of the abdominal wall, a music

which can be heard at some distance. It is a cooing, croaking, belching sound, and receives the most fantastic explanations; the presence of live frogs in the stomach and the like is sometimes thought of. In hypochondriacs it gives rise to somber imaginations, and hysterical persons take advantage of it to create a sensation or admiration by such ventriloquism."

Baradat de Lacaze,* on examining patients from different wards who did not suffer from gastric disorders, found that he could produce the splashing sound regularly for two hours after liquid food had been ingested, and for six hours after full meals composed of both liquid and solid food. As we shall see presently, my own observations, made on a hundred patients, do not correspond with the results obtained by this author.

Oser † observed that in cases of gastric atony the fluctuation of small waves could be elicited for four or five hours after a full meal, and Bar-

*"Étude sur le bruit de clapotage." Thèse de Paris, 1884.

†"Die Ursachen der Magenerweiterung," Wiener Klinik, 1881.

adat de Lacaze stated that the splashing sound could be produced for two hours after small meals, and as long as six or seven hours after full meals, in all cases in which the passage of food from the stomach was retarded.

Malibran questions whether this symptom is necessarily pathological; still, he admits its significance if it continues under certain conditions.

The same author remarks that during infancy the splashing sound can be produced in the large intestine if distended by gas; that it can not be exactly localized by the ear in cases of infants. He denies that the splashing sound of the stomach and the gurgling noise of the intestine in infants can be distinguished with certainty. He also reports six cases in which the autopsy had shown the possibility of error in this regard. In these six cases the splashing sound had been produced during life in the colon half filled with semi-liquid fecal matter.

When the new methods of examination of the stomach were first introduced, it was assumed that the splashing sound elicited below the um-

bilicus in dyspeptic persons meant dilatation of the stomach. And this was correct.

By the term dilatation of the stomach, *ectasis ventriculi*, most authors at present understand a typical condition in which the food stagnates in the stomach, in which the ingesta taken the day previously, or before, are found on washing out the stomach in the morning.

Einhorn * has enumerated the terms used by different authors to designate a pathological condition of the stomach which not only comprises an anatomical feature, as the word dilatation implies, but which is characterized by a much more important lesion of the mechanical functions of that organ. These terms are: "dilatation of the stomach," "anatomical and clinical dilatation of the stomach," "*ectasis*† *ventriculi*," "insufficiency of the stomach," "gastric insufficiency of the first and second degree." He himself uses the word "ischochymia" (ἴσχειν, to retain, and χυμός, chyme) for

*"Diagnosis and Treatment of Stenosis of the Pylorus." Medical Record, January 19, 1895.

† Ectasia is ungrammatical. The word is ectasis.

a prolonged stagnation of chyme in the stomach, to designate a complex of symptoms without stating the cause.

Since we, for clinical purposes, distinguish between dilatation and atony of the stomach, the phenomenon of this splashing sound alone does not suffice to indicate dilatation, or atony as clinically understood. It is, however, important for determining the lower border of the stomach, the low position of the organ when exceptional causes, such as tumors, can be excluded. It is of diagnostic importance, as it indicates relaxation of the muscles of the stomach in cases in which it can be easily produced over a large area. If found while the stomach is free of food it is, except in instances of continuous supersecretion, a means of diagnosticating *ectasis gastrica*.

Moreover, atonia gastrica, gastroptosia, and dilatation of the stomach are identical, and if we keep this fact in view we shall succeed in doing away with the *tobu wabohu* in the writings of many authors in regard to these terms.

Relaxation of the muscles of the stomach

means that the stomach does not contract around its contents, that the muscles follow the pressure, *i.e.*, the weight of the ingesta, and this is gastroptosia.

Relaxation of the fibers of the muscles means elongation of the fibers, and therefore dilatation of the stomach.

Kemp's distinction between gastroptosia and dilatation of the stomach is as follows: In dilatation the lesser curvature retains its relation to the diaphragm. The distance between the lesser and the greater curvature is increased, but the lesser curvature still maintains its relation to the diaphragm, with the exception that the pyloric end may extend farther over and somewhat farther down; but, in the main, this rule holds good, and it can be looked upon as a differential point between gastroptosia and stomach dilatation.

Kemp is quite correct. Gastroptosia is a lowered position of the pylorus and of the lesser curvature. The definition of the lower border of the stomach alone is not diagnostic, since this may be merely the characteristic symptom

of a large stomach. When we have to distinguish between ectasis and ptosis, we must know the position of the lesser curvature; without such knowledge, neither a general increase of volume, nor an abnormally lower position of the stomach, nor a combination of both, can be diagnosticated. Gastroptosia can best be diagnosticated by means of Kemp's circumscribing gastrodiaphane.

Kussmaul was the first who called attention to the descent and the vertical position, as well as to the loop form of the stomach.

A complete descent of the entire stomach is not possible, since the cardiac orifice can not change its position in the region of the twelfth thoracic rib.

The word atonia is the pure Greek *ἀτονία*, and means relaxation. It does not mean motor insufficiency, as some will have it.

Stiller uses the word atonia in its proper meaning. Elsner says: "What immense confusion will happen if the generally adopted understanding that atonia gastrica is motor insufficiency of the muscles of the stomach shall be

abandoned." We shall see how, on the contrary, great confusion will be cleared up by calling the thing by its right name.

Some author says: "The descriptions in the books of the symptoms of gastroptosis" (the correct word is gastroptosia) "are hopelessly obscure and chaotic, characteristic and diagnostic points are few, and these few misleading." To this I wish to say that the symptoms in gastroptosia are manifold and numerous, but if we keep in view that there is only one factor, and that factor is relaxation, we have a characteristic point, and one which is not misleading, but indicates at once a rational method of treatment, which in most, if not in all, cases will cause the symptoms to disappear or become modified. How all the difficulty, the hopelessly obscure chaos of which the author in question complains has been brought into the medical world, like many other similar conditions, solely by our unscientific, misleading onomatothesia, the readers may judge for themselves.

Ewald, after describing the symptoms which are produced by stagnation of the contents of the

stomach, says: "In such cases we have to deal with motor insufficiency, or, as some older writers call it, atony of the stomach, which in general, however, causes less intense symptoms—altho they may become intensified in some cases."

Boas asserts that atonia gastrica, myasthenia gastrica, and mechanical insufficiency have been employed as synonyms, and gives the following definition: "By atony of the stomach is understood the inability of the organ to propel the chyme into the intestine within the legitimate time." He proposes the term myasthenia gastrica, because atony is essentially deficient activity of the smooth muscular fibers associated with reduced elasticity of the gastric wall, and because the terms atonia and mechanical insufficiency signify too little. We see that Ewald's and Boas's definitions of motoric insufficiency differ. Rosenbach terms as gastric insufficiency the disproportion between the capacity of the muscular forces and the demand made upon them, and he enumerates three causes which bring on this disproportion; among others he mentions nervous weakness of

the muscles of the stomach. Buch says atonia and myasthenia can not be identical with insufficiency; he prefers the name myasthenia. If he had said atonia or myasthenia it would have been more correct, as we shall see. The Greek word "asthenia" corresponds with the English "infirmity"; they both mean sickness. However we may translate, there is some indistinctness; the only word to the point which signifies exactly the pathological condition is atonia or relaxation. One author says: "Myasthenia and atonia are to be distinguished, one from the other." How is this possible? I do not know, for there is no myasthenia without atonia and no atonia without myasthenia.

Boas is of the opinion that myasthenia isa primary weakness of the muscles caused by nervous influences and has to be considerd separately, and that this would be scientific as well as practical. He further says the weakness of the muscles with loss of elasticity, which occurs sooner or later in ectasis caused by stenosis of the pylorus, was called by older writers atonia, and he concludes that myasthenia is the cause

of insufficiency, atonia one of its consequences. Summing up all these definitions, we have a regular gallimatias.

In order to show how necessary it is to clear up the existing confusion in regard to these terms, let us quote at hazard from a paper of E. W. Andrews in *The Journal of the American Medical Association* for October 6, 1900, entitled "The Reefing Operation for Movable Kidney": "Nephropexy will often fail in wandering kidney brought about by gastroptosis and enteroptosis." It is difficult to see how this author imagines that wandering kidney can be brought about by gastroptosia. It sounds as tho one should say bellyache brought about by the belly; it is tohu wabohu. The same paper treats of a case in which the right kidney descended so far as to touch the bladder, and was easily palpated in any position, but, as the author adds, there was no enteroptosis. This is a regular tohu wabohu.

In simple atony, only the tonic contraction is weakened, and this condition may exist for years, even for life, without developing to such

a form as is characterized by motor insufficiency with retention and in higher degrees with stagnation of ingesta.

The three different degrees of relaxation can thus be diagnosticated by means of the splashing sound: Splashing sound, which can be elicited only during the normal period of digestion, means simple atony; splashing sound produced after the legitimate time of digestion has expired means motor insufficiency; and splashing sound produced in the morning, after the night's fasting, before liquid or food has been introduced, may mean stagnation, dilatation of the stomach, as understood by most writers, or, as it is also called, ectasis, and by other names. To be exact, when there is stagnation of food over-night, we find splashing sound in the morning before any food has been introduced on that morning.

Since splashing sounds, as we have seen, may be a proof of retarded expulsion, we may in many instances arrive at a diagnosis without inducing the sound, so much dreaded by most patients; our diagnosis can be made

by means of a few slight tappings on the abdomen.

Altho not in all, but in most, cases gastroptosia is the cause of dyspepsia, in extreme cases we find reflex vomiting and reflex cough. We can obtain conclusive evidence of the relation of gastroptosia to dyspepsia, and the reflex symptoms, by relieving the gastroptosia by means of plaster strapping, as I have described it. With the relief of the gastroptosia by strapping we relieve, as a rule, dyspepsia and reflex symptoms.

In a great many cases in which the splashing sound can be produced without presenting dyspeptic symptoms, we may find nervous disorders, especially so-called neurasthenia. It is a fact, altho not yet generally known, that nervous derangements, caused by gastroptosia, are as frequent, numerous, and manifold as nervous derangements caused by uterine displacements; just as in cases of what we might call ptoseodyspepsia we can show the relation to gastroptosia, so can we show the relation of gastroptosia by relieving the ptosis by means of the

strapping of the abdomen with adhesive plaster. Ptoseo-dyspepsia often passes under the name nervous dyspepsia—a thing which, I believe, does not exist, since there is probably, in every case of so-called nervous dyspepsia, an anatomical basis to be found.

Wherever I have found neurasthenia in a patient on whom I could produce the splashing sound, I applied the method of strapping the abdomen, and numerous are the cases in which this simple treatment relieved the nervous symptoms.

It appears that some writers of the present time make it a special point to speak with disdain of the significance of the splashing sound; in reality, however, there exist few pathological symptoms which are of such great practical value as that of the splashing sound, and at the same time require so little skill to be made serviceable.

The chemical examination of the contents of the stomach will not suffice for the diagnosis; the presence of the splashing sound is of value in diagnosticating the abnormal state of the

mechanical functions of the stomach. We know that this mechanical part has paramount influence on the further process of digestion; if only this part is normal, other conditions lacking, digestion may go on, all the same, without material disadvantage. Therefore the examination for the splashing sound will be indispensable; it will always be of supreme importance whenever we examine a patient for gastric disorder.

Directly, and by itself alone, the splashing sound, whenever it can be produced, is, as stated before, a means of diagnosis for determining the lower border and the dimensions of the stomach.

Together with Dr. Einhorn I have, in the latter's clinic in the German Dispensary (medical department—men), examined a hundred patients, without selection, for the splashing sound, in accordance with the following scheme: I wrote down how long a time it was since the patient had partaken of food; then we examined the patient for the splashing sound—first, without giving him water to drink. If the

symptom could not be elicited, the patient was given half a glass of water and then examined again. We noted whether the symptom could be produced easily or with difficulty. After I had recorded the result in my table, I wrote down the diagnosis of the case from the dispensary record.

In the accompanying table (see pages 19 to 22) are given the results of a hundred cases examined for the splashing sound.

In thirty cases no splashing sound could be elicited. In six of these, food had been taken only from one-half to two hours before examination. In two cases no result was obtained, on account of invincible tension of abdominal wall. In one case the symptom was found six, in two seven, in one eight, and in one twelve hours after eating. In sixteen cases the splashing sound could be elicited as far down as or below the umbilicus. Out of these sixteen cases there were only nine in which gastric symptoms had been complained of. In thirty-three cases, with splashing sound, there were no gastric complaints. In three cases with grave gastric af-

fections (two, carcinoma ventriculi; one, gastritis chronica) the splashing sound could not be elicited. In those two of carcinoma the examination had been made three and a half and two hours respectively after eating.

Diseases of the stomach are often associated with diseases of the apparatus of circulation and the apparatus of respiration. In fact, all diseases of long duration and weakening character go together with affections of the stomach. Thus, for instance, in nineteen out of twenty-four cases of heart and pulmonary diseases we find the existence of this splashing sound recorded in our table.

Number.	Diagnosis.	How Long after Eating?	Half a Glass of Water.	Splashing Sound.	How Far Down?	Remarks.
		Hours.				
1	Anemia	3½	+	+	3 fingers' breadth above umbilicus.	
2	"	2½	o	+	2 " " " "	Lues.
3	"	2	o	+	2 " " " "	
4	Asthma	3	+	o	1 finger's " "	
5	"	2	o	+	" " "	
6	"	4	+	o	2 fingers' " "	
7	Anorexia	3	+	+	" " "	
8	Ascites	:	:	:	.....	Tumor hepatis.
9	Bronchitis	7	+	o		
10	"	2½	+	o		
11	"	2	+	o		
12	"	1	+	o		
13	"	4	o	+	1 finger's " "	
14	"	7	+	+	1 " " " "	Easily produced.
15	"	4	o	+	2 fingers' " "	With difficulty produced.
16	Carcinoma ventriculi	3½	+	o		
17	"	2	+	o		
18	Colitis	3½	o	+	3 " " " "	" " "
19	Eczema scroti	3½	+	o		
20	Emphysema pulmonum.	3	o	+	2 to 3 fingers' breadth above umbilicus	Very feeble splashing sound.
21	"	½	+	o		
22	"	4	o	+	1 fingers' breadth above umbilicus.	Easily produced.
23	"	3	+	o		

Number.	Diagnosis.	How Long after Eating?	Half a Glass of Water.	Splashing Sound.	How Far Down?	Remarks.
		Hours.				
24	Enteritis	6	o	+	1 finger's breadth above umbilicus.	Easily produced.
25	"	4	o	+	3 fingers' " " "	
26	"	4				
27	" tuberculosa....	3	+	+	2 " " " "	With difficulty produced.
28	" chronica.....	3	o	+	3 " " " "	Very feeble splashing sound.
29	" "	2	+	o		
30	" "	3½	+	o		
31	" "	8	+	o		
32	Epilepsy.....	2½	+	+	As far down as umbilicus.....	Easily produced.
33	Erysipelas.....	3	o	+	3 fingers' breadth above umbilicus.	Very feeble splashing sound.
34	Gastro-enteritis	3	+	+	As far down as umbilicus.....	Easily produced.
35	Gastritis acuta.....	7	+	+	1 finger's breadth above umbilicus.	
36	" "	7	+	+	2 fingers' " " "	Very feeble splashing sound.
37	.....	4	o	+	3 " " " "	With difficulty.
38	Gastritis a potu.....	3	+	+	4 " " " "	Very feeble splashing sound.
39	" chronica.....	4	+	+	4 " " " "	
40	" "	7	+	o		
41	" "	5	o	+	2 " " " "	Myasthenia gastrica. Splashing sound over a large area.
42	" "	4	o	+	As far down as umbilicus.....	Easily produced.
43	Gastro-enteritis acuta...	3	o	+	2 fingers' breadth below umbilicus.	" "
44	Hyperæmia cerebri.....	3	+	+	3 " " above "	Very feeble splashing sound.
45	Sciatica.....	3	+	o		
46	Ischuria.....	3	+	o		
47	Carcinoma hepatis.....	3	o	+	1 finger's " below "	

48	Enlargement of liver....	1½	o	+	Closely below umbilicus.....	Stomach pushed down by enlarged liver.
49	Lues..	3	o	+	1 finger's breadth above umbilicus.	Easily produced.
50	"	2½	o	++	3 fingers' " " "	
51	Lumbago.....	7	+	+o	3 " " " "	
52	"	1½	+	o+		
53	Malaria.....	3	o	+	2 " " " "	
54	"	2	+	+o		
55	"	3	+	o		
56	"	..	..	..	.....	No result on account of invincible tension of abdominal wall.
57	"	7	+	+	1 finger's breadth above umbilicus.	
58	Nephritis chronica.....	3	o	++	1 " " " "	
59	" "	7	+	+o	Niveau of umbilicus.	
60	Neurasthenia.....	2½	+	o		
61	Obstipatio.....	5	o	+	2 fingers' breadth above umbilicus.	Easily produced.
62	Opiophagus	3	o	+	Niveau of umbilicus.	
63	Pleuritis	3	o	+	3 fingers' breadth above umbilicus.	
64	Pneumonia chronica....	3	o	++	2 " " below "	Gangræna pulmonum.
65	Rheumatism.....	2½	o	++	3 " " above "	
66	"	7	o	+	2 to 3 fingers' breadth above umbilicus.	
67	"	5	+	o		
68	"	3	o	+	Niveau of umbilicus.	
69	"	3	+	o		
70	Saturnism	6	+	o		
71	Tuberculosis pulmonum	3	o	+	1 to 2 fingers' breadth below umbilicus.	
72	" "	3	o	+	2 to 3 fingers' breadth below umbilicus	Easily produced.
73	" "	7	+	+	3 fingers' breadth above umbilicus.	
74	" "	3	+	o		
75	" "	3	+	+	2 " " " "	
76	" "	6	o	++	2 " " below "	" "
77	" "	1	o	+	3 " " above "	

Number.	Diagnosis.	How Long after Eating?	Half a Glass of Water.	Splashing Sound.	How Far Down?	Remarks.
		Hours.				
78	Tuberculosis pulmonum	..	..	..	.....	No result on account of tension of abdominal walls.
79	" "	9	o	+	2 fingers' breadth above umbilicus.	
80	" "	4	o	++	3 " " below "	Easily produced.
81	" "	2	o	+++	1 finger's " " "	" "
82	Tænia	12	o	++++	2 fingers' " above "	Very feeble splashing sound.
83	Ulcus ventriculi.....	3	+	+		
84	" "	3	o	++	2 " " " "	Et vitium cordis.
85	Urticaria.....	4½	o	+++	2 " " " "	With difficulty produced.
86	Vertigo	2½	o	++++	1 finger's " " "	Easily produced.
87	"	3	o	+++	1 " " " "	" "
88	Vitium cordis.....	4	+	+	4 to 5 fingers' breadth above umbilicus.	
89	" "	3½	+	+	2 to 3 fingers' breadth above umbilicus.	
90	" "	1	o	+	1 finger's breadth above umbilicus.	" "
91	" "	3	o	++		
92	" "	3	o	+++	2 fingers' " " "	Very feeble splashing sound.
93	" "	4	o	++++	2 " " below "	Over large area.
94	" "	3	o	+++	4 " " above "	With difficulty.
95	" "	4	o	++		
96	" "	3	o	+++	3 " " " "	" "
97	" "	2	o	++		
98	" "	5	o	+++	3 " " " "	" "
99	" "	3½	o	++	Almost as far down as umbilicus..	Easily produced.
100	" "	4	o	+	2 fingers' breadth above umbilicus.	

II

METHODS FOR LOCATING THE POSITION OF THE STOMACH

By ROBERT C. KEMP, M.D., New York.

For an intelligent understanding of this subject, it will be necessary to define those conditions which constitute an abnormality in the position of the stomach and to differentiate between them.

Dilatation of the stomach may be due to general atonia gastrica or exist without other abdominal relaxation, as the result of spasm, or of either benign or malignant stricture of the pylorus, and there are varying degrees of motor insufficiency, even in marked dilatation of the stomach.

If there is atony of the stomach with motor insufficiency, the patient having gastric symptoms while the lower border of the stomach is defined at a level of the umbilicus, *the lesser*

curvature maintaining its relations to the diaphragm, we may then consider the organ to be dilated. The muscular fibers first elongate in the vertical direction and the distance between the lesser and the greater curvature is increased. Dilatation may also ensue in the transverse and anteroposterior dimensions, and the pylorus may be a little farther to the right and in a slightly lower plane, while the lesser curvature maintains its relation to the diaphragm, and this is the differential point between dilatation and ptosis of the stomach. As remarked already, there is no ptosis without dilatation; but we distinguish dilatation without ptosis by considering the relation of the lesser curvature to the diaphragm.

The differential diagnosis can be arrived at with absolute certainty by means of translumination of the stomach. Some also claim that, during translumination, the light follows the respiratory movements with dilatation, but does not do so with ptosis, and consider this a second differential point. My own observations do not confirm this view.

On the other hand, with ptosis the suspensory ligaments of the stomach are relaxed and the entire organ sinks, the lesser curvature as well as the greater; and, in aggravated cases, the lesser curvature looks inward to the right, the greater curvature outward to the left, and the pylorus may often lie below the level of the umbilicus. The ptosis of the intestine, which is attached to the pylorus, readily explains the semirotation of the stomach on purely mechanical grounds.

As we see, the downward displacement of the stomach is associated with change of its form. It assumes in the higher degrees of such displacement either the shape of a loop, with its convexity down, or a vertical position, similar to that of the fetal period; or, again, a vertical direction has developed, by the sinking down of the pylorus to such an extent that the pylorus stands nearly vertically below the cardiac orifice.

I might state that, tho Dr. Einhorn employs the term ischochymia (retention of chyme) in place of dilatation of the stomach, I prefer the latter name, as more generally accepted. In

addition, the retention of chyme is the result of the condition of atony.

Having described the chief abnormalities in the position of the stomach, for a clear under-

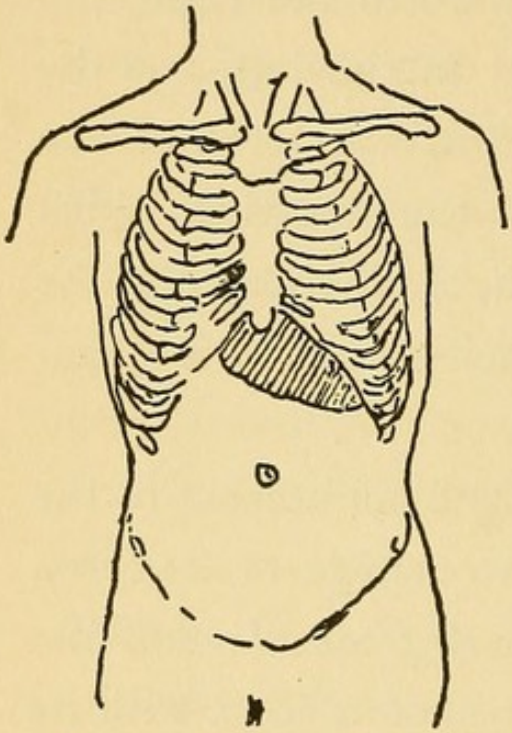


FIG. 1. —Normal Position.

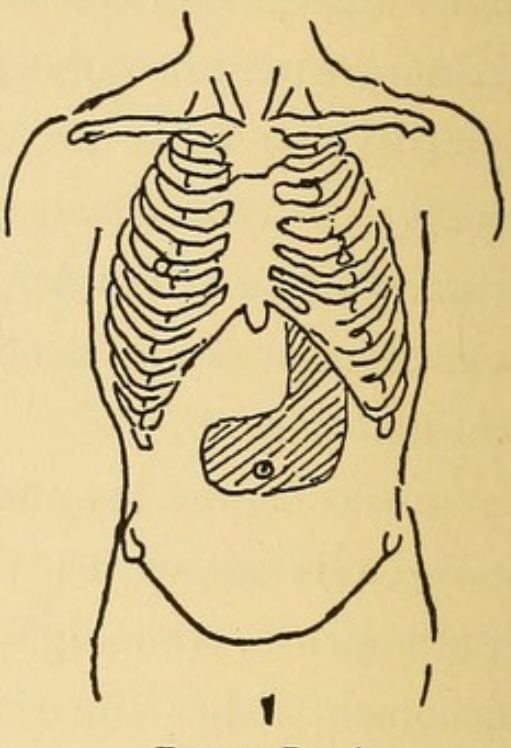


FIG. 2.—Ptosis.

standing of our subject it would seem necessary to map out the normal position of the organ.

The cardiac orifice lies a little to the left of the sternal junction of the seventh left cartilage (seventh rib), on a line with the eleventh dorsal vertebra. It lies about four to four and a half inches from the anterior surface of the abdomen.

The pylorus lies between the right sternal and parasternal lines, slightly below the tip of the ensiform process, and corresponds to the body of the first lumbar vertebra. It descends slightly when the stomach is distended.

The greater curvature, when the stomach is normally distended, lies about two to three fingers' breadths (one and one-half to two and one-quarter inches) above the umbilicus. The fundus rises as high as the lower border of the left fifth rib in the mammillary line, slightly above and behind the apex of the heart.

The anterior surface is overlapped above by the liver, the left lung, and the seventh, eighth, and ninth ribs. When the organ is distended with food the lesser curvature is directed obliquely backward toward the spine. The colon (transverse), even when partially distended, may overlap the greater curvature, and the latter itself tends to fall away from the abdominal wall when the patient is in the dorsal position.

The average length from fundus to pylorus is ten to twelve inches; from the lesser to the

greater curvature, four to five inches; from the anterior to the posterior wall, about three to three and a half inches. The lesser curvature varies in length from three to six inches, and the cardiac orifice and the pylorus lie much closer together than is often supposed. The cardiac orifice will lie in a slightly higher plane than the pylorus, but if we draw a plane through the latter, the lesser curvature will be found to lie in a plane nearly parallel to the plane of the diaphragm.

Methods of Examination.—On the day or night previous to examination the bowel should be thoroughly emptied by a cathartic. If there be much tympanitis on the day of examination, this should be relieved by a hot enema, and, if the condition be very marked, then rectal irrigation with normal saline solution at 110°–120° F. should be performed with the Kemp tube.

This recurrent irrigator acts like a Sprengel air-pump and carries off the gas in a most satisfactory manner.

The first method that we employ in mapping

out the position of the stomach is by inspection.

Inspection.—A recognizable bulging, distinct from the epigastrium, especially if it occur in the umbilical or hypogastric region, may be

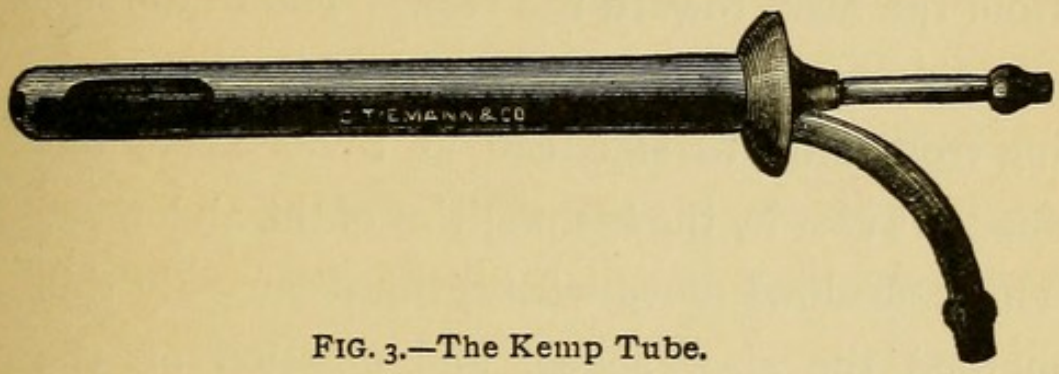


FIG. 3.—The Kemp Tube.

due to a dilated stomach; the epigastrium under these conditions is usually hollow and depressed. This method may prove to be of assistance in thin patients, especially if the stomach is distended with gas.

Peristaltic motion of the portion of the dilated stomach that protrudes is at times observed.

Kussmaul has noted very active peristaltic motion in the dilated stomach (peristaltic unrest), the waves passing from the linea alba below the umbilicus in an upward direction and to the right to the lower margin of the liver.

We may facilitate inspection by placing the patient upon a raised table, the head toward the window, the shades being arranged so that the light enters on a plane only slightly above that of the patient, and the rays of light are directed from the head toward the feet. The examiner, standing toward the foot of the table and bending from side to side, can at times make out shadows cast by the inequalities of the abdomen. These shadows move with respiration. By this method the size, shape, and position of the stomach can often be made out.

Knapp places the patient in the same position, but stands at the side or at the shoulders, and brings his eyes down to the level of the abdomen and observes the respiratory waves passing over its surface. After some experience one can detect delicate transverse lines, or waves, passing upward and downward with respiration. These lines correspond with the curvatures of the stomach. Tho I quote these methods, I have only secured occasional success with them myself.

The following signs, however, I have found

quite reliable. With the patient in the recumbent position, a marked concavity between the costal arches—extending from the ensiform process to or below the umbilicus, with a vertical median sulcus, wider above than below, the abdomen being flattened in the central part and bulging in the lateral regions—is significant of stomachoptosia. In the erect position the epigastrium becomes still more depressed, while the umbilical, and especially the pubic regions, bulge outward.

Palpation of the Stomach.—Inspection should be supplemented by palpation. Palpation should be performed gently and the hands of the operator should be warm.

The patient should be in the dorsal position with the legs drawn up, in order to relax the abdominal muscles. The patient should also breathe naturally, and keeping the mouth open often aids relaxation. The physician should preferably be seated on the right side of the bed and palpate with the right hand, which should be flat or slightly bent upon the abdomen, with the ulnar side downward. One can

stroke from above downward, and, with practise, it is possible in some cases to feel the stomach-wall and appreciate the position of the greater curvature, as the stomach gives a more uniformly elastic sensation than do the intestinal walls. On the other hand, some commence palpation from below and work upward, dipping in the ulnar edge of the hand rather deeply. By this means it is at times possible to determine the position of the greater curvature.

By means of palpation we can readily determine whether nephroptosia be present. Under *inspection*, we have already noted the signs that are significant of gastroptosia. If, in addition, we find a "floating kidney," this renders our diagnosis quite conclusive.

One of our valuable methods of locating the lower border of the stomach and as an adjunct in mapping out its boundaries is the splashing sound, treated of in the first chapter.

Percussion of the Stomach.—The accurate determination of the position and size of the stomach is often very difficult by simple percussion. The sound varies, according to whether

the organ is empty or filled with air or food and water. The position of the patient, whether lying down, semi-oblique, or standing, modifies the results. In order to obtain any results, the stomach should contain some air. Dehio, for example, has demonstrated, both on living subjects and on the cadaver, that if the *stomach is empty* the tympanitic sound which we produce on percussion is due to the colon and not to the stomach; since the latter is contracted into the left concavity of the diaphragm and is not in contact with the anterior thoracic wall. Hence the time at which the examination is made is important. Moreover, the *lower curvature* tends to fall away from the abdominal wall.

The patient should first be examined in the dorsal position with the knees flexed.

This method determines with fair accuracy the upper right portion and upper left portion. The use of the plessimeter is sometimes an aid to percussion. The absolute determination of the lower border by percussion is more difficult. It is rendered easier if the bowels have been thoroughly emptied, since the colon is then less

likely to ride over the greater curvature. The percussion sound over the colon is lighter and does not equal that over the stomach. The stomach sound is of greater intensity and clearness and of higher pitch. This, of course, refers to conditions when air is present as the factor. Food or fecal contents alter the result, which is further modified by percussion in the semi-oblique and standing positions. I consider the splashing sound the more accurate method of determining the lower border of the stomach.

Auscultatory Percussion.—In this method we employ the stethoscope. The chest-piece may be placed above the seventh rib in the left mammillary line, or between the tip of the ensiform process and the left costal margin, or in the same vertical line, but slightly below these points. One should first percuss near the stethoscope, to fix the characteristic sound. The tympanitis of the stomach is transmitted generally through the liver and lung. The percussion should be begun *well distant* from the possible location of the stomach, and should be

performed in the vertical direction, downward and upward and also laterally. One should begin nearly at the symphysis and percuss in vertical lines upward. The patient should be in the usual position, as heretofore described, and should hold the stethoscope for the operator against the abdomen. A sound of greater intensity and clearness and of higher pitch denotes the border of the stomach. The greater bulk of the organ, when dilated or in a condition of ptosis, lies to the left of the median line. We must remember, however, that some cases of marked dilatation extend a great distance to the right of the abdomen.

A new method, recently reported as being of value in determining the position of the stomach, is by the use of Reichmann's ascultatory percussion-rod. This consists of a short ivory rod, with circular grooves and intervening projections, somewhat like the handle of a large ivory knitting-needle. The rod is pushed firmly down over the stomach at a right angle to its surface (in a vertical line to the abdomen), and is gently stroked with the finger.

The stethoscope is applied over the organ and the "pitch" carefully observed. When the rod passes beyond the limits of the stomach a change in "pitch" is observed. It is claimed that the boundaries of the organ can thus be mapped out. I have seen this employed in several cases, but examination by other methods, notably by translumination, demonstrated the results secured by the rod to be incorrect. The originator of the method and some of his disciples, however, claim excellent results.

Flicking.—The index and middle fingers of the left hand are pressed down on the abdomen. The middle finger of the right hand is pressed firmly against the last phalanx of the thumb and is then suddenly released, striking a sharp blow against the fingers exerting pressure. This acts, as it were, like the plessimeter. Good results are claimed from this method of percussion.

Inflation of the Stomach with Carbonic Acid Gas.—This method is employed in order to render the stomach visible to inspection, if possible; also to aid the determination of the

position of the lesser curvature, as well as the greater, and to enable a differential diagnosis between dilatation and gastroptosia.

The simplest method is to administer, first, a half-glass of water in which about a dram of tartaric acid is dissolved, and, after this, another half-glass of water containing a dram to a dram and a half of soda bicarbonate. If small quantities are employed the stomach will not become visible and palpable.

There are certain objections to this method. At times there is considerable escape of gas through the cardiac orifice or pylorus, and the small intestine may be distended in some cases. This is a possible source of error. Also on some occasions, especially in gastroptosia, what was apparently stomach becoming protuberant on the abdominal wall was demonstrated by translumination to be intestines forced out forward and laterally by the stomach. There may be sudden hyperdistention of the stomach, with resulting pressure on heart and lungs, and unpleasant or even dangerous symptoms result, especially in a patient suffering from cardiac

disease. When there has been a hemorrhage, or signs of ulcer or cancer, or signs of peritonitic trouble, the use of this method is contra-indicated. Several fatal accidents have occurred. It also sometimes irritates the mucous membrane. My chief objection to the method is that the quantity of gas is not under control. One could employ a stomach-tube and Dr. Rose's small carbonic-acid gas generating-bottle as a substitute. Carbonic-acid gas inflation is worthy of trial in those who are in fair physical condition.

Inflation of the Stomach with Air.—The method consists in introducing a soft stomach-tube and slowly pumping air into the stomach by means of a double bulb or a Davidson's syringe. The tube should be introduced with the patient sitting up in bed, and he should then gently recline on the back, and inflation should then be carried out. This method possesses the advantage that the amount of air pumped into the stomach can definitely be regulated. Thus one can fill a vessel with a liter of water, invert it over a pail of water, and note how many

compressions of the bulb displace the given quantity of fluid. He can thus measure the quantity of air pumped in. The first few squeezes of the bulb should be given rapidly, so as to cause spasmodic closure of the pylorus. The same indications and contraindications exist for this method as for the use of carbonic acid gas, with the advantage of being able to regulate more definitely the degree of inflation. Some patients object to the passage of the tube, which is of fair size. In any event, if there is discomfort from either method of inflation, the condition should be immediately relieved by the passage of the stomach-tube.

One author, Fürbringer, suggests that when we inflate with air the tube should be introduced only to the middle of the esophagus, and air should then be pumped in. He claims that this method prevents retching.

Inflation of the Stomach with Water.—To Dehio we must give the credit of devising the most scientific method of determining the position of the stomach by means of water inflation. He percusses over the patient's stomach, the

organ preferably empty and in the erect position. He then administers a glass of water, eight ounces, not too cold, and percusses the area of dulness; he then administers a second, third, and fourth glass of water, percussing in each event and noting carefully the position and extent of the dulness. The patient is then directed to lie on his back, and tympanitis will appear where dulness was before. This conclusively demonstrates that the area corresponded to the stomach. If there is pronounced dilatation or ptosis, a single glass of water will often cause dulness to appear below the navel or in the inguinal region. The results may be obscured in patients with much adipose or if there is fecal accumulation in the colon. In this event it should be cleared out by injection. I have also found the following method of value, especially if there be some gastric contents: first place the patient in the *semi-oblique position* and percuss the stomach; then administer two or even three glasses of water. We then secure stomach tympanitis above, then a band of stomach dulness and intestinal tympanitis

below. It is easier to differentiate between dulness and tympanitis than between two types of tympanitis. There are numerous other complicated methods by means of inflatable bags, manometers, etc., for determining the position of the stomach, which are scarcely of practical value. Leube introduces a stiff sound and determines the position of its lower end through the abdominal walls. This method would not seem to be especially safe. Others differentiate between the stomach and colon by inflating the colon with air or carbonic acid, employing the same methods as in the stomach, only using twice the quantity of soda bicarbonate and tartaric acid. Rose's apparatus would prove to be valuable to inflate the bowel. To further differentiate, water was given by stomach. On the other hand, some first empty the bowel thoroughly and then inflate the intestine with water. It is often difficult for the patient to hold the enema. There are also two other methods which are of value in determining the lower margin of the stomach: First, the administration of small quantities of soda bicarbonate

and tartaric acid with the patient in the standing position. In some cases one can approximately map out the lower border of the stomach, by listening to the "sizzling sounds" with the stethoscope. This may at times be serviceable. Second, the use of the stomach whistle (Fig. 4). This consists of a rectal tube of small caliber, with a whistle in the end. To the other extremity is attached an ordinary stomach aspirating bulb without valves. The tube is inserted, the finger placed over the open end of the bulb, and a single bulb full of air is forced into and aspirated out of the stomach by rapid and short intermittent contractions. This entirely eliminates the possible chance of distending the stomach with air and the organ remains practically empty. A

FIG. 4.—Kemp's Stomach Whistle.

stethoscope is placed over the abdomen and the point of greatest intensity of sound is marked by a cross with a colored pencil. The tube is pushed in and out and the various points of sound are marked; the lowest is the lower border of the stomach. The ear, of course, can be applied in place of the stethoscope. Translumination of the organ was then performed and the lower margins absolutely corresponded. I am perfectly cognizant of the method of administering water and then blowing air into the stomach through a tube, but the "bubbling sounds" only give the level of the fluid and not accurately the lower margin of the stomach. The whistle is therefore of value in this regard, tho it will not necessarily differentiate between dilatation and gastroptosia. This experiment with the stomach whistle further demonstrated that in the standing position the stomach, even when empty, descends to the full length of its suspensory ligaments at once, and its lower border is practically at a constant level or within about an inch of the same, whether the organ be full or empty; for it was at the same level when a pint

or more of fluorescent fluid had been ingested as when then demonstrated by translumination.

One of our most scientific methods of locating the position of the stomach and differentiating between dilatation and gastroptosia is by gastrodiaphany, or translumination of the stomach. It also enables us accurately to determine the degree to which these conditions have attained, and may modify our prognosis and treatment.

Translumination of the Stomach.—In 1845 Casenave first applied the method of translumination to living tissues. In 1867 Milliot succeeded in transluminating the stomachs of animals and experimented with the stomachs of cadavers, but to Dr. Max Einhorn, of New York, the credit is due of being the first to demonstrate translumination of the stomach on the living subject and the practical value of gastrodiaphany. His instrument, which he denominates a gastrodiaphane, consists in effect of a soft-rubber stomach-tube, at one end of which is fastened an Edison lamp. Conducting wires run through the tube to the

battery, and there is a current-interrupter at some distance from the tube. The lamp is enclosed in a glass bulb, to act as a reflector and prevent the action of heat on the stomach (Fig. 5). He has the patient drink one or two glasses of water, so as not to distend the stomach, inserts the light, and examines the patient in a dark room, either in the sitting or in the recumbent position.

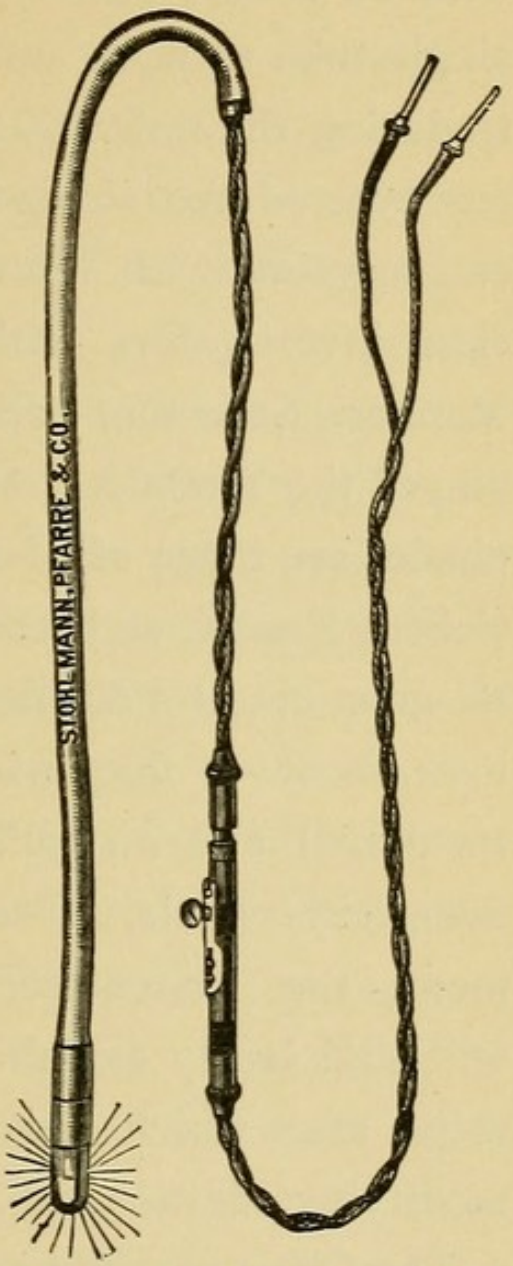


FIG. 5.—Einhorn's Gastrodiaphane.

Heryng and Reichman employ a modified tube, with a water-cooler about the lamp. They first pass a stomach-tube and pour in from a pint to two quarts of water, examining in the erect position. Kutner and Jacobson, under

Ewald's direction, performed a great number of experiments. They first used a gastrodiaphane with an inflow and outflow tube, and later a single tube with an inflow above the lamp, introducing the water through this after the light has entered the stomach. These experimenters, together with Meltzing, are the chief foreign investigators with gastrodiaphany. M. Manges, Stockton, and many others have employed the method. Among various gastrodiaphanes are those of Hemmeter, Lincoln, Solis-Cohen, Koplik, and Lockwood. To Lockwood we must credit a decided advance in the type of instrument—a fine, wire-wound cable (rubber insulated) and a small light, no larger than a five-grain capsule. The cut of my own instrument, the "circumscribing gastrodiaphane," will sufficiently explain the Lockwood instrument, after which it is modeled, with certain modifying additions.

The Circumscribing Gastrodiaphane.—During the past two years a careful series of observations with translumination of the stomach suggested to me an improvement on the gastro-

diaphanes now in use. Manipulation of the tube after the electric ball has entered the stomach frequently causes gagging and at times vomiting, interfering thus with the accuracy of the method. The cables of all the instruments were found unsatisfactory in case of gastroptosia of great degree when we endeavored to explore carefully the pyloric end of the greatly dilated stomach. In addition, it was impossible to guide the light in a definite direction; it would sometimes pass to the right, sometimes to the left, and often it was necessary to draw it in and out a number of times a distance of several inches.

The instrument which I devised to overcome these drawbacks has a cable about six inches longer than the Lockwood gastrodiaphane, and is of about the same caliber. The cable is somewhat more flexible for the space of a quarter of an inch—about the same distance from the light—in effect a joint at this point. At the base of the light is attached an extremely thin accessory cable, covered with rubber. This runs parallel with the main cable and prac-

tically increases the diameter to only a very slight degree. After introduction of the in-

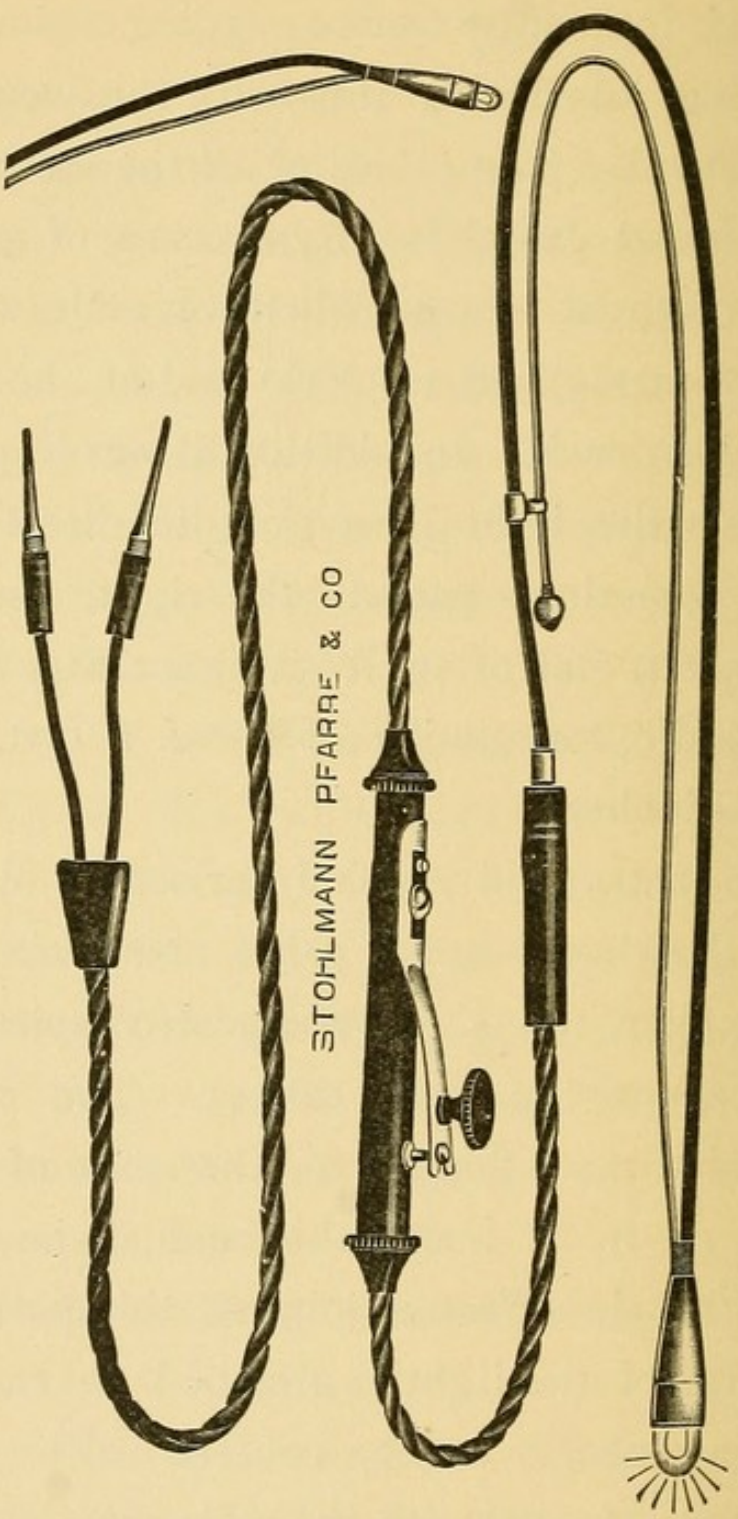


FIG. 6.—Circumscribing Gastrodiaphane.

strument the main cable is held firmly and the accessory cable drawn upon by turning the cable at the same time; the instrument can be directed in any desired direction. In addition to this, by manipulation of the accessory cable, the main cable can be so bent that the light will explore the entire wall of the stomach anteriorly and can be made to pass up to the pylorus and along the borders of the ribs. It is thus kept under definite control. Care should be taken that the cables are parallel when passed into the stomach, and the accessory cable should be relaxed before withdrawal. The main cable, except at the joint near the light, is somewhat stiffer than the Lockwood light. Eight dry-cells are employed with a rheostat. The cover of the battery case has a clip and supports for carrying the gastrodiaphane, so that an extra box is unnecessary. There is also an arrangement for an extra lamp in case of accident. Water was the medium formerly employed, several glasses of it being administered before the light was passed.

One of the greatest advances in the technic

of translumination of the stomach is the employment of fluorescent media. There are three fluorescent media so far found to be of value: (1) Bisulfate of quinin, gr. x. in a pint of water. The addition of ℥ v. of dilute phosphoric acid intensifies its action. The same amount of dilute sulfuric acid may be substituted. The reaction of the quinin solution is in itself acid and the fluorescence a very pale violet. Increased acidity intensifies its action and fluorescence disappears if the solution is rendered alkaline. (2) Esculin; this is derived from the *Æsculus hippocastanum* (horse-chestnut), indigenous to Europe. Fifteen-grain doses have been used in malaria. One can employ small doses, gr. ⅛ to gr. ½ in a pint of alkaline solution, which gives a blue fluorescence. This preparation is difficult to secure. (3) Fluorescein phthalic anhydrid (5 parts), a naphthalin product, and resorcin (7 parts) heated to 200° C. (392° F.). It is a reddish powder, faintly soluble in water with a neutral reaction and practically gives thus no fluorescence; soluble in alcohol and in alkaline media,

giving a green fluorescence like liquid opal. It has been employed to detect ulcers of the cornea. It can be secured from Merck & Co., and is extremely cheap. No further literature was obtainable. I therefore injected one to two grains of fluorescein into dogs and rabbits in alkaline and alcoholic solutions, with no resulting effects either physiological or local. Later, assisted by Mr. Ferry, the chemist of St. Bartholomew's Clinic, we further investigated its properties. He suggested to me the addition of glycerin to intensify the fluorescence, and we found that the hydrochloric acid of the stomach must first be neutralized. The patient should first be given a glass of water (8 oz.), in which gr. xv. of bicarbonate of soda have been dissolved. A second glass of water (8 oz.) is then administered, in which are dissolved the same amount of sodium bicarbonate, ʒ i. of glycerin, and gr. ⅛ to gr. ¼ of fluorescein. One to two ounces of lime water may be substituted for the sodium bicarbonate. Curiously enough, as we increase the fluorescein in strength, fluorescence diminishes and colorization begins. By means of

fluorescent media, I have found it possible to illuminate the stomachs of fat or muscular subjects, that were formerly unsatisfactory, to examine for tumors and the location of the stomach with greater accuracy, and I believe that I can fairly state that the brilliancy of the illumination is increased many times.

Examination of the urine of patients who had taken fluorescein shows no deleterious effects—no albumin, no sugar, no casts. Tho fluorescein acts in an alkaline medium and free acid destroys fluorescence, yet on catheterization of these patients greenish fluorescent urine is obtained one hour after the administration of fluorescein solution, and this condition persists for about four hours. The acidity of the urine is not due, however, to the presence of free acid. Dr. Ferd. Valentine has thus demonstrated that fluorescein solution added to acid urine causes it to fluoresce. In fluorescein solution we have an additional means of testing the permeability of the kidneys.

The technic of gastrodiaphany is as follows:

The patient's stomach should be empty. He

is given a glass (8 oz.) of the alkaline solution, and then a second glass of fluorescein solution (8 oz.). I frequently give an extra half or full glass of water. A dark room gives the only satisfactory results. It can readily be improvised, by pinning blankets across the windows. The gastrodiaphane is introduced by gaslight or candle light, the patient sitting opposite you in a chair, with the abdomen exposed. The electric current is turned on and the room darkened. The patient should then stand up, as this position is preferable. It is my custom to mark out the anatomical regions on the abdomen of each case with blue pencil, and then draw the outlines of the stomach during translumination. I have already carefully defined the differential diagnosis between dilatation and gastroptosia. With gastroptosia the lesser curvature can be determined. In some cases the stomach will be bottle-neck above, with the base below, or somewhat pear-shaped, the narrow part above, as the light disappears beneath the ribs. In a dilated stomach the transverse diameter of translumination is nearly the same;

as we withdraw the light it only begins to narrow just below the tip of the ensiform. If we illuminate in the dorsal position, the light hardly shows at all; it becomes clearer as the patient gradually sits erect, and, finally, is most marked in the standing position. This substantiates the view of Meltzing, who states that in the dorsal position only a portion of the stomach is in contact with the abdominal wall, and it further demonstrates the necessity of the standing position for accurate illumination.

In the following illustrations (Fig. 7, *A–H*) are shown a normal stomach, the dilated organ, and several degrees of gastroptosia. There is no question but that ptosis of the stomach exists from a very slight to an extreme degree, and in some of the patients nephroptosia is not present, especially in the mild types.

The next method of locating the position of the stomach to which I shall refer is by means of the *x*-ray. I shall speak of it only briefly, and my readers must consult some standard work on skiagraphy for the subject.

X-ray.—One can administer subnitrate of

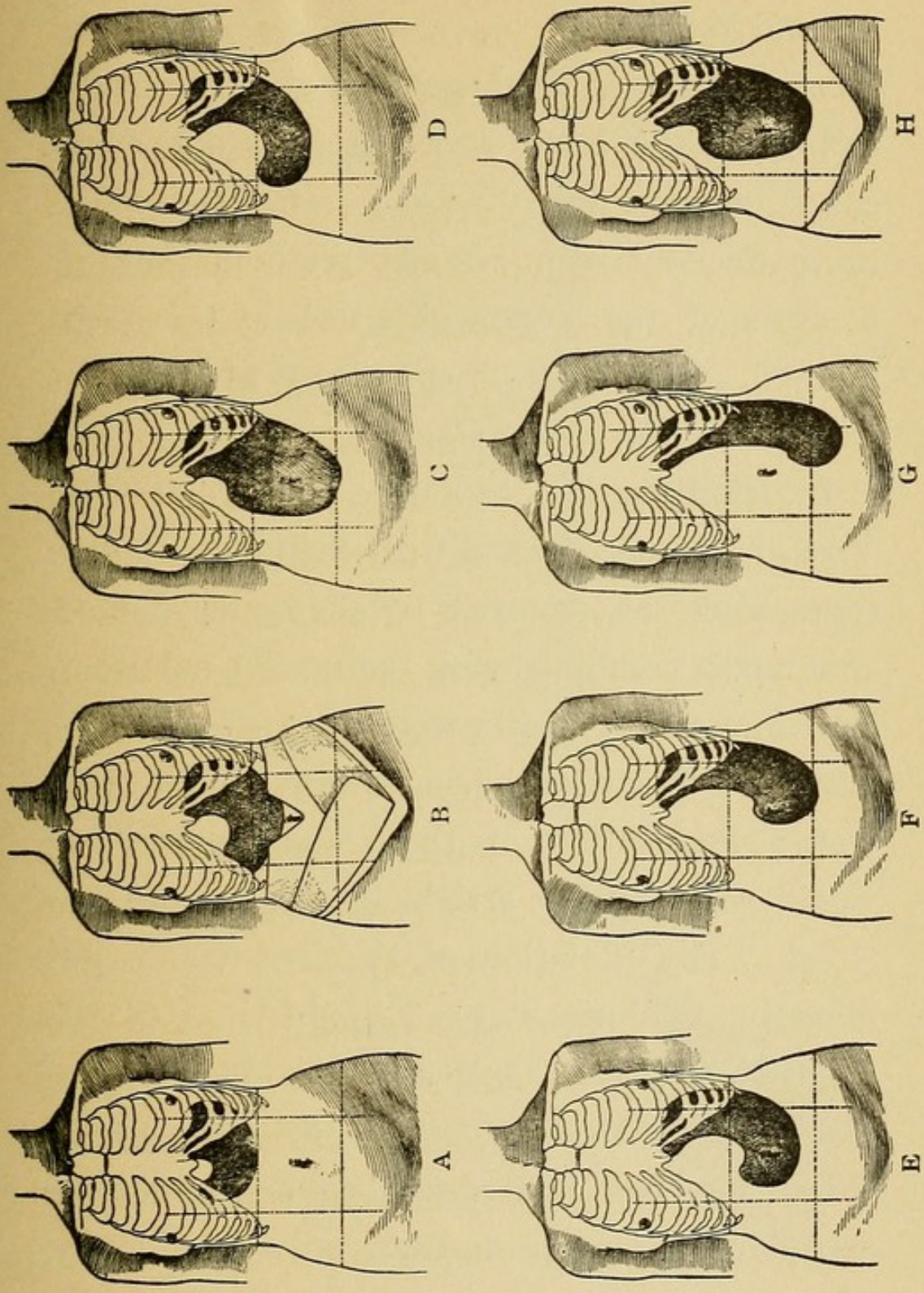


FIG. 7.—A Normal Stomach, the Dilated Organ, and several Degrees of Gastroptosia.

bismuth in capsules, and, by means of the *x*-ray and the fluoroscope, define the position of these capsules in the lower part of the stomach, and hence the lower border (greater curvature) can be mapped out. On the other hand, a bismuth emulsion can be administered and the position of the organ observed by the same method. The stomach can also thus be photographed by the *x*-ray.

In addition, Dr. Sinclair Tousey, of New York, has experimented with defining and photographing the stomach, by employing fluorescent media combined with radioactive solutions. The fluorescent media were after the formulæ described by the author under translumination. For a description of these experiments, we would refer to the article by Dr. Tousey, entitled "The Relation of the *x*-Ray and Radioactive Solutions to Examination of the Stomach" (*New York Medical Journal and Philadelphia Medical Journal*, May 21, 1904). These methods just described necessitate an expensive apparatus and are only suitable for office work. For accuracy and brilliancy of re-

sults in clearly locating the position of the stomach, they do not compare with translumination. In an article entitled "Observations on Radium" (*The Medical Record*, July 30, 1904), Dr. Max Einhorn, of New York, describes a method of translumination of the stomach with radium, by means of a device which he calls the radiodiaphane (Fig. 8). This consists of a hard-rubber capsule, containing 0.05 gm. of pure bromide of radium (1,000,000 strength). This lies at the end of a soft-rubber tube, connected with an inflating bulb. There are small openings near the

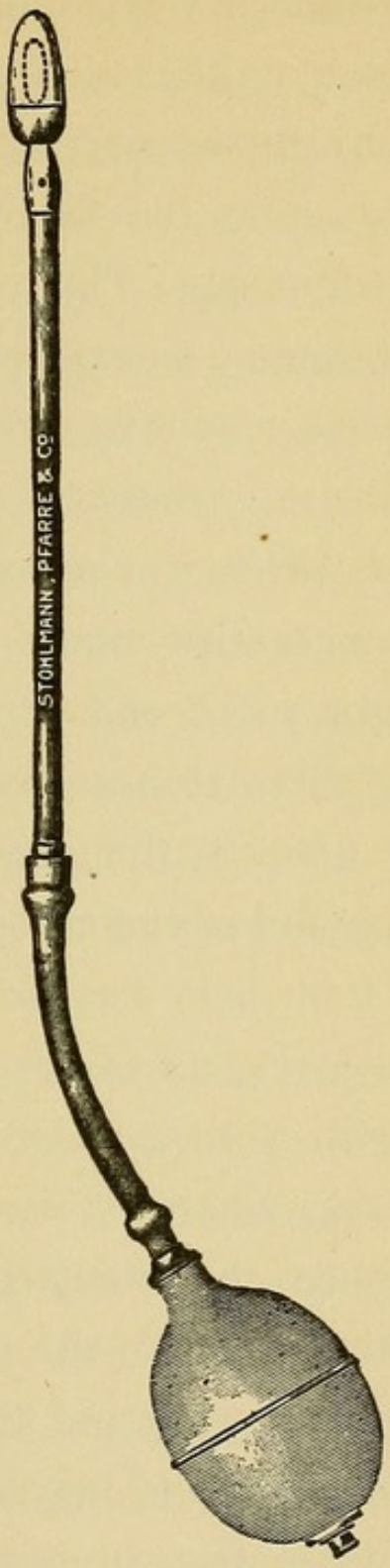


FIG. 8.—The Radiodiaphane. (Einhorn.)

capsule, on the end of the tube or connecting joint, so that air can be pumped into the stomach, the inventor having demonstrated that better results are obtainable in an air medium than with fluid. The patient should preferably be examined on an empty stomach. The radiodiaphane is moistened with water and introduced into the stomach. Kahlbaum's fluoroscope is applied to the upper left abdominal wall. The examination must be made in an absolutely dark room, and it usually takes two or three minutes to accustom the eyes to the darkness. A figure is then observed resembling the stomach and of the color of the moon. Around this a faint halo may be seen to the left above the stomach, up to the ensiform process, to the left axillary line, and even to the left side of the back, where it is much fainter. The lungs above the stomach and diaphragm are illuminated. To the right the liver does not transmit the rays and the screen remains dark. If the screen is moved farther down over the abdomen the illumination usually ceases below the large curvature. Besides we observe a very

intense spot of illumination (about the size of a big walnut), which corresponds to the position of the radium capsule. If air is insufflated into the stomach the illumination is more marked. On deep inspiration the illumination becomes weaker (probably on account of the greater distance of the abdominal wall from the radium capsule); on deep expiration, however, the illumination becomes much brighter. When the radiodiaphane is withdrawn, one observes how the intensely illuminated area (of the size of a walnut) travels upward, to disappear in the region of the ensiform process. When the instrument again descends into the stomach, the light at once reappears.

The originator of the method states that the stomach can be examined laterally and to the left of the back, regions that are inaccessible to the gastrodiaphane. The position of the greater curvature can also be readily determined by this method. The author has no personal experience as to this method. Radium we know to be extremely costly and the radiodiaphane is an expensive instrument, and the proper trans-

lation of the results secured requires special technical skill. For the mere determination of the position of the stomach, the simpler methods should be advocated for the general profession. I note with interest, however, that Dr. Einhorn has determined an intrathoracic tumor by radiodiaphany, and further experimentation in this field is well worthy of trial.

I have described, therefore, at considerable length the various methods for locating the position of the stomach, and, for the benefit of the general practitioner, I shall briefly, in closing, refer to the most suitable methods. On inspection, the anatomical conformation peculiar to gastroptosia is readily appreciated, and palpation will at least define a floating kidney, if such be present. Securing these data, we are quite certain of gastroptosia. Some cases of ptosis, however, do not present the typical appearance on inspection, and some mild cases exist without appreciable nephroptosia. The splashing sound is of great value. Percussion and auscultatory percussion are of value, especially the latter in some cases, and we should

examine in the dorsal position with the knees flexed, and also in the semi-oblique and standing positions. The bowels in all cases should be emptied before examination. Inflation of the stomach with carbonic acid, or with air, or, finally, with water, is a valuable adjunct. The employment of water, such as Dehio's method, is of service. The production of sizzling sounds in the standing position, by administering small quantities of tartaric acid and sodium bicarbonate or by the use of the stomach whistle, will accurately determine the position of the lower border of the stomach. Finally, in gastrodiaphany, translumination of the stomach, we have an ideal method for differential diagnosis between dilatation of the stomach and gastroptosia. It also determines accurately the degree of dilatation or ptosis, and gives one a basis on which to decide the question of operative procedure. The new gastrodiaphane, which Dr. Rose has denominated "circumscribing," is certainly an advance in technic. Recently, for example, I was enabled to direct the light into the fundus of the stomach to the

left border, so that I could see by *lateral translumination* that the stomach lay behind the enlarged left lobe of the liver, cirrhotic in origin. The peculiarity of the case was that the enlargement was confined to the left lobe, and illumination was absolutely shut off in front. This is certainly of value. Furthermore, the use of fluorescent media, especially of fluorescein, has increased to a manifold degree the efficiency of gastrodiaphany. The method is simple, the light easy to pass without discomfort to the patient, and a single demonstration is sufficient to instruct a man of average intelligence. As a matter of interest I append references to the latest literature on the subject: *Post-Graduate*, February, 1904; *New York Medical Journal and Philadelphia Medical Journal*, February 13, 1904, "Fluorescein in Translumination of the Stomach"; *Medical News*, April 30, 1904, "A New Method for Translumination of the Stomach by Means of Fluorescent Media, etc."; *Medical News*, August 6, 1904, "Observations on Dilatation of the Stomach and on Gastroptosis";

American Medicine, Dr. Solis-Cohen, of Philadelphia, 1904; *Medical Record*, Dr. H. Lincoln, of Brooklyn, 1904; *Post-Graduate*, November, 1904, "Circumscribing Gastrodiaphane"; *The New York State Journal of Medicine*, February, 1905, "The Value of Translumination of the Stomach as an Aid to Diagnosis"; *American Medicine*, March 4, 1905, "Mucous Colic."

III

ATONIA GASTRICA AND A NEW METHOD OF TREATMENT

A NUMBER of pathological conditions of the stomach are caused by insufficient activity of its muscular fibers, diminished activity of its walls, elongation of the suspending ligament of the lesser curvature, the lesser omentum, and gastroptosia.*

These disorders may be associated with insufficiency of motor functions and retention of the contents of the stomach beyond the legitimate time; and all these conditions have one

* I write gastroptosia instead of, as I formerly did, gastroptosis, because a Greek feminine noun which ends in sis, xis, and psis as the second component remains unchanged when the first component is a preposition, as, for instance, proptosis, periptosis, diagnosis; but if the first component is not a preposition, then in composition the ending is changed into sia, as eupraxia, apraxia, palingenesia, hierognosia, and also gastroptosia.

thing in common, they are manifestations of relaxation—relaxation of muscular fibers, of the ligament, of the walls, of the stomach.

The word gastroptosia, correctly translated, means abdominal ptosis (falling), not necessarily ptosis (falling) of the stomach alone. This latter would be stomachoptosia.

The word gastroptosia, or, what means the same thing, atonia gastrica, is a good term, for there is as a rule not one abdominal organ only descended, altho one may be more displaced than the other. The words gastroptosia and atonia gastrica are good terms for another reason, namely, because they include the relaxation of the abdominal walls. For reasons which will appear presently I prefer, as the heading of this chapter, the phrase atonia gastrica.

The tone, the activity of the abdominal muscles, aids in fixing the abdominal organs in their proper physiological position. Relaxation of this apparatus is the essential factor in atonia gastrica, and in therapy it is the first factor we have to consider.

Enteroptosia is ptosis of the abdominal viscera in general, or, so far as literary translation is concerned, it may mean ptosis of viscera, not necessarily of the abdomen alone. Certainly we may understand by this term ptosis of the bowels, but this is arbitrary. Splanchnoptosia means also ptosis of viscera, not abdominal viscera exclusively. Splanchnon can, for instance, mean the heart. I simply give facts which are worth knowing when we have science at heart.

Those who have given the word atonia gastrica the meaning of motor insufficiency of the stomach have caused much confusion.

Atonia gastrica may exist without motor insufficiency.

Myasthenia gastrica is a word without any definite meaning.

Motor insufficiency of the stomach implies a disproportion between the capacity of the muscular forces of the stomach and the demand made upon these forces. Such insufficiency may occur under certain circumstances in a healthy stomach, when the mass of the ingested food is too large or the nature or condition of

the ingesta unsuitable. Atony may cause insufficiency, but atony is not itself insufficiency. Atony may exist without insufficiency when the resistance at the pylorus is subnormal. Atony may be caused by insufficiency.

There exists ectasis or dilatation of the stomach, which we have to distinguish from gastroptosia, but there is no gastroptosia without dilatation. Gastroptosia depends on relaxation, and relaxation of the fibers of muscles means elongation of the fibers; therefore relaxation is, *eo ipso*, dilatation.

For practical purposes let us retain the word gastroptosia, as meaning ptosis of the stomach, *as part of abdominal ptosis*, and in contradistinction to ectasis of the stomach without ptosis.

In abdominal ptosis, or atonia gastrica, a series of contributory factors comes into play, and in each individual case there are, as a rule, a number of such factors cooperating.

Altho in most cases ptosis of several viscera appears simultaneously, it may also happen that one part alone is sunk down, but it is not therefore justifiable to attribute symptoms of abdom-

inal atony or ptosis to the displacement of one organ in particular, as Glénard has done in selecting the intestine, and as a great many physicians were wont to do when they imagined that the floating kidney alone was the guilty part.

A healthy stomach maintains the position of its lower border constant in all positions of the body; not so the atonic stomach. The latter changes its position according to the different positions of the body. While the patient is in the upright position, the lower border—that is, the larger curvature as well as the pylorus—sinks down. In the recumbent position both will rise, and changes from right to left take place according as the body assumes a different position. Buch explains this change of position as being due to elongation—that is, relaxation of the suspending ligament of the lesser curvature—and he thinks that while there is no atonia gastrica without relaxation of this ligament, neither is there any atonia gastrica without gastroptosia.

Discussions on gastroptosia have been very

lively during recent years, and the opinions of the different authors in regard to its etiology differ, as we shall see in the chapter on history and literature. They also differ with regard to a number of morbid conditions which have been connected, correctly or incorrectly, with gastroptosia. This lively controversy has been the means of enlarging our knowledge in this field of investigation.

There can be no doubt that it is of paramount importance to speak first of the etiology of atonia gastrica, for the knowledge of the etiology in any given case is the best guide for therapeutical action. Cases of atonia gastrica are of importance in every-day practise. The pathological changes in these cases are subject to special therapy, which is as rational as it is in most instances successful.

The displacement of the stomach and other abdominal organs is often an acquired condition, but recent investigations have furnished evidence that a congenital predisposition to it generally plays a most essential part in its causation.

In accordance with different etiological conditions, we have to distinguish different forms of atonia gastrica. The overlooking of this distinction between various kinds of gastroptosia of diverse origin has given rise to many different explanations. The different forms of gastroptosia have, according to their etiology, distinct significance.

Gastroptosia in adults of both sexes may be the concomitant of constitutional defects and anomalies, and, first of all, of paralytic thorax, chicken-breast, or funnel-shaped breast. We find displacement of the stomach in men or nulliparæ of tender and lean habit, with narrow, long, precociously ossified thorax, wide intercostal spaces, and frequently Stiller's stigma of fluctuating tenth rib; in short, it is found in persons with typical phthisical habit. Gastroptosia is indeed very frequently met with in phthisical patients, but rarely in strong and robust people except when caused by trauma or peritonitic adhesions. There are exceptional cases of movable spleen and kidney, even stomachoptosia of purely local nature, happening in

robust subjects; in such cases the subjective painful symptoms may be missing. On the other hand, gastroptosia is frequent in poorly nourished individuals and among feeble saleswomen who are forced to be standing for eight hours or more during the day.

The reason why patients with long, narrow thorax are specially subject to gastroptosia is this: In such patients the diaphragm occupies a position lower down than normally, on account of the increased vertical diameter of the lungs. In cases of emphysema of the lungs and exudation in the pleural cavity there is still a lower level of the diaphragm. In these conditions the organs situated below the diaphragm can not find sufficient space in the hypochondrium and are obliged to descend. In the constitutional form it is not often that the spleen and liver are sunk down. The kidney, in men with gastroptosia of the constitutional form, is less often felt than in cases of the constitutional form in women.

Among my cases there were three in which the symptoms of gastroptosia had been relieved

completely; there was no more abnormal splashing sound until the patients had intercurrent diseases. One of them suffered from severe attacks of malaria, and the two others had influenza. When I saw them again after these affections, gastroptosia had developed anew and the splashing could be easily elicited over a large area, exactly as was the case before their first treatment. In all diseases which, like typhoid fever, cause muscular weakness in general, atonia gastrica will develop itself.

Acquired, especially rachitic, changes of the skeleton may cause relaxation of the abdominal viscera. Stratz has thus described such conditions: When the sacrum is not sufficiently broad, the spinæ ilii anteriores superiores stand too wide apart and the vaults of the ilium are flattened; in some cases the width of the spinæ may be larger than the width of the cristæ, and all this causes the distance between the points of insertion of the abdominal muscles to be greater, and thus their support to be weakened.

The downward displacement of the stomach is associated with change of its form. It as-

sumes in the higher degrees of such displacement either the shape of a loop with its convexity down, or a vertical position similar to that of the fetal period; or, again, a vertical direction has developed by the sinking down of the pylorus to such an extent that the pylorus stands nearly vertically below the cardiac orifice.

Far-down displacement, marked changes of form, and real disfigurements of the stomach are found in some cases of kyphosis and scoliokyphosis. Fleiner describes a case in which the splashing sound could be produced immediately over the symphysis, while the apex beat of the heart was felt in the axilla. In this case, however, notwithstanding these anomalies in the situation of the viscera, there existed no marked disturbance of the gastric functions.

Next to the constitutional, there are other causes due to local and, as a rule, mechanical disorders, and these disorders may exist in the stomach itself or outside of it.

Permanent motor insufficiency produces stomachoptosia (which may, however, form a

part of general atonia gastrica), as also do tumors of the pylorus or of the lesser curvature which are weighing on the stomach. In the latter instances the expelling power of the organ may remain intact.

Gastroptosia may be caused by hernia—hernia of the mesentery, for instance; above all, hernia in the linea alba may give rise to gastroptosia. In these cases also the expelling power of the stomach may remain intact.

Tumors of the spleen and liver may also cause gastroptosia. Another group of cases owes its existence to enlargement of the abdominal space. The largest contingent of these is furnished by the postpuerperal types of gastroptosia, and these have been called Landau cases, because Landau first described them thoroughly. This form of gastroptosia may exist without giving rise to symptoms. If a woman has given birth to many children, there occurs a physiological relaxation of the abdominal walls, which leads to a physiological descent of the viscera of moderate degree without symptoms. The Landau form will be well

pronounced in cases of women in whom the spine, in its lumbar region, is abnormally curved forward (rachitic affection), and who during pregnancy are obliged—in order to keep the balance—to bend backward while the uterus is forced forward to an abnormal degree.

Men, after having been released from obesity by heroic diet or treatment, may acquire gastroptosia. Gastroptosia in these instances, puerperal as well as after obesity cure, is the result of adaptation to space.

As mentioned already, the activity of the abdominal muscles aids in a manner not sufficiently explained in fixing the abdominal organs in their physiological position.

Relaxation of this apparatus forms, therefore, the first etiological momentum in puerperal and in *post-obesitatem* enteroptosia. It is true that relaxation of the abdominal muscles is to a certain degree compensated by increased expansion of the intestine, but a complete compensation is hardly ever established. Women who do not receive proper attention immediately

after confinement may acquire or suffer increase of preexisting gastroptosia.

Glénard's whole theory of splanchnoptosia is based on the relaxation of the suspensory ligaments of the intestines, especially that of the transverse colon; and Stiller, the discoverer of the floating tenth rib, says that splanchnoptosia is a descent of the atonic stomach, of the colon (especially the transverse portion), of the kidney (the right or both kidneys), exceptionally of the liver or the spleen; a descent which has been developed mostly in tender age, in consequence of general relaxation, especially of the peritoneal suspensory ligaments in individuals with congenital general dyspeptic neurasthenia, tender muscles, lean habit, and slender bone structure, manifested in a higher degree by a floating tenth rib.

The same author remarks: "Boas takes pains to formulate the diagnostic difference between splanchnoptosia and nervous dyspepsia, but one can plainly see that he is not successful; the same is the case with his attempt to distinguish gastric motor insufficiency from nervous

dyspepsia." Splanchnoptosia and nervous dyspepsia are, according to Stiller, identical, and gastric motor insufficiency is its constant and often only symptom. As we have seen, there are cases of gastroptosia or splanchnoptosia, as it is called by Stiller, without dyspeptic symptoms, and these are not so very rare, and thus Stiller's view is applicable only to the great majority of cases, or rather it applies only to cases which have been described as nervous dyspepsia.

The question about the relation of typical gastroptosia or enteroptosia or splanchnoptosia or atonia gastrica, whichever term we may select, to all its nervous and dyspeptic concomitants and to the well-known picture of nervous dyspepsia, has been answered by Glénard, to the effect that in reality there is no nervous dyspepsia, since the symptoms are produced by changes in the anatomical position of abdominal organs.

For a long time the corset and the strings with which the skirts are fastened around the waist were said to play an important rôle in the

genesis of the affection, but now their part in causing the evil has been decided to be of only moderate measure. In those cases which would be of most importance in deciding the question as to what part the corset and the skirt-strings are playing, *i.e.*, in young girls and nulliparæ, it appears that frequently a tight-fitting corset has never been worn, because it could not be tolerated. It is undeniable that tight-lacing, tight attachment of skirt-strings, will aggravate an existing gastroptosia, because the compression of the abdomen from the sides is apt to cause displacement of the right lobe of the liver toward the middle, and thereby to cause pressure on the pyloric portion of the stomach, thus favoring development of gastroptosia.

Our text-books tell us that stasis in the venous circulation of the abdominal cavity, stasis caused by heart disease, and stasis in the system of the portal circulation give rise to gastric atony.

As remarked already, it is a well-established fact that there exist cases of gastric atony

which for a long time give rise to no symptoms. Boas reports the case of a seamstress in whom the clinical symptoms of such atony, associated with retention of the contents of the stomach, was accidentally established, altho this woman did not complain of any suffering. According to Buch, it is not a rare occurrence to find, on necropsy, dilatation of the stomach, the existence of which during lifetime had not been suspected; and Pentzoldt has described and depicted the case of a man who had died from diabetes and pulmonary tuberculosis, but had never complained of gastric disorder. On autopsy, considerable ectasis and ptosis of the stomach were found, and the walls of the stomach were remarkably thin. In these cases there was a compensatory activity, thanks to which the contents of the stomach—notwithstanding the high degree of atony—entered the intestine in proper time. The compensation consisted in relaxation of the ring of the pylorus—that is, of its circular muscular fibers. This compensation presents an analogy of the compensation in valvular diseases of the heart.

Some individuals may live for years with an abnormally dilated and displaced stomach, complaining of slight if any symptoms, as do individuals with serious valvular affections of the heart, who are often unaware of their disease, so long as the compensatory hypertrophy of the ventricle is adequate to counteract the defect in the valve.

But some day the compensation fails, and then appear suddenly or in surprisingly short time all the symptoms of stomach dilatation. It is possible that some of the instances described as acute dilatation of the stomach may belong to this category of cases of failing compensation.

Relaxation of the stomach may be caused by disease confined to muscular fibers, through affection of their innervation. B. Stiller found, in a large number of nervous dyspeptics with floating kidney and splashing stomach, that the tenth rib was movable; that is, movable to such a degree as normally the eleventh and twelfth ribs are movable, not being fastened by cartilaginous, but only by ligamen-

tous, structure to the costal arch. He observed that when there is such a floating tenth rib, there are likewise a floating kidney and a displaced stomach. Altho this floating rib is not found in every case of gastroptosia, it was never missing in well-pronounced cases. He thinks that the degree of mobility of this rib corresponds with the degree of gastroptosia and the degree of neurasthenia, while the degree of mobility of the kidney does not allow such a deduction.

He found children who had floating kidney with and without a floating tenth rib, and also children with it but without floating kidney and without gastroptosia. He believes, however, that such children will later on become neurasthenics and gastroptotics.

He further observed that floating rib, nephroptosia, and gastroptosia were seldom looked for in patients of advanced years. This fact is explained by the circumstance that the subjective enteroptotic symptoms improve with advancing years, and that people who formerly had consulted the physician on account of neu-

rasthenia would not visit him any more with complaints inviting examination for enteroptosia.

A great deal has been written on the relation between anemia and chloriasis in young girls and displacement of the stomach. It is certainly rational to assume that chloriasis is not the result of gastroptosia, but the manifestation of a constitutional anomaly which simultaneously favors the disease of the blood and the development of the displacement. There exists chloriasis without gastroptosia, and there is a probability that chloriasis may have been the primary evil, causing reduction of tone of the abdominal muscles, and thereby inducing gastroptosia.

Men afflicted with gastroptosia present symptoms of general nervous irritability less often than women.

The important question of the relation of gastroptosia to nervous symptoms, which latter are of frequent occurrence and of manifold kind, has been touched upon already, when Glénard's and Stiller's views were given.

Some authors have spoken of a relation between hyperacidity and gastroptosia, but, according to my own observation, there exists no rule; ptoseodyspepsia, if I may use the name which I have suggested, manifests itself similarly to hysteria; the symptoms are inconstant and changeable, some cases present even achylia, but the probability is that hyperacidity is more frequently found in gastroptosia.

Atonia gastrica is caused, as the foregoing remarks demonstrate, mostly by constitutional weakness, and requires tonics in general. We have, however, to deal directly with the mechanical derangement, and it is rational to apply mechanical treatment as the first and direct means of relief.

As stated already, the activity of the abdominal muscles aids in fixing the abdominal organs in their physiological position. Relaxation of this apparatus forms, therefore, a factor in gastroptosia, and it is the first factor we have to consider in therapy.

To strengthen the abdominal muscles, different measures have been suggested. They are,

in the first place, a substitute for the loss of tone by means of a bandage; next, hydrotherapy, massage, electricity, and gymnastics. Cold douches to the abdomen and sitz-baths of short duration have been tried. Massage executed *secundum artem* in the form of effleurage, pétrissage, and tapotement, in connection with Thure Brandt's *Unternierenzitterwirkung* and faradization of the abdominal walls, intragastric faradization and galvanization, have also had systematic trial; but the results, at least in far-developed cases, were unsatisfactory. In some instances some of these procedures are not harmless, for what we gain on the one hand by invigorating the muscles, we may lose on the other by irritating the psyche of a hysterical person. We have to take into consideration that we are dealing with the nervous condition of a patient. But, moreover, all these remedies are illusory in the case of patients of the working class. I might, however, speak favorably in such cases of massage with a cannon-ball of five or six pounds' weight, which is cheap, convenient, and perhaps more effective than mas-

sage with the hands. I might also recommend swimming for such cases, when in season and opportunity is offered; and also, as productive of some good, I might think of the podylaton, commonly but horridly or barbarously called bicycle.

None of all these remedies just mentioned will I criticize or discard. They may all in their turn serve as accessaries to the remedy which has given me more satisfaction in grave cases than all the others put together.

The therapy of gastroptosia consists in the attempt to give tone to the abdominal walls, and, if this can not be attained, to find a substitute for the loss of tone by means of a bandage. My experience has been scarcely satisfactory with bandages as they are made by the patients or the bandager. Except in Landau and cases of obesity, it seems difficult to have a well-fitting bandage made, impossible in cases of patients of lean habit. Recollecting how well a broad rubber plaster has served me in cases of umbilical hernia when cut in the shape of the abdominal wall, tapering off behind, and secur-

ing to perfection the whole abdomen; recollecting, moreover, how well such strapping has been borne, and knowing of what great service it proves in case of fractured rib and in some cases of pleurisy, I have used a plaster of the

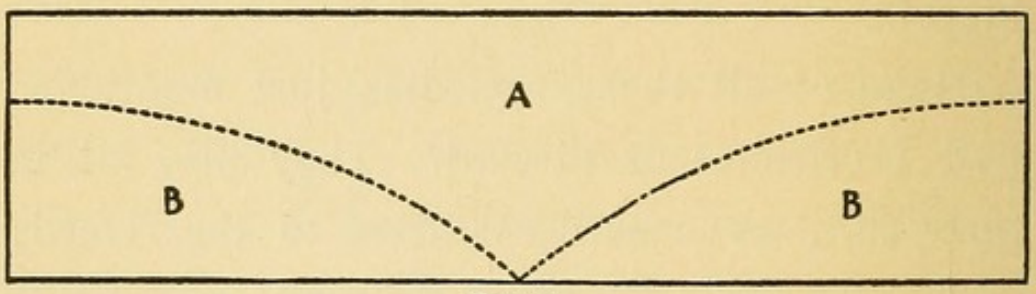


FIG. 9.

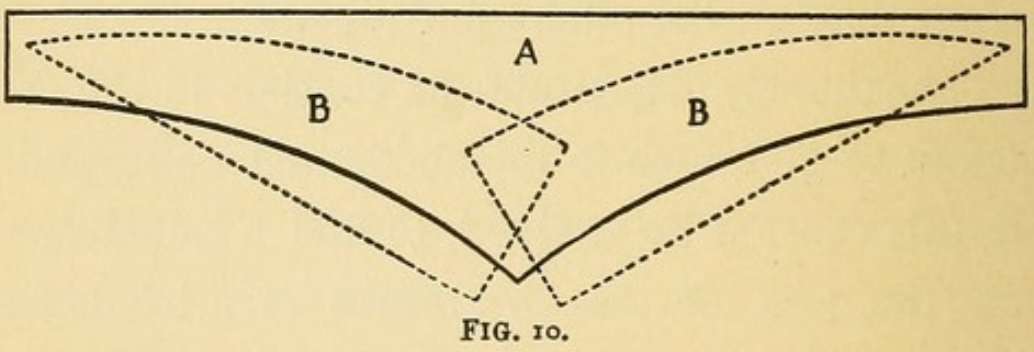


FIG. 10.

form and in the manner to be described in cases of gastroptosia.

At first I applied the ordinary rubber plaster only. A piece of the size of twenty-six to thirty-six or more inches, as the case may be, by seven inches, is cut as shown in Fig. 9. *

* The sections indicated by the dotted lines, and marked B (see Fig. 9) are separated from the bandage A, and laid upon it in reversed position so as to overlap (see Fig. 10).

The large piece is applied as tightly as possible around the abdomen, the point in the middle over the symphysis, drawing it well upward, while the narrow ends meet and overlap at the spine (see plates I. and II.).

The plaster should not include the crest of the ilium, but should run closely along and above it. The support of the abdominal walls is made perfect by the additional application of the two side pieces of the plaster, extending from the hypogastrium over the inguinal and iliac regions, reaching also to the spine, and overlapping (see plates III. and IV.).

In applying the side pieces we may use considerable force.

In many instances, especially in cases of full habit, it is much preferable to apply the two side pieces first and the large piece last (see plates V. and VI.).

The plaster has been applied by several colleagues, who have tried the method in different positions of the patient—the dorsal, the semi-oblique, or even the Trendelenburg in cases of extreme ptosis. In fact, this last position was

at once suggested when I first spoke of abdominal strapping for gastroptosia before a medical society.

In many cases it happens, sometimes after a few days, sometimes after one or two weeks, that the plaster becomes loose at the lower margin, from the symphysis to the groin, while it remains well adherent otherwise. In order to guard against this accident, I find it practical to strengthen this border by applying an extra small strip of plaster all along the lower border, as shown in plate VII.

Most marked and prompt relief has been afforded in such cases of extreme severity in which reflex cough and reflex vomiting were among the symptoms. Patients whose night's rest had been interrupted by almost constant coughing, and whose nutrition had been impaired by frequent vomiting, have at once enjoyed comfort, after months of distress, the first night after strapping, and have been able to retain at least properly selected food, which they had not been able to do before such strapping. One of the first cases of this kind was that of a

Page 87.

Application of Main Piece of Plaster. Front view.

Page 87.

Main Plaster Applied, Ends Overlapping at the Spine.

Page 8,.

Side Pieces of Plaster Applied. Front view.

Page 87.

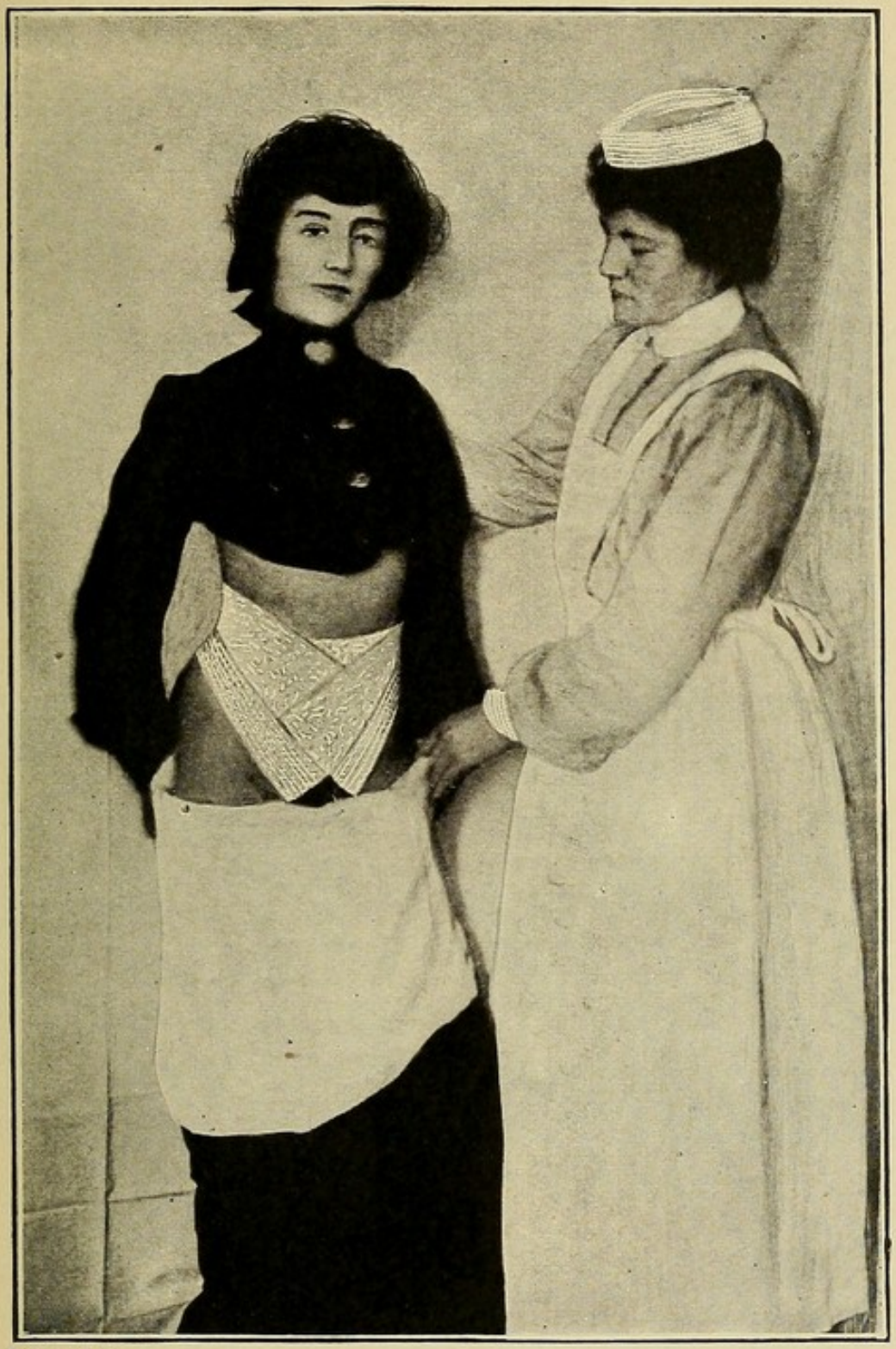
Plaster Dressing Complete. Dorsal view.

Page 87.

Side Pieces of Plaster Applied First.

Page 87.

Plaster Dressing Complete. Side pieces applied first, main piece last.



Page 88.

Plaster Dressing Completed by Additional Strips Applied Over the Lower Border.

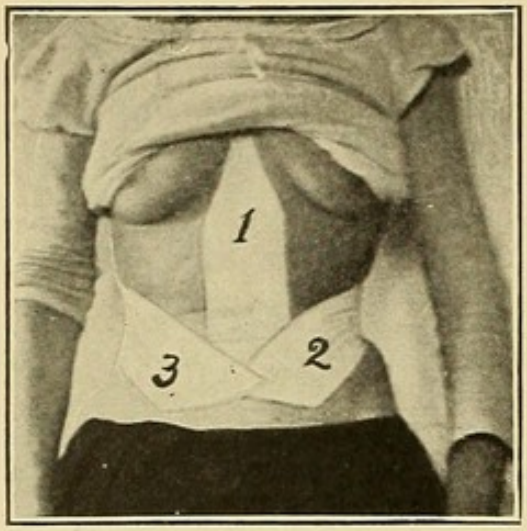


FIG. I.

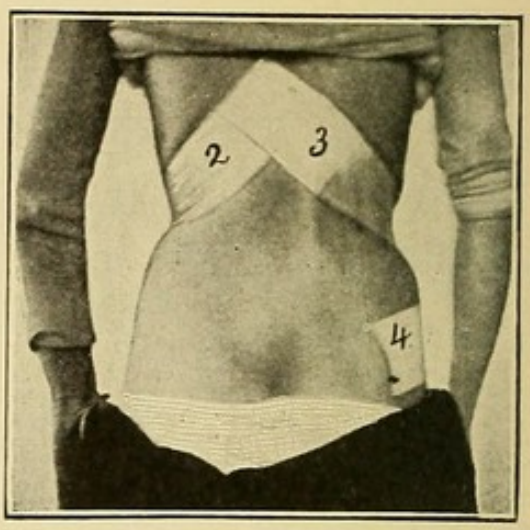


FIG. II.

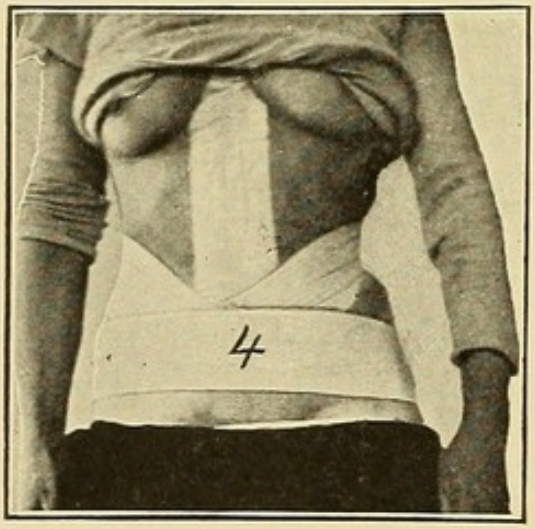


FIG. III.

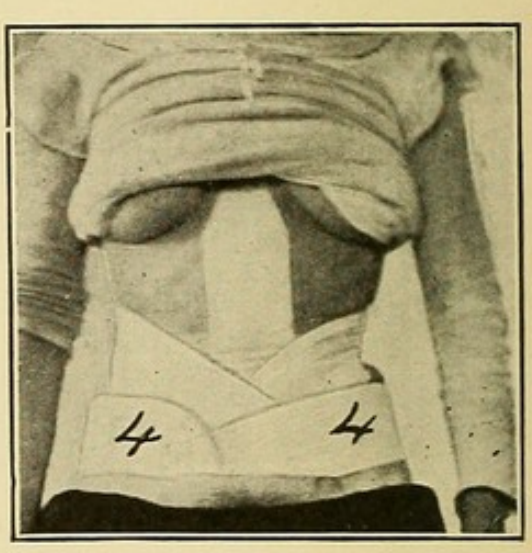


FIG. IV.

Page 102.

Rosewater's Abdominal Plaster Strapping.

woman suffering from pulmonary phthisis associated with gastroptosia. Another case was that of a hard-working woman with gastroptosia, who, notwithstanding her reflex coughing and vomiting during an enforced application to housework, was promptly relieved. It is possible that in this second case some other treatment in the end might have been successful; but to subject her to massage, electricity, or hydrotherapy was, on account of her circumstances, out of the question.

At the time when I first presented my observations before the New York Post-Graduate Clinical Society, on December 22, 1899, and again before the American Gastro-Enterological Association, at a meeting in Washington on May 1, 1901, the majority of my patients had been dispensary cases, saleswomen, housemaids, hard-working housewives, and some men of the working class.

In one case of floating kidney, after the plaster had been borne for only six weeks, I observed, for months after the relief had been found permanent, that the relaxation of the or-

gans or the ligaments suspending the organs, together with the relaxation of the abdominal wall, was no longer perceptible; such was, at least, the case when I saw the patient last, six months after the plaster had been removed.

I give now the cases which were described at the above-mentioned meeting of the American Gastro-Enterological Association.

I. S——, 27 years of age, saleswoman. Had had cerebrospinal meningitis, gastroptosia and nephroptosia, anteversion, descensus of ovaries, gastralgia, hyperacidity, periostitis of one of the spinous processes of the lumbar vertebræ, and fainting spells. It is true she was subjected at once to treatment of the uterine disorder, the periostitis, and her enfeebled condition in general, but the principal and decided relief, without which all other treatment might have been of little effect, was given by strapping. Far be it from me to say that the strapping alone is a cure-all in cases of gastroptosia, but it is by all means the most essential in all aggravated cases thereof.

In one case of heart disease complicated with gastroptosia, which I had under observation for

two years, I attribute the most excellent results, the marked improvement of the general condition, to the strapping, because, from the time of the first strapping, my patient was able to eat and to digest as he had not been able to do before, in spite of all medical and hygienic measures applied to him.

In one case, a young girl with gastroptosia was subject to fainting spells several times every day. The plaster was applied in the clinic of the Post-Graduate. No other treatment was resorted to until I had had an opportunity to examine the contents of the stomach. When she came, after having borne the strapping for one week, she reported that her general condition had much improved and that she had not had her habitual fainting spells. The examination of the contents of the stomach showed achylia. In this and other cases of women we have to make allowance for the existence of hysteria; but even so, relief of the gastroptosia can not be of less importance.

On the whole, in looking up my records, I come to the conclusion that strapping is of

great service and gives prompt relief in all cases of gastroptosia of high degree; it is especially valuable where there are complications of lung, heart, or uterine diseases.

A case which in my opinion is important is the following:

J. M——, a boy 5 years of age, was brought to my office October 10, 1900. Poor appetite, lives on bread and butter and water; absolutely no other food. Has much nausea and vomiting, pain after eating, and frequently diarrhea. Enuresis nocturna diurnaque. Is an exceedingly nervous child, very excitable in playing with brother and sister. Well-pronounced gastroptosia. Ordered strychnin and iron, ablution of the whole body with the damp, ice-cold sponge. *October 29.*—No improvement. *November 14.*—Still eats nothing but bread and butter, but a little more than formerly. Bowels now regular. Enuresis nocturna less. *March 19.*—Appetite still poor, but has learned to drink milk. Enuresis nocturna diurnaque still continues. Apply rubber-plaster bandage. *March 27.*—The bandage has remained well in place and has given no discomfort. The general nervous condition has

greatly improved; he is no longer irritable in playing with other children, as he used to be. Now eats everything, even apples and bacon, altho the former caused a slight diarrhea. Enuresis nocturna now rare; diurna still exists. Case yet under observation.

I have never seen the child since I described the case, but I learn through members of his family that he has entirely recovered from all his ailments.

How well the plaster is borne was shown by the case of a lady in the higher walks of society, to whom I had applied it to relieve gastralgia remaining after a rest cure for gastric ulcer. This patient wore her plaster bandage for over five weeks, during which time she took her accustomed daily bath. When I removed the plaster, after this period of five weeks, the skin was found in perfect condition.

How the strapping is borne under extraordinary circumstances was demonstrated in the case of an acrobat who performed with heavy iron bars in a variety theater. Notwithstanding his muscular strength, he suffered from

gastroptosia and complained especially of reflex vomiting. He was able to perform with the plaster on, and obtained relief from his distressing symptoms. I lost sight of him. He belonged to a company on the road, a one-night stand, but I learned from the druggist who had sold him the plaster that he had written from some distant place for another supply.

Dr. Clemm reports the case of a directress of a ladies' orchestra who played the first violin. The active exertion necessitated by the vocation of this woman makes her case in a certain measure parallel with that of this acrobat. Dr. Clemm lost sight of his patient as I did of mine, and therefore does not know how long the improvement has lasted, but he was informed at intervals that this patient *herself* or some one of her company had afterward applied the simple contrivance.

In the paper of May 1, 1901, I made the following remarks, which may prove of interest at the present time when the method of strapping has become extensively adopted:

"It is not my intention to give detailed ex-

amples in this paper. The principle of the method of strapping recommends itself without such examples. All I have to say is that my experience has demonstrated that strapping, in almost all cases, is well borne, is enthusiastically appreciated by the patients, and, altho it has to be renewed in some cases, is invariably of permanent benefit. It is to be hoped that this method will at least be given a chance in cases of floating kidney before they are delivered over to the operative procedure of the zealous surgeon. . . . Gastroptosia is much oftener overlooked than diagnosticated. Even in papers on diseases of the stomach we notice quite frequently that all attention is given to secretion, to the chemistry of the stomach; the motor functions, which should be considered the most important of all, come second; the position of the organ is seldom mentioned; of the relaxation of the stomach manifested by the presence of splashing sound on tapping on the abdomen, or of the absence of this important symptom, not a word is said, altho this atony may be the cause of or be connected with the

anomalies of secretion, with gastric disorders in general, with nervous symptoms, and in heart and lung affections it may be of great importance."

Almost simultaneously with me, but independently—that is, without knowing of my observations—Dr. N. Rosewater, of Cleveland, Ohio, demonstrated, before the Cleveland Medical Society, February, 1900, a similar method of strapping in case of atonia gastrica. This paper was published in the Cleveland *Journal of Medicine*, June, 1900. The first case he treated dates from the year 1898 and is the following:

"In April, 1898, I examined Pearl G——, aged 7 years, who up to that time had not been able to speak. The only sound she uttered was a guttural 'g.' Other physicians told the mother nothing could be done, perhaps it would pass away in time. Examination of her mouth revealed a normal palate, enlarged tonsils, and a very much hypertrophied, ragged tongue. Altho not tongue-tied, it could not be protruded. This was sufficient cause for a lack of

articulation. Her hands and feet were cold and clammy. On standing erect there was considerable protrusion, breadth, and tenseness of abdomen; the costal arch was very wide, as if it had yielded to the force of the protruding abdomen. The left kidney floated in the left iliac fossa, while the right kidney was palpable on deep inspiration. There was also a gastroptosia. I called the attention of my colleague, Dr. Feil, to this rare condition, and proceeded to slip the left kidney up into its place and to correct the abdominal ptosis by a series of bandages to be described later. This child was also suffering from incontinence of urine, both day and night. She always slept with her mouth open. I told Dr. Feil at that time that I suspected a causal relation between the enlarged tongue and the enteroptosia, and perhaps a correction of this condition ought to bring about some correction of the tongue. No medicine was to be given in this case.

"I regret not having photographed the condition, but hardly expected to obtain so perfect a result. The bandaging was done as follows:

With the child supine, first one strip of two-inch perforated rubber adhesive was fastened at one end to the lower part of the abdomen, a little above the pubic bone, the belly pushed up, while traction was maintained till the other end of the adhesive strip was fastened to the sternum; another strip attached diagonally on the left side by one end just above Poupart's ligament, and traction made diagonally outward attaching the distal end upon the ribs on the back; another strip correspondingly attached on the right side; finally a strip three inches wide attached from hip to hip across the abdomen above the pubes as a belt. This aid to the natural anchorage of the abdominal muscles upon their bony framework furnishes physiologic rest and support to weak muscles, to organs dragged or pressed upon, to blood- and lymph-vessels, and to nerves and ligaments out of normal tone and function from the constant irritating drag. On May 14, three weeks later, the mother reported that the child could make herself understood somewhat, could play much longer, and did not get tired and out of breath

so easily. She slept with her mouth shut. The bandages were renewed on June 19. She could breathe through her nose all the time and could pronounce words. Everybody noticed that her speech improved very much. Her hands, body, and feet were warmer and dry. On September 11 I was called hastily to see her at her home. Her mother said: 'Pearl is suffering from inflammatory rheumatism and her left hip pains her terribly. I can't move or touch the child without her screaming for pain.' She and her sister had been out the day before for a long walk. I found the pain exquisite at the hip and knee. The bandages had come off before the girls took the long walk. There was no redness or swelling of the joint and her temperature was normal. Suspicion fell on the floating kidney, which I found had slipped under Poupart's ligament and was probably pressing upon the anterior crural nerve. I slipped the kidney back into its place and rebandaged. Fifteen minutes later the child was on its feet playing as usual.

"Speech was fully established nine months

from first bandaging and has been constantly improving in quality and rapidity of articulation. Bandages were left off last June and were not replaced during the long vacation. I examined her repeatedly under deep breathing, erect and on lying down, but found the kidneys were not palpable. The child has grown stout, and her hands and feet are warm and dry. Incontinence of urine ceased at once and has not returned since bandaging first began. The stomach is still prolapesd, tho she eats more than ever.

"After I had replaced her left kidney and kept it in its place with the bandages as described, I kept her under my observation for over two years and found it always held in place. She was in my office only a few days before the event about to be narrated, and was examined by both Dr. W. G. Stern and myself; the kidney was then in place. October 9, 1900, she came to see me, complaining of pain in her left inguinal region. It seems that on that day her teacher had not permitted her to leave the classroom. Before she had time to

empty her bladder, she was seized with sudden pain and felt something give way. I found her right kidney prolapsed and left kidney floating again, and, replacing, I bandaged as before. Up to this date, May 20, 1901, I find it is still in place and neither kidney palpable on deep inspiration.

"The overweighted bladder had likely made sufficient traction on the left ureter, either alone or aided by a full pelvis, to drag the kidney down. This case emphasizes the necessity for teachers to be made aware of the possible injuries resulting from refusal to allow attention to the demands of nature in a reasonable time."

Rosewater's Abdominal Plaster Strapping. —Rosewater, as do all other authors, pushes the abdominal viscera upward. In case of extreme relaxation or full habit, in Landau cases, it is my practise to apply the side-pieces first, as mentioned and shown in plate V.; this answers best and most conveniently the purpose of pushing up the abdominal viscera before the main piece is applied.

Rosewater places a plaster strip vertically from

the symphysis to the sternum (Fig. I., 1, Plate VIII.), adds two other strips (Fig. I., 2, 3, Plate VIII.), extending from the symphysis obliquely sideways and upward over the abdomen, crossing each other on the back (Fig. II., 2, 3, Plate VIII.), and finally making a circular turn (Figs. III., IV., 4, Plate VIII.). There are also pieces applied to cover all strip ends, a total of eight different pieces.

The Rosewater Adhesive Belt.—With the patient flat upon his back, a sufficient length of two to three inches wide zinc oxid adhesive plaster is fastened at its one end to the abdomen just above the pubes, then the abdomen is pushed up while sufficient traction is maintained upon the adhesive plaster until the other end is fastened upon the sternum parallel to it and strongly supporting the recti muscles. A similar strip is attached diagonally, the first end to the left of, adherent to, and lapping over the pubic end of the first strip, while maintaining traction upon the abdomen and extending diagonally to the left, upward and outward so as to fasten the strip smoothly over the ribs as far

back as the spine. Upon the right side a similar strip is attached under similar abdominal traction to the right, and its distal end is made to meet and overlap the end from the left side, forming a single diagonally drawn girdle that completely overcomes the downward and forward abdominal drag, forming a strong support to the oblique and spinal muscles. A last piece of plaster is fastened by one end upon one hip and stretched horizontally across the abdomen so that its lower margin is just above the pubes, and the whole in crossing overlaps and fastens down the lower ends of all the other strips, while the distal end is firmly fastened to the opposite hip, acting as an additional girdle, preventing still more securely some of the downward and forward abdominal drag which is not always possible without it, and distributing upon the strong hip bones much of the abdominal weight, acting as a relief to the weak spine, the whole furnishing physiological rest and tone to the failing anatomical wall, to weak muscles, to organs dragged or pressed upon, to nerves and ligaments out of tone, nourishment, and

function from constant drag or pressure, restoring overstretched (therefore stenosed) blood- and lymph-vessels, both of the abdominal wall and deeper structures, to their normal caliber.

This method I have used with variations to suit individual cases or to test various plans and material, but the above is suggestive of the principles involved.

The perpendicular strip in some cases can be left off or used with only the horizontal cross strip, especially with children. When there are stomach or other left-sided displacements or in cases of perigastritis or other inflammatory conditions, especially with adhesions, an extra diagonal strip on the left side may be added. With hepatic or right-kidney displacements, or inflammatory conditions of the right side, I support more toward the right. Instead of the single lowest horizontal strip, I often prefer two centrally overlapping halves, drawing each slightly upward and outward; it is better for heavy abdomens, and the strips fit with greater nicety over the hips. By previously bathing the skin with two-per-cent. aqueous borax solu-

tion or with ether, itching is much lessened. Any adherent stickiness after removal of the belt can be cleaned with gasolin or ether or by softening with petrolatum or bland oil prior to a hot bath. The belt should be renewed in two weeks; never give consent to its remaining over six weeks for fear of irritation, even suppuration. Shave off hair if in way of plaster.

Over the excellent adhesive belt of Dr. Rose mine has greater range of adaptability to varying conditions, handiness for bedside use, also greater surface of integument left bare without loss of utility. Dr. B. Schmitz's single encircling strip corresponds to my two diagonal strips, which when they unite in the back form one girdle like his; but the two separate strips seem to lift and support the abdomen better from below upward and outward than his single strip, which traverses up one side, following the proper direction for lifting and supporting, and then down on the other side in the opposite direction to the proper lines for lifting and supporting, seeming hardly likely to support as firmly, and also seeming more difficult to put

on except the patient be almost nude, whereas my separate strip, besides supporting correctly, can be nicely applied even when the clothes are only loosened.

The advantage of the horizontal strip is quite important, especially for the obese, and is protective about the easily ruptured groin, for this, the lowest point, is that of greatest downward pressure.

I have sometimes, where the adhesive quality of the plaster was poor, put on small strips overlapping the ends at right angles, to make them hold the ends down and last longer. I also cut the front ends of the diagonal strip, also the top of the first strip, on the bias for cosmetic reasons. In laying the plaster over excoriated or irritated surfaces I place a layer of paper or cloth under the plaster where it passes over such a surface. I found several years ago after comparison of the same make and quality of plaster a decided preference in favor of the non-perforated plaster.

The advantages of the adhesive belt are adaptability to individual cases, ease of securing a

perfect fit whether at the office or bedside, not being subject, as the removable belts and corsets are, to the caprice, error, loss of time, and shortcomings of the instrument-maker, also to the forgetfulness or neglect of the wearer to put it on daily or of incorrectly putting it on. The adhesive belt is sure to be sticking to the patient just as and when the physician wants it, day and night, and is firmly held in any position whether of great strain or not. It is the only satisfactory method of lifting and supporting the flat-bellied, and is elegantly adaptable for the corpulent, while they require the strongest possible upward lift and support. After tone has been established in the organs and muscles, corpulent patients can use the movable belts for support and to prevent return of the atony, and the movable belt can be worn where extreme hairiness or irritated skin prevents the use of the adhesive belt.

The question whether the stomach can be lifted up by this procedure can be easily decided by mapping out its upper and lower borders before and directly after bandaging.

Both borders can be easily demonstrated to have risen in most cases one inch or more. If there are exceptions it is in those who have had laparotomies, usually fixation operations, or peritonitis, where adhesions seem to interfere with the lifting up of the abdominal contents.

There are some who have a misconception that the abdominal muscles thus supported will thereafter always require such support, and that muscular atrophy will follow from the pressure and lack of function. Were these muscles encased in a plaster-of-Paris cast or in a non-pliable corset, and not at all used, such reasoning might be plausible, but these muscles are just as pliable and kept in good function and tone during the time the belt is worn, the adhesive belt simply assisting muscles below normal tone, acting rather as a constant tonic of correct dosage, and is always at hand. As one instance of a prolonged tonic effect, an over-corpulent hard-working woman comes once annually to have a bandage applied, which she wears about two months, and this, she claims, keeps her strong the rest of the year. Another

is a patient with lordosis, gastroptosia, and extremely sensitive spinal muscles, who for over two years had a new adhesive belt applied as fast as the old one was taken off, the belt entirely encasing her abdomen and muscles of the back; she continued to gain in health, weight, and strength till discharged cured. For over a year she has remained well and not required a belt of any kind.

Indications for its use as a tonic begin when a diagnosis of atonia gastrica is made or even anticipated, as, for instance, the overcorpulent workingwoman cited above.

The adhesive belt is less important in those early cases in which the cause of the atony is some slight hygienic error, such as overwork, lack of sleep, or some sudden shock which need not recur or is correctable by well-known means; but when the exciting cause is constant or intermittent or unavoidable, as from continuous overwork or occasionally repeated muscular overstrain, or from anemia, lithemia, syphilis, rachitis, etc., the adhesive belt is indicated early, to avoid the otherwise constantly increasing atonia.

For Gastroptosia.—When a demonstrable gastroptosia has finally resulted some form of bandage is indicated to lift and support the abdominal wall and its contents, so that it and all the organs and vessels can properly functionate. The adhesive belt having the greatest range of adaptability for lifting and supporting properly is especially indicated. After correction of the ptosis, to prevent a recurrence a movable belt or properly fitted corset may answer. It is often for the sequelæ of the visceral ptosis that relief is sought as follows:

Circulatory disturbances, resulting from the drag upon the abdominal vessels, both superficial and deep, with consequent narrowing of caliber, require increased cardiac impulse to overcome and produce the normal flow to the parts they feed; the heart must accordingly pump with that much greater force into the cranial and thoracic cavities than these parts require, causing relatively increased general or local congestion in these cavities, as witnessed by throbbing headaches, conjunctival congestion and other eye disturbances, bulging, con-

gested tonsils, thick and enlarged tongue, and also goiters, which disappear after applying the adhesive belt. In fact, so constantly do I find goiter and gastroptosia associated that I venture to make a diagnosis of gastroptosia upon evidence of goiter.

Cardiac Indications.—The heart, finally embarrassed by the above-described overwork as evidenced by missed beats and rapid also irreggular action, will often (even while we are still at the bedside) regain its tone and even improve its rate and rhythm directly after the adhesive belt is applied.

In one case with leaky heart valves, extreme dropsy of the extremities, air hunger, continued sleeplessness, and cherry-colored sputum, all indicating intense thoracic and cranial congestion, after the adhesive belt was applied, the legs elevated, and nothing else given, the patient passed nearly three gallons of urine in twenty-four hours and slept comfortably on his back. It is only after the belt is applied in such cases and the blood-paths are opened up and made uniform that heart tonics and stimulants,

such as digitalis, strychnin, etc., can do their work properly; for if given without first releasing the drag or pressure on the blood-vessels, they simply increase the congestion of the part above the relatively stenosed vessels in trying to force an adequate blood-supply through them. Thus constipation, by closing up the blood-paths in the intestines, causes throbbing headaches and cranial and thoracic congestion by forcing the heart to greater impulse through its impeded vessels, while rapid relief of the constipation thus rapidly relieves both headaches and resultant congestion.

Pulmonary Indications.—An adhesive belt is often indicated in congestions and inflammations of the thoracic cavity, such as bronchitis and pneumonia, also pleurisy in obese or debilitated subjects, and in those in whom coughing is painful, distressing, or seems to injure the abdominal parietes, or causes involuntary micturition. The adhesive belt enables them to roll and toss in bed with far more ease and comfort, and is a great support during convalescence.

I have found it of great help in pertussis. In

one case (five years ago) in which constant vomiting threatened the life of a six-year-old child, vomiting at once ceased and recovery was rapid. Dr. Kilmer has lately reported similar results in a large number of cases from a cloth bandage much more troublesome to make and also to stay on children (except perhaps on infants) than the adhesive belt.

Gastro-intestinal Indications. — Were a work on gastro-intestinal diseases to be written to-day by one not hampered by past traditions, a revolution in the presentation of the entire subject would occur. A small amount of space would be devoted to the findings of the stomach contents except as data of corroboration of the functional symptoms, whereas by far the greatest part would be given to causes leading to the deteriorated function of the digestion tract, not the least of which is atonia gastrica. Were such a man to lecture to a class of medical students he would dwell, not so much upon the rarer conditions of a cancer, ulcer, or chronic fermentative disturbance, which the average medical man will not see more than once or twice a year,

but rather upon the more common condition of almost every-day practise—gastroptosia. Gastro-intestinal diseases ensue as secondary results of visceral ptosis far oftener than as primary affections. The adhesive belt is here especially indicated. A test meal in these cases is useless for treatment and only useful as a matter of record. When the ptosis has been corrected usually the functional condition returns to normal, so that only then can we obtain findings by the test meal which will be constant, whereas treatment of the functional condition is only temporizing. This applies equally to superacidity or subacidity, to mucous catarrhs, fermentative conditions, intestinal indigestions, acute or chronic diarrheas, constipations and those alternating with diarrheas. The remarkably rapid results from the adhesive belt have demonstrated that the ptosis and atonic state of the parts involved act more often as causative than as resultant factors, for even the dilated stomach often results from ptosis followed by atony and dilatation. For ulcer of the stomach, Mayo (and no one is better qualified to speak than he)

says, "Clinical experience has taught that drainage is the best method of surgical treatment." In this we can all concur, but by the aid of the adhesive belt the stomach is so much more surely drained that no case should go to the surgeon without first trying the adhesive belt, unless there is a positive stenosis of the pylorus, as the following case will demonstrate.

Miss K. L——, aged 25, whom I first saw in Rosenheim's clinic, where she had been under treatment. Morning lavage brought up quantities of food remnants. Symptoms of belching, burning pain, nausea, and vomiting after meals. She had been treated for fifteen months in Boas's clinic, who then sent her to the Charité, where under von Leyden's care she remained ten months, repeatedly refusing operation, finally leaving there to come to Rosenheim's clinic. He after six weeks' trial was about to send her to the surgeon, but at my request, after the patient protested, a trial of the adhesive belt was made, resulting at the end of only three weeks in disappearance of all subjective symptoms and a gain in weight. Repeated trials failed to show food remnants in the morning

lavage. (Diet, two meals a day instead of six and seven as before.)

In chronic perityphlitis, perigastritis, cholecystitis, and when organs are dragged about while in a state of irritation or inflammation, the adhesive belt, by fixing them and preventing drag, is a great aid when surgery can not be used. In typhoid fever, when there is an extreme atony and when everything is done to avoid undue heart action, and during delirium, when violent sudden strains and motion of the body are to be avoided, the adhesive belt is very valuable. Convalescents left their beds with new bandages, and there were no relapses or sequelæ. What is true as to bandaging of typhoid convalescents applies to all with acute debilitating diseases.

Pelvic Indications.—The adhesive belt is indicated for many pelvic disturbances. Incontinence of urine in children or in adults, irritated bladder attended with spasm, also neuralgias, have yielded often to abdominal bandaging, the abdominal pressure causing disturbances of in-

nervation and muscular weakness. Ovarian and uterine conditions, such as oothecalgia, dysmenorrhea, and leucorrhea from local congestion, results of poor circulation caused by undue abdominal pressure, may be corrected by the adhesive belt. Relief during dysmenorrhea often has been immediate.

Disturbance from fibroids of the uterus and other abdominal tumors when causing excessive downward abdominal pressure, constant backache, frequent micturition, are relieved by the belt, the direction of support depending on the case. Disturbances of pregnancy from weight and pressure will often disappear on the use of the belt or an elastic bandage. No woman after delivery of the child should be allowed to sit up without the adhesive belt. It is the ideal bandage for such cases.

Pressure of the overhanging and of the obese abdomen, in those who walk about often, is made upon the vessels of the groin. I have traced local edema, which the plaster belt quickly relieves, to such cases. Also a neuralgia, traceable to a floating kidney pressing

either directly on a nerve or on the vessels of the groin, interfering with nerve nutrition, was relieved at once on replacement and bandaging.

Obstinate cases of varicose ulcers in such patients as have resisted previous medical treatment over long periods were invariably cured when treated with elevation of the leg and the adhesive belt. In no case was the cure delayed beyond two weeks.

Obstinate eczema and intertrigo due to hanging belly, when the overlapping surfaces maintained a constant irritation, were rapidly relieved and cured after the overlapping portion was lifted away and supported with plaster.

Coxalgia resulting from pressure of weight upon a recently injured coccyx, sciatica, and other severe pelvic backaches have been rapidly relieved by not only bandaging the heavy abdomen but also lifting the fleshy hips and supporting them upon the sacral spine, thus taking off excessive weight.

Spinal lateral curvature with displaced, somewhat twisted organs, manifested by most excruciating suffering at the menstrual epoch, also

with severe gastric symptoms, has been permanently relieved of all subjective symptoms by lifting and forcing the organs back in the direction from which they seemed displaced, by means of the adhesive belt, maintaining traction also against the curvature.

The backaches of kyphosis and lordosis are also benefited by the adhesive belt. The displaced organs (kidneys, stomach, transverse colon, liver, and spleen) can be lifted and supported. The kidneys can be replaced and often kept in place by proper manipulation.

In conclusion, as a preventive measure all children and adults who have, or in their daily walks or work are liable to have, weak abdominal muscles or hernias, all who labor hard, lift or carry heavy burdens, all soldiers and others in hot climates, or those who make sudden or long, exhausting marches, should wear as a support and preventive a proper girdle or belt and have their abdominal muscles strengthened according to practicability by such methods as electricity, massage, hydriatics, gymnastics, etc. Women should avoid wrongly constructed corsets.

Gymnastic exercise, especially for women and children, should be limited to such motions as can not possibly cause displacement of the organs.

Independently of Dr. Rosewater and myself, Dr. B. Schmitz, of Wildungen, Germany, has hit upon a similar device, but he had in view the treatment of the kidney merely. His method will be described in another chapter; also the suggestions for which we are indebted to him in the adjustment of the belt in cases of inflamed kidneys.

Dr. Walther Nicolas Clemm, of Darmstadt, introduced into Germany the method of abdominal strapping for the support of the abdominal viscera in case of gastroptosia, as suggested by me. His first article on the subject appeared in the *Therapeutische Monatshefte*, February, 1903, and quite a literature on the subject has since been created, showing how much the device is appreciated abroad.

Dr. Clemm says: "The applications of this dressing I have extended. I employ it in after-

treatment of ulcus ventriculi, as well as in all affections of the stomach tending to hemorrhage; above all, in the suppression of painful pylorus spasm and also in after-treatment of typhlitis. In all these conditions the same benefit will be derived from the use of dressing as in many other affections, such, for instance, as Schmitz has described when he supported not only the displaced but also the normally situated tho inflamed kidney. I believe, however, that the simple abdominal belt is much preferable to Schmitz's complicated dressing with plasters in the shape of straps and girdles."

The directions for the dressing in after-treatment of ulcus ventriculi I myself drew up, soon after I began practising the method. In gastric ulcer we have, as a rule, to deal with the ulcer itself, which will cause pain immediately or soon after ingestion of food—exactly as a sore on the tongue when irritated by morsels of food introduced into the mouth, and especially in the case of coexisting hyperchlorhydria. After an ulcer cure has been accomplished and

the characteristic ulcer pains have subsided, we may find the symptoms of hyperchlorhydria much more pronounced than they were before the treatment of the ulcer. Patients, instead of having the characteristic ulcer pains—that is, the pains that follow ingestion—will complain of the characteristic hyperchlorhydria pains they feel some hours after eating, or during the night, or early in the morning. These new pains after an ulcer cure were the veritable crux of physicians in former times, when the symptoms of hyperchlorhydria and their treatment by means of diet were not understood so well as they are now, when the regimen of Illoway—the most perfect that can be imagined—was yet unknown. The text-books gave no aid; while they mentioned narcotics, they gave warnings of a new danger to be incurred by their employment, and confessed that even as palliatives they were of little avail.

With the idea in mind that pain might be relieved by means of equally distributed pressure on the whole abdominal wall, and influence

thereby be exercised on the circulation and innervation of the abdomen, I applied the plaster belt and found that it actually answered the purpose. At that time I was not yet aware that abdominal strapping had the effect of regulating disorders of gastric secretion.

Observations made in the treatment of dispensary patients in the New York Post-Graduate Medical School and Hospital, and the very exact investigations of Dr. C. J. Graham Rogers in Dr. Kemp's clinic of Manhattan State Hospital, Wards Island, have demonstrated the fact that there exists a close relation between secretory disorders and gastroptosia, that all forms of anomalous gastric secretion may be associated with gastroptosia, and that relief from anomalous secretion may follow as promptly as relief from motor insufficiency after gastroptosia has been relieved.

Dr. Rogers has made an analysis of stomach contents in cases in which the abdominal strapping had been applied. His report, which he read at a meeting of the New York Post-Graduate Clinical Society, December 18, 1903, in-

stances 35 such cases, all of Dr. Kemp's clinic in the epileptic ward of the Manhattan State Hospital, Wards Island. Of these 35 cases, 14 were put on a special diet. Three of these 14 had gastroptosia, and, in addition, there was hyperchlorhydria present. In all these cases the gastric symptoms cleared up after the application of the belt and subjection to special diet, together with internal medication.

Seven cases of gastroptosia were then selected and treated with the belt alone. In one of these there existed hypochlorhydria and in six hyperchlorhydria. In four of these marked improvement followed.

It is evident, therefore, that the after-treatment of ulcus ventriculi by means of the abdominal plaster belt is effective in reducing the hyperacidity.

Dr. Clemm, in his paper "On Adhesive Plaster Dressing to Support the Abdominal Viscera," a translation of which appeared in *The Post-Graduate*, November, 1904, mentions further, among the disorders which he discovered to be benefited by applying the belt, all

affections of the stomach inclining to hemorrhage. I have as yet no experience on this point, but consider Clemm's suggestion a most rational one. He speaks likewise of the method as being of service in the suppression of painful pylorus spasm. According to my own experience, there are cases in which it will prove serviceable, and others in which the cause of the pylorus spasm is not connected with gastroptosia, where the belt can not be of any benefit whatever. He has recommended it also in after-treatment of typhlitis. I wish to add that it is to be considered for theoretical reasons a most rational prophylactic against perityphlitis. I may be permitted on this occasion to say that the barbarous term "appendicitis," so universally in use, is about the most horrible example of scientific ignorance—as Kant calls it, in contradistinction to ordinary ignorance—and bad taste.

Clemm, in the same paper, says: "I have treated with the belt simple ptosis of viscera and have had more or less lasting success. In a case of very obstinate mucous colic and in

cases of cholelithiasis I found the abdominal belt very valuable as a complementary measure in addition to a method I have suggested."

Dr. Kemp also, as well as myself, before we knew of Dr. Clemm's experience, found that abdominal strapping may be prescribed in mucous colic.

Some distinguish between enteritis membranacea—a genuine enteritic catarrh—without colicky pains and colica mucosa, the latter being characterized by the well-known complications of symptoms, chief among which are colicky pains. Nothnagel calls this latter form a disease *sui generis*. As far as my own observations (confirmed by observations made by Dr. Kemp) show, mucous colic is not a disease *sui generis*, but one of the symptoms of gastroptosia.

The question whether gastroptosia is in all cases the cause of mucous colic must be decided by further observation; but it is easy to arrive at a decision *ex juvantibus*. Thus far but few writers have paid attention to the coincidence of gastroptosia with mucous colic. Kemp

writes:* "In gastroptosia, I believe we have the chief etiological factor in mucous colic. Ewald has pointed out that ptosis of the colon frequently occurs simultaneously with this condition, and Einhorn has demonstrated that gastroptosia is present in a large percentage of cases of mucous colic. . . . Mucous colic is not present in all cases of gastroptosia, any more than is hemorrhage in all cases of typhoid fever. All cases of mucous colic are neurasthenic, but all cases of neurasthenia do not suffer from mucous colic.

"On the other hand, there must be a predisposing cause both for the neurasthenia and the mucous colic, since these two constitute, I believe, a 'vicious circle' and react on each other. I have indeed been enabled from my own experience to demonstrate the fact that gastroptosia is an etiological factor in mucous colic. The abnormal secretion of the stomach (as it occurs in cases of gastroptosia) undoubtedly aggravates this condition.

*"Observations on Dilatation of the Stomach and on Gastroptosis." Medical News, August 6, 1904.

"To further substantiate this view I have under observation a patient with typical attacks of mucous colic, which began only two months ago. These commenced a month after confinement. She has gastroptosia, due to insufficient support of the abdomen after the birth of her child. She is not neurasthenic, and is only nervous at the time of her attack. This is certainly significant.

"It would seem that ptosis of the intestines and the resulting changes in the caliber of the lumen of the gut at various points fully explain the cramp-like effort to expel the mucus and the tubular-cast shape of the mucus which we see at times. Furthermore, injections of olive oil appear to relieve the attacks of colic, just as it does given by mouth in the case of stenosis of the pylorus. I do not believe the mucous discharge is due to a true inflammatory condition, but to changes in the circulation due to the abnormal position of the intestines. Where there is a narrowing at one point there must of necessity be a dilatation and congestion in the intestine above it.

"I believe that adhesions, rectal obstruction, or irritation, and other such causes given by our authorities, are merely accessory factors in the vicious circle. . . . I invariably apply abdominal support in cases of mucous colic, and have always found relief therefrom."

Thus far but few writers have paid attention to the coexistence of gastroptosia in cases of mucous colic, and I know of none, except Clemm and Kemp, who, in the treatment of mucous colic, have considered the presence of gastroptosia.

The first case of mucous colic Dr. Kemp treated at my suggestion with adhesive plaster strapping was cited by me in a memoir I published in *The International Clinics* of 1903. It was that of a woman of thirty-five years. I saw her by courtesy of Dr. Kemp in St. Bartholomew's Clinic, New York, on December 20, 1902. She had been passing mucus and had had colicky pains for seven years; had gastroptosia and suffered also from hyperchlorhydria. The diet we ordered was that introduced by Illoway for cases of hyperchlorhydria; the ab-

domen was strapped with the adhesive plaster belt, and the rectum was inflated with carbonic acid gas. Under this combined treatment she improved continually in every direction. From January 2 to January 9, 1903, the day she was dismissed, she had passed no more mucous strips and had had no more colicky pains.

By means of the abdominal strapping science has been enabled to recognize the relation of a number of ailments to atonia gastrica.

Mrs. W——, a lady of refinement, came to my office September 30, 1903. She was 32 years of age, the mother of three children, the youngest being four and one-half years. Being of excellent physique she had always enjoyed good health until three years before I saw her, when she began to suffer from some uterine disorder. She went from here to a celebrated gynecologist of Berlin, who removed one of the ovaries. On that occasion she came near losing her life accidentally from secondary hemorrhage. Having recovered from the operation she returned to America. This was about fifteen months before coming to me. From that time

on she suffered from diarrhea. As a rule she had from six to eight very rapid watery evacuations daily, the discharges coming as if forced from a syringe. Most of them occurred in the morning before and after breakfast. She had to be extremely careful in her diet, knowing by experience which articles of food were likely to aggravate her deplorable condition. During the fifteen months she had consulted many physicians and had taken much medicine, but, excepting some temporary relief, there had been no satisfactory result. Menses are regular from four to five days; no dysmenorrhea. Finding that hers was a case of gastroptosia with well pronounced nephroptosia, I applied the belt. October 1, she had only four evacuations and these were less watery. Felt stronger, had good appetite. Ate chicken with rice, which was a dish which she had previously excluded from her bill of fare as something on the *index rerum prohibitarum.* November 12, she had worn the belt over four weeks. Her general condition was excellent. She ate and drank with impunity whatever she fancied, even sauerkraut, and she can drink beer and wine now as she had been accustomed to do in former years. Her bowels were regular and normal.

I will not enter into details of this case because my only object in quoting it is to show the prompt and lasting effect the plaster dressing can exert in some cases of enteritis, how enteritis can be one of the symptoms of gastroptosia, and, last but not least, how the plaster dressing excels all medication in such cases as the one here described.

Dr. Rosewater in a letter addressed to me writes: "One of the most positive remedies for chronic diarrhea (or acute either) is the abdominal strapping. It is remarkable how little attention I have had my patients pay to the usual cautions about diet, when afflicted with this trouble. I let them have pie, pastry of all kinds —sauerkraut—almost anything ifproperly masticated (in lithemia cases no uric-acid foods), and they are astonished at the fact that they have no trouble whatever with these popularly condemned articles of diet. This idea of intestinal indigestion or fermentation being the cause of the diarrhea is most often putting the cart before the horse, as we say; they are the results of faulty correctable conditions. . . . No case,

so far, has failed to get positive and permanent benefit. I suppose, however, a case of bowel tuberculosis with ulceration could not be cured."

Dr. Mangelsdorf,* of Bad Kissingen, observed that the stomach of a patient whom he had examined the day previous had become, during an attack of migraine, very much larger than on the preceding day. Two years before, the occurrence of rapidly passing temporary stomach dilatation had been confirmed on consultation with a high authority. Since then he had devoted closer attention to this phenomenon and in the succeeding years observed a considerable number of cases which converted his previous opinion into a certainty, that every attack of migraine is accompanied by a dilatation of the stomach far beyond its customary borders.

These observations were made by subjecting every migraine patient coming under treatment to a careful examination as to the limits of the

*I give here a complete translation of Dr. Mangelsdorf's paper (Berliner klin. Wochenschrift, 1903, No. 44), which translation is taken from The Post-Graduate, January, 1904.

stomach, then confirming it by one or several examinations while still free from an attack, and repeating this during and after an attack, until the stomach had regained its normal dimen-

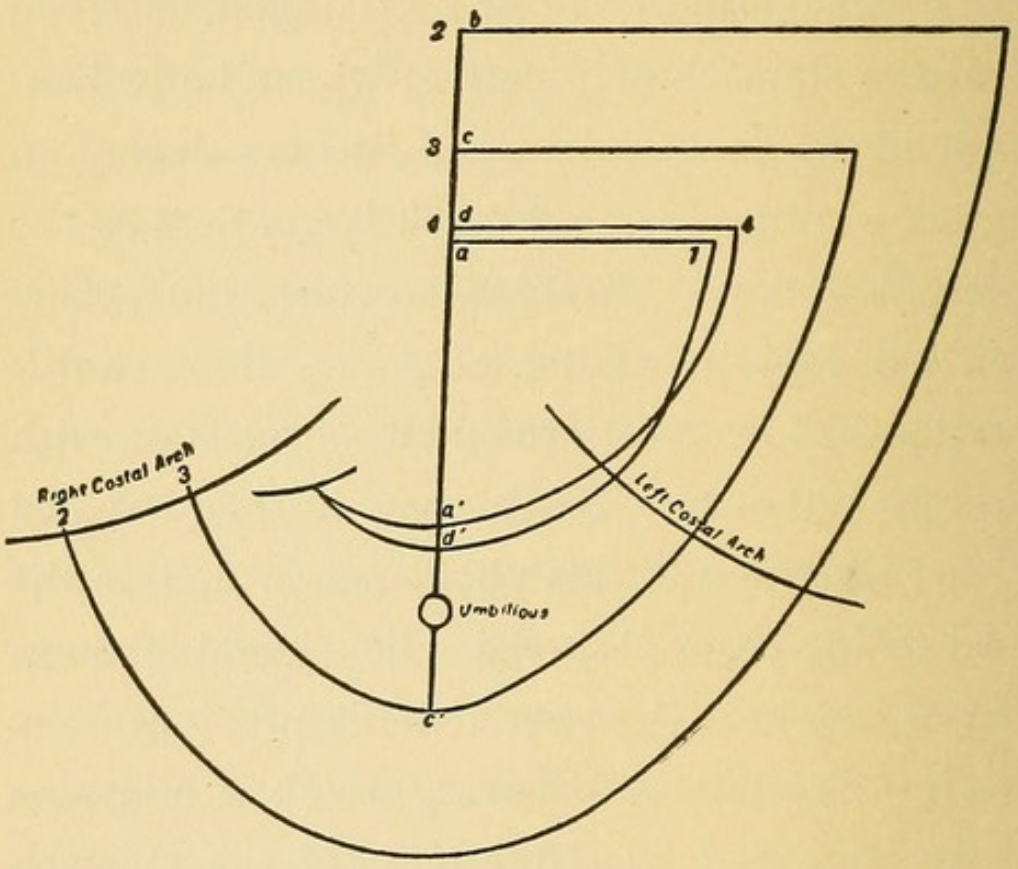


FIG. 11.—Migraine, June 19, 1902. Borders of stomach; 4, June [illegible]; 2, June 19, in the evening; 4, June 20, in the morning.

sions. This dilatation is symmetrical in all directions and contracts in a corresponding manner, as shown by Figs. 11 and 12, not schematically drawn but reduced from life size and illustrating the condition perfectly.

Still more to the purpose are curves presenting in centimeters the greatest vertical diameter of the stomach. The attack illustrated in Fig. 12 presented by the measures *a–a'* [1], *b–b* [1], *c–c* [1], *d–d* [1], *e–e* [1] and *f–f* [1] isthus demonstrated as a curve.

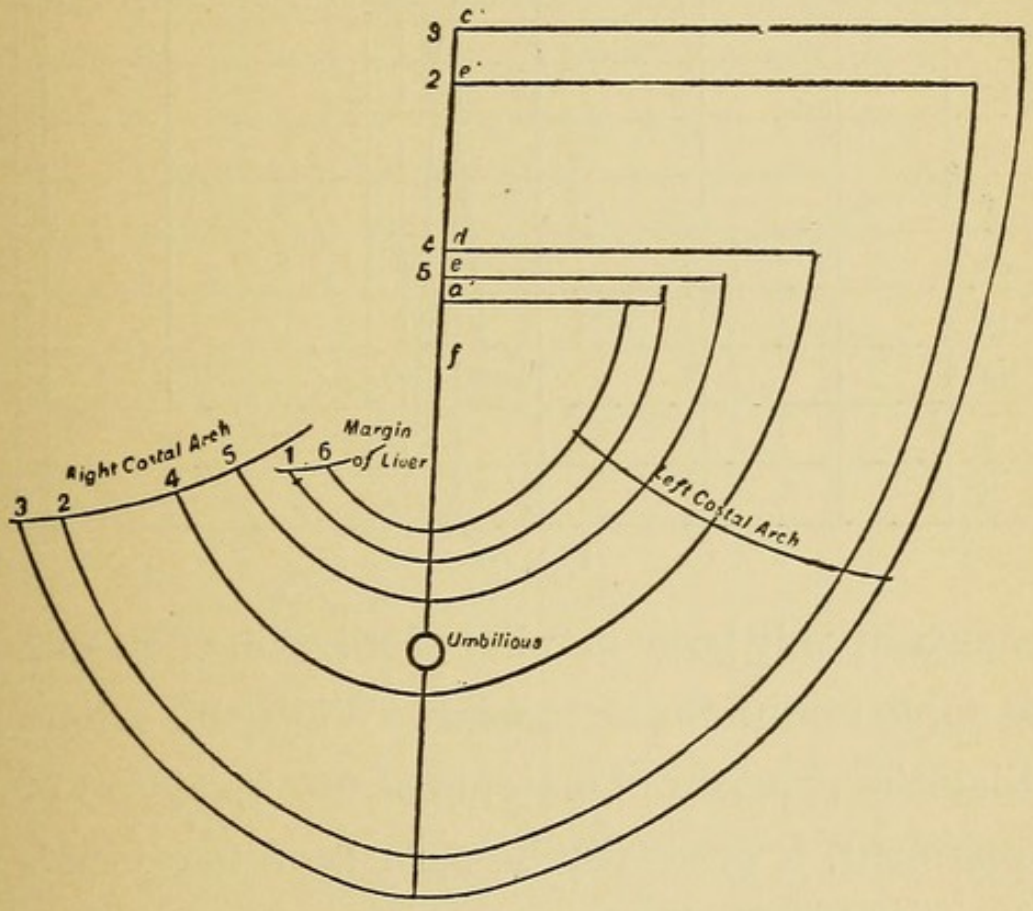


FIG. 12.—Migraine, August 29, 1902. Borders of stomach; 1, August 16; 2, August 29, in the morning; 3, August 29, in the evening; 1, August 30, in the morning; 5, August 30, in the evening; 6, August 31, in the morning.

Repeated attacks of migraine, with more or less rapid succession of dilatation and contrac-

tion, lead in the course of years to a permanent change in the tonicity of the stomach. Atony obtains which, after reaching a certain degree, produces disturbances in the stomach and intestines. These subjective symptoms caused a

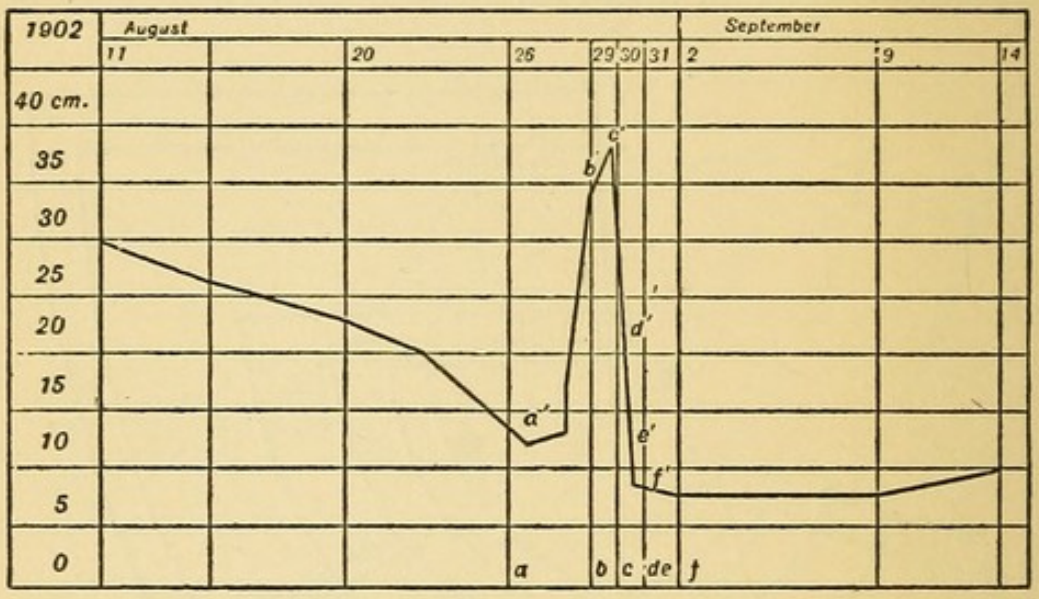


FIG. 13.

comparatively large number of migraine patients to apply to him for treatment. While this atonic dilatation, present in patients at the inception of treatment, is gradually brought back to normal, the attacks of migraine occurring from a variety of causes furnish curves, as illustrated in Fig. 14.

If these figures indicate that the phenomenon is more pronounced on July 23 and 31 and August 14 than in the attack of June 4, in the later

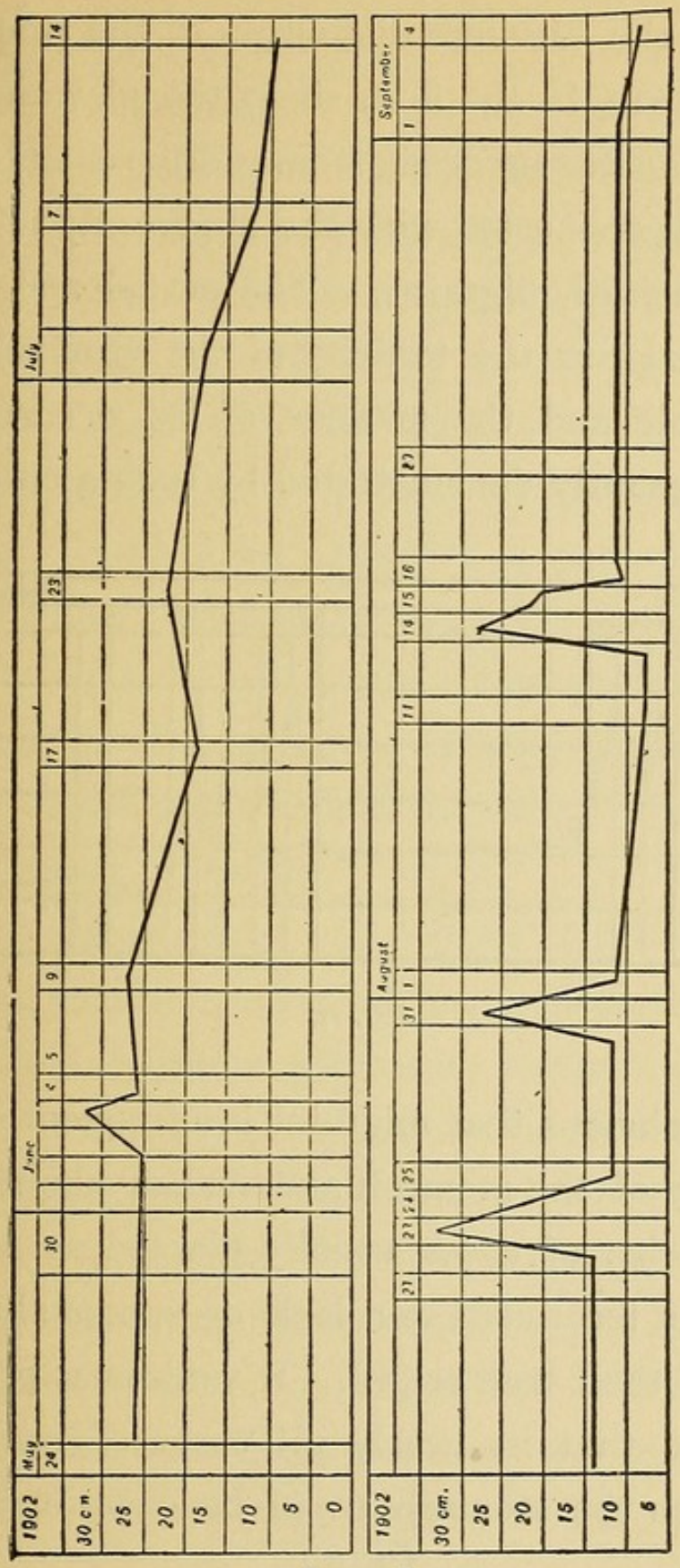

1902
May
24
30
June
2
5
9
17
23
July
7
14
30 cm.
25
20
15
10
5
0
1902
August
21
27
31
1
11
14
15
16
27
September
1
4
30 cm.
25
20
15
10
5

FIG. 14.

attacks the absolute distention of the stomach is less than in the first, since the elevation at the later dates proceeds from a different niveau than that connected with the apparently milder first attack of migraine. The actual and lasting damage to the tonicity of the stomach on the whole and the manner of its occurrence are pregnantly demonstrated by such a curve.

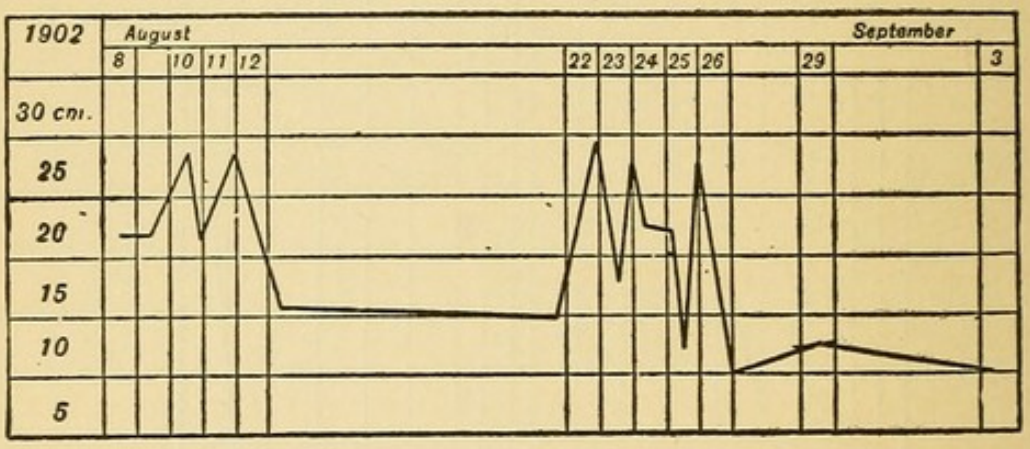


FIG. 15.

It is obvious that migraine is a frequent cause of atony of the stomach and makes plausible a long series of cases usually classed as neuropathic, a term used for lack of specific knowledge of their true origin. It suffices at present to state that in nearly all cases of migraine in which the stomach could be examined, this

atonic condition was in evidence. In 469 patients suffering from migraine (150 men and 319 women) observed by him up to date—February, 1903—it was possible to examine the stomach in 418 cases. In 9 cases the limits could not be defined, owing to dense layers of adipose tissue and other causes. Of the 409 remaining cases only one female patient had a normal stomach and she was a young girl of fourteen, suffering from migraine but a short time. Detailed information concerning this, as well as the close relations between migraine and atony of the stomach and intestine, is reserved for future publication.

The occurrence of acute atony of the stomach in attacks of migraine can be explained only by centrally operative causes, at present quite as obscure as migraine itself. Proceeding upon this assumption he endeavored to make observations concerning possible changes in the stomach occurring in connection with all sorts of attacks occurring in various nervous and brain diseases. Practise in an institution does not furnish the best opportunities. Several

years ago Prof. de Von Speyer, of Bern, placed at his disposal the rich material of the Kantonal Insane Asylum. The findings corresponded to Mangelsdorf's former ones, being entirely negative in all forms of diseases except in idiopathic epilepsy. Epileptic attacks produced phenomena strictly analogous with those occurring in migraine and corresponding to those observed in epileptics in his practise. Opportunity for observation in private practise is quite rare; all the more reason for accentuating the obligation to Medicinal-Rath Dr. Wuerschmidt, who placed at his disposal the epileptic patients of the insane asylum at Erlangen. A series of observations confirmed the fact that every epileptic attack noted by him was accompanied by the gastric phenomenon in question.

Given a relative frequency of attacks, epileptics of long standing develop a persistent atony of the stomach. This fact was readily demonstrable in all epileptics whose stomach he had occasion to examine.

Another curve obtained in connection with the case of a female patient who suffers from

nocturnal frights is submitted. The more frequently these gastric phenomena in migraine and epilepsy are observed, the more diagnostic value do they seem to possess in judging of these two diseases, always believed to stand in close relation to each other.

Thus the accompanying curve demonstrates conclusively the close connection between the nocturnal fright of adults and epilepsy. In another case of nocturnal fright in a gentleman thirty-one years of age, the same curve was obtainable.

Dr. Mangelsdorf purposely refrains from all reference to the literature on this subject, as well as any attempt to explain these phenomena, or from dwelling upon the details and very interesting histories of cases, and rather refers to the very satisfactory and encouraging results obtained for migraine patients, by relieving the stomach atony—patients whom he was able to observe for several successive years.

Abdominal strapping, according to my experience, seems in a few cases to be prescriptible, as an adjuvant at least, in acne rosacea.

I was called in consultation to a case of atonia gastrica associated with hyperchlorhydria and serious gastric disturbances. Another affection, which, however, I did not consider at first in suggesting treatment, was well-marked acne and rosacea. I confined myself to applying the plaster strapping, and recommending Illoway's diet for hyperchlorhydria.

The patient was extremely lean, one of those cases in which no kind of bandage, or abdominal supporter made by the bandager, will fit and give support to the relaxed abdominal walls and organs.

I saw the lady again some weeks after the first consultation. A marked improvement in every direction was noticed; not only had the gastric symptoms, of which she had complained, been relieved, but acne and rosacea were decidedly less noticeable.

It is a well-established fact that gastric and intestinal disorders bear relation to the appearance of acne, but the apparently close relation between atonia gastrica and acne, as manifested in this case, had never before suggested itself to my mind. Here it was a mere accidental observation, for I had not been prepared to see

the skin disorder relieved so promptly by means of strapping the abdomen.

Not long after this first observation had been made, a young lady teacher came to my office to be treated for acne, this most common of all skin disorders. Her face was seriously disfigured, causing her much embarrassment. For two years she had been treated; she had consulted specialists, and an endless number of remedies, advised by physicians and by friends; strict dieting—the worst of all—had been tried in vain.

This patient, likewise, had atonia gastrica; the splashing sound could be easily elicited over a large area; her appetite was excellent, gastric symptoms she had none, but she was very thin. On account of this habit, while the appetite was good, the digestion likewise all that could be desired, I judged (without tormenting the patient with the stomach tube) that there must be an unnecessarily large amount of free hydrochloric acid in her stomach, and I ordered her to drink as much olive oil as she could—at least three tablespoonfuls a day—in order to reduce the superfluous amount of acid in the stomach, and for another reason of which I shall speak pres-

ently. It is well known that the ingestion of olive oil reduces the amount of hydrochloric acid in the stomach.

I applied the abdominal plaster belt, and, without going into details, I wish to state that the acne was promptly cured in the course of time. It is true it would appear again for a few days about the time of menstruation, but in a milder form, not to be compared with the affliction before the abdominal strapping was applied.

The following cases have been reported by Dr. R. Weissmann:

Mrs. B. L——, hysteroneurasthenia, habitual obstipation, insomnia, inability to walk any considerable distance. Pendent abdomen, right-sided floating kidney. Bandage applied. Patient at once enabled to walk longer distances. Digestion is improved, the nervous manifestations subside.

Miss M. S—— complains of dizziness, headache, tired feeling, habitus enteroptoticus of Stiller, splashing sounds as much as six to seven hours after meals. Bandage applied. Immediate improvement of symptoms. The patient

leaves for home after three days, but after a few weeks pens request for a new bandage which has done excellent service.

Mrs. G. S——, 64 years old. Obstipation, loss of appetite, feeling of downward pressure, heartburn, eructations, impeded movements on account of abdominal sensitiveness, emaciation, occasional headache and fever, pendent belly, splashing sound. Bandage applied. Improvement of general condition in a few days. The support is worn for six weeks, and agrees capitally. After three months the patient asks my presence at a considerable distance for the adjusting of a new bandage, conclusive evidence of the beneficial effect of the first bandage.

Miss A. H——, hystero-epileptic convulsions, melancholy moods, persistent obstipation, considerable eructations, heart palpitation, habitus enteroptoticus, splashing sound, right-sided floating kidney. Bandage applied. Disposition more serene, hysterical attacks diminish, movements of bowels become regular.

Miss V. A——, for two years almost uninterrupted headache, insomnia, obstipation, habitus enteroptoticus, right floating kidney. After application of first bandage, immediate sound

sleep, amelioration of headaches. After four bandagings notable improvement; patient not heard from since.

The following case from my own practise is of special interest, confirming what a German observer has said, namely, that the adhesive plaster dressing will in many instances prove of better service than all the pessaries:

Miss V——, 25 years old, American, had studied at European universities; now teaching at college. Came to my office July 20, 1904. Dysmenorrhea. Menstruated since her fifteenth year; never without dysmenorrhea. As a rule, pain was so excessive as to confine her to bed for two days during the monthly period. Treatment, curetting included, had been of no avail. Uterine flexion, descensus, and enlargement of both ovaries. Well-pronounced splashing sound. Except frequent attacks of nausea, no gastric symptoms, not even constipation. Plaster applied.

July 29. After menstruation. At this period there had been much less difficulty than ever before. Was confined to bed for a few hours only. Bandage is well borne.

September 10. Last menstruation had been still less troublesome than preceding one. Bandage had become loose and was removed. There is no splashing sound, not even after drinking water. From this time on, notwithstanding that no bandage was applied anew, patient passed her menstrual period without any pain.

The beneficial effect in such cases, I think, was due to the equally distributed pressure on the abdominal walls, which pressure, no doubt, influenced circulation and innervation. The plaster-of-Paris dressing applied in case of fracture acts in an analogous manner. It is certain that we can not secure equally distributed pressure by means of abdominal supporters, made by bandagers, to such perfection as we can by means of the plaster bandage. The same difference may be noted in the effects produced by splints and those by plaster of Paris, in the treatment of fractures.

German writers have pointed out that the plaster bandage is the ideal prophylactic post partum, especially against hemorrhage and

ptosis. I can confirm this, in so far as the multiparæ on whom I had applied the plaster after confinement were enthusiastic in praising it when compared with the binder they had had after former partus.

There exists a peculiar form of gastritis—if we may classify it as gastritis—a form which has been described much in recent literature. It is gastritis caused by development of mold in the stomach. A case of this kind came to the Post-Graduate Clinic in April, 1902.

Mrs. M. J——, 56 years of age. She had been suffering all winter from loss of appetite, nausea, vomiting, and irritation of the throat; the main complaints were of a burning sensation in the throat and vomiting of almost everything she ate. There was a great deal of gas in the stomach, but the pain was confined to the esophagus. She was very anemic, and had lost during her sickness twelve pounds in weight. There was a tumor felt in the epigastrium, somewhat toward the left side; well pronounced splashing sound, nephroptosia. Blood examination was made by a colleague, but I have lost the record. However, it is imma-

terial. After the patient had been given condurango, methylene blue, and, in order to give temporary relief, small doses of morphin, all in vain, I resorted to plaster strapping and ordered creosote in three-drop doses. The strapping at once gave great relief; the patient spoke with enthusiasm of the comfort experienced. She recovered rapidly and gained in weight. The tumor as well as the splashing sound had vanished by the time the plaster had been on five weeks.

This was a case of mold in the stomach.

By what other means, I wish to ask, could this patient have been relieved so promptly? The creosote, it is true, may have destroyed the mold, altho it is doubtful if three-drop doses were sufficient to accomplish this; but the stagnation, the motor insufficiency, could be improved only by mechanical measures. No bandager could have made for this emaciated patient an abdominal supporter which would have adapted itself and exerted equally divided pressure and support as the plaster strapping did.

The following two cases confirm what a German writer has said on the good services of the adhesive-plaster bandage in some chronic cases:

The first was that of a young man whom I brought for demonstration before the Clinical Society of the New York Post-Graduate. He had been suffering from severe gastric symptoms for fifteen years; was emaciated, had not had, according to his expression, a good day free from distress during all these fifteen years. He had strongly pronounced gastroptosia and hyperchlorhydria. Neither the medical treatment of hyperchlorhydria nor the application of an abdominal supporter, ordered by a colleague and made by a bandager, gave relief. I applied the plaster, and from the very day the plaster was applied he began to improve, gained four pounds in weight during the first week, and when I presented him before this society, four weeks after the strapping, he had gained eleven pounds and was free from all gastric symptoms. He presented himself from time to time afterward and is now in a perfectly healthy condition.

Another case was that of one of the matricu-

lates of the Post-Graduate, who had been a sufferer for twelve years from gastric symptoms; he had hyperchlorhydria and well-pronounced enteroptosia. Strapping gave relief at once and permanently. This case has been published by the patient himself in *The Post-Graduate.* He had worn the plaster I applied for seventy-five days.

Whatever has been said to the contrary, the positive fact is that the strapping is very well tolerated by most patients, and the contrivances of the bandagers are absolutely useless in the case of lean persons.

IV

FLOATING KIDNEY

At the seventy-fifth annual meeting of German Naturalists and Physicians, September 22, 1903, Dr. B. Schmitz, of Bad Wildungen, spoke on movable kidney and demonstrated a new method of treatment, namely, adhesive-plaster strapping, which he had conceived independently of us (Rosewater and myself), and had for some time employed exclusively in such cases. His remarks were as follows:

Ren mobilis, in its severest forms familiarly styled floating kidney, is not of rare occurrence, and its treatment is frequently demanded. Altho it is impossible to give exact statistics as to the prevalence of this disorder in the living, we may assume that it happens in from 12 to 15 per cent. of the population. In 100 necropsies in which the positions and relations of the kidneys were especially noted, Wolkow and De-

litzin found 15 movable kidneys. Another observer found it only in 12 per cent.

It is a fact that women are more apt to suffer from this disorder than men. Of the two kidneys, the right one is more often displaced than the left. Most frequently is movable kidney found in that period of life extending from the twentieth to the thirtieth year. No age, however, is exempted excepting earliest childhood.

The kidneys are located in the abdominal cavity along the lumbar vertebral column in the prevertebral niche in the excavation of the diaphragm, and there they are fastened in the first place by the capsule by which they are enclosed, and next anteriorly by an abdominal adipose fold; further by the truncus of vessels and nerves, and are finally secured in place by the abdominal pressure of the intestine.

The kidneys are not absolutely immovable. They participate to a certain extent in the respiratory excursions of the diaphragm, but under normal conditions to such a degree only that they are not palpable.

As soon as we can palpate a part of the kid-

ney (for instance, the lower pole), or more so, two-thirds of the organ, and are able by means of a certain grasp and pressure to displace the whole organ, we speak of an abnormally movable kidney.

In some instances, even when the kidney is very movable, there may be no symptoms indicating a pathological position of the kidney, and the anomaly is discovered only by accident.

If the severity of the therapeutic measures corresponded with the difficulty of treatment, then the surgical operations which have been suggested and practised for relief from floating kidney would give us an idea what difficulties a floating kidney offers.

We will not investigate the conditions under which radical surgical measures are prescribed, but we will emphasize the fact that in the first place milder, unbloody methods should be considered, the more so since the surgical operations, under the most favorable circumstances, have not given the good results expected from them.

The mild, unbloody methods aim to secure

the movable kidney in its place by means of bandages. Some have combined the dressing with a pelote fastened below the costal arch so as to press directly upon the kidney and thereby to keep it in place.

I do not approve of this pelote treatment, because a permanent pressure on a kidney can never be beneficial; moreover, this application may be dangerous when the kidney, as may easily happen, changes its place and is thus forced by pressure to retain the malposition.

Dr. Schmitz then describes the methods most generally employed and well known, and speaks of their disadvantages. His own (the application of an adhesive-plaster dressing) has been described by Rosewater as follows: Under moderate traction a strip of adhesive plaster 5 cm. wide is applied horizontally from the left to the right side on the abdomen, directly over the symphysis; this strip is extended on the affected side parallel with the crest of the ilium to the back, crossing the back in an oblique direction until it overlaps the spine.

He suggests fixation of the kidney by means

of plaster strapping, as already mentioned in a former chapter, in every case of chronic nephritis, and reasons as follows: The diseased, inflamed, and irritated kidney will suffer intensely from vibrating and thrusting shocks. Riding in railroad cars or carriages is always injurious to patients with kidney disease. Even the shaking which every step in walking transmits to the kidney is unpleasantly felt by nephritic patients. He has observed that patients with kidney disease felt more comfortable as soon as the kidneys had been secured by plaster strapping, and that the amount of albumin in the urine was lessened during treatment by strapping.

Dr. Schmitz, in treating movable kidney, has overlooked the fact that movable kidney means gastroptosia, and that he did not treat symptoms originating in particular from the kidney but those which were in most instances manifestations of gastroptosia.

I hope he will pardon me if I give in the following emphatic way my own views on this subject. These remarks formed the contents of a paper which I had written in February, 1902,

published under the title "Floating Kidney Idolatry," and aimed at the overzealous surgeons who went so far as to recommend nephropexy in about every case of movable kidney.

At hazard—it happened to be the first of some papers on the subject which fell into my hands one day—I read an article by Alexander Macgregor in *The Lancet* of December 14, 1901, entitled, "Movable or Floating Kidney a Cause of Acute and Chronic Painful Dyspepsia," etc.

The author says: "The cause of dyspepsia in some cases is not the stomach itself, but the symptoms are due to the wanderings of a floating kidney. Except in those cases where the dislocation interferes with the function of the kidney itself no symptom points directly to the nephroptosia. The kidney is not really thought of as being the cause of an acute attack of jaundice with sickness and severe pain in the epigastrium, yet it has been known to give rise to such symptoms."

Schleiden has shown that some natural philosophers have accused the moon of influences on events in nature of which she is innocent, and

compares the rôle the moon is made to play with the rôle of the cat accused of having broken dishes while the kitchen maid is the malefactress. This applies to the rôle the floating kidney is made to play in regard to gastric and nervous symptoms.

Studying the history of medicine or the history of religion, we see that nothing is too paradoxical to find believers, at least for a time. The importance which at present is attributed to a floating kidney is one of these aberrations of men of science of which we find examples enough in history. It is surprising to observe how much learning has sometimes been employed by serious men to support a theory which appears in a later period entirely unscientific. Such errors are the more dangerous the higher the authority which pronounces them, and the more generally the errors are prevailing.

Macgregor describes a number of cases in which one or both kidneys were movable, in which the abdominal walls were flaccid, making palpation easy; the kidneys were easily grasped and could be moved over a wide area, and in all

these cases, as he remarks, *nothing abnormal was detected in the stomach.* These italicized words are all he says about the stomach. We do not learn if the motoric functions of this organ were intact; he does not mention how and for what he has examined. Some think they have done enough when they have introduced the tube, examined the secretory functions and the chemistry of the stomach; our English colleague does not say whether he has even done that much. He does not tell us anything of the position of the stomach. But we will not address this reproach to this author alone. There exists a large fraternity, there is a voluminous literature of recent date giving us a litany of symptoms and depicting in vivid colors all the mischief attributed to floating kidney. A new specialty has developed, which we may name nephroptosiology.

Macgregor's treatment in all his cases was to apply an abdominal bandage, and in no instance has he found it necessary to recommend operation. In selecting this mode of treatment he fulfilled the first indication which presents

itself in cases of gastroptosia whether the stomach alone, the liver alone, or the kidney alone, or all the splanchnon is concerned, for the rational proceeding, as we shall see, is to give relief to the patient by supporting the abdominal walls, and in the great majority of cases this is indeed all that is required.

It is an established fact that patients with gastroptosia have, as a rule—but by no means in all cases—dyspeptic or nervous, or dyspeptic and nervous symptoms. My observations have demonstrated, nay, have furnished conclusive evidence, that these nervous and dyspeptic symptoms may be connected directly with the displacements of the abdominal organs.

Patients with gastroptosia, with or without nephroptosia, with nephroptosia of the first, the second, the third, or fourth degree, received the treatment I have described repeatedly—that is, the abdomen was strapped with rubber plaster and in numerous cases and in a very short time the gastric and nervous symptoms subsided. Relief of the gastroptosia secured relief of the gastric and nervous symptoms.

V. Krafft-Ebing sounds a warning not to assume too quickly that gastric symptoms are the cause of neurasthenia in cases of neurasthenia associated with gastric symptoms, but when treatment of gastroptosia is followed by cessation of neurasthenic symptoms there can be no doubt of the relation of the one to the other.

The same author warns also against overestimation of the importance of the floating kidney so often found in emaciated neurasthenic pluriparæ. He says that in many instances this floating kidney becomes of importance only when the attention of patients has been directed to it, and when their minds become occupied with this wandering organ. V. Krafft-Ebing has adopted the principle not to reveal to the patient the interesting discovery of a floating kidney, and to make little of it in case the patient has been informed by some other physician, or to take advantage of the patient's knowledge of the presence of a floating kidney by telling them that they have to eat well to reduce the ptosis. Besides, he considers this the best remedy against the wandering of the abdominal organs.

Quite so, we will agree with v. Krafft-Ebing, but in order to have patients eat well and gain in weight we have to strap the abdomen. This is what I have found to be the best means to restore the gastric functions, and thereby the best remedy against the wandering of the abdominal organs.

Before I was aware of v. Krafft-Ebing's principle not to speak to the patient about the floating kidney I had adopted it myself, because such a course suggested itself some years ago in New York while the floating kidney, thanks to some enthusiastic surgeons, was in fashion.

It is self-evident that there are cases of gastroptosia in which disorders or disturbances are directly due to displacement of the kidney, and that surgical interference in such instances may be required, but I shall not dwell on these exceptions. In most instances all symptoms due to gastroptosia, but which may have been ascribed erroneously to the kidney alone, will be relieved by the most rational, by the simplest method imaginable, the restitution of the tone of the abdominal muscles, and this relief is very

often a permanent one, as I have had occasion to observe. Not only do the gastric and the nervous symptoms disappear within a short time and the patients gain flesh, but the improvement is lasting. Some patients who had been suffering for many years before treatment, and whom I saw again one and two years after treatment, had no splashing sound any more, no more displacement of kidney, and enjoyed perfect health in general.

There are cases in which the gastroptosia is due to neurasthenia and in which, notwithstanding the treatment by means of strapping, the splanchnoptosia will persist so long as the primary cause is not removed, but even in these instances great benefit is derived from the support of the abdominal muscles. I have had such a case under observation for two years; the patient is a poor woman, very much emaciated, with well-pronounced splanchnoptosia and complete and permanent achylia. The abdominal strapping has helped considerably to ameliorate her nervous condition, to enable her to do work; she is enthusiastic in praising the

beneficial effect of the strapping, and has it renewed about every two months. She has gastric trouble only when she deviates from the prescribed diet, but the splanchnoptosia and the emaciation remain the same as they were. I doubt very much whether in this case anchoring of the displaced kidney would be of any service whatever. I should feel inclined to say as the Frenchmen express themselves about certain remedies: "If it does no harm, it can do no good."

My experience tells me that we are not justified in resorting to operation, in performing nephropexia, without having first tried the method of supporting the abdominal muscles, and that the method of strapping seems to me the best of all the methods to this end.

James Israel, of Berlin, at the International Congress in Moscow in the year 1897, said: "Careful observation made on a great number of cases has convinced me that the operation of nephropexy is very often superfluous and irrational, because the many symptoms which are attributed to movable kidney—a very common

occurrence—are in only a very small number of cases really related to this displacement; these symptoms are caused mostly by general enteroptosia or neurasthenia or affections of the generative system." He speaks against the popularization of this affection, because many women who have heard of floating kidney and all the ghost stories about them, keep these horrors in their minds and have no peace until they are operated on.

L. Bazet, in the Transactions of the Medical Society of the State of California, 1898, gives a résumé of the condition and advances of renal surgery up to that date. He says: "There are patients—they are mostly women—in whom the floating kidney is but a part of a complex condition, where enteroptosia and neurasthenia appear to play the principal rôle. Here all the viscera are altered in their suspension, and these patients are nervous in the proper meaning of the word. When in such cases nephropexy is performed there is absolutely no therapeutic benefit."

Nephropexy in cases of floating kidney was

one of the first methods employed in renal surgery. As always happens when a new operation springs up with the relative security of modern asepsia, the number of operators is increased, thoughtlessness creeps in, and the proper indications are not sufficiently studied to justify the reasonable propriety for surgical interference. Such was and is yet the case with nephropexy. Bazet, in the paper quoted already, says failures, observations, and experience, all carefully reported, threw a new light on the subject, and now such an authority as Israel has come to the determination systematically to refuse operation in nephroptosia.

In order to show once more how necessary it is to clear up the existing confusion in regard to medical terms, let us quote at hazard from a paper in *The Journal of the American Medical Association* for October 6, 1900: "Nephropexy will often fail in wandering kidney brought about by gastroptosis and enteroptosis." The same paper treats of a case in which the right kidney descended so far as to touch the bladder, and was easily palpated in any position, but, as

the author adds, there was no enteroptosis. This is a regular *contradictio in adjectu.*

The floating kidney idolatry is a thing of the past, therefore this chapter can be regarded merely as a contribution to medical history.

V

TYPE OF ADHESIVE PLASTER FOR THE ABDOMINAL BELT

By R. C. KEMP

One of the most important features in the treatment by means of the adhesive-plaster belt is the employment of the proper type of plaster. Irritation of the skin of a most disagreeable kind results from the use of improper material. The stiffer varieties of plaster do not exercise equable pressure; they kink into folds, eroding the skin, do not adhere closely in every part, and hence allow accumulation of sweat beneath the plaster with resulting irritation.

In the first instance no other but rubber adhesive plaster can be employed.

The adhesive plaster of the pharmacopeia contains fourteen per cent. of finely powdered resin, eighty per cent. of lead or diachylon plaster, and six per cent. of yellow wax.

The action, however, is not always satisfactory, because it often happens that delicate skins are irritated by this large proportion of resin, and eruptions are produced that interfere with the retention of the dressing. Moreover, the resin plaster is not adhesive at the temperature of the human body, and must be heated in order to adhere properly. It may also be made more sticky by slightly brushing the surface with a little chloroform, which dissolves some of the resin. The latter expedient, altho more convenient than that of heating, has been found to increase the tendency to irritation of the skin, already referred to.

Rubber adhesive plaster is free from the objections to resin plaster, and is ready for application without any preparation. These advantages have led surgeons of the present day to discard almost entirely the official plaster from their armamentarium, and now when an operator asks for a piece of adhesive plaster, the assistant invariably gives him the rubber adhesive without a thought that there may be another kind. In fact it is seldom a modern sur-

geon employs resin or soap plaster for the dressing of wounds, or for making an extension after a fracture.

In the summer of 1900, while at Athens, Dr. Rose endeavored to demonstrate his belt, but was unable to do so because rubber plaster was not known and could not be procured in Greece.

He met with another curious experience when he attempted to compare the German plasters spoken of in the writings of Clemm, Weissmann, and Schmitz with our American plasters. He was unable to obtain a sample, and a piece which had been imported at his expense disappeared before he had tried it. Hence we were unable to compare the German with the American adhesive plaster. We only know from the writers quoted that oxide of zinc rubber plaster on moleskin is now exclusively used in Germany for abdominal strapping.

Moleskin plaster has been employed by the surgeons for a great period of time. I myself noted especially in one case of fracture of the neck of the humerus, in a patient whose skin was exceptionally sensitive, that the rubber ad-

hesive plaster on moleskin caused less irritation even than the zinc oxide spread on muslin. This seemed strange at first, but it was noted on investigation that the moleskin adapts itself much more closely to the parts than does the plaster with ordinary backing.

The moleskin plaster for Rose's belt was, I can fairly claim, first applied in this country at my clinic at the Manhattan State Hospital, West, Wards Island. We applied several varieties of plaster simultaneously to the same patient, and found that the moleskin plaster caused the least irritation; in fact, when properly applied, practically none. It is a fact, however, that different people have skins of widely differing irritability, and some so much so as to prove a distinct idiosyncrasy upon the application of any occlusive dressing. The oxide of zinc is an ingredient to allay, if not entirely to prevent, dermal irritation.

In the physiological laboratory we have learned of the effect of varnish applied to the bare skin of animals, namely, arrest of secretion. The same effect is produced with the

pliant moleskin, adapting itself to every curve and movement of the muscles, not separating from the surface at various points, as do other varieties of plasters. There is no irritation to be feared so long as the well-sticking, properly applied rubber plaster on moleskin excludes access of air. Occasionally at the margins, or at some point that has inadvertently become loosened, there may happen irritation due to allowing access of air, permitting secretion from the sweat-glands. This occurrence has been mentioned already in a foregoing chapter.

The German writers have called attention to the advisability of previously cleansing the abdominal surface with ether before applying the plaster and to shave where it is necessary. All this is needed to prevent irritation, to secure asepsia, besides for another reason. In order to secure and maintain the greatest possible degree of adhesion, it is indispensable to see that the skin is perfectly dry, free from oily or greasy substances, or from any sort of dusting powder.

A number of experiments were made with the

various moleskin plasters manufactured by several makers, and of these I make the following criticism: Several of them were somewhat stiff and did not adapt themselves well to the body curves; some did not stick well, the plaster mass being too dry; some did not retain the adhesive qualities long enough. Johnson & Johnson's gave us the best satisfaction. It is soft, pliable, sticks well. One patient of mine has worn a Rose's belt, rubber adhesive plaster on moleskin, made by this firm, for over five months without any appreciable irritation. Once in four weeks the belt was removed, the abdominal surface cleansed, and then a fresh belt applied.

According to our experience, the oxide-of-zinc rubber plaster on moleskin, what is known in the trade as "Z O" plaster, is the ideal material. The plaster comes in rolls of one and of five yards and seven inches in width.

The ultimate success depends largely on the employment of the best type of plaster.

VI

HISTORY AND LITERATURE

On the basis of literature R. Weissmann, of Lindenfels, Germany, gave in a monograph, "Ueber Enteroptosie—Magen- und Darmatonie,"—a historical sketch on the study of atonia gastrica, of which I avail myself to a great extent. In fact, this whole chapter is a translation of some part of Weissmann's treatise.

As far back as 1887 Lindner wrote that minor gynecological affections were receiving the strictest attention, while gastric atony was persistently overlooked. Volland, in 1896, also dwelt upon the eminently practical importance of the doctrine of ventral atony and enteroptosia, and considered it his duty to draw the attention of every practitioner to these ailments. He is convinced that the recognition and correct interpretation of these conditions will pave the way to regaining the confidence of a large

percentage of the sufferers of the better class, now alienated from the medical profession. For we might as well candidly acknowledge that we have not accorded proper recognition to these conditions and their sequels, much less have we treated them successfully. As far as Volland has been able to observe, the vast majority of so-called neurasthenics were suffering from gastric disorders due to gastroptosia. He feels sure that the most effective point of attack against neurasthenia is unquestionably the previously affected stomach and intestines.

The kidney was the first of the abdominal viscera to be recognized in connection with dislocation. Floating kidney was first accurately described by Bayer in 1841. As causes for the development of floating kidney, this author specified tight-lacing, indirect pressure by the liver, loss of adipose tissue, menstruation, pregnancy, effects of abdominal pressure in hard labor, concussion in dancing and riding, traumatic causes.

Hertzka, writing thirty-five years later and differentiating between fixedly dislocated and

floatingly dislocated kidney, gave as the etiological factor all conditions increasing abdominal pressure for more or less protracted periods—such as pregnancy, chronic obstruction, liver hyperemia, long-sustained abdominal colics with persistent vomiting, and, finally, the effects of a sudden blow or fall.

Landau looked upon disappearance of kidney fat and relaxation of the abdominal walls, with diastasis of the recti muscles, as the dominant etiological factors.

Lindner adds to the etiology of floating kidney in women the fact that it does not only occur in multiparous women with relaxed abdominal walls, but in larger percentage in those who have borne no children. Coincidence of floating kidney with malpositions in the genital organs was noted, but only in patients with relaxation of the abdominal walls. Lindner says that the misplacement of genital organs is not the cause of floating kidney, as affirmed by Landau and Senator, nor yet the loss of renal adipose tissue, nor was he able to agree with v. Fischer Benzon as to the causal effect of tight-

lacing and corsets. Indeed, a rationally constructed corset hinders prolapse, and the skirt supports are tightened below the edge of the liver. He maintains that inborn anomalies, or at least a congenital disposition, are a true cause. This opinion is repeated by several authors of a later period. Krez looks upon innate disposition to relaxation of abdominal supports as a prime factor.

Becker and Lennhoff established certain relations between the lay of the kidneys and the form of the body, and detail this by stating that the right kidney is most often palpable in the slender with pleasing bodily outlines, long, narrow thorax, and slightly flattened abdomen. The peculiarity of this bodily shape might be expressed in the index:

$$\frac{d \cdot j - p}{c \cdot a} \times 100 \text{ d.h.}$$

in a fraction to be multiplied by 100, the numerator of which, expressed in centimeters, represents the distance between the jugular fossa and the symphysis pubis, and the denominator of which represents the minimum circumference of the abdomen. The greater the

index, the more probable the chance of palpating the kidney. An index of above 77 made it safe to figure on palpable kidney in (German) women.

Two kinds of enteroptosia are discerned by Frickhinger, namely, the acquired and the hereditary, the latter to be found in connection with kyphosis and paralytic thorax. Stiller likewise acknowledges that enteroptosia may be acquired. In the absence of an enteroptotic habitus, the absence of the tenth floating rib furnishes the point.

The sum-total of enteroptosia is claimed by Glénard to be based upon a *vitium primæ formationis*. Corsets, lacings, parturition, high heels, acute or chronic traumata are merely chance causes. The most important contributing cause is the disappearance of adipose tissue. That the condition *in toto* of enteroptosia is the result of an inherited tendency is proven by a hereditary manifestation—the above-mentioned tenth floating rib. Bouveret, Charcot, Ewald, Drummond, and Kuttner pronounce in favor of hereditary tendency. The same view-

point is supported by Obrastzow. He states that the frequent coincidence of neurasthenia and enteroptosia is to be explained by the fact that in true enteroptosia, apart from prolapse of the abdominal viscera and defective general nutrition, constitutional defects of innervation of the abdominal muscles work hand-in-hand with a (probably hereditary) defective muscular structure. It can not properly be surmised that hereditary enteroptosia occurs. Its full development is attained only at the age of puberty. Hereditary taint plays an important part in its causation, and he considers enteroptosia a symptom of degeneration.

Strauss recognizes two groups in gastroptosia. In the first, gastroptosia represents an anomaly of the physical constitution. In the second, it presents a disorder called forth by local, and for the most part mechanical, causes. In the first group the troubles are a localized manifestation of a more or less lowered physiological condition. In the second group the dislocating cause may be sought for in the stomach or outside of it. Those within the

stomach are permanently abnormal disturbance consequent upon motor insufficiency, with or without dilatation, continuous hypersecretion (as we have seen, there are cases in which deficient secretion and dilatation are *eo ipso* always present—R.), and pyloric tumors. Those outside the stomach are traction by hernia, more especially peritoneal hernia.

Chvostek, who as far back as 1876 described a case of floating (wandering) liver, as well as Meissner, is of opinion that the cause thereof is to be sought for in hereditary relation and lengthening of the suspensory ligament of the liver.

That the liver plays an important rôle in the development of nephroptosia is also dwelt upon by Kuttner, altho he attributes the lowering of the kidney primarily to adipose-tissue waste. The respiratory excursions of the kidneys gradually increase, until finally the kidneys are no longer struck by the excursions of the diaphragm. Now the liver transfers its respiratory movements to the right kidney, pressing it down still farther. This is stated to be the

reason why floating kidney occurs more frequently on the right than on the left side.

According to Meinert, the great majority of enteroptosias are caused by tight-lacing, no matter whether effected by corsets or waist-bands. Some malformations of the thorax act in the same manner.

The same view is maintained by Kelling, save that he admits that it is the weight of the liver and the stomach that may drag them down, whenever the space within the abdominal cavity has become too large for its contents, as after childbirth, in emaciation, and the occurrence of hernia. Huber also makes tight-lacing responsible for the origin of enteroptosia; likewise Fleiner, altho the latter attributes the origin of stomach collapse to the diminution of ventral space through pressure of corsets, with consequent diminution of food supply, emaciation, and vacant space into which the stomach can relapse. Meinert makes enteroptosia dependent upon clothing. Every dress worn by young women before the fifteenth year, fastened to the thorax instead, as alone correct, of

the shoulders, leads to gastroptosia. Only the pressure of a solid neighboring organ, the liver, is capable of forcing the suspensory support of the stomach to yield. For this reason neither a primary weakness of the ligamentary apparatus (Glénard) nor the relaxation of the anterior abdominal wall (Schmidt) is the initial cause of enteroptosia.

The statements of Meinert and Fleiner, concerning the predisposing of certain thorax forms and of volume conditions within, as bearing upon the development of gastroptosia, are confirmed by Bial; v. Korányi attributes to high heels, in combination with the considerable load of clothing fastened around the hips, the responsibility for floating kidney in women. As to corsets, he agrees with Ebstein in according them a subsidiary share in the etiology of floating kidney. Stifler fails to find a special cause for the occurrence of floating kidney in pregnancy and childbirth, inasmuch as they occur so frequently in the non-bearing. The main cause is diminution of intraabdominal pressure or else strengthening of the same in a

negative sense, as in abdominal fat accumulation and prolapsed abdomen. Hufschmidt lays stress on diastasis of the recti muscles, which favors and facilitates the occurrence of enteroptosia. Under normal conditions the weight of the abdominal organs and respiratory pressure influence abdominal pressure. Schwerdt also mentions diminution of abdominal pressure as the most important symptom of enteroptosia, and distinguishes between tension pressure and burden pressure. The initial point of enteroptosia is relaxation of the anterior abdominal walls and consequent lessening of tension pressure. The organs in the abdominal cavity are forced to follow the laws of gravity and to sag down. Thereupon the burden pressure in the lower parts is increased. Increase of tension pressure, on the other hand, begets decrease of burden pressure. Measurements in a variety of bodily postures of the total pressure in cases of enteroptosia indicated a lower pressure than in the non-afflicted. Distention pressure is the name given by the author to the tension produced by gases forming in the alimentary canal.

Persistent high pressure may cause paresis and paralysis of the muscular coats, and, eventually, abolition of tension pressure.

Langerhans refuses to recognize diminution of intraabdominal pressure as an etiological factor in enteroptosia, and even questions its existence. Concerning the etiology of enteroptosia he promulgates the following theses:

1. Relaxation of the abdominal muscles gives rise to the enteroptosia of Landau.

2. There is such a thing as a hereditary enteroptotic tendency.

3. The corset exercises no deleterious effect.

4. Genuine chlorosis frequently leads to gastroptosia—the enteroptosia of Meinert.

5. Nervous dyspepsia is one of the etiological causes of enteroptosia. Nervous dyspepsia exists with or without enteroptosia.

According to Pick, the causation of enteroptosia in a majority of cases is to be looked for in a decrease of tonicity in the muscles of the abdominal walls. This decrease may be caused by general debility, lack of usage of abdominal muscles, adipose-tissue deposit in the subcuta-

neous connective tissue, diastasis of the recti muscles. The sequence is lessening of intra-abdominal pressure. This makes it possible for the intestines to yield to the pressure of gases from within, and thus atony of stomach and bowels is generated, which condition favors their sagging.

According to Aufrecht, nephroptosia is the beginning, the primary stage, and primary requirement of enteroptosia. Nephroptosia originates either spontaneously in inherent flabbiness of ligaments or through pressure on the part of the liver consequent upon lacing, etc. Displacement of the kidney leads, in consequence of its connection with the duodenum by means of the duodeno-renal ligament, to traction of the duodenum and interference with its function. The influence upon the stomach by the dragging duodenum leads to atony. The persistently downward gliding kidney likewise impinges upon the right curve of the colon and hinders normal peristalsis by its volume no less than by traction exercised by the hepatocolic ligaments. The consequence is stagnation of

the contents of the ascending colon—obstipation. Thus a nephroptosia alone may call forth the appearances of enteroptosia. Enteroptosia is joined to nephroptosia when tension of the abdominal walls is diminished. Women who have borne children furnish the largest contingent among sufferers from this affection.

Glénard was the first to describe enteroptosia as a pathological entity, as to the etiology. The starting-point of enteroptosia, according to Glénard, is in the flexure of the ascending colon. This is the first to sag, followed by the transverse colon, this in turn exercising traction on the pylorus and the omentum, thus causing descent of the stomach and liver. The sagging of the curve of the ascending colon gives rise also to traction on the parietal peritoneum and thus encourages sinking of the right kidney downward and inward. Sagging of the flexure is caused by trauma, pressure upon the lower part of the thorax by the corset, by strain, relaxation of the abdominal wall, and pregnancy. Montenius maintains that enteroptosia is brought about by all conditions which interfere

with the normal mutual pressure of the intestines.

Dietl was the first to point out the frequent occurrence of floating kidney and a definite group of symptoms caused by the same. Chroback first demonstrated the connection between movable kidney and hysteria. Hertzka early reported, with regard to dislocated kidneys, that the symptoms exhibited by the patient were so manifold and divergent as to cause the physician to overlook the possibility of this disease. Accompanying pain was probably consequent upon traction upon the blood-vessels and nerve-plexuses.

According to Lindner, floating kidney is the most frequent abnormal condition of the female body, and this influence upon a great percentage of diseases to be observed in women is yet not generally known and properly estimated.

The symptom symposium in palpable kidney is, according to Kuttner, very unstable and dubious. He enumerates pain, neuralgias, dizziness, fainting spells, high-grade nervousness, hysteria, hypochondria, heart palpitation, and

digestive troubles as the more frequent symptoms. Persistent constipation also obtains. He joins Oser, Nothnagel, Leube, and Ewald in opining that in the majority of cases of gastroectasis and mobile kidney it is a matter of coincidence.

The first one to describe the whole round of symptoms which occur in enteroptosia as a disease *sui generis* was Glénard. In one of his first publications (*Revue de Médecine*, January, 1887) he says: "Clinical observation goes to prove that enteroptosia in the same and identical patient is diagnosticated and treated without favorable result, according to the various phases of this trouble, as anemia, then as metritis (by cauterization), or as prolapse of the uterus (where pessaries come into use), then as dyspepsia, then as rheumatism, still further on as gall-stone colic, then as masked carcinoma, still later as a neurosis, as hypochondria, as hysteria, and, finally, as neurasthenia. At length the physician must make way for the quack, unless the patient prefers to forego all treatment."

Ewald, the first in Germany to describe Glénard's disease, questions whether enteroptosia occurs as frequently as Glénard affirms, and holds the diagnostic points of Glénard as not convincing. The transverse cord, mentioned above, is the pancreas; pulsation of the aorta common to many conditions. Nephroptosia does not necessarily carry splanchnoptosia in its train. The author differentiates the picture of splanchnoptosia from that of pendent abdomen (Landau). Traction of ligaments causes disturbances by reflex action, culminating in insufficient action upon gastric and intestinal contents, various stagnations, accumulation of decomposition products of albuminous bodies and the metabolic products of microbes, this leading up to autointoxication.

According to Meinert, at least ninety per cent. of floating kidneys are concomitants of enteroptosia. This accounts for the multiplicity of subjective complaints.

Frickhinger attaches secondary importance only to the symptoms described by Glénard, and sums them up as indications of neuras-

thenia and hysteria. Manifestations characteristic of enteroptosia, as described by Glénard and Féréol, are merely sequences of organic disturbances, analogous to those occurring in other diseases. As the pathological processes relate largely to the alimentary canal, it is explainable why it so frequently presents itself in the guise of nervous dyspepsia. Enteroptosia is not a clearly defined pathological entity by any means.

Boas finds it difficult to exclude evidence of a functional neurosis. On the other hand, the organic basis of Ewald's "nervous dyspepsia" could not be gainsaid.

Kelling finds the clinical importance of gastroptosia in the increasingly difficult work of the stomach through increase in the *Hubhöhe* (Oser). (The translation is "lift height," but I do not know what it means. — R.) Furthermore, that food in its onward progress through the duodenum has to be pushed forward in a tube bent in an acute angle. The revulsion and churning up of contents is carried on by a stomach, previously resting on

proper support, but now in a sagging condition, whereby the muscles are subjected to considerable tension by the weight of the contents. And since the muscular coat suffers from overdistention, the stomach is incapable of exercising the pressure required for proper digestion. It follows that the physiological capacity of the stomach in gastroptosia is far from normal. Agreeing with Meinert, Kelling brings anemia into relation with enteroptosia. Succussion sounds are of frequent occurrence in gastroptosia.

Brüggemann denies the connection between gastroptosia and chloriasis. True, he always found abnormal sagging of the lower border of the stomach, but claims this to be caused by atony of the ventricular walls, as a consequence of changes in blood conditions. Meltzing also denies any connection between gastroptosia and chloriasis.

Fleiner, and notably Stiller, describe the group of symptoms along the lines of Glénard. Stiller declares floating kidney to be a local manifestation of a general condition. He notes how the doctrine of floating kidney has passed

through considerable changes in the course of years. At the very beginning the numerous dyspeptic and nervous complaints accompanying floating kidney attracted attention. The frequent coincidence of dilated stomach and floating kidney did not pass unobserved, before Glénard formulated the conception of enteroptosia. This indicated a marked advance in the domain of neurasthenia and nervous dyspepsia. To him they were familiar pictures, these gracefully built, lean, pale young men and women with dyspeptic and nervous complaints—one is almost tempted to say with nervous facial expression—presenting on examination thin, soft abdominal walls, a flabby, splashing stomach, and a palpable kidney, mostly on the right, sometimes on both sides. Landau declares retroflexion of a movable uterus to be one of the symptoms of enteroptosia. According to Agéron, pronounced gastroenteroptosia may have in its wake far-reaching disturbances of nutrition, under the guise of anemia or chloriasis, caused by high-grade motory disturbances of the sunken stomach.

Leo disputes the causal relation between gastroptosia and chloriasis. Like Brüggemann, he acknowledges that the lower margin of the stomach sags to abnormal depth in chloriasis; this in consequence of atony, not of gastroptosia.* It is true that in the chlorotic who have worn a corset gastroptosia is demonstrable, but chloriasis is by no means rare in young women who have never worn a corset. Owing to the widespread use of the corset, stomach sagging is an almost habitual abnormality of the female sex, only a fraction of whom ever suffer from chloriasis.

Bial, according to whom gastroptosia in men is anything but a rare occurrence, on close examination finds conditions everywhere sufficient to explain the occurrence of anomalies, without having recourse to the effects of simultaneous changes of position. That an anomaly of so little moment in the case of men should be of such far-reaching consequence in women is peculiar, to say the least. Perhaps the cause

*Brüggemann's distinction between atonia and gastroptosia is incomprehensible.

should be looked for in a lessened power of resistance of the female nervous system.

Schwerdt, in an extraordinarily interesting essay, sets forth the view that the designation enteroptosia is merely a symptomatic designation of the actual disorder. Ptosis of the intestines by no means plays the leading part. The essence of enteroptosia consists in relaxation of the whole nervous system, a chronic condition of fatigue which, in whatever way we look at it, is a functional disease—a functional neurosis—not only involving motor spheres, but likewise sensory and negative territory. To the disturbances primarily evolved in the nervous system must be added those resulting from autointoxication. It results also in functional paralysis of the skin, which in enteroptosia performs increased vicarious, compensating labor.

This author differentiates three stages of disease, which he describes as follows:

First stage: Progressive muscular weakness, manifold sensations, emaciation, anemia. The only objectively demonstrable feature is loss of

weight, possibly decrease of physical energy and of intraabdominal pressure.

Second stage: Completed condition of enteroptosia, one or more abdominal organs in the wrong place, neuroses of the digestive apparatus, high-grade autointoxication.

By means of compensation the disease in its first and second stages may come to a standstill. Such compensations are hypertrophy of the muscular element in the digestive tubes and other hollow muscles, coupled with increased activity in the glands of the skin. Overfilling of the organism with toxic material, general collapse of physical powers.

Schwerdt opines that Basedow's disease and enteroptosia are in some manner intimately connected, and that in the finality myxedema and sclerodermia are progressive stages of the same disease. He pleads guilty to the use of the term "dyscrasia" throughout his dissertation, and is reminded of the armory of our forefathers, wherein, together with cathartics, emetics, and diaphoretics, bleeding is put to rest. Chloriasis and anemia, occurring as

symptoms of enteroptosia, are declared by Buxbaum to be due to unequal distribution of blood and disturbances of circulation consequent upon changed mechanical conditions. Uneven blood distribution, notably collection and stagnation of blood in the vessels of the lower abdomen—capable of holding two-thirds of the total quantity—is apt to simulate high-grade anemia and chlorotic conditions. Enteroptosia is founded on passive hyperemia, for which feeble peristalsis is in part to be held responsible; secondarily, the blood accumulation is seconded by relaxation of the abdominal walls and by the flow in the intestine.

According to Obrastzow, temporary enteroptosia after advanced emaciation does not call forth manifestations of nervous dyspepsia, in contradistinction to constitutional "genuine" enteroptosia. Langerhans looks upon enteroptosia as the most frequent cause of intestinal neurasthenia and hysteria. A frequent concomitant is probably coloptosis and, in numerous cases, retroflexion of the uterus. Strauss (who, as noted above, distinguishes two groups

of gastroptosia) describes the symptoms of the first group precisely as does Stiller. The disease is declared to be a part symptom of a more or less pronounced low vitality. Chloriasis is to him the expression of a constitutional anomaly, which has prepared simultaneously chloriasis and the conditions for descent of the stomach. Chloriasis may also be responsible for relaxation of suspensory ligaments, and thus promote the occurrence of gastroptosia. That in cases wherein gastroptosia and neurasthenia occur together the latter is due to the former, is acknowledged by this author in a limited sense only. The disturbances of the stomach do not follow a regular course, and long-persisting, severe disturbances of motility are rare.

As symptoms of enteroptosia Krellreuther enumerates the following: general, chronic debility; downward pressure; exhaustion; dizziness; heavy head; fainting spells; lumbar pain; disturbance in the whole abdomen; pain in one or both hypochondriac regions; dyspnea; head flushes. In the alimentary canal itself: anorexia; a feeling of gastric insuffi-

ciency; easily appeased appetite; feeling of fulness; heaviness and pressure on the stomach (more particularly after eating); tendency to vomit; morning sickness; frequently vomiting after meals, combined with eructation; heartburn; gases and splashing sounds in the stomach; pressure-point in the sunken epigastrium; finally obstipation, frequently dominating the whole picture of disease.

A vast majority of authors pronounce in favor of abdominal bandages (abdominal support) for the treatment of enteroptosia. Günzburg, on the contrary, recommends small doses of yeast, calculated to promote improved nutrition and accumulation of adipose tissue. Rumpf also questions the beneficial effect of bandages, and puts in a plea for gymnastics and massage. In mobile kidney he claims to have achieved sixty per cent. of cures and twenty per cent. of improvement by the use of Thure Brandt's subnephritic vibratory massage. Stiller, on the other hand, looks upon massage as essentially useless. Meinert insists upon primarily banishing the corset, followed by an endeavor to

reestablish normal diaphragmatic breathing, and, further, recommends bran bread, lavage of the stomach, faradization, rest, and forced feeding. The same treatment is indorsed by Fleiner and Pick. Both aim at removing the weakened condition of the abdominal walls and the raising of intraabdominal pressure. Buxbaum assumes, as already mentioned above, that in enteroptosia we are dealing with a passive hyperemia of the lower abdominal organs, and, therefore, therapy should consist in the use of such thermic, mechanical (hydrotherapeutic), and electric methods of treatment as strengthen the gut, intensify peristalsis, and make for intraorganic acceleration of the blood current. As one of the first to recommend abdominal bandages for sagging of viscera, Chvostek is to be named. He uses an elastic belly bandage for wandering liver, compressing the meso- and hypogastric region. Lindner, Kuttner, Ewald, Stifler, Krez, Hufschmidt, Boas, Kelling, Huber, Schwerdt, Obrastzow, Strauss, Ostertag, Maillart, and Krellreuther pronounce without exception in favor of the use of a suit-

able belly bandage. Ewald dwells upon the importance of emptying the bowels by saline aperients. Stifler adds the use of carbonated steel baths, and claims to have had success in one case by electrolytic treatment.

In addition to bandages and belts, Hufschmidt recommends massage, faradization, gymnastics, and hydrotherapeutics (in this he is supported by Boas), and favors also forced feeding; he is indorsed by Kelling, Strauss, and Kellreuther. The latter condemns the pad in floating kidney, and dwells upon the fact that prime importance attaches to the actual lifting of the pendent abdomen by the belly bandage. Ostertag, in the construction of his belly bandage, lays stress upon the bandage efficaciously raising the sagging lower abdomen and keeping it firmly and continuously fixed, so as to hinder any descent of the parts. He aims to accomplish this by giving support by the bandage to the bony structures, both above and below. Langerhans favors the abdominal bandage only in the so-called Landau cases, and for the rest recommends gymnastics. At

all times the nervous system is entitled to the strictest observation and treatment. Aufrecht recommends Glénard's hypogastric belt. By means of this belt a diminution of abdominal space in an upward and downward direction is produced. This causes limitation of mobility in descended organs, checks their to-and-fro movements, and lessens the stretching of suspensory ligaments, notably those of the kidney and stomach. Thus circulatory conditions are vastly improved and the nervous reflexes caused by ligamentary traction are obviated. Glénard's belt is not a belly bandage in the properly accepted sense of that term. All so-called abdominal bandages are, according to Aufrecht, absolutely worthless in the treatment of gastroptosia.

In his essay of 1896 Schwerdt defines the aims of therapy in enteroptosia: the raising of intraabdominal tension pressure, the lessening of contact pressure, and removal of gaseous distention pressure. Accordingly, the therapy seems to suggest massage, gymnastic exercises, belly bandages, regulation of the bowels, interdiction of fattening diet, and employment of

disinfectants for abnormal fermentative processes. In his next publication, in 1897, the same author dwells upon the value of hydropathic methods for antagonizing autointoxications. Liberal diet, massage of the whole body, and more particularly of the perineum, were strongly recommended. For strengthening the abdominal muscles he recommends gymnastic exercises, to be carried on at first in the dorsal position. Where causal treatment of relaxation of the abdominal muscles and its sequels by mechano- and electrotherapy was not feasible, the application of a belly bandage afforded relief, notably in splanchnoptosia with pendent abdomen. Schwerdt says that perhaps blood-letting might be of service in combating the dyscrasia incidental to enteroptosia.

J. Ross Watt communicates a peculiar method of treating floating kidney, invented by himself, based upon the assumption that the wearing of abdominal bandages, as also the formerly frequent surgical interference, had not been productive of satisfactory results. He cuts two wing-shaped pieces from ordinary packing

paper, which are to cover the whole of the lower abdomen, to meet in the median line and on all sides project two centimeters above the bony borders. From this model two leaden wings are manufactured, covered with cloth and placed upon the patient's abdomen and everywhere firmly adjusted by the hand, after bringing the kidney to its normal condition. To a long, well-fitting corset, drawn over these leaden wings, these wings are fastened. Adjustment and removal of this bandage are to be done in the recumbent position. The flexible lead readily assumes the shape of the abdominal surface, and thus exercises equable pressure upon the whole surface of that part of the body. Hence the weight is not greatly felt. The author claims to have achieved permanent fixation of the kidney to its normal site inside of three or four months.

Rose, Rosewater, and Schmitz stand for the principle that imperfect activity of the abdominal muscles is to be compensated by adhesive plaster, and each one of the three authors named endeavored in his own manner to make practical application of this principle.

RC 816 R72
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RC 816 R72