OBSERVATIONS

ON

ATONIC MOTOR INSUFFICIENCY AND
DILATATION OF THE STOMACH:

THEIR CAUSES, DIAGNOSIS, AND TREATMENT.*

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ALTHOUGH in the Ingleby Lectures for 1894¹ which discussed the common forms of dyspepsia in women I emphasized the frequency of motor insufficiency as a cause of these stomach troubles, it was not until about a year later that I began to use the method of examination which has since enabled me to prove that atony and dilatation of the stomach is a very much more common condition than I believe is generally accepted by the medical profession.

That method consists in the administration of the stomach powder recommended by Dr. Eric Meinert, of Dresden, which contains 120 gr. of sodium bicarbonate and 90 gr. of tartaric acid; these quantities being dissolved separately in water and given successively to the patient. I used to fear that such powders would cause much pain and distress, but immediately after Dr. Meinert had shown me their use I commenced employing them in hospital and private practice. I have rarely seen any pain produced, and it has never been more than trifling and temporary in character. The only needful warning is that the stomach should be empty or vomiting of food may follow, which is disagreeable to both doctor and patient, but if the stomach is empty the most that occurs is the vomiting or eructation of inoffensive froth.

I may mention in passing that a stomach powder consisting of 15 to 30 gr. of sodium bicarbonate with the same quantity of citric or tartaric acid is an altogether insufficient dose to distend the stomach properly, or to define its shape, size, and outline. Up to the time of my visit to Dresden I had been in the habit of inflating the stomach when the siphon tube was passed by means of the bellows of a spray producer, as recommended by Professor C. A. Ewald, of Berlin, but this is not a satisfactory proceeding. A few weeks ago a patient whose symptoms certainly resembled dilatation of the stomach was brought to me by an old house-physician, who told me that he had distended the stomach as we used to do and had satisfied himself that there was no dilatation. After the exhibition of a stomach powder any doubt upon this point was dispelled by the stomach becoming plainly visible, its greater curvature reaching to the pubes, and the whole organ filling up the greater part of the lower half of the abdomen.

CAUSATION.

I have collected from my private casebooks 100 cases of dilated stomach seen during the last five years. Of these cases 36 were males and 64 females, a proportion of nearly two to one in favour of the latter sex. The following table shows the age-incidence:

TABLE A.—Age-Incidence in 100 Cases of Dilated Stomach.

	10-20	20-30	30-40	40-50	50-60	60-70	Total.
Males	0	2	10	10	5	9	36
Females	1	18	22	20	3	0	64
Total	1	20	32	30	8	9	100

In males the disease seems hardly to commence before 30, and although most common between the ages of 30 and 50 it appears to persist throughout life. In women, on the other

* Read at the October Meeting of the Birmingham and Midland Counties Branch of the British Medical Association.

hand, it begins earlier, but almost ceases after 50. It is noteworthy that all the cases which seemed to be due to obstruction were over 30 years of age. I have endeavoured to ascertain the influence of marriage upon this condition.

TABLE B.—Influence of Marriage.

Women.	10-20	20-30	30-40	40-50	50-60	Total.
Married	0	3	13	15	2	23
Unmarried... ..	1	15	9	5	1	31
Total	1	18	22	20	3	64

The table brings out the fact that of 19 women under 30 years of age 16 were unmarried, while of the 42 women between 30 and 50 years of age 28 were married and 14 single. In estimating the meaning of these figures, we must remember that comparatively few women in the middle class marry under 30 years of age. In other respects, the table affords little to comment upon except perhaps that the number of single women is disproportionately high; this may perhaps be explained by the fact that my cases belonged to the middle class, in which the married women have generally servants to assist them in housework, and on the whole lead comparatively easy lives, while many of the single women were nurses or teachers or clerks who suffered from overwork.

In seeking to determine the conditions under which dilatation of the stomach is apt to arise, I have inquired into and tabulated what seemed to be the most striking etiological factor in the past history of the patient, that is to say, where I could obtain a history of prolonged neurasthenia or dyspepsia or anaemia or ulcer, the case is attributed to that condition; or if the patient said that he or she had never been well after an attack of influenza, pneumonia, or enteric fever, the disease named has been assigned as the cause. The table shows the

TABLE C.—Assigned Causes in 100 Cases of Dilated Stomach.

Causes.	Men.	Women.		Total.
		Single.	Married.	
Neurasthenia	14	12	3	29
Dyspepsia	14	15	13	42
Ulcer	3	1	4	8
Cancer	2	—	—	2
Chronic diarrhoea	—	—	1	1
Anaemia	—	3	—	3
Menopause	—	1	—	1
Pregnancy	—	—	2	2
Metrorrhagia	—	—	1	1
Loose kidney	—	1	—	1
Influenza	2	1	3	6
Enteric	—	—	1	1
Pneumonia	1	—	2	3
Total	36	34	30	100

way the cases were distributed; neurasthenia accounts for 29 and dyspepsia for 42. Many of the dyspeptic cases were undoubtedly neurasthenic, but I have included under this heading all cases which presented a history of early stomach trouble, without attempting to distinguish the nervous from the inflammatory cases, as this seemed to be impossible. Many others were neurasthenic, and indeed only the 10 cases due to cancer or ulcer can be looked upon as dilatation from obstruction. In the remainder the condition was one of simple atony or motor insufficiency with subsequent dilatation of the stomach; this was sometimes early and curable, but too often of old standing, and only partly relieved by the means at my disposal.

SYMPTOMS AND DIAGNOSIS.

On each page of my casebook there is an outline upon which I have drawn the position and size of the distended stomach, and I have tabulated the results in the following manner. I do not consider the stomach dilated unless the great curvature comes below the level of the umbilicus, and only slightly dilated if the great curvature does not come down below the

level of the anterior superior spines: below that line and half way to the pubes I call "marked dilatation," while anything lower than that I regard as "extreme dilatation." With this explanation I think the following table becomes intelligible:

TABLE D.—Analysis of the Size of the Stomach in 100 Cases of Dilatation.

Dilatation.	Men.	Women.	Total.
Slight	7 (19.5 per cent.)	8 (12.5 per cent.)	15
Marked	20 (55.5 per cent.)	35 (54.7 per cent.)	55
Extreme	9 (25.0 per cent.)	21 (32.8 per cent.)	30
Total	36 (100.0 per cent.)	64 (100.0 per cent.)	100

It may be noticed that out of the 100 cases 15 were slight, 55 marked, and 30 extreme, so that in 85 per cent. the great curvature reached well below the level of the anterior superior spines. While the number of slight cases is nearly equal in the two sexes, their relative proportion shows them to be more frequent among the men; the marked cases are in the same relative proportion in the two sexes; while the extreme cases are more common among the women. The degree of dilatation was not greater where there was obstruction than where there was simply atony. In 10 cases due to obstruction the dilatation was extreme in three and moderate in the other seven.

Pain.—Pain was by far the most common symptom of which the patients complained; it is noted in 68 instances. This is true whether the cases were slight, marked, or extreme, and in both sexes. It varied in position and in its relation to food, but it was most common in the epigastrium, and after eating; next to the epigastrium perhaps the most common seat of pain was in the bowels or lower part of the abdomen, and after that in the back, between the shoulders, and in the chest. Occasionally it was described as being worse when the patient was tired or worried, and sometimes it was relieved by taking food.

Vomiting.—Vomiting was not nearly so common as might be expected; it occurred in only 16—9 females and 7 males. As the whole group of cases includes nearly twice as many women as men, this symptom was evidently more frequent among the latter (men 19.4 per cent., women 14 per cent.). It was present in 4 only of the 30 (13.3 per cent.) "extreme" cases—in two women and in two men. It was slightly more common (14.5 per cent.) in the "marked" cases, 6 of the women presenting this symptom, but only two of the men; and was most frequent in the "slight" cases, among which it was noted in one woman and three men (26.6 per cent.).

Loss of Weight.—For many years I have been in the habit of weighing all my patients, and of making a note of any recent gain or loss of weight, but, as may be easily understood, it is difficult in many cases to get definite information upon this point, especially from women. My notes show that there was loss of weight in 14 women and 20 men. On some of the women it is expressly stated that there had been no loss of weight. Evidence upon this head was relatively much more frequently forthcoming from the men than from the women. Loss of weight occurred proportionately more often among the 10 cases (8 ulcer, 2 cancer) due to obstruction than among those due to atony. Of these cases 2 of the women could give no information as to their previous weight, but the other three had lost 20, 14, and 9 lb. respectively; 2 of the 5 men had lost 42 lb., two 12 lb., and one 11 lb.

Constipation and Diarrhoea.—Constipation was often complained of, but does not turn out to have been so constant as I had supposed. I have notes of this point in each case; it was present in only 39 out of 64 women, while in 3 the bowels were loose; among the men the proportion was very nearly the same—21 out of 36, with 3 cases of chronic diarrhoea.

Flatulence.—This was a very common subordinate symptom, and no doubt in some cases was the cause of the pains complained of. Flatulence in atony and dilatation may be due to fermentation and to the formation of carbon dioxide, olefant gas or marsh gas, but is frequently present in cases where there is no marked stagnation of food and certainly no reason to believe that there are any unusual fermentative changes

going on in the stomach—that is, where the gastric contents in the morning consist only of a few cubic centimetres of harmless mucus. Air may pass into the stomach with the food, and its passage is facilitated by (1) imperfect mastication of the food due to either defective teeth or rapid eating; (2) want of tone in the oesophagus, so that the bolus of food is grasped loosely and air forced down into the stomach with it. It also seems probable that where there is loss of tone in the muscular walls of the oesophagus and the cardiac opening of the stomach, air may be drawn into the stomach during respiration. No doubt there are other cases in which the air is voluntarily swallowed, but in the cases for which the above explanations hold good the act is quite involuntary.

The Tongue.—The state of the tongue was noted in only 73 cases; in 26 it was furred or foul. In the slight cases the dirty tongues were 7 out of 13; in the marked cases 9 out of 35 and in the extreme 10 out of 25. A dirty tongue was more common among the men than among the women, for out of 24 men 10 had foul tongues, whereas out of 49 women only 16 presented this symptom. The men, undoubtedly, showed other evidences of gastritis more frequently than the women.

Other Symptoms.—After pain and vomiting the most usual complaint was flatulence and water-brash; a few complained of weakness, giddiness, or headache; two of diarrhoea and one of want of appetite and loss of weight. I have said nothing about splashing and visible peristalsis because I do not regard these symptoms as of serious value. They may be present when there is no dilatation and absent when there is, and they are generally demonstrated to students on extremely emaciated persons where the diagnosis does not stand in need of any such assistance. In the less obvious cases they are useless. I have gone over my cases very carefully in order to see whether any group of symptoms corresponded with the different degrees of dilatation, but I have not been able to make out any relation. The classical symptoms of dilated stomach were generally absent and the diagnosis of the cases would have been impossible by the usual methods.

Chemistry of the Dilated Stomach.—For detailed information of the results of examining the stomach contents in cases of dilated stomach I must refer to cases treated at the hospital. I have notes of 57 cases under examination, from which the following conclusions can be drawn: Free hydrochloric acid was present in 32 out of 57 cases, it was absent in 20, in excess in 2 and deficient in 3. Peptic digestion was normal in 29 out of 52 cases, weak in 17, and absent in 6. Starch digestion, that is to say, the diastatic action of the saliva on starch, was shown to be normal by the presence of a good sugar reaction in all but 5 cases, and in these the erythro-dextrine reaction was present. Lactic acid was present in 48 and absent in 9, while butyric acid was present in only 4. Those cases in which butyric acid was present did not differ essentially from others in which it was absent either in degree of dilatation or the presence of obstruction; in fact, this acid may be present in stomachs which are not dilated at all. The fasting stomach contents were examined microscopically in all cases and sarcinae were only seen in 2, of which 1 was a case of cancer. Torulae were slightly more frequent, being met with in 6, but one of these was the same in which sarcinae were present. Test breakfasts and the routine careful examination of the stomach contents have taught us a great deal and have supplied a fund of knowledge which can be applied in practice without obliging us to subject all our patients to these manipulations. As a rule I dispense with them, but in doubtful cases they may give us the necessary ray of light. For example, absence of hydrochloric acid is a point in favour of cancer, but is too often present in chronic gastritis to make it absolutely trustworthy: and, again, excess of hydrochloric acid may explain some obstinate cases of gastralgia; but, on the whole, I am of opinion that their great value has been by teaching us sounder views as to the nature of gastric digestion which, when we come to treatment, help us materially.

Stomach Motility.—Many methods have been devised to determine the rate at which the stomach discharges its contents, and of these the administration of salol seemed the best, but after using it for some years I have discarded it as useless, and this conclusion seems to have been arrived at by most of those who have had large experience of it. Where the stomach is dilated we may take it for granted that there

must be delay in the discharge of its contents, and I do not think it of great practical importance to determine this point more precisely. I have, however, endeavoured to ascertain wherever possible whether the fasting stomach still contains the remains of food, and in all my hospital cases the stomach tube is passed early in the morning before the administration of the test breakfast, and the contents removed for microscopical examination. The general result has been to show that it is extremely rare to find anything but a little mucus, containing a few starch granules and epithelial cells.

PROGNOSIS.

The gravity of each case of atonic dilatation depends much more on the duration of the symptoms than on the extent of the dilatation as determined by distension with CO₂. I have seen cases of "extreme" dilatation as defined in this paper recover very rapidly after a short course of treatment, while others in which the dilatation was not so marked have proved incurable. Therefore the prognosis must be guarded in all cases; it may be hopeful where the symptoms are of short duration, where the patient is young and the general health good; on the other hand, it should be less hopeful where the symptoms are of long duration, in the presence of pronounced neurasthenia or of bad general health.

We should also be careful before expressing a definite opinion to point out that much must depend upon the influence of treatment. In some cases the symptoms disappear very rapidly, and the stomach regains its normal limits after a short rest in bed.

TREATMENT.

The rational treatment of atonic dilatation of the stomach is for the most part that of the neurasthenic condition upon which it depends. In cases which resist tonic treatment, a modified Weir-Mitchell course is indispensable. Such patients should go to bed for three to six weeks, and have general massage to prevent muscular waste and improve nutrition, with perhaps abdominal massage too, with the object of strengthening the abdominal walls. Faradism may be also tried as a tonic to the muscles. Intra-gastric electrization by both the faradic and constant currents with Max Einhorn's electrode has not been followed by any benefit; and, according to Goldschmidt (quoted by Moritz),² electrization of the interior of the stomach neither influences the rapidity with which it empties itself, nor produces contractions of its walls. Every case upon going to bed is put upon an ounce of milk every hour diluted with barley water, soda water, or lime water, and no other food is allowed so long as pain continues. If, as is usually the case, no pain is felt in the recumbent position, the milk is increased by 1 oz. hourly on successive days until the maximum of 4 oz. is reached. Should all go well, to this may be added 4 oz. of minced chicken twice a day, with a very small slice of rusk or toast. After two or three days minced mutton may be given as a variation, with the addition of a little mashed potato and custard pudding for dinner, and cocoa and rusk for breakfast instead of part of the milk. So by degrees the patient is brought round to a normal diet of three or four meals daily. When this result is attained the patient is allowed to get up, and, if still able to eat the same food in comfort, is sent home or, better, is ordered away to complete the cure by change of air and scene.

All cases do not proceed so smoothly. In some the tongue may remain foul and pain continue even after taking nothing but diluted milk. Under these circumstances it may be necessary to wash out the stomach every night by means of a siphon tube. This time seems to me preferable to the morning. The usual argument in favour of the latter course is that it leaves a longer time for the digestion of food, but if the stomach does not empty itself some acid gastric contents remain far into the night in contact with the stomach walls, which must tend to keep up and even aggravate any inflammatory condition present, while, on the other hand, if the stomach is washed out at bedtime with warm water this source of irritation is removed.

Sometimes milk diet fails, and then recourse must be had to minced lightly-cooked mutton, which hospital patients generally refuse without the concession of a small piece of toast or rusk to be eaten at the same time. On this diet the patient gets three meals a day of 4 oz. of minced mutton,

the quantity being increased to 6 oz. if the smaller amount is insufficient to satisfy hunger. I have repeatedly seen the tongue become clean and dyspeptic symptoms, which had persisted upon diluted milk, pass away under this regimen; I have, therefore, no doubt of its value or hesitation in recommending its use.

The only routine drug treatment I employ is something to prevent or overcome constipation, which is frequently troublesome, even in those patients whose bowels were quite regular when they were going about. In hospital I usually order the *mistura magnesiæ sulphatis cum ferro* three times a day, as such patients like to have a bottle to take regularly; but in private practice I am content to give a capsule of cascara or some similar remedy every night at bedtime. If the tongue is foul I give one or two doses of calomel (gr. i), or blue pill (gr. v), with either of the following mixtures:

R Bismuthi carb., gr. 10; sodii bicarb., gr. 10; pulv. rhei, gr. 2; muc. tragacanthi, m 15; aq. menthae pip. ad fl. oz. 1. Or R Sodii bicarb., gr. 10; tinct. rhei, m 15; ext. cascara. liq., m 10; tinct. nucis vom., m 10; tinct. zingiberi fort., m 5; inf. gentianae co. ad fl. oz. 1. Sig. to be taken immediately before each meal.

Where the disease is not of long standing we should try what can be done by milder measures, and it is often sufficient for such patients to lie down for half an hour after each meal and to avoid fatigue. This advice should be supplemented by such a prescription as the following:

R Acid. nitrohydrochl. dil., m 15; tinct. nucis vom., m 10; ext. cascara. liq., m 10; tinct. zingiberi fort., m 5; inf. gentianae co. ad fl. oz. 1. Sig. to be taken immediately after each meal.

I do not diet these slighter cases unless there is good reason to do so, such as evidence of gastritis; in that case I treat them by eliminating from the diet such articles of food as cause irritation, including fats, uncooked vegetable food of all kinds, coarse tea and the stronger alcoholic drinks, but when there is no gastritis I make no restrictions, but allow them to eat what they can.

I have said nothing about assisting gastric digestion by the various remedies which modern pharmacy has proposed. If I do not accept all these methods it is because some appear to be founded upon erroneous physiological notions or upon misconceptions of the capabilities of drugs. Discomfort after food depends ultimately upon want of motor activity in the stomach, and those who never suffer from dyspepsia are vigorous persons whose stomach walls contract actively and soon discharge into the duodenum whatever they may have swallowed. Purgative remedies relieve indigestion by exciting this action, and I have a desire to believe that nuxvomica and caffeine, the latter in the form of black coffee, act in the same way. Test breakfasts show that deficiency of hydrochloric acid is common, but it is impossible to give a sufficiently large dose by the mouth to compensate for this defect. Some have attempted to do so by giving 30 drops of dilute hydrochloric acid every twenty minutes for two hours after each meal, but few patients would swallow so much medicine. The use of pepsine is not supported by the results of stomach examination, as it is extremely rare to find pepsine absent, except where hydrochloric acid is also wanting. Pepsin, if it were a trustworthy drug, would be better, but unfortunately it does not retain its proteolytic properties, at least I have never been able to obtain commercial pepsin which was of any digestive value. Pancreatin fails probably because although the hydrochloric acid present is insufficient to promote good peptic digestion it is enough to inhibit the action of trypsin. No reason exists for administering diastatic ferments in these cases, as in my cases the salivary diastase was always active. In connexion with the question of gastric digestion, it should not be forgotten that the intestinal digestion is quite capable of supplementing any deficiencies of the stomach, for not only have experiments upon animals shown that nutrition can go on perfectly well in the absence of a stomach, but Schlatter's case and others have proved that all the functions of digestion and assimilation may proceed perfectly after the entire stomach has been excised.

I would guard against being supposed to convey the impression that we are always able to give relief by the means above mentioned. In many cases we can only alleviate the trouble, and the patients continue to suffer a great deal of discomfort, so that the question naturally arises whether surgery may not afford relief. The operation of gastro-jejunostomy is so eminently rational a remedy that one would desire to see it tried where the patient is

suffering a great deal of inconvenience. But life is not at stake, and it must be borne in mind that even allowing for the great facility and skill with which such operations are now being performed they are not altogether devoid of risk. My personal experience of the operation in neurasthenic cases has not been favourable, and I hesitate to recommend it. Even when performed with due skill and success the patient has not always been benefited by it; the old symptom of pain after food has persisted, while the general condition has in some cases been made even worse than before. The shock of the operation seems to be too much for the enfeebled nervous system, and I suspect that if the after-history of surgical proceedings in neurasthenic cases were followed up, it would be found that this is very often the case. It is safer in incurable cases to provide a stomach tube and teach its use, warning against its abuse, for some nervous patients will wash out their stomachs three or four times a day. It is enough to wash the stomach out at bedtime twice a week, but if there be any increase of discomfort, the tube may be used every night for a few nights in succession.

Lastly, a light abdominal belt fulfils an obvious indication and may in certain cases be worn with advantage.

CONCLUSION.

As the result of this survey the following propositions are submitted:

1. That atonic dilatation of the stomach is a common condition; that it occurs about twice as often in women as in men, and most frequently between the ages of 20 and 50, and that it is ten times more common than dilatation from obstruction, which generally occurs after 30 years of age.
2. That it is caused by neurasthenia or by any prolonged debilitating illness which may set up neurasthenia.
3. That there are no characteristic symptoms and no correspondence exists between the amount of dilatation and the severity of the symptoms.
4. That the diagnosis can in the great majority of cases only be made by the distension of the stomach by CO₂, evolved from 120 gr. of sodium bicarbonate and 90 gr. of tartaric or citric acid.
5. That the prognosis does not depend upon the extent of dilatation, but rather upon the duration of the symptoms, the general health of the patient, and the effect of treatment.
6. The treatment must be mainly that of neurasthenia, supplemented by the use of such drugs and diet as may be indicated by complications, for example, gastritis.
7. Gastro-enterostomy often fails to relieve these cases.

REFERENCES.

- ¹ BRITISH MEDICAL JOURNAL, 1894, vol. 1, pp. 571 and 673. ² Münch. med. Woch., 1895, p. 1143.

HAIR-BALLS AND OTHER CONCRETIONS IN THE STOMACH.

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CERTAIN concretions are apt to form in the stomach and to give rise to severe abdominal symptoms accompanied by an abdominal tumour. As a rule they consist of hair, cotton, wool, or string, but occasionally they are composed entirely of vegetable fibre or resinous material.

Hair-balls of sufficient size to attract attention are very rare, and only about 24 cases are recorded in the literature.* When comparatively small the mass is round or oval in shape, and occupies the pyloric region, where it acts like a ball-valve; but as it increases in size it becomes moulded by the gastric contractions until it forms a solid cast of the stomach, and may even extend into the oesophagus (Best) or through the pylorus into the duodenum and jejunum (Gull, Pollock). It is smooth, compact, and heavy, and consists of a vast number of hairs, varying from 2 in. to 20 in. in length, which are closely interwoven and agglutinated by mucus and food débris. In Gull's case the component hairs were of three colours, and could be recognized as belonging to the patient and her two children. Sometimes the hair is mixed with

cotton, thread, or pieces of string. The largest concretion on record weighed 4 lb. 7 oz. (Russell). The habit of swallowing hair is not confined to the human subject, but is met with in many of the lower animals, and especially in cats, the Angora breed of which are said frequently to die from gastric concretions at those periods of the year when the fur is shed (Ohepmell). Lunatics usually prefer harder substances, such as nails and crockery, for periodic consumption, but in the case recorded by Quain fatal perforation of the stomach ensued from a ball of cocoa-nut fibre weighing 4 lb.

Concretions composed of vegetable matter are occasionally found in the stomachs of persons who have consumed large quantities of fibrous roots and such like substances owing to a perverted appetite, or from a superstitious belief in their medicinal properties. Thus in Kooyker's case a mass of starch and vegetable fibre, weighing 29 oz., was found in the stomach after death, while in that recorded by Schreiber the organ was completely filled by a mass of roots (*Schwarzwurzel*).

Stones or gastroliths are extremely rare, and only four authentic examples have been recorded. They usually consist of shellac, which has been introduced into the stomach in the form of polish or varnish, and may either be single or multiple (Friedlaender). As a rule they do not exceed 3 oz. in weight, but in the case recorded by Tidemand the mass weighed 1,500 grams.

The local effects of a concretion consist of dilatation of the stomach with ulceration of its mucous membrane, while occasionally the viscus becomes fixed by adhesions to the pancreas or the abdominal wall (May). When the mass extends into the oesophagus or duodenum, the corresponding orifice of the stomach is dilated and incompetent. Occasionally the irritation of the foreign substance gives rise to papillomata (Best).

SYMPTOMS.

The fact that various foreign bodies are frequently found in the alimentary tract of lunatics has given rise to the impression that gastric concretions only occur in persons of unsound mind. This belief is not only erroneous but has been the cause of serious mistakes in diagnosis, since more than one writer has stated that had he been aware that sane persons were liable to the complaint, he might have suspected the nature of the abdominal tumour and have saved his patient's life by a timely operation.

(a) *Hair-Balls*.—Out of the 24 cases recorded of this kind no fewer than 23 were females, the youngest of whom was 18 and the oldest 34 at the time of death.† There was never any indication of mental disease, and in several instances it was expressly stated that the patient was neither hysterical or particularly emotional. The habit of hair swallowing is usually acquired in early life when the hair is worn loose upon the shoulders. In the majority of cases it originates in the trick frequently practised by young girls of holding a lock of hair in the mouth while reading a book, or of biting the ends of a coil when angry or excited. In other instances it seems to arise from the inclination which is so strong in some

* Schönborn stated in 1883 that only 7 cases had been recorded, but he appears to have ignored English and American literature.

† Since this article was written Paton has reported the successful removal of a hairball from a girl 8 years old.