of fat, for I have many other things to talk to you about, and one of them is massage.

As you know, from two to three times as much lymph as blood exists in the human body. Massage promotes the stripping of the connective tissues of their lymph and the renewing of it, and thus makes the lymph (which is the sewerage and nutritive agent) pure and nutritious. By this interchange and removal of waste products from muscles, connective tissues and skin, and their daily discharge into the blood circulation, the external organs of excretion are enabled to keep the flow of lymph and blood in a higher state of purity. Massage will build muscles; and the abdominal wall, in this disease, must be built up, and, as I pointed out before, if you build up the abdominal wall the levator ani and the diaphragm will bring themselves up to a state of tone to oppose the lower and upper zone of this muscle respectively.

I believe that massage helps the patients not only to get control of the lower neurons of the body, but likewise of the upper neurons. Indeed, it would appear as if some of the higher moral faculties were improved by massage. You, gentlemen, who are fresh from the physiological class, know that the nerve muscle preparation is regarded as if the nerves and the muscles went as one, and I believe they do, and I further believe that the lymph born from muscle is pabulum, not only for the lower neuron, but for the higher one as well. It may contain an internal secretion which goes to both the brain and spinal cord.

The fact that Cohnheim has found that muscle juice combined with the pancreatic secretion is required to prevent diabetes points out that the lymph born of muscle and cast into the circulation, both in exercises and massage, contains other things than waste products.

Some of these cases of visceroptosis have albumin and casts in the urine. We have paid no attention to their presence unless the clinical history otherwise pointed to chronic Bright's disease. The clearing up of the urine and disappearance of the casts by the Weir Mitchell treatment in many of these cases show these conditions to be due to the "twisting" of the vessels of the floating kidney, and has fully justified a disregard for the albumin in the urine. I sometimes think there are many cases of Bright's disease and arterio-sclerosis which are dependent on malnutrition. The cry that we eat too much may be true from one portion of our population, but there are two other sections of mankind—one that eats just enough and one that eats too little. I am inclined to think that it is not that we eat too much as that we have too much to eat that is the matter with the over-fed element of the race. If we could live like savages—glut ourselves ten months of the year and nearly starve for the remaining two months—there would be no disease due to over-feeding.

These patients with visceral prolapses cannot be successfully fed unless in a recumbent posture. In most cases the stomach is prolapsed, with the pyloric end more or less anchored to its normal position. The result is that the stomach contents are not properly emptied into the duodenum except at night when the patient goes to bed. This causes gastric dilatation, and as a result they tell you they cannot take milk; but the difficulty at once disappears when the patients take to the recumbent posture, then they take milk as readily as any other patient. The trouble from which they suffer is that they have difficulty in getting the milk curds out of their stomach in the erect posture.

That leads me to a new phase of gastric prolapse, and it is this: that phthisis and gastric prolapse are not an infrequent combination; on the contrary, my experience leads me to believe they are combined in nearly 50 per cent. of the cases of phthisis. The patient with gastric prolapse and phthisis is handicapped in the battle for life unless the recumbent posture of the Weir Mitchell treatment is undertaken at the start out. There is much sense in the usage of the ancient Romans, who fed when reclining upon couches.

Examination of the stomach contents in cases of gastric prolapse gave very variable amounts of acidity. The one thing that seemed fairly clear was this: that HCl was very much diminished in dilatation (secondary to the prolapse), and in two such cases there was an entire absence of the mineral acid after the test breakfast. In both of these cases the degree of secondary anaemia was striking, and since one finds occasionally neurasthenia with marked secondary anaemia in which there is neither prolapse nor dilatation, giving similar results, we have looked on the test-breakfast results as constitutional rather than local.

Action of the Abdominal Wall.

In conclusion, there are a few more words to be said on abdominal wall action and building. In the normal position of the stomach one looks upon the abdominal wall contractions as having very little to do with the onward progress of the food, but when the stomach is at the navel or below, the muscular contractions of the abdominal wall are factors of the highest importance in emptying the stomach contents into the duodenum. This reason alone should lead you to maintain vigorous abdominal walls. There is no necessity for direct massage of the levator ani. All forms of intrapelvic massage are unnecessary and abominable. Those who have given a study to physical culture recognize that one cannot develop the right arm, no matter how unilateral the exercises may be, without developing the left arm simultaneously. If one develops the triceps, the biceps, which is the opposing muscle, keeps pace in the process of hypertrophy. All one needs to do to develop the power of the levator ani is to produce hypertrophy of the abdominal wall. Several patients who have complained of relaxed vaginal and anal outlets before treatment have remarked with pleasant surprise at the complete control after. Gynaecologists will tell you that lacerations of the vaginal outlet can be considerably compensated for by a vigorous levator ani. In the last five years the female pelvis has been passing over from surgery to medicine. Indeed, it is not too much to say that the vast majority of operations for displacement and prolapse are both unscientific and unnecessary. What is said of ptosis in the pelvis can be said with more emphasis of operations on movable kidneys and gastric prolapse.

My experience with automassage of the abdominal wall, as recommended by A. Abrams, is only partially satisfactory.

In conclusion, I wish to say that there is no age with visceroptosis barred from the benefits of this treatment. One patient, aged 58 years, has done as well as those under 30 years.

RECURRENT VOMITING IN CHILDREN.

BY

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This malady is also known as cyclical, fitful, or periodic vomiting. The features are so remarkable and the difficulties of diagnosis so great that this disorder deserves close consideration both by the clinician and pathologist.

Crozer Griffith¹ finds that vomiting of a recurrent type is met with in various disorders—for example, in the adult it forms a feature of the so-called "gastric crises" of tabes dorsalis. "Gastric crises"² have, however, been described independent of this disease, occurring in adults and characterized by vomiting and great abdominal pain, which may or may not persist after the act of vomiting; the attacks may occur at regular intervals, or this feature may not be present; as a rule the individual is free from fever. Boas³ has spoken of this group as examples of so-called "gastric neurosis," and subdivides them according as to whether there is a reduction or increase of hydrochloric acid in the gastric juice.

Under the name of "gastric" attacks Langford Symes⁴ describes the occurrence of constipation, vomiting, and even collapse, the vomiting often seeming to relieve the attack; these cases occur in children only, and, as a rule, there is discoverable some antecedent error in the dietary.

In 1882 Dr. Gee⁵ described 9 cases of "fitful" vomiting; in some there was considerable abdominal pain; in others none. Of recent years an effort has been made to describe as a separate group of cases occurring in children those in which the recurrent attacks of vomiting occur independently of dietetic errors, and are unaccompanied by pain, or only by so much as might be explained by the strain put upon the abdominal muscles by repeated acts of vomiting; such cases may, however, complain of slight headaches. Since this group has been differentiated in this way a number of cases have been described, more especially by American and French writers.

Briefly stated, "recurrent vomiting of children" begins generally after the first year of life, though it may occur at the second month (Rachford),⁶ and may persist to the eleventh year; in many cases the symptoms pass off altogether, or they may develop into migrainous attacks; in three cases

described by Marcy,⁷ Griffith (loc. cit.), and one by Holt,⁸ death has resulted. Very frequently, but by no means always, a prodromal stage has been noticed, lasting a few hours or days, in which the child, previously quite well, may show malaise, coated tongue, loss of appetite, headache, and as a rule constipation; the temperature may rise during this period; after the prodromal stage has passed away vomiting begins; whatever food is taken is returned, and this is succeeded by the ejection of mucus, bile, and even blood. The attacks of vomiting may last several days or a few hours, or, as in the case described by us, several weeks off and on; once the vomiting has ceased, the child rapidly regains its health and strength, until the next attack, which may occur within a few months or only yearly; retching has also been noticed, and in some cases the hydrochloric acid secretion has been present; in others it has not been found at all. Constipation is common and may resist all treatment; relief of the constipation does not relieve the vomiting. Pain is almost entirely absent, or, as already stated, there may be a little tenderness in the epigastrium and slight headache. Thirst is very common and very intense; the appetite is quite lost, the tongue coated, the breath of a peculiar odour attributable to acetone, and the urine may contain acetone and indican. The abdomen is usually greatly retracted or flattened in prolonged cases, the loss of flesh is very extreme (cf. Figs. 1 and 2). The attack of vomiting may cease as suddenly as it began, and the child soon resumes its former condition. There may be fever during the attack of vomiting.

Pepper⁹ in 1890 gave a description of cases somewhat similar to the above, but his description applies also to cases in which abdominal pain was an important characteristic. In speaking of one of the cases described by Holt (loc. cit.), Pepper refers to Herter's observation—namely, that the toxicity of the urine was found to be greatly increased.

Rachford (loc. cit.), 1897-8, describes these cases as examples of "migrainous gastric neurosis," and has observed in such cases that the urine may contain albumin, hyaline casts, etc., and that as the attack passes off these disturbances of the urine subside; in some cases the albuminuria persists after the subsidence of symptoms. Rachford has found a considerable amount of alloxur bases in the urine in such cases, and is disposed to consider the whole group of symptoms as due to toxic agents belonging to the xanthin group; the same bases were found in ordinary cases of migrainous attacks in adults. Whitney¹⁰ (1898) describes another case of this disorder, in which the recurrences were remarkably regular, occurring almost to a day regularly every three months, the only exception was when the interval was two months.

In 1900 Crozer Griffith (loc. cit.), whose paper has already been referred to, published a report on 4 cases, 2 of which—also described by Marcy (quod vide)—ended fatally, and one of these (No. 4) was examined *post mortem*. In view of the observations made by later writers it is important to observe that in this fourth case, during the prodromal stage of one of the attacks there was neither indicanuria nor acetonuria, though on the second day after an attack began both were

observed. At the autopsy of this case almost complete necrosis was found of the mucosa of the stomach and intestines. Kelly, who performed the autopsy, says that, in view of the fact that the *post-mortem* examination was done within less than a day after death, the changes found in the alimentary tract were not due merely to *post-mortem* decomposition. Slight parenchymatous changes were found in the pancreas, spleen, and kidneys, and there was some fatty infiltration of the liver.

Marcy (loc. cit.), 1900, describes 3 cases, 2 of which (2 and 3), however, have also been described by Crozer Griffith (loc. cit., 3 and 4). The other case presented the unusual feature of violent and almost constant choreiform movements of the muscles of the face, neck, and upper extremities occurring during an attack of vomiting.

Marfan¹¹ (1901) refers to 25 cases of the malady. In some cases it was noticed that the vomiting abated somewhat, and recurred as violently a little later on. Acetone was found to be present in the breath, urine, and vomit two days after occurrence of the crisis. Several children of the same family had been noticed previously to be affected. Marfan considers that there is some nutritional disturbance which is either the cause or effect of an intoxication; the index of the severity of this nutritional disturbance was the degree of acetonæmia as shown by the presence of acetone in the vomit, urine, and

breath; this was noticed quite early in the attack of vomiting—that is, before vomiting could itself have been the cause of the acetonæmia.

H. L. K. Shaw¹² (1902) describes four cases, and says that Holt, Pepper, Griffith, and Valagussa¹³ found an excess of uric acid in the urine either before or during an attack.

Edsall¹⁴ (1903) has considered this disorder from the point of view of its association with "acidosis" or "acid-intoxication." By this term is meant the reduction of the alkalinity of the fluids of

Fig. 1. Appearance on admission to the hospital.

the body by the intervention of acid bodies. The coma met with in diabetes mellitus is considered by some to be due to the presence in the body of β -oxybutyric acid—a substance considered to be a precursor of diacetic acid and acetone. It is not certainly known how this acid is produced, nor is it universally admitted that β -oxybutyric acid is responsible for the coma, for this body does not produce the symptoms of diabetic coma (Martin¹⁵), though β -amido-butyric acid and dilute mineral acids may do so. Possibly the precursors of β -oxybutyric acid produce the effects, but the nature of these bodies is not known. It is generally held that β -oxybutyric acid, diacetic acid, and acetone occurring in the urine are indices of the decomposition of tissue proteids. Besides occurring in excess in diabetes mellitus, acetone may be present in abnormal amounts in other conditions, such as inanition, chronic tuberculous disease of the lungs, cancer, poisoning, gastroenteritis, grave anaemia, infectious diseases, and prolonged vomiting. Edsall, in discussing acid intoxication and its relation to "recurrent vomiting," insists that acidosis may be due not only to primary disturbance of metabolism, but also to metabolic disturbances which are secondary to digestive disorders; much of the support for his views is derived from the nature of the relationship of

acetonuria to the vomiting; despite the contrary observation already noted (Crozer Griffith, loc. cit.) that in the prodromal period acetone was absent from the urine in one case and yet was found in the second day of an attack, Edsall is able to report as a result of Pierson's observation,¹⁶ that acetone in very small quantity occurred in a prodromal period before vomiting began; in three cases acetone was present as observed by Marfan at the beginning of the attacks of vomiting. When it is remembered (1) that probably in all cases, β -oxybutyric acid and its allies, diacetic acid and acetone, are the result of the disintegration of body proteid; (2) that observations in these cases of recurrent vomiting deal rather with the qualitative than with the quantitative estimation of acetone, and (3) that acetone occurs in health in the urine to the extent of 0.01 gram in twenty-four hours, then the discordant and incomplete observations of various writers and the failure of some cases to react favourably to the intensive alkaline treatment recommended by Edsall can be easily understood. One of Edsall's cases failed to react to the alkaline treatment, and he closes his article by stating that it is possible that some of the cases of recurrent vomiting are due to an agency other than acidosis. Marfan and others doubt that acetonæmia indicates acid intoxication. So marked are the changes in certain cases of recurrent vomiting after the administration

of massive doses of alkalis that it cannot be doubted that this remedy is responsible in these cases for the improved condition, but that the change is due to neutralization of acid bodies does not follow. Stadelmann¹⁷ found that large doses of alkalis lessened the amount of uric acid in the urine, but there is no evidence to show that this resulted from any process of neutralization of toxic acid bodies; the more probable explanation is that alkalis check oxidation. Pierson (loc. cit.), 1903, found that acetone and diacetic acid were present in the urine in very early stages of the attacks of vomiting, and, as already stated, it was his observation that has been made use of by Edsall to support the theory of acid intoxication, namely, that acetone occurred prior to the onset of vomiting.

The immediate cause of these attacks is still unknown; in many cases such predisposing factors as neuroses occurring in various other members of the same family are considered of great importance. Whitney (loc. cit.) and others are disposed to consider the attacks as forms of neurosis; others, especially Rachford, consider them expressions of the "lithæmic" state due particularly to leucomaines, and closely allied to various gouty manifestations such as migraine. Much support is given by Griffith, Pepper, and others to a toxic causation, and this is supported by the occurrence of albuminuria and the presence of casts; pruritus has also been noticed in our own case and in others, and in one of Griffith's cases diffuse articular pains were a marked feature. Little or no support is given to the view that the attacks are due to recurrent gastric catarrh.

DIAGNOSIS.

When the first attacks occur, the greatest difficulty may be experienced in excluding acute gastritis, meningitis, appendicitis, and intussusception, or any other form of intestinal

obstruction in the early stage. By reason of the pigmentation which was so marked a feature in this case, Addison's disease must be added to the list.

The following report of a case under our observation is of interest because of the severity and long duration of each attack of vomiting, and because of the persistence of these attacks from 3 to 11 years of age.

A girl, N. F., aged 11 years, was brought to the Brompton Hospital because of the parents' suspicions that she was consumptive. No signs of this disease were discovered, and as she was so very ill she was admitted to University College Hospital under the care of Dr. J. Rose Bradford in April, 1904. Ever since the age of three years she had suffered from periodic attacks of severe vomiting, seven attacks in all, coming on apparently without any cause or warning. The vomiting lasted on and off for a month on each occasion, producing extreme loss of flesh and weakness. The attacks passed off rapidly when improvement once began, and weight and strength were quickly restored. The attack from which she was suffering on admission had lasted longer than usual. The child was usually very constipated. The family history was a good one and the child had been singularly free from any other illnesses.

On admission, she was found to be extremely wasted (Fig. 1), weighing 1 st. 10½ lb.; she was very listless, taking no notice of her surroundings and replying to questions very unwillingly. Nothing abnormal was found in any system beyond the fact that the teeth were carious and that the neck and body were very much pigmented and the abdomen markedly hollowed. The urine was free from albumen and

blood; acetone was present in a large amount and diacetic and β -oxybutyric acids were also detected. The temperature during the first twenty-four days was subnormal; after the administration of bicarbonate of soda the temperature became normal, and once or twice it rose to 101° F.; the pulse at first was slow but with improvement rose to normal and even to 144 per minute. The blood examination showed erythrocytes 4,988,000 per c.mm.; hæmoglobin, 82 per cent.; colour index, 0.75; leucocytes, 16,100 per c.mm.; small lymphocytes, 9.5 per cent.; large lymphocytes, 7.0 per cent.; hyaline cells, 4.0 per cent.; neutrophils, 79.0 per cent.; oxyphils, 0.5 per cent. On admission, vomiting

Fig. 2. Appearance shortly before discharge from the hospital.

occurred three to four times daily, indeed, after each attempt at a meal.

The rectal feeding carried out was of the ordinary character, and was combined with rectal lavage; the mouth feeding consisted of minced meat, chicken, potatoes, etc. The sodium bicarbonate was administered in large doses—90 to 120 gr. daily, as recommended by Edsall (loc. cit.). It will be noticed that whatever line of treatment was carried out the weight increased, even when mouth feeding was resumed without any special treatment, though we must admit that the subsequent history shows that when the child returned home all her former wasting and vomiting recurred. Rectal feeding alone produced marked improvement, but the development of considerable local irritation led to our abandoning this form of treatment. It will be noticed that the child vomited more frequently during the period in which sodium bicarbonate was being administered, though, as already mentioned, gain in weight was progressive, but not at the same rate as in other periods.

Our observations support the view that some cases of recurrent vomiting are quite different to others, in that they fail to respond to treatment with massive doses of alkalis—even rectal feeding in our case produced better results than any other form of treatment. It remains to be said that the child's general condition improved *pari passu* with the increase of weight, and that the pigmentation of the abdomen largely disappeared.

TABLE I.—Showing Results of Treatment.

Period.	Treatment.	Number of Times Vomited.	Average Frequency.	Weight at End of Each Period.
First 2 to 3 days 2nd period, 11 days	Nothing special Rectal feeding only	3 to 4 times a day 4 times in 11 days	Every 3 to 4 hours Once every 2½ days	1 st. 10 lb. 6 oz. { 1 st. 12 lb. 7 oz. Gain 2 lb. 1 oz.
3rd " 14 "	Rectal and mouth feeding	8 " 14 "	" 1½ "	{ 1 st. 13 lb. 12 oz. Gain 1 lb. 5 oz.
4th " 17 "	Mouth feeding and sod. bicarb.; no rectal feeding	11 " 17 "	" 1½ "	{ 2 st. 1 lb. 1 oz. Gain 1 lb. 5 oz.
5th " 10 "	Mouth feeding; no sod. bicarb.; no rectal feeding	17 " 10 "	" 1½ "	{ 2 st. 2 lb. 5 oz. Gain 1 lb. 4 oz.

We are indebted to Dr. Bradford for the use of the notes of this case, to Dr. Thiele for the observations on the urine, and to Mr. E. S. Worrall for the photographs.

ANALYSIS OF 55 REPORTED CASES.

This analysis is made from the following reports, including the present case. Gee (1882), 5 cases (Nos. II, III, IV, V, and VII); Rachford (1897 and 1898), 2 cases; Whitney (1898), 1 case; Marcy (1900), 3 cases; Griffith (1900), 2 cases; Marfan (1901), 25 cases; H. L. K. Shaw (1902), 4 cases; Valagussa (1902), 4 cases; Edsall (1903), 2 cases; Pierson (1903), 3 cases; Rotch¹⁸ (1903), 2 cases; Holt (1904), 1 case.

Age.—The attacks of recurrent vomiting may begin in babyhood—one case began at 2 months; they may recur to the eleventh year. In a considerable number of cases the vomiting did not begin till the third year of life.

Prodromal Period.—In 16 of the 54 cases prodromal periods were recorded as occurring before the onset of the vomiting.

Duration of Vomiting.—The period during which vomiting occurs may be of short duration—twelve hours—or may last a month or several weeks. The more common duration is from three to fourteen days, with an average of five to six days.

Frequency of Attacks.—This is very variable; in extreme cases the attacks have occurred every three weeks, or the interval between the attacks may be a year. A common interval is three months.

Character of Vomit.—This consists usually of food mixed with mucus and, in some cases, with bile. Blood is reported in five cases, and Marfan records the smell of acetone in the vomit.

Free Hydrochloric Acid.—H. L. K. Shaw found free hydrochloric acid in one of three cases examined; it was absent in the other two. Holt also found free hydrochloric acid in his case.

Acetone.—Acetone was detected in the urine, breath, and vomit of the cases reported in this paper. Marfan speaks of acetonaemia occurring in his cases. Marcy found acetone in the urine and breath of his three cases. H. L. K. Shaw suggests the presence of acetone in the urine of his second case; no odour of acetone was noticed in the vomit of his fourth case. Edsall's first case showed a marked acetone odour shortly after the beginning of the vomiting; his second case showed acetone, diacetic acid and β -oxybutyric acid in the urine shortly after the commencement of an attack of vomiting; the same substances were found in the urine of the present case. Pierson observed a sweetish smell of the breath in two of his cases, and acetone and diacetic acid in the urine of all three cases.

Wasting.—This was very marked in twelve cases and great hollowing of the abdomen is reported in two cases.

Thirst.—This is not a very common symptom, but is reported in nine cases.

Urine.—This is frequently scanty in the attacks; in one of Griffith's cases it was reduced before the attack; Rachford observed in one case albumin and hyaline casts; Marcy reports suppression of urine in the last attack of his second case, blood casts were also found in this case. Holt found a trace of albumin, casts, and blood in his case. H. L. K. Shaw found indican in one case. Marcy, on the other hand, found that indican disappeared from the urine.

Uric Acid.—Holt reports that the proportion of uric acid to urea in his case, before the attacks of vomiting, was 1 to 54; during the attack 1 to 157 or 1 to 132. Marcy says that in his cases uric acid was not in excess and not below the average. Griffith noticed a large deposit of uric-acid crystals before the attacks in his first case, and there was an abundant deposit of ammonium urate in one of H. L. K. Shaw's cases.

Constipation was sufficiently marked as to be commented on

in twelve cases. Intestinal obstruction was feared in one of Griffith's cases.

Temperature.—Marfan found that the temperature was rarely more than 38° C. (100° F.), and Rotch reports the temperature subnormal; it is the rule for fever to occur during the attacks of vomiting (the "fitful" fever of Gee), and it may reach 103.5°; frequently fever of less marked character occurs in the prodromal period.

Various other Phenomena Observed.—The symptoms of the prodromal period include offensiveness of the breath, dyspnoea, and sighing respiration, choreic movements, and general restlessness. Rotch observes that migrainous attacks are likely to develop in after-life, and Marcy found marked pruritus after the attacks in each of his three cases. Faecal vomiting has never been observed.

PROGNOSIS.

The tendency is for the attacks to disappear as puberty is reached. Three of the 55 cases were fatal (Marcy, Holt); a post-mortem examination was obtainable in one case only (Marcy).

TREATMENT.

Before Attack.—The general rule followed has been to administer mild aperients, to give easily digestible food, and administer bromides and febrifuges.

In Attacks.—It is advisable to exclude all food except barley water and broths, etc. In some cases morphine combined with atropine may be necessary, but infusion of normal saline per rectum or subcutaneously is probably more useful. Marfan gave fractional doses of magnesium—20 cg. five times in twenty-four hours—ordered simple lavage of the rectum daily, and in severe cases infusion of 40 to 60 c.cm. of normal saline night and morning. Edsall strongly recommends the use of large doses of sodium bicarbonate—180 gr. in twenty-four hours—and Pierson states that if given when the prodromal period occurs the attack may be warded off. Rotch confirms Edsall's views: to some extent sodium bicarbonate was of use in our case.

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ON RECURRENT VOMITING OF CHILDHOOD (CYCLICAL VOMITING), WITH THE REPORTS OF TWO CASES.

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UNDER the title recurrent, cyclical or periodic vomiting has been described a condition which is confined to children and in which the chief symptom is attacks of vomiting without abdominal pain, occurring at varied intervals, between which there is generally perfect health, and which have no relation to diet. If we may judge by the paucity of English literature on the subject, it is one which has received little attention on this side of the water. Dr. Holt,¹ of New York,