ON DYSPEPSIA.[1]

(' *The Practitioner*,' VOL. XIX., *December* 1877.)

To the healthy body the performance of its functions is a source of pleasure. The strong muscles rejoice in work, and exercise, to use up their superabundant energy, becomes almost a necessity; the brain works easily, ideas flow readily and clearly, and thought becomes a delight. Both bodily and mental work, however pleasant, entail waste which must be supplied, and the pleasures of exercise lead to the pleasures of the table, giving a zest to the plainest food and enhancing the flavour of the most delicate viands. When the day is over, exercise and food give place to the pleasure of sleep, and almost as soon as the head is laid on the pillow, the dreamy delightful languor which succeeds healthy exercise passes into dreamless slumber, from which the sleeper awakes on the ensuing morn, refreshed and strengthened for the occupations of a new day. With such a condition as this we are probably all more or less familiar, and its full enjoyment during a walking tour is, to my mind, one of the greatest charms of an autumn holiday. But unfortunately the conditions of life do not allow men to remain constantly under the favourable conditions in which we are placed during our vacation. Some have hard grinding bodily fatigue, continued hour after hour until the tired limbs can scarcely move, others have the still more exhausting mental drudgery, when, despite the exhausted brain, the closing eyelids, and the aching head, the cramped fingers must drive the pen scratch, scratch, scratch, long past the midnight hour, into the cool grey of early morning. Excessive mental and bodily work thus become not a blessing but a curse, and although they generally bring some compensation by increasing the pleasures of sleep and rest, it is not always so. For although the wise man says "sleep is sweet to the labouring man,

[1] Read before the Abernethian Society at St. Bartholomew's Hospital.

whether he have eaten little or much," yet not unfrequently excessive mental labour drives sleep from the couch, and weary work is succeeded by more uneasy rest. Too much work thus weakens both the muscles and the brain, and causes the exercise of their functions to be performed imperfectly, and attended with suffering, instead of being, as in the healthy state, a source of pleasure. Now the same is true of the digestive organs. Within certain limits, the stomach, liver, and intestines are very accommodating, and will digest much or little food, single dishes or a variety of meats, with great facility, but whenever the tax upon their power becomes too great, they refuse to act, and in various unpleasant ways make known to their master that they are on strike, and either want less work or work of a different sort. As the stomach is that part of the digestive system into which food is first collected, and which therefore is generally the first to suffer from overwork, we will consider its part in the digestion of food first, and the indigestion due to the imperfect performance of its functions, without at present taking up those of the intestines or liver.

We have now so much knowledge of an exact nature regarding the process of digestion, that we are apt to forget how recent is its date, and I therefore think it may not be unadvisable or uninteresting to devote a few minutes to describing the successive steps by which it has been acquired. The knowledge that food was broken up and partially dissolved in the stomach must have been early acquired, for the ancients as well as the moderns sometimes overtaxed their stomach with food or drink, and led that organ to reject the meal which had shortly before been consumed. In the paintings on Egyptian tombs,[1] we see ladies depicted who are suffering in this way; and although they might not be themselves in such a condition as would lead them to examine very closely into the nature of the vomited matters, it could hardly escape the attention of the attendants or of the physicians who might be called in, and who sometimes, indeed, produced vomiting,[2] that these matters consisted of the broken down and partially dissolved foods which had constituted the last meal. But how this solution was effected long remained a mystery. Some said that it was effected by the stomach grinding down the food in the same manner as the gizzard of a bird; but the ancients generally

[1] Wilkinson's *Ancient Egyptians*, 1854, vol. i. p. 52.
[2] Wilkinson, *Op. cit.*, vol. ii. p. 350.

seem to have had the idea that it was effected by heat and moisture leading to a sort of putrefaction,[1] or by a secretion from the stomach with special solvent powers.[2]

The experiments of Réaumur in 1752, and of Spallanzani in 1783, showed that the food was not simply ground by the stomach, for substances enclosed in perforated metallic balls, and thus protected from any mechanical action of the gastric walls while exposed to the solvent action of the gastric juice, were found to be dissolved when the metal case was after a certain time withdrawn from the stomach by means of a string attached to it. The theory of putrefaction was also disposed of by Spallanzani,[3] who found that instead of this process going on in the stomach, it was immediately checked when substances in which it had begun were introduced into the organ.[4] But it is highly probable that the ancients meant something different from ordinary putrefaction, although they may have used the name to designate the process which takes place in the stomach during digestion, and Boerhaave propounded the theory that digestion was a process of fermentation. The questions, therefore, remained to be solved —Is digestion a simple solution in the gastric juice? or is it a change in the constitution of the food by oxidation or otherwise?[5]

In most experiments the gastric juice had been obtained in an impure state, and its admixture with saliva or mucus had rendered its reaction doubtful, but Carminati, in 1785, determined that it was acid when obtained pure during digestion, although nearly neutral during fasting in animals. Prout, in 1824, found that the acid was hydrochloric, and Tiedemann and Gmelin, in 1827, finally confirmed the results of Carminati. They were inclined to attribute the solvent power of the gastric juice to the acid it contained, but their own experiments, as well as those of Johannes Müller, and still more of Dr. Beaumont, showed that acid of the same strength had nothing like the solvent power of the gastric juice, and that this secretion must therefore contain a peculiar solvent principle. This Eberle supposed to be the gastric mucus, but a few trials proved that this mucus alone would not dissolve the food, and that digestion took place

[1] Hippocrates, etc., Haller's *Physiol.* t. vi. p. 322.
[2] *Paulus Aegineta*, vol. i. p. 91.
[3] Spallanzani, *Expériences sur la Digestion*, Genève, 1783, p. 90.
[4] Spallanzani, *Op. cit.*, p. 310.
[5] Tiedemann and Gmelin, *Journ. de Physiol.* vii. 1827, p. 144.

only when it was combined with acid. The next step was taken by Schwann in 1836, and by Wasmann in 1840. They showed that it was not mucus in general but a special substance, pepsin, contained in the mucus of the stomach, which digested albuminous matters when combined with acid. The researches of Brücke have shown what the proper strength of the acid is, and that when it is either too strong or too weak digestion is hindered. The requisites for the rapid digestion of albuminous matters in the stomach, then, are an abundant supply of gastric juice and its proper composition as regards the proportion of acid and the amount of pepsin present in it. These requisites are supplied in the healthy stomach, which secretes a large quantity of active juice during digestion; but in disturbed and diseased conditions, either of the organ itself alone or of the whole system, they are more or less wanting, and digestion is imperfectly performed—we have, in fact, indigestion.

We owe our knowledge of the condition of the stomach in great measure to a fortunate accident which established a gastric fistula in a young man, and enabled observations to be made on him such as we can usually make only on animals—observations which were, however, imperfect, and have since been extended as well as confirmed by gastric fistulæ artificially established in dogs. A young Canadian, Alexis St. Martin, was wounded by a charge of duck-shot, which carried away the muscles on the left side of the thorax for several inches, along with the anterior half of the sixth rib, broke the fifth, and lacerated the left lung, stomach, and diaphragm. Notwithstanding the extent of his injuries, he finally recovered under the care of Dr. Beaumont; but the stomach became adherent to the abdominal wall, and preserved a permanent opening, which was usually stopped up by a valve of mucous membrane. This valve could be readily pushed back by the finger and the interior of the stomach distinctly seen. After St. Martin's recovery, Dr. Beaumont took him into his service and made numerous observations upon him, which, as I have already said, have been of the greatest value.

According to Dr. Beaumont, "the inner coat of the stomach, in its natural and healthy state, is of a light or pale pink colour, varying in its hues according to its full or empty state. It is of a soft or velvet-like appearance, and is constantly covered with a very thin transparent viscid mucus, lining the whole interior of the organ. Immediately beneath the mucous coat, and apparently

incorporated with the villous membrane, appear small spheroidal or oval-shaped granular bodies, from which the mucous fluid appears to be secreted." On the application of aliment, the action of the vessels is increased, the colour heightened, and the vermicular motions are excited. The small gastric papillæ begin to discharge a clear transparent fluid, which continues rapidly to accumulate as aliment is received for digestion. "This fluid is invariably distinctly acid. The mucus of the stomach is less fluid and more viscid or albuminous, and sometimes a little saltish, but does not possess the slightest character of acidity. On applying the tongue to the mucous coat of the stomach, in its empty unirritated state, no acid taste can be perceived. When food or other irritant has been applied to the villous membrane, and the gastric papillæ excited, the acid taste is immediately perceptible."[1] It must be noted, however, that this acidity, though distinct, is not great, not such as to set the teeth on edge. The experiments of Bernard on dogs have given the same results as those just described, but have shown besides that while moderate stimulation of the stomach causes secretion, great irritation has an entirely opposite affect. For example, when the mucous membrane was gently stroked with a glass rod it became rosy red and secreted juice abundantly, but when violently rubbed the colour disappeared, it became pale, the secretion of gastric juice stopped, that of mucus seemed to be increased, and the animal seemed sick, and began to vomit. This experiment throws considerable light on the relation between the condition of the stomach and the appetite, and enables us in some degree to diagnose the condition of the stomach from the answer we get to our first question regarding the digestion of our patients—How is your appetite? Various opinions have been held regarding the cause of hunger, some attributing it to the friction of the sides of the empty stomach against each other, others supposing it to be due to the gastric juice acting on the mucous membrane in default of anything else to attack. The real cause seems to be twofold. 1st. A certain condition of the stomach, probably consisting in distension either of the lymphatics or capillaries of the mucous membrane, which is relieved when food is ingested and secretion begins. 2nd. A condition of the system which is not removed by the mere presence of food in the stomach, but requires for its alleviation the absorption of nutritive material into the blood. This second condition may be observed

[1] Beaumont, *Physiology of Digestion.* 2nd ed., Burlington, 1847, p. 95.

in children suffering from tubercle of the mesenteric glands, where, owing to the imperfect absorption, a voracious hunger seems to consume the little sufferer, notwithstanding the quantities of food with which its stomach is constantly filled. The first cause of hunger or appetite, for they are merely gradations of the same condition, is the commonest, and the one with which we are at present concerned. Normally the stomach seems to prepare itself at regular intervals for the work it has to do, and as meal-time approaches the minute vessels probably become distended, and a feeling of appetite certainly appears. In some persons the time when this feeling comes on can be modified by mental impressions. If they know they are to dine at seven instead of at six, the appetite appears a short while before the time fixed for the meal, but if they think they are to dine at six and do not get dinner until seven, the expectant stomach begins to crave at six, and causes much discomfort during the ensuing hour while its wants are unsatisfied. In some conditions of the body we find that there is no appetite at first, but after a mouthful or two the desire to eat comes on, and the person rises from table after a full meal. Although I have not observed that Dr. Beaumont mentions this condition as occurring in St. Martin, yet we should be inclined to associate it with a mucous membrane paler and more flaccid than usual.[1] The lymphatics and capillaries, instead of being full before the meal, would only become so when the circulation in the stomach was increased by the introduction of food, and their distension, after the first few mouthfuls, in this debilitated condition of the stomach would become equal to that in the healthy mucous membrane before any food had been taken at all.

In other conditions again we find that the patient has, as he says, a good appetite and feels very hungry before meals, but after the first mouthful or two he is satisfied, and cannot eat any more. Here we in all probability have a condition of congestion greater than normal, so that instead of mere appetite positive hunger is felt before meals, but as soon as the first mouthfuls are taken, the increased vascularity which they induce raises the irritability of the stomach, and the stimulus of the food acts upon the mucous membrane in the same way as rough rubbing did in Bernard's experiment, destroying the appetite and even producing nausea. As a general rule, indeed, whenever the appetite becomes unusually good without any apparent cause, we may look out

[1] Beaumont, *Physiology of Digestion*, Burlington, 1847, Expt. 45, 3d. Ser.

for a so-called bilious attack, for if the irritated condition of the gastric mucous membrane, which is at first felt as appetite, goes on increasing it soon proceeds to anorexia, nausea, and vomiting.

An example of this may be given from Dr. Beaumont's observations. On examining the stomach of St. Martin one day, four hours after breakfast, and an hour after the chyme resulting therefrom had passed through the pylorus, he found that "several red spots and patches abraded of the mucous coat, tender and irritable, appeared over the inner surface.[1] The tongue too had upon it a thin whitish fur. Yet his appetite was rather craving." Two days after this Dr. Beaumont introduced some food in a muslin bag, through the aperture, into the stomach, and on withdrawing it five hours afterwards, found that it came from near the pylorus, and was covered with a coat of mucus and yellow bile. "The contents of the stomach," he says, "have been unusually acrid since yesterday morning, and St. Martin complains of unusual smarting and irritation at the edges of the aperture; countenance sallow, tongue covered with a thin yellowish coat; and several deep red patches on the inner coat of the stomach; does not feel his usual appetite." Had St. Martin been left to himself and continued the diet of the previous days, consisting, as it appeared to do, of pork, steak, and fried sausages, we should probably have had him suffering from vomiting, and possibly sick headache, but Dr. Beaumont dropped into his stomach twelve grains of blue pill and five cathartic pills, which operated next morning with the effect, Dr. Beaumont says, of removing the symptoms and restoring healthy sensations and functions. Had no pills been given the condition of the stomach next day would probably have been such as Dr. Beaumont describes on another occasion, when the sick headache was actually present. He had been introducing various articles of food, amongst others fat pork tied to a string, into St. Martin's stomach, and two or three hours afterwards found the smell and taste of the fluid from the stomach to be slightly rancid, and St. Martin complained of considerable pain and uneasiness at the stomach, general debility, and lassitude. The next day the distress at the stomach and pain in the head continued, accompanied by costiveness, a depressed pulse, dry skin, coated tongue, and numerous white spots or pustules resembling coagulated lymph spread over the inner surface of the

[1] Beaumont, *Physiology of Digestion*, Burlington, 1847, Expt. 17, p. 180, 3d. Ser.

stomach. Dr. Beaumont accordingly dropped into the stomach half a dozen calomel pills,[1] containing four or five grains each, which in about three hours had a thorough cathartic effect, and removed all the foregoing symptoms, and the diseased appearance of the inner coat of the stomach.

When looking at a patient's tongue I have often wished that people wore windows in their bodies, and that one could see into their stomachs as readily as into their mouths. This wish is to some extent gratified by a perusal of Dr. Beaumont's observations, for in the three which I have just quoted he gives us a picture of three very common conditions.

In the first we have a craving appetite, tongue showing a thin whitish fur, and stomach with several red spots and abraded patches.

In the second we have loss of appetite, thin yellowish fur on the tongue, sallow, or, as we should often term it, bilious countenance, and stomach showing several deep red patches.

In the third the appetite is not mentioned, but we may conclude that there was none, as St. Martin had distress and uneasiness in the stomach, the tongue was coated, there was debility, lassitude, costiveness, depressed pulse, dry skin, and headache. The stomach showed numerous white spots or pustules.

Curiously enough, however, the stomach sometimes showed signs of extensive disturbance without any apparent affection of the general health. This was especially noticeable after drinking spirits too freely. The mucous membrane then presented an erythematous appearance and livid spots, from the surface of which exuded small drops of grumous blood, numerous patches of aphthæ, a thick coating of mucus, and the gastric juice mixed with thick ropy mucus or muco-purulent matter slightly tinged with blood resembling the discharge from the bowels in dysentery. This condition of the stomach was accompanied by a thin, yellowish brown fur on the tongue, and uneasy sensation and tenderness at the pit of the stomach, and some vertigo with dimness and yellowness of vision on stooping down and rising again, and a sallow countenance, but otherwise he felt well and had a good appetite.[2] These four observations of Beaumont's describe the symptoms and appearances of the tongue which we usually meet with in cases of transient indigestion, and depict the condition of the stomach which he found associated with them.

[1] Beaumont, *Physiology of Digestion*, Burlington, 1847, Expt. 1, p. 118, 2nd Ser.
[2] *Ibid.* Burlington, 1847, p. 252.

We have now to consider the causes which induce these appearances, and we may shortly describe them as irritants of the stomach—

a. From excessive quantity.

b. From improper mechanical or chemical qualities.

A meal excessive in quantity will act as an irritant because a longer time will be required for the stomach to dissolve it, and during all this time the undissolved pieces of food are being rubbed up and down the mucous membrane and irritating it mechanically.

An improper quality of food may have a similar action mechanically. Suppose a lump of cocoa-nut to be eaten, the pieces when swallowed will be absolutely unacted on by the stomach, however long they remain there, and at the time when the organ ought to contain nothing but a soft pulpy chyme, which it would pass on to the duodenum, its walls are stimulated by the unaccustomed presence of the bits of kernel, hard and unyielding as at the moment they were introduced.

Other substances are injurious on account of their chemical properties. Alcohol acts as an irritant by its chemical qualities, producing, when its use is continued, very extensive alterations in the mucous membrane, and it is to be remembered, that some substances which are not in themselves irritant may become so from changes which they undergo themselves, or occasion in other foods after their introduction into the stomach. Thus, fat pork is not an irritating substance—far from it; but it may become rancid in the stomach, and the fatty acids thus liberated may act as powerful irritants. Some cheese is indigestible on account of its insolubility and hardness, in the same way that cocoa-nut is, but other cheeses not liable to this objection may prove irritant by inducing the formation of butyric acid from the sugar taken into the stomach in the food or formed there by the action of the saliva and starch which have been swallowed together. Butyric acid appears to be the cause of that uncomfortable feeling known as heartburn, for Dr. Leared found that a pill of some sweet inert substance dipped in this acid and swallowed reproduced the sensation of heartburn exactly. A very acid condition of the contents of the stomach acts as an irritant and may cause vomiting, the vomited matters being so sour as to set the teeth on edge. What the exact cause of this sourness is I do not know, whether it be hydrochloric, lactic, butyric, or other acid, nor do I know exactly the cause of

its production, but I well remember having a most violent sick-headache and an attack of vomiting after drinking some new beer which I suppose continued in my stomach the fermentation which ought to have been complete before it was drunk, and which at the same time induced other ingredients of my dinner to join it in the process.

It is a question not yet completely solved how far the mucus of the stomach acts as a ferment in producing acidity, and also whether abnormal substances formed in the intestine are absorbed from it by the vessels, secreted from them by the gastric glands, and poured out into the cavity of the stomach, just as we know that iodine is.

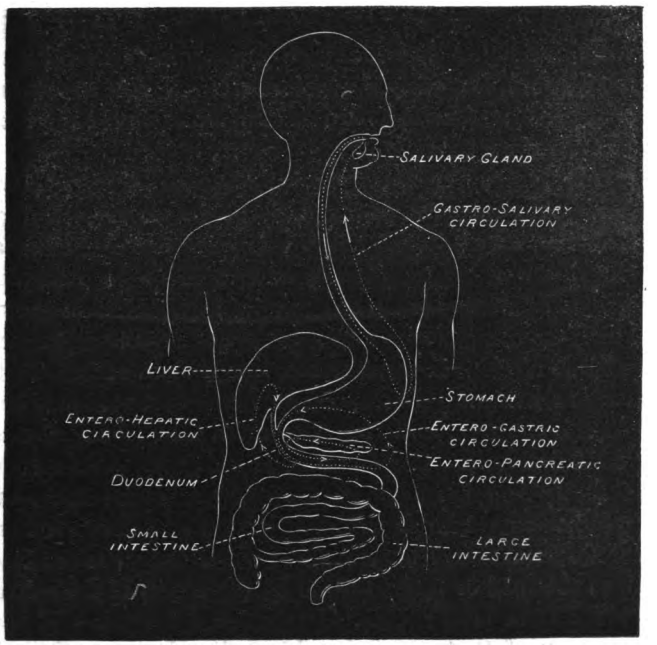

Fig. 15.—Diagram showing absorption from one part, and excretion from another part of the intestinal canal.

Treatment of Temporary Indigestion.—The conditions of the stomach hitherto mentioned, as well as the symptoms that accompany them, disappear when little food and that of a bland and unirritating nature is given for a short time, but recovery is greatly quickened, as we see from Dr. Beaumont's experiments,

by the administration of a purgative. Now comes the query, Does this act reflexly upon the stomach through its nerves, or does it clear away from the intestine substances which are being absorbed from it, carried to the gastric walls, and excreted by them just as tartar emetic would be, and causing like it irritation of the mucous membrane? (*Vide* entero-gastric circulation in diagram, and compare p. 178.)

For my own part I am inclined to take the latter view, for on one occasion Dr. Beaumont finding that St. Martin's stomach was out of order, poured in an ounce of castor-oil. This did not purge, and the stomach continued as before. He then gave some calomel, which produced purgation, and the morbid appearances were quickly removed.

The question also arises, to what extent were the erythematous patches, and especially the lividity, due to obstruction to the circulation of the blood through the liver by biliary congestion? Dr. Beaumont says nothing about the existence of piles in St. Martin coincidently with this affection of the stomach. Had he done so it might have given us some useful hints regarding the pathology, obstruction to the portal circulation being likely to manifest itself in the veins of the rectum as well as those of the stomach.

When the irritating substances leave the stomach they may produce a similar effect upon the intestine and cause griping and diarrhœa.

Having said so much regarding slight acute indigestion, I must treat very shortly the subject of gastritis. Acute gastritis, such as is produced by irritant poisons, I will completely pass over, and only say a few words regarding sub-acute gastritis, or gastric catarrh. If any one is obliged to inhale fine irritating dust for some time the mucous membrane of the bronchial tubes becomes inflamed, secretes a quantity of mucus or muco-purulent matter, and the inflammation is accompanied by more or less pain and rawness in the chest and attempts to expel the mucus by coughing. Not unfrequently the same condition comes on after exposure to a draught, although no irritating substance has been inhaled. The mucous membrane of the stomach and that of the lungs are not unlike in their reaction to irritation or cold. I have already mentioned that after St. Martin had been freely partaking of spirits for some days Dr. Beaumont found his stomach inflamed, bleeding, and partly filled with ropy mucus and muco-purulent

material. From the ample experience which one gets at this hospital I think we may safely say that had St. Martin gone on drinking for some days more he would probably have got his stomach into such an irritable condition that he would have felt considerable pain and tenderness to pressure in the epigastrium, every morning when he rose he would have vomited some of the mucus which it had secreted over night, and he would have vomited the greater part of each meal shortly after he had taken it. The appearances presented in such a condition would probably have been the same as those actually observed by Dr. Beaumont, but somewhat intensified.

But a similar condition may occur in the stomach from exposure to cold or to a draught, just as in the case of the lungs, although no irritating substance has been swallowed.

How draughts act in producing this condition is a subject not unworthy of the Society's attention, but time would fail me were I to attempt to develop a theory of catching cold either in the stomach or lungs, in this paper.

Treatment.—The treatment which is very successful is to give about ten grains of bismuth with ten of magnesia, in a little mucilage three or four times a day before meals. If the vomiting be excessive it is well to combine a few drops of hydrocyanic acid and some bromide of potassium, and if the pain at the epigastrium be great a warm poultice or even a mustard plaster should be applied.

We must now pass on to the chronic forms of indigestion, and shall first take that of chronic gastric catarrh. The condition of the stomach here is just that presented by St. Martin after his alcoholic indulgence, but when it has continued long the structure of the stomach becomes more or less altered, the gastric glands undergoing fatty degeneration, the connective tissue becoming increased and the mucous membrane firmer.

The symptoms are such as we should expect. There is either little appetite or a craving appetite, easily satisfied—sometimes instead there is a feeling of emptiness in the epigastrium or nausea, although there is little vomiting. From the irritable condition of the stomach there is often pain coming on shortly after food, or more or less constant, but increased by food. The secretion of gastric juice being imperfect, the food is slowly digested and undergoes decomposition, forming gases and acids, and thus giving rise to flatulence and heartburn. The constant

discomfort and pain makes the patient irritable, and the imperfect digestion of the food as well as the diminished quantity taken on account of the pain caused by it lead to muscular weakness, and mental languor and depression.

The bowels are frequently constipated, or may be subject to alternate fits of constipation and diarrhœa. The pain complained of is partly due to the tender condition of the stomach, but it is also caused to a great extent by distension of the stomach with flatus.

This condition is very frequently seen in middle-aged or elderly women who come to the hospital complaining of "windy spasms." On inquiring more closely into their symptoms they tell you that they have "pain in the pit of the stomach, striking through between their blade-bones," and further questions will elicit most of the other symptoms already described. There are two remedies in the Hospital Pharmacopœia which work wonders in such cases: the Haustus Gentianæ cum Rheo., and the Haustus Calumbæ Alkalinus.[1]

Both of these draughts contain bicarbonate of soda and a vegetable bitter. When given before meals the alkali stimulates the secretion of gastric juice, while the bitter is supposed to lessen the secretion of mucus. The food thus becomes more rapidly digested, less acid and less gas are formed, and the spirit of chloroform, by acting as a carminative, enables such gas as is formed to be more readily expelled. When taken after meals this beneficial action of the alkali is lost, and it becomes injurious rather than beneficial, except in cases where excessive acidity is developed during digestion.

In regard to the pathology of acute attacks of indigestion, I

[1] The formulæ for these are:—

Haustus Gentianæ cum Rheo.

Infusion of Rhubarb	½ fl. ounce.
Tincture of Gentian	30 minims.
Bicarbonate of Soda	10 grains.
Spirit of Chloroform	10 minims.
Peppermint water	to 1 fl. ounce.

Dissolve and Mix.

Haustus Calumbæ Alkalinus.

Bicarbonate of Soda	10 grains.
Tincture of Orange Peel	30 minims.
Infusion of Calumba	to 1 fl. ounce.

Dissolve and mix.

mentioned that the livid spots observed by Dr. Beaumont might possibly be connected with obstruction through the liver. An additional argument in favour of this view is offered by the fact that chronic catarrh, such as I have just described, may not only result from repeated or constant irritation of the stomach by alcohol, tea, spiced and indigestible foods, &c., or from cancer or ulceration of a part of the stomach, but also from interference with the portal circulation, as in disease of the liver.

Lastly, we will shortly consider atonic dyspepsia. This condition probably corresponds to that temporarily observed by Beaumont, where the mucous membrane was pale and flabby. The symptoms are here also such as we should expect, the appetite being almost absent, yet the patient is often able to eat a fair meal. The stimulus of the food, however, in a stomach below par does not cause a sufficient secretion of gastric juice, and possibly also the composition of the juice is not all it ought to be; the digestion consequently goes on slowly, there is heaviness and weight at the epigastrium after meals, and the belly becomes tumid from the generation of gas. Eructation gives relief, but not unfrequently is accompanied by heartburn, acids being formed as well as gas, and coming up together.

The symptoms, in fact, are those of imperfect digestion, already described under chronic gastric catarrh, with this difference, that there is no marked pain and tenderness at the epigastrium, and the tongue, instead of being red or covered with fur, through which enlarged papillæ project, is rather pale, flabby, moist, and marked with the teeth at the edges.

This condition depends on weakness of the circulatory and nervous systems. For the secretion of gastric juice demands not only an action of secreting cells, but also a full supply of rich blood to supply the materials needed. Both the cells and the blood-vessels are under the direction of the nervous system, and unless it responds to the stimulus of food, the cells do not secrete, the blood-vessels do not dilate, the juice is not poured out, and digestion does not take place.

The treatment in such a condition is somewhat the same as in chronic catarrh, viz. alkalies and bitters; but in addition we must attend to the general condition of the patient, and give iron to improve the condition of the blood, and the nutrition of both cells and nerves. Strychnia or nux vomica also is a most useful adjunct, as it increases the excitability of reflex centres, including those

which preside over the vascularity of the stomach and the secretion of its cells, and thus renders them more ready to respond when the stimulus of food is applied to them. At least this is the theory I have formed to explain the undoubted advantage which we derive from its use in such cases.

In this paper I have not treated the subject of dyspepsia in the way in which it is usually found, either in text-books or lectures, but have preferred to fix upon a few points which may lead to an active discussion, and to a thorough knowledge of the connection between the symptoms we find in our patients and the conditions of the stomach which lead to them.