

AN ADDRESS ON DILATATION OF THE STOMACH.

Delivered before the Harveian Society of London.

BY SIR WILLIAM H. BROADBENT, BART., M.D.,

Physician-in-Ordinary to H.R.H. the Prince of Wales, and Physician
to St. Mary's Hospital.

ON DILATATION OF THE STOMACH.

DYSPEPSIA gives rise to a great variety of symptoms, and is responsible for much discomfort and suffering, and even misery, if we take into account the depression of spirits with which it is frequently accompanied. I propose to deal here with one of the consequences of dyspepsia, which, at the same time, aggravates its injurious effects, and constitutes a serious obstacle to remedial measures. This is dilatation of the stomach, which has, moreover, symptoms of its own and requires special treatment.

There are various degrees of gastric dilatation, and I should almost be prepared to say different kinds. The increased capacity of the organ, the imperfect collapse and contraction when digestion is completed, and the exaggerated area of resonance before or after meals are common to all cases, but in some patients splashing is easily elicited, and when the tube is introduced, at whatever interval after food, a quantity of ill-smelling liquid will be withdrawn; in others a splash is heard only for two or three hours after food, and after this time the stomach will be found quite empty by the tube when the line of resonance is as high as the fifth space. It is not easy to draw a line between mere distension and dilatation: theoretically we should say that actual dilatation existed when the stomach tolerates passively the presence of gas, and does not clear itself of contents after digestion.

CAUSES.

The causes of dilatation of the stomach are such as give rise to indigestion and flatulence, and first among them stands improper and injudicious food and feeding.

Improper and Injudicious Food and Feeding.—Over-feeding generally is a common cause of dyspepsia, which may go on to the production of dilatation. Appetite, which would be satisfied by a reasonable amount of one or two kinds of food, is re-awakened by a succession of dishes; the stomach is thus completely overloaded, and is incompetent to deal with the mass of material it receives. Bulky, farinaceous articles of diet, certain green vegetables of the cabbage tribe, which give rise to flatulence, with copious draughts of liquid, will distend the viscus and, by frequent repetition, impair its contractile power. The largest stomach I ever saw *post-mortem* was in the body of an Irishwoman, whose staple diet was potatoes and tea; it extended from the left hypochondrium to the right iliac fossa. Habitual taking of food between meals is a practice which is ruinous to digestion; like other organs, the stomach requires a period of rest. Food, again, taken in a condition of exhaustion or extreme fatigue is never properly digested; and the man of business who thinks he is taking exercise, which in some degree neutralises the ill-effects of confinement to his office, by walking home from the city, not infrequently adds to them by fatigue which impairs his digestion. The rush from work to food, and from food hastily eaten back to work, is, again, a frequent cause of indigestion; as is also the hurry from breakfast to catch a train to town.

Functional Derangements of Nervous Origin.—But the stomach is astonishingly tolerant of excessive and improper food, and adjusts itself to irregularities of meals and untimely feeding with extraordinary facility; and, on the other hand, the severer forms of dyspepsia and gastric dilatation are met with when the meals are wholesome in character, moderate in amount, and regular in time. Some other cause, therefore, than errors in diet must play a very important part in their production. Hereditary or congenital tendency to dyspepsia, injury to the stomach by improper food in infancy and child-

hood, will account for some cases, but a more potent influence is disturbance by the nervous system, taking effect in some cases on the secretion of the digestive fluids, in others on the muscular contractions of the stomach. A large proportion of the dyspeptics who consult us, and of those who suffer from dilatation of the stomach, are neurotics; and the neurosis is the cause of the stomach trouble, and the nervous symptoms are not the consequence of indigestion, as is so commonly assumed.

Anatomical Conformation.—In dilatation of the stomach, however, my observation has led me to conclude that there is very frequently another factor, an anatomical disposition, which hinders the expulsion of the products of the digestion. This is when the pylorus is suspended high up in the epigastrium by a short lesser omentum, which also limits its movements. Under such circumstances if the stomach is distended and overloaded it is dragged down by the weight of its contents and an acute flexure is formed at the junction of the duodenum and pylorus, which constitutes an obstacle to the passage of the chyme. I have many times seen, when peristalsis has been provoked by handling, an enormously dilated stomach define itself through the thin abdominal walls, making a sharp bend at about two-thirds or three-quarters of its length from the cardiac end, the pyloric portion passing directly upwards or even upwards to the left, while the contraction travels from left to right, and on arriving at the pylorus evidently encounters obstruction which it is unable to overcome. Mr. Mayo Robson has recently pointed out another mechanical cause of dilatation of the stomach in adhesions which have formed as a result of ulcer or of perihepatitis.

SYMPTOMS.

The symptoms to which dilatation of the stomach gives rise are extremely varied. They include all those attributable to indigestion, but it would only lead to confusion to enumerate them, and I shall specify only such as are more or less characteristic of dilatation, and they may be roughly classified as gastric, mechanical, reflex, and as due to ptomaine poisoning.

It is not always easy to say to which of these classes particular symptoms ought to be referred, and they no doubt overlap, but it will facilitate description and discussion to attempt some kind of classification.

Of the gastric symptoms proper the most characteristic is copious vomiting. One meal after another is taken through the day, or, in some cases, for two or three days, with more or less discomfort, but without sickness, and then apparently the whole is returned, the quantity sometimes being enormous. The vomited matters are usually of a brown colour and offensive odour, with a floating scum. This, of course, is a symptom commonly present in malignant or other stricture of the pylorus, and the diagnosis between dilatation secondary to disease of the pylorus and simple dilatation is often difficult. The complete absence of free hydrochloric acid from the vomited matters, or from the contents of the stomach when withdrawn by a tube, has been relied upon as evidence of cancer; but even if this point were absolutely trustworthy, which I doubt, it is very difficult of establishment. The presence or absence of sarcinæ, again, is not conclusive either way; there is always an abundance of fermentative organisms, and sarcinæ may or may not be among them. Time and the results of treatment will ultimately establish the diagnosis, and in most cases the judgment must be held in suspense for a while.

In other cases the vomiting is frequent and occurs at varying intervals, after each meal or every night, the stomach however, never completely emptying itself, so that whenever food is taken it is received into a quantity of fermenting material, and itself undergoes fermentation instead of digestion. Eructation of offensive gases is sometimes a symptom, but in bad cases the stomach has lost the power of expelling gases. The breath may or may not be offensive. The state of the tongue does not afford much assistance in the diagnosis. The most common surface appearance which it presents is a thin, pale, moist coat, which might be described as slimy or greasy looking, while it is large, soft, flabby, and indented at the edges. Almost every variety of fur may, however, be met with, and in some cases the tongue remains quite clean. Usually, the appetite is impaired, and not uncommonly there

is an absolute disgust for food, so that the proper nourishment of the patient becomes a matter of extreme difficulty. On the other hand, there may be a spurious appetite, the patient having a sensation of hunger and sinking very soon after food, and sometimes an imperious craving for food at all times of the day and night.

One of the most serious of the mechanical effects of dilatation of the stomach is upward displacement of the diaphragm and pressure upon the thoracic viscera. The heart is often very greatly embarrassed by pressure and displacement, and when the organ is fatty or dilated, or weak and flabby, dilatation of the stomach may determine a fatal arrest of its action. In one case at St. Mary's Hospital, a patient admitted for extreme breathlessness and weak and frequent action of the heart, and found on examination to have considerable dilatation of the stomach, died apparently from the effect of this upon a sound heart, no other cause of death being discovered *post mortem*. I had ordered the stomach to be washed out, but collapse supervened before this could be done. A hearty or indigestible meal may give rise to sudden death, or the dilatation may render fatal exertion or emotion which would otherwise have been survived.

Palpitation of the heart after meals is a common accompaniment of a dilated stomach. More frequently the heart's action is irregular, sometimes violent, at others feeble; occasionally there is intermission. As a rule, the patient is acutely conscious of irregular or intermittent action of the heart of gastric origin, whereas when it is present from cardiac disease, he knows nothing about it. Probably reflex disturbance may play a greater part in the production of palpitation, intermission, and irregular action of the heart than pressure, since cardiac disturbance may be very severe when the enlargement of the stomach takes a downward direction, and the line of resonance is not very high.

A symptom more distinctly traceable to pressure upon the heart and lungs is oppression and difficulty of breathing on lying down at night. In the recumbent position the weight of the liver and the abdominal viscera generally is more or less thrown against the diaphragm instead of falling away from it, and both heart and lungs are additionally embarrassed by the increase of pressure upon them. Sleeplessness is a very common effect.

A still more common form of sleeplessness is produced by a minor degree of gastric dilatation. The patient sleeps on going to bed, but at 2, 3, or 4 A.M. is awakened, and remains awake for some hours, perhaps till morning. The explanation is that the stomach does not completely expel its contents, and in the course of the night fermentation takes place with evolution of gas, which, by aggravating the pressure on the diaphragm, disturbs and prevents sleep. The subject usually does not recognise flatulence, or discomfort arising from flatulence, as the disturbing influence, but anything which causes the eructation of gas removes the inability to sleep. It may here be remarked that flatulent distension of the stomach produces its worst effects when the patient ceases to be conscious of the flatulence as such. The discomforts arising from the presence of gas are usually due to the efforts of the stomach to get rid of it, and it is when the stomach suspends these efforts and allows itself to be passively distended that the pressure and reflex effects give rise to serious trouble.

The mention of the form of sleeplessness just considered leads up to the consideration of nocturnal asthma, which is the most characteristic of the reflex symptoms. This comes on at about the same time in the night, and almost certainly from the same cause—fermentation, during the first hours of sleep, of imperfectly digested food, with the formation of gaseous and irritating products. The spasm of the bronchial tubes, however, cannot be due to pressure, and must be a result of a reflex from the gastric branches of the pneumogastric to the motor fibres of the bronchiæ. The excitement or aggravation of nocturnal asthmatic paroxysms in predisposed individuals by indigestion or flatulence, late or heavy meals, or certain articles of diet, is matter of frequent observation; when the attacks are habitual, dilatation of the stomach may be suspected as the cause. It is usually in adults at or after middle age that asthma is set up by dilatation of the stomach. There may be no bronchial catarrh whatever, or the gastric affection may precipitate the occur-

rence of asthma as a complication of bronchitis. The attacks are sometimes very severe. Occasionally nocturnal spasm of the larynx may be provoked in the adult by dilatation of the stomach, and may appear to threaten life.

Vertigo, sometimes so severe that the patient has to cling to railings in the street, or to help himself by the chairs and tables in crossing a room, is not uncommon as a result of dilatation of the stomach. It may or may not lead up to a paroxysm of vomiting. When premonitory of an attack of sickness, the giddiness may be attended with nausea, faintness, pallor, and cold perspiration, which is sometimes so protracted as to threaten life before relief is obtained by an attempt, often futile, to empty the stomach. In other cases, with an extreme sense of giddiness, there is no faintness whatever, and the patient can carry on a conversation or continue writing when he could not move from one chair to another without staggering. The dependence of the vertigo on the state of the stomach is shown by the fact that eructation of gas brings instant relief, and the patient who is not troubled with nerves learns to wait for this with equanimity. This vertigo *a stomacho læso* is distinguished from auditory vertigo by the fact that there is no apparent translation of external objects. The patient is unconscious that his head swims, but the room does not turn round, nor the floor tilt up, nor the bed topple over. The attack, moreover, does not come on with overwhelming suddenness, and I do not remember a patient actually falling.

Nightmare, violent starting of the limbs on going to sleep, are other illustrations of reflex disturbance.

The symptoms which may be set down to ptomaines absorbed from the fermenting contents of the stomach are headache, depression of spirits, and morbid ideas. Many of the discomforts attributed to "biliousness" or "liver derangement" are really due to this and other affections of the stomach. Altogether the sum of misery to the patient and his family and friends occasioned by dyspepsia is a very considerable item in the unhappiness of civilised society.

Other effects of dilatation of the stomach which must not be forgotten are loss of flesh and a dark sallow hue of the complexion. The loss of flesh is often such as to be suggestive of malignant disease, especially where there is obstruction of the pylorus, and the dark discoloration of the face might easily be taken as indicative of cancerous cachexia. It can scarcely be called pigmentation, as it clears up too rapidly when the gastric affection is relieved. The conjunctivæ may or may not be stained.

DIAGNOSIS.

The definite diagnosis of dilatation of the stomach rests ultimately upon physical signs. These are an abnormal extension of the area of gastric resonance with a tympanitic echo of the heart sounds over this area, the more or less ready production of splashing, and the tinkling of water falling into the distended viscus when the patient is made to drink, and, finally, the actual measurement of its capacity by means of the stomach tube.

Sometimes the stomach can be seen to bulge out at the epigastric region, forming a rounded prominence across the upper part of an abdomen not otherwise much distended, or, indeed, excavated. The lower limit can be recognised by inspection, and can be defined accurately by stroking the abdomen downward with the flat of the hand, when a difference of resistance is felt as the fingers glide off the distended viscus. This stroking method of palpation often affords valuable corroborative information when no bulging is visible.

In percussing out the stomach it is well to examine the patient in two positions—sitting up and lying down. In a few obscure cases additional information may be obtained by turning him also first on one side, then on the other. In the upright position the weight of its contents may drag the stomach down and away from the abdominal wall, so that the tympanitic note is indistinct, and its extent, and especially its upper margin, indefinite; while in the horizontal position the fluid gravitates to the back, which becomes the lowest part of the viscus, and the whole anterior surface is in close contact with the wall of the abdomen, when the characteristic resonance is easily elicited and is found to encroach upon the chest. Account must always be taken of the period

after meals at which the examination is made, and of the amount and character of the food last taken, in forming an opinion as to the degree of dilatation present and in making comparison between one day and another.

Almost the only question to be solved when there is undue resonance in the epigastrium and left hypochondrium is how much of it is due to stomach and how much to colon. Even when the line of resonance is as high as the fifth space it may be that the stomach is carried up by the colon or by gaseous distension of the small intestine, or atony of the diaphragm may invite displacement upwards.

The first point in differentiating stomach from colon resonance is the uniformity of the percussion note over a given area from above downwards and right and left, beginning in the epigastrium, or just below the heart, where it is probably gastric. The tap must be light and glancing. A perpendicular stroke, especially if at all forcible, brings out a note belonging to the general abdominal resonance, or to any dilated viscus in the neighbourhood, and effectually confuses gastric and colon distension. But percussion alone is never to be trusted absolutely. It is checked in the first instance by placing the stethoscope at some point within the resonant area, and giving sharp flips with the nail over its entire extent. So long as exactly the same ringing note reaches the ear from the various points at which the tap is made, it is probable that they are all upon the same viscus. The stethoscope will be shifted, and the click of two coins, one placed on the skin and struck by the other, may be substituted for the flip with the finger nail. In all these trials, it must be borne in mind that the note belongs to the underlying viscus, whatever it may be, at the point where the tap is made. If, for example, the stethoscope is placed in the epigastrium, and the tap is made over a dilated transverse colon lower down, the colon note will be heard, enfeebled perhaps, but not altered in pitch. Let now the stethoscope and point of impact change places, and a totally different note will probably be heard.

Another check is afforded by the conduction of the heart sounds. When the stomach is dilated to such an extent as to displace the diaphragm upwards, the heart and stomach will be in close contact, with only the diaphragm intervening. The heart sounds are then conducted, or rather echoed, with a tympanitic ring all over the stomach, thus helping to define its limits. It is worthy of note that the second sound is always much more distinct and ringing than the first.

The splashing sound may be elicited in various ways. In the upright position the ear or stethoscope is placed in contact with the anterior abdominal wall at or near the epigastrium, and a sharp motion is then communicated to the body. The splash of the liquid in the dilated stomach is usually very distinct. When, however, the stomach is full, or nearly full, of liquid, and there is no room for gas, splashing cannot be produced, but the naked ear may feel a powerful wave of fluid impinging against the abdominal wall. Care must be taken not to mistake borborygmi, easily induced in the colon, for splashing.

In the recumbent position a sharp push with the fingers from behind over the false ribs will make the liquid splash, or the patient may be partially rolled over. When all the corroborative evidence attainable is desired in a difficult case, the patient may be made to drink while the observer listens at the epigastrium and in its vicinity. If the stomach is dilated and is not too full of fluid, the gurgling and tinkling produced as the water enters it and drops into the liquid which it already contains will often give a good idea of the size of the organ.

In some cases peristaltic action of the stomach can be provoked by handling, and the dilated viscus can be felt to become firm and prominent under the hand. This, indeed, is not infrequently also visible, and the contraction can be seen to travel slowly from left to right up to the pylorus. It only occurs, of course, when there is actual obstruction at the pylorus from thickening or from an acute flexure as already described. No peristalsis can be elicited when the dilatation has resulted from atony of the muscular coats of stomach or from passive distension.

Colonic peristalsis travels from right to left. It is very rarely that a diagnosis can turn on this, but in one case of a patient sent to me by a distinguished physician as dilatation

of the stomach due probably to malignant disease of the pylorus, a contraction proceeding from right to left at once indicated obstruction and dilatation of the colon, which was successfully treated.

The final demonstration of the existence of dilatation of the stomach is effected by the employment of the stomach tube. The contents are first withdrawn, and warm water rendered alkaline by carbonate of soda is then poured in pint by pint till the stomach will hold no more. The normal capacity ascertained by this method varies, the average being about one or two pints. Dilatation exists when the amount which can be introduced is three pints or over. In severe cases six or eight pints have been poured in.

(To be continued.)

A MEMORANDUM ON THE INDIAN OPIUM QUESTION.

By SIR JOSEPH FAYRER, M.D., F.R.S., K.C.S.I.,
Physician to the Secretary of India in Council.

It is most strenuously urged by a large and influential, and, as I believe, thoroughly conscientious party, that the use of opium, either by eating or smoking, is attended with the most pernicious results, causing, sooner or later, demoralisation and destruction alike of body and mind. They seem to be of opinion that the degraded condition of the *habitués* of opium eating or smoking houses, whether in India or China, represents the natural, and, one might almost say, the inevitable results of the use of opium. Ideally one would wish that stimulants and narcotics, such as alcohol, hemp, opium, tobacco, chloral, and sundry others of recent invention, had no existence: but unfortunately human nature is so constituted that it will not forego the use of these drugs, each and all of which is liable to be abused, and, when so abused, produces the most degrading and pernicious effects upon the human race.

One of the curses of our own country and our own race is the abuse of alcohol; the amount of disease, misery, and crime produced by it is incalculable. With any who might enter into a crusade against this form of indulgence, which should correct the abuse and limit the use of it within reasonable bounds, I confess that I should have the greatest sympathy, but I should never expect to succeed in excluding alcohol altogether from use as food.

There cannot be a doubt that in the great cities of India, in China, and probably elsewhere in the East, the abuse of opium is carried by a certain but a limited number, to a great extent, but to nothing like the extent to which the abuse of alcohol is carried.

It is well known that over large areas of country in India, by tens of thousands of people, opium, in moderation, is habitually used by the natives, and that they have a thorough belief in its efficiency to protect them against malarious disease, and that, under its influence, all the functions of life are better performed; that life is not shortened, and that physical and mental conditions are improved and not deteriorated. This receives the support of those who know far more about the subject than I do, and I am not aware of anything to controvert it. It is said, I believe, by its opponents, that the tendency to opium eating is ever to increase — to induce, it may be, slow but sure degradation and destruction. I do not believe this. In the course of many years' experience in India I have known so many who have been habitual consumers of a small quantity of opium, without in any way suffering from it, or without any tendency to increase the habit, that I am unable to agree with those who state otherwise. One of my most intimate friends, a native nobleman, with whom I frequently associated, died after the age of 80. He was a man of remarkable intellectual, mental, and physical vigour, of wonderful powers of endurance of fatigue, a great sportsman, a splendid shot, as complete an example of a native gentleman as one could wish to see. He was an opium eater, and consumed his two or three doses a day