The causes and treatment of imperfect digestion / by Arthur Leared.

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THE

CAUSES AND TREATMENT

OF

IMPERFECT DIGESTION.

BY

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TO

SIR JOHN FORBES, M.D., D.C.L., F.R.S., &c.,

IN ADMIRATION

OF A LIFE SPENT IN THE FURTHERANCE OF

SCIENTIFIC MEDICINE,

This Volume is Dedicated.

ADVERTISEMENT.

The following pages contain the results of a long-continued attention to derangements of digestion. My aim has been to utilize such materials as I possessed, rather than to seek them elsewhere; in short, to write little which my own experience had not verified. For this reason, I have not hesitated occasionally to express myself at variance with authority.

My great difficulty has been to write a short rather than a long book on this comprehensive subject. The divisions I have made of the varieties of Dyspepsia were adopted after much consideration, and I venture to hope will be found practically useful. To prevent un-

necessary repetition, typical, but not overdrawn cases, have been substituted for more diffuse illustrations from my Case-book. A brief introductory account of the physiology of Digestion appeared desirable, for the sake of laying before the reader the recent advances of science.

12, Old Burlington Street,
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CHAPTER I.

A BRIEF STATEMENT OF THE PHYSIOLOGY OF DIGESTION.

THE simplest conception of the human digestive apparatus is an elongated cavity in which solid food is dissolved, and is then, in common with all fluids that are swallowed, drained into the blood-vessels through the porous sides of this tube. The liquid nutriment of the body is thus in part disposed of, while a portion is taken up by certain minute tubes communicating less directly with the circulation.

If, however, we regard the alimentary canal as including gullet, stomach, small and large intestines, simplicity vanishes. We find a tube abruptly and enormously dilated, and again equally contracted, while the dimen-

sions of all its parts are capable of great and sudden variation. Instead of depending on gravity and the general movements of the body, the food is taken into the stomach, afterwards rolled about while there, and then propelled through the intestines by a muscular machinery of singular ingenuity.

The mode in which absorption and secretion are connected with the wondrous cell-mechanism of the stomach and intestines, is next to be considered. We find the mucous membrane not only the agent by which the blood is replenished from the tube, but also the medium through which certain fluids are copiously poured into it. We observe that the membrane is in some places studded with innumerable points—the mouths of minute secreting organs; and we discover large supplemental organs—the liver and pancreas, constantly preparing elaborated fluids to be sent into the common reservoir. By continuing the investigation, we find that, instead of a simple porous tube, the parts and functions of the digestive organs are really most complicated, and that some, as yet, baffle investigation.

The actions to which the food is submitted

may be classified into four groups, as they are performed within certain mechanical limits. These are—

The actions of the mouth and gullet.

The action of the stomach.

The action of the small intestine.

The action of the large intestine.

In the first group, mastication and insalivation claim special attention; and one peculiarity of these actions is, that they are visible to us. The familiar act of chewing is seldom a subject of reflection, and yet it throws a more complicated system of levers into motion, accompanied by a drain of fluids from more curiously adapted apparatus than the arts can parallel. But another thing of more practical importance is peculiar to this group—the actions which compose it are, for the most part, within control. Food may be well or badly chewed as we please: once beyond the portals of the throat, our transient power over it is lost. The pleasures of taste may beguile, or inattention or voracity may induce us to eat too rapidly or too much; but nature, in general, punishes the transgression, and the man of weak digestion especially suffers. Gastric sensations are produced

that should have no existence, and dyspepsia is originated.

By the crushing and dividing action of the teeth, the food is reduced to a condition adapted to the operation of its proper solvents. Now the form and arrangement of the human teeth afford one of the most conclusive arguments in favour of a mixed animal and vegetable diet; and, conversely, the necessity for sufficient mastication is proved by the evidence of design.

During mastication, the salivary fluids become intimately mixed with the food. Mastication is itself aided by this, while the food thus saturated is prepared for the action of the gastric juice. The chemist frequently employs water as a similar means of preparing substances; but it has been well observed, that saliva is much better adapted than water for blending with many substances used as food. The numerous air-bubbles for which the saliva is remarkable are not without significance; since the presence of atmospheric air in the stomach is accessory to digestion. But an essential use of insalivation is lubrication of the morsels: without this, it would be impossible to swallow certain kinds of food.

Besides these uses, the saliva has at least one well-ascertained chemical action. It possesses the remarkable power of converting starch into sugar. As this action continues in the stomach, there is no doubt that saliva exercises an important influence in the digestion of farinaceous substances.

Saliva is a complex fluid consisting of a mixture of secretions differing considerably in their nature. It has been ascertained, by means of tubes passed into their respective ducts, that the secretions of the parotid and sublingual glands, which contain little solid matter, are of the consistence and colour of water, while the syrup-like fluid of the submaxillary gland contains a larger proportion of solid constituents. Numerous follicular glands of the mucous membrane of the mouth also contribute their secretions to form the saliva: in a healthy state, it always possesses an alkaline reaction.

Now it seems certain that these various fluids have their special functions. As the parotid and sublingual secretions are produced most abundantly during mastication, these are chiefly concerned in the dilution of food. The supply

from the submaxillary gland has been shown to be greatest at the moment of swallowing; and to assist this, its lubricating secretion is admirably suited. The chemical effects of the saliva appear mainly due to the secretion of the follicular glands of the mouth.

Great difficulty exists in estimating the quantity of saliva. It is chiefly regulated in health by the requirements of mastication, and is, therefore, like the gastric juice, proportionate to the aliment. The conclusions of Bidder and Schmidt, from experiments recently made, give about three pounds of saliva in twenty-four hours, as the average amount, although its secretion appears to be arrested during sleep. Here I may observe, that the general tendency of new observations on the digestive fluids is to prove their quantities greater than had been previously supposed.

Certain stimulants greatly augment the flow of saliva. Tobacco smoking is the cause in some persons of an immense loss of the secretion, and this is not the least injurious consequence of the habit.

It was often observed, when hand-spinning was the custom, that women so employed

became very thin. This was with good reason attributed to the waste of saliva occasioned by the constant necessity in the process of wetting the fingers.

But the flow of saliva is also governed by certain mysterious sympathies. It can be increased by merely directing the attention to it; so when the appetite is keen, not only the smell or sight of savoury food, but the idea of it in the mind, will cause the mouth to water.

Besides a number of other substances in solution, saliva possesses two that are peculiar to it. One of these is Ptyalin, which forms about one and a half per cent. of the whole, and to it are due the characteristic smell and the known chemical properties of the secretion. The other, Sulphocyanide of potassium, exists in smaller proportion, and from its constant presence would seem to answer some important though unknown purpose.

On reaching the stomach, the food is, again by the aid of muscular action, brought into contact with a new secretion. In an account of this occult process, the observations of Dr. Beaumont in the remarkable case of Alexis St. Martin are indispensable. There exists in

this man a free communication between the stomach and the outside of the body, the consequence of a gunshot injury in early life.* The following description has been often quoted:—

"These motions not only produce a constant disturbance, or *churning* of the contents of the stomach, but they compel them, at the same time, to revolve about the interior from point to point, and from one extremity to the other.

"After passing the œsophageal ring, it (the food) moves from right to left, along the small arch; thence through the large curvature, from left to right. The bolus, as it enters the cardia, turns to the left, passes the aperture, descends into the splenic extremity, and follows the great curvature towards the pyloric end. It then returns in the course of the smaller curvature, and makes its appearance again at the aperture in its descent into the great curvature, to perform similar revolutions. These revolutions are completed in from one to three minutes. They are probably induced in a great

* St. Martin is still living. The accident referred to, occurred in 1822, and Dr. Beaumont commenced his observations in 1825.

measure by the circular or transverse muscles of the stomach. They are slower at first, than after chymification has considerably advanced."

During the time of these motions, the pyloric extremity of the stomach is in a state of contraction, but allows the food, as soon as reduced to a pulpy mass, or chyme, to pass into the intestines. A full meal is probably thus gradually diminished until the stomach becomes entirely empty. Should, however, foreign substances or indigestible food be present, the organ becomes at last weary of its efforts—the contraction of the pyloric orifice gives way, and the undissolved residue enters the intestines, and, as we shall afterwards see, becomes a source of irritation.

Obviously, then, the use of this persistent churning is, that every portion of the alimentary mass shall be quickly brought into contact with its liquid solvent. With the same intention the chemist agitates substances when he wishes to hasten solution; but in the case of the stomach, the constant removal of the dissolved portions must greatly assist further action.

This solvent, or gastric juice, is the product

of the small follicular glands with which the entire mucous surface of the stomach is studded. There is nothing in the physical properties of the fluid to indicate its potency. Clear, colourless, and very slightly viscid, its reaction during healthy digestion is moderately acid, while the scanty secretions of the empty stomach are neutral or alkaline. Certain minute and somewhat peculiar bodies (rennet cells) are discovered in the gastric juice by means of the microscope. They are formed in the tubular glands of the stomach; but whether they confer the properties conveyed in the name given them is not certain. Frerichs believes that they supply the true gastric ferment.

But what is this gastric ferment? We have seen that the peculiar properties of saliva depend on the presence of Ptyalin. In gastric juice we find another peculiar albumen-like substance, and this has been termed Pepsin. The action of this pepsin is devoted to that important class of alimentary substances into which nitrogen or azote enters, including the flesh of animals, fish, and eggs. There are few more refractory substances as regards solution, yet they are readily reduced by the gastric

juice to a mass uniform in physical as well as chemical qualities. But what is more curious, substances in an eminent degree prone to coagulation—as, for example, the casein of milk—now lose that quality, besides undergoing other changes. On this account, the reduction of azotized food in the stomach is regarded as including not merely solution, but the formation with the gastric juice of new compounds. In recognition of the agent indispensable to these changes, the compounds have been termed "Peptones."

As for the starchy and fatty elements of food, they undergo no changes from the secretions of the stomach beyond minute subdivision.

The amount of pepsin in the gastric juice is exceedingly variable, but seems to be proportioned to the nature of the food. In the case of carnivorous, it is much more copious than in that of herbivorous animals. In man, the proportion appears to hold a medium place, but to be still remarkably influenced by diet. The analyses of gastric juice obtained by Dr. Grünewaldt, in a case to be presently quoted, yielded 36·6 parts of pepsin in 1000 of the juice. The patient was then well fed, but subsequently

returned home to her accustomed and poorer fare. Analyses of the gastric juice then made by Dr. Schröder yielded only 3 parts of pepsin in the 1000 of juice. It has been repeatedly proved that alimentary substances undergo solution in gastric juice out of the body with considerable facility.

Acidity is an invariable property of gastric juice secreted during digestion. Yet, strange as it may seem, chemists have not been able to determine the particular acid always present. The truth is, several acids are found in human gastric juice, but the question of the essential acid may be regarded as now narrowed to two —the lactic and the hydrochloric. Lately the hydrochloric seemed to carry the day. But still more recently, in some carefully conducted experiments by Dr. Smith of Philadelphia, on gastric juice obtained from St. Martin, lactic acid was found to be "the main agent in producing the characteristic reaction." *

Copious as the saliva is, the gastric juice far exceeds it in quantity. The estimate of Dr. Schröder, from observation on a woman suffer-

* Experiments on Digestion, page 11, by F. Smith, M.D., Philadelphia, 1856.

ing from gastric fistula, is one of the latest and most reliable. He tells us that the average amount secreted in twenty-four hours was fourteen kilogrammes, or upwards of thirty pounds.* This is truly astonishing, and reveals to us an immense water circulation between the blood-vessels and the alimentary tube. It is plain that, if the secretions of which this tube is the receptacle were not taken back into the blood, we should be obliged to drink much more largely than we do.

It was proved by Dr. Beaumont that the amount of gastric juice is regulated by the wants of the system—not by the quantity of food swallowed. As an alkali will only combine with an acid in a definite proportion, so a given quantity of gastric juice will only dissolve and combine with a proportional quantity of food. Any surplus of the latter thus becomes a source of irritation, to be got rid of by vomiting, as commonly happens in the case of children; or, what is far worse, it is passed into the intestines.

Besides gastric juice proper, the stomach,

* Succi Gastrici Humani Vis digestiva, ope fistulæ stomachalis indagata. Dorpati, 1853.

especially when empty, secretes a tenacious mucus, which forms a thick protective sheathing for its internal surface.

The stomach is capable of great alterations in size. When distended, it resembles nothing so much as the pouch of a bagpipe. In the dead subject, I have found its greatest capacity to be about three quarts.

On passing out of the stomach by the pyloric opening, so named from its gate-like valve, the food enters the small intestine. Through this narrow and tortuous tube, measuring about twenty-five feet in length, the pulpy mass is now slowly propelled. The artificial divisions of this intestine into duodenum, jejunum, and ileum, need not detain us. But the part about twelve inches long, known as the duodenum, has some interesting characteristics. Its fixed position is clearly destined to prevent the food passing too rapidly out of the stomach, while displacement of the organ itself is thus prevented. The contributary streams from the liver and pancreas are poured in at the upper end of the duodenum.

The natural sensibility of the duodenum

appears to be greater than that of any other part of the alimentary tube. Doubtless this has a special significance. It seems to be a provision for supplying the chyme, as it passes from the stomach, with its due proportion of bile and pancreatic juice. By reflected nervous action, the sensitive intestinal surface, and the mouths of the biliary and pancreatic ducts themselves, will be stimulated in proportion to the quantity of material that comes in contact with them, and a proportionate demand for the secretions to be intermixed is then probably transmitted *viâ* the ducts to their respective glands.

This would certainly be analogous to what happens when a flow of saliva is instantly produced by the contact of a morsel of food with the interior of the mouth. It is proved by experiment, that the supply of bile and pancreatic juice is suspended along with digestion itself; and in cases of death, after long abstinence or from starvation, the gall bladder is invariably found full of bile.

In the older writers we find the stomach and duodenum constantly alluded to under the title

of the "primæ viæ," and the passage through them of "crudities" was justly regarded as a source of varied ills.

The small intestine not only receives the several digestive fluids, but secretes a proper solvent juice. Yet this tube, when compared with the stomach, must be regarded as essentially a medium for absorption. Water, and substances soluble therein, are directly absorbed by the blood-vessels of the stomach; but here we find in addition oily and chylous matters in general, taken up with a like facility. For these purposes the villous, or velvet pile-like surface of this intestine, is specially adapted; and the distension of its lacteal vessels, as seen in an animal killed soon after a meal, proves that they actively aid in absorption. The numerous valvular folds of the intestinal mucous membrane are evidently for the purpose of assisting the process by increasing the surface to be traversed by the food, and delaying its passage. But the subject of absorption can hardly be brought within my present limits.

Estimates of the quantity of the intestinal juice must be very unreliable. It was set down

by Haller at eight pounds in twenty-four hours, while half a pound in the same period is the estimate of Bidder and Schmidt. A marked difference exists between the products of the gastric and the intestinal glands: the reaction of the intestinal juice is alkaline, and its solvent power is not interfered with by the presence of bile, as in the case of the gastric secretion. The properties of dissolving albuminous substances, and of converting starch into sugar, are certainly possessed by the intestinal juice. We may, therefore, regard it as supplemental to the gastric juice and saliva, and, as we shall presently see, it co-operates with the pancreatic secretion in the manufacture of sugar.

But the secretion of the small intestine must necessarily be intermixed with all the other secretions which flow into it. A combination is thus probably formed capable of reducing such alimentary substances as had escaped solution in the stomach, for of the existence of intestinal digestion there is no doubt.

The large size, the shape, and the superficial position of the liver, make it, even in a popular sense, one of the best known organs of the

body. Neither is any organ so much maligned. Pains and various ill effects are daily attributed to it, or to bile as its responsible agent, of which both are guiltless. Nor can it be denied that this hostile feeling is much encouraged by practitioners, who find the *liver* a convenient scapegoat. The truth is, we have much to *unlearn* as well as to *learn* about the diseases and the functions of this gland.

Modern researches prove the liver to be essentially a blood-refiner. It separates from this fluid certain carbonaceous matters in forms suitable for direct combustion in the lungs, on the one hand, and for reabsorption on the other. Bile is rather accessory than indispensable to digestion. Dogs in whom the flow of bile is directed outwards through fistulous openings, may, as M. Blondlot has proved, live and enjoy themselves tolerably for years. The chief obvious effects of such an operation are voracity, loss of weight, flatulence, and a putrescent tendency in the intestines when the animals are fed on meat.

Bile, as found in the human gall-bladder, is a viscid, greenish-yellow coloured fluid, having a bitter taste, the intensity of which is pro-

verbial. Its principal organic constituent is glyco-cholic acid, and this is united with alkalies, of which the principal is soda. To these alkalies the well-known detergent properties of ox-gall are mainly due; but, when quite fresh, bile is neutral. It has been proved that the secretion of bile in dogs is most active from ten to twelve hours after a full meal. It seems that untimely decomposition of animal food is thus prevented; and bile appears also effective in preventing the fermentation of starchy food. That bile is concerned in the assimilation of fat, is more than suspected; but how it effects this is not well understood. The quantity of bile secreted in twenty-four hours is estimated at between three and four pounds.

The pancreas, or sweet-bread, as it is termed in the lower animals, in several respects resembles a salivary gland. In structure the comparison is almost complete, and in physical aspect the pancreatic juice is saliva without air-bubbles. The pancreatic juice is alkaline like saliva, and, like it, contains a small proportion of an albuminoid peculiar ferment. But the quantity of these fluids appears to be very different. The amount of pancreatic juice secreted

in twenty-four hours by a man weighing one hundred and forty pounds, has been estimated by Bidder and Schmidt at seven ounces. Considering the size of the gland, and the apparent importance of the secretion, I cannot avoid thinking that the quantity is much greater.

Like saliva, the pancreatic fluid converts starch into sugar; but the latter secretion also exercises a peculiar action on fat, the precise nature of which must be regarded as *sub judice*. M. C. Bernard asserts that the juice forms with fat an emulsion which is then absorbed. I believe, however, that pancreatic juice really decomposes fat by separating the olein or absorbable part from the margarin and stearin, which are excrementitious.*

In a recent work, a very important action has been attributed to the pancreas by M. L. Corvisart. He asserts that its fluid exercises an energetic digestive power over albuminous substances, and that the action of the organ is, therefore, supplementary to that of the stomach.†

* I venture to refer the reader to my observations on this subject in the *Medical Times and Gazette*, June 3, 1854.

† Sur une Fonction peu connue du Pancreas. La

Supporters of this view are not wanting, and, on the other hand, objectors backed by experiments have already sprung up.

The large intestine is about a fifth of the length and twice the diameter of the small intestine, and they are separated by a valve. There is no immediate connexion between the amount of the food and the bulk of the fæces. As for any overplus of digested material, there are outlets besides the intestine, by the lungs, the kidneys, and the skin. The trifling residue of food which escapes digestion and absorption is, therefore, in the healthy state, the chief contribution from the small to the large intestine, comprising hairs, portions of bone, the husks of seeds and kernels, the internal woody fibres of vegetables, and such refractory substances.

But by far the largest portion of the fæcal mass is thrown out by the glands of the colon itself. This acid excretion is characterised by a disagreeable but not naturally a putrid odour, and consists, like the solids of the urine, of material removed in the renovation of the

Digestion des Aliments azotes. Par Lucien Corvisart. Paris, 1857-58.

body. The large intestine is a main sewer, with numerous contributories,—a reservoir for waste to be periodically emptied.

The large intestine does not appear to possess any digestive powers, although it is capable of absorbing substances in solution. This capacity probably becomes increased vicariously when that of other portions of the alimentary canal is interfered with, for, in such cases, nutritive enemata are of the greatest service.

The gases of the alimentary canal hold a position of importance, for we always find the healthy stomach and intestines somewhat resonant on percussion. Obviously, then, a certain amount of gaseous distension is useful and necessary. Carbonic acid and nitrogen in large proportion, with some oxygen and a little hydrogen, are the gases that are commonly found in the stomach and small intestines; while, besides all these, sulphuretted and carburetted hydrogen are found in the large intestines. For some of these, we can be at no loss to account. A considerable amount of common air is constantly swallowed, entangled in saliva, and we accordingly find the components of the air in the stomach, but with a

diminished proportion of oxygen, and in the intestines this is still more the case. What becomes of the remaining oxygen, supposing atmospheric air to supply all the nitrogen?

A portion of the missing oxygen is supposed to be taken up by the capillaries, while a portion of it combines with the food. Some authorities maintain that gases never emanate from the mucous membrane, but I shall afterwards give pathological reasons for a contrary opinion. Fermentation and putrefaction of the food must account for the presence of the other gases, as they do not exist in the blood, and cannot be derived from the atmosphere.

In concluding this brief sketch of the physiology of digestion, let me again draw the reader's attention to the large quantities of several of the digestive secretions. In a man weighing ten stones, or one hundred and forty pounds, they reach, in the aggregate, to a sixth of his weight in twenty-four hours; at least, this is fully borne out by the preceding data taken from the best and most recent authorities. But it is obviously not quantity merely, but quality of secretion that is essential. These abundant and elaborate compounds are to be

regarded as products of the entire economy —not merely of the glands from which they respectively flow; and nothing is more essential to the due performance of secretion than a healthy state of the nervous system.

CHAPTER II.

THE CAUSES OF DYSPEPSIA.

THE digestive power may be compared to the physical strength. Every individual can without inconvenience carry a certain weight, while any addition to it is accompanied by a proportionate sense of oppression. In the same way, what may be termed accidental dyspepsia is usually a simple derangement of functions, the result of excess. The amount of food which a man is capable of digesting is limited by his assimilating power. This limit is altogether relative, being strictly proportionate to his age, constitution, state of health, and habits.

The two most general conditions of undisturbed digestion are: a proper relation of the aliment to the digestive organs, and a healthy state of the organs themselves. The first is generally within control of the individual; with the second, the case is obviously different; and when, as frequently happens, both conditions

are imperfectly fulfilled in the same person, dyspepsia, more or less complete and lasting, ensues.

Bearing these general views in mind, let us examine particular causes; and first, as regards the influence of age.

Appetite, or the natural desire for aliment, indicates that the waste of the body requires to be replenished—that the outlay begins to exceed the income.

From birth to the moment of dissolution, throughout the longest as well as the shortest life, this waste and supply are in active operation. Owing to its rapid growth the infant requires food at very short intervals, and the activity of the excreting organs proves the energy of the molecular changes. So long as growth continues, the same conditions, although in diminished ratio, may be observed.

But when the stature and form of the body are matured, the demands for nutrition are gradually diminished, and this diminution certainly continues as age advances. That the man of advanced years does not require, and should not partake of, as much food as the young man, is the practical inference.

How this instinct was recognised by a profound thinker, may be read in Cicero's Essay on Old Age. He expresses himself gratefully, that while advancing years increased his desire for conversation, they had diminished the necessity for food and drink.* It would be well if these reflections were oftener made in what we regard as more enlightened times.

At all stages of adult life, but particularly during its decline, the appetite is over-stimulated by condiments, and tempted to excess by culinary refinements.†

Dyspepsia is not the worst result of this. Blood impurity, out of which issue the agonies of gout and other maladies, follow closely in its train.

It is easy to show how an infringement of the laws of digestion, as regards the constitution of the individual, will produce dyspepsia. One man, as I have said, digests with ease an amount

* Habeo senectuti magnam gratiam, quæ mihi sermonis aviditatem auxit, potionis et cibi sustulit.

† Abernethy, in his peculiar style, insists that civilized man "eats and drinks an enormous deal more than is necessary for his wants or welfare. He fills his stomach and bowels with food which actually putrefies in those organs."

of food which would be fatal to the comfort of another. Animal food is easily digested by some persons twice, or even three times daily, while if taken by others more than once, it is sure to induce suffering. The diet of persons associated together is nevertheless generally the same, and a sufficient individuality in matters of eating and drinking is seldom observed.

When the general health is deteriorated from any cause, digestion is infallibly impaired. In many instances it is sought to prop up the one by overtaxing the powers of the other, and dyspepsia is often thus permanently added to the old disorder.

The proverb that "custom is second nature," is to a great extent true of the human constitution. By gradual usage health may be maintained under circumstances which would be disastrous to the novice. Now it cannot be questioned that, in this country, great faults are committed in the relative amount and distribution of meals. Breakfast frequently consists of tea or coffee, with a small proportion of plain bread or toast. This allays the appetite,

but is insufficient for the supply of bodily waste during the long interval between breakfast and a late dinner; during which, in many instances, no luncheon is taken. It also frequently happens, that no solid food is partaken of from dinner-time until the following morning, which is an additional reason for a more substantial breakfast.

Experience convinces me that the delicate stomach suffers severely from these causes. The long unemployed organ, in some instances, appears to secrete mucus in excess, which undergoes certain chemical changes at variance with digestion.

But a more serious hindrance has reference to the supply of gastric juice necessary for the digestion of dinner. Large quantities of a fluid charged with nitrogenous and various other materials must be suddenly extracted from the blood. It requires no argument to prove that the source itself will be more favourably circumstanced if lately replenished, than when exhausted by other drains, consequent on several hours of active life. And in these cases, it frequently happens, that when at length dinner

is taken, the appetite exceeds the digestive power, and thus another material cause of dyspepsia arises. Long abstinence often causes the amount of food taken at dinner to be relatively, as well as absolutely, in excess. When a sufficient quantity of nutriment has been taken in the morning, less will be requisite at a later period, and usually less will be indulged in.

The distribution of meals during the day seems to many quite an unimportant matter. Dinner, as I have said, comes late, quickly followed by tea, and sometimes by supper also. This approximation of meals is pernicious, for the human stomach was unquestionably intended to enjoy intervals of rest. The organ should be allowed to act on its contents *en masse*, so that we should not constantly eat like a ruminant animal. It is probable that the health of any individual would utterly break down, supposing the natural amount of food to be taken at very short but equal intervals throughout the day.

Another mistake is frequently made in the continual alteration of the time of meals. Every hour of the day, from one to eight, will sometimes be ranged through for dinner in the

course of a single week. Such irregularities are of little moment to the robust stomach, but are very injurious to the weakened organ. All our functions are singularly influenced by habit in relation to time.

Digestion, therefore, will be best performed at the period when the stomach, from habit as it were, expects employment.

The quality of food is of course an essential consideration. I shall enter more into this subject under the appropriate head of Treatment: it will be sufficient here to advert to adulteration of articles of diet as a possible cause of dyspepsia. Independently of adulteration, the natural qualities of those articles is to be considered. Thus, an inferior description of meat or other article may in those, unaccustomed to it, produce serious inconvenience; and the impurities of water are well known to disorder the digestion of some persons.

There is still, as I believe, another cause of dyspepsia connected with food. It is the destiny of man to inhabit every part of the globe where external influences can be successfully resisted. To effect the latter the quality of food forms a most important element, and Nature has pro-

vided for it accordingly. The whale-blubber of the skin-clad Esquimaux, and the rice of the naked negro, are not more necessities arising out of locality than they would be matters of choice. Even within European limits there are the same indications: the diet of the masses in England and in Italy is essentially different.

The effects of universal communication are nowhere more obvious than on the luxurious table. To furnish the refined cuisine all climates, and both sea and land, are laid under contribution, and the same stomach is expected to digest these various productions. Now what is suitable diet in England is not so in India, although Anglo-Indians will give a preference to the substantial dishes of this country, *e.g.* the cheeses and the hams, over such as would be more in accordance with a thermometer at ninety degrees. The mere circumstance of confounding together many articles of diet, the products of opposite climates, appears to me a very probable source of dyspepsia in those otherwise predisposed.

Under the head of the relation of the food to the organs may be placed the effects of insufficient mastication. It is a fruitful source

of dyspepsia, and is more frequently the result of haste or carelessness, than inevitable from the state of the teeth. The great prevalence of dyspepsia in the United States has been attributed to the rapid but characteristic manner in which meals are there dispatched. In some employments the insufficient time allowed for meals is, for the same reason, a cause of disturbed digestion, and too often gives rise to permanent disease.

Besides actual loss of teeth, soreness of them, or of the gums, sometimes attended by unhealthy and even fœtid secretions, greatly interferes with mastication. It is most important that solid food should be duly prepared by chewing, for the action of the stomach: and equally important that the starchy elements of food be sufficiently submitted to the action of pure saliva.

I shall now consider the state of the digestive organs themselves, and the causes which, by affecting them indirectly, are productive of dyspepsia. Some have regarded the causes in question as inseparable from civilization, assuming that its conditions are incompatible with the highest degree of health. But there

is every reason to believe that dyspepsia affects all races. The Laplander is especially subject to water-brash ; and the use of bitter substances to promote digestion is common amongst many savage tribes. When we consider the extremes of abstinence and repletion common to their precarious mode of existence, their fits of complete indolence, followed by exhausting fatigue, we can scarcely feel surprised that their digestive organs should suffer.

The relative superiority in physical strength of civilized over savage nations has been sufficiently proved. This is a good test in other matters, and fairly affords the conclusion that refined and settled habits are not *necessarily* attended by any physical disadvantages. It is observable, however, that those who dwell in large towns are mostly afflicted by dyspepsia. There, too often the mental powers are overtasked, the natural functions made subservient to outward circumstances, and the relation between mind and body, as well as their mutual reactions, disregarded or forgotten. Much of that nervous energy which ought to be expended on the digestive organs, is appropriated by the organ of thought.

In other cases, attention to the commonest physical wants is neglected in monotonous pursuits; the appetite for food is disregarded until it no longer exists; exercise is either not taken at all, or is fitful and unseasonable; while the atmosphere usually breathed is polluted. Such is no overdrawn picture of the town life of the many, and these are generally more or less the subjects of dyspepsia.

Persons engaged in offices are exposed to a directly exciting cause. The stooping posture in which they write, mechanically interferes with the stomach's action. In some trades the pressure of certain implements upon the epigastric region, as in the case of curriers, bootmakers, and weavers, is very productive of dyspepsia. I have observed many severe cases attended with pyrosis amongst the weavers of Spitalfields.

Not less injurious to healthy digestion are self-indulgent, luxurious habits; but on this threadbare subject it would be mere waste of time to enlarge. Idleness, and the want of a definite pursuit in life, must also rank high in this class of causes.

The importance of the reproductive functions in the whole economy is so great, that whatever

injuriously affects them must, sooner or later, react on the functions of nutrition. We occasionally meet lamentable instances of the results of sexual excess, especially at too early a period of life, and of later intemperance, of which dyspepsia is almost an invariable accompaniment. But the injurious effects of the too free indulgence of the sexual instincts have been highly coloured. Ailments have been magnified, or their significance distorted, by unprincipled charlatans whose especial prey are the young and the inexperienced.

Youth is supposed to be the period of greatest enjoyment of life, as it certainly is of the quickest sensations and most vivid impressions. Considerable experience has, however, convinced me that the years of early manhood are frequently clouded by their own peculiar anxieties. An aching desire for excitement and change, *ennui*, and apparently hopeless indolence, when those are unattainable, may often be observed. I am no apologist of such faults of character, but would not too promptly condemn, because I believe them frequently caused in the young by an enfeebled state of body. This can be often traced

to an overstrain of the mental powers—a strain daily increased amongst men by the spirit of emulation fostered and rewarded by the competitive system to an extent formerly unknown. Accomplishments amongst ladies are made objects of relentless perseverance. In both sexes, at a time when growth is incomplete and new functions are springing into existence, the mental are developed at the expense of the corporeal powers. Nutrition suffers because appetite and digestion are impaired, and the mind itself becomes physically prostrated. For, as over-exertion of the mind fatigues equally with that of the body, it is no profane attempt to unshroud the impenetrable to say, that thought is the result of a physical action in the brain. In what may be for convenience termed the secretion of thought, the same demands are made on nutrition as occur in the exercise of the body. It has been often observed that great *thinkers*, if healthy, are usually large *eaters*.

The state of the air we breathe is highly important in relation to dyspepsia. We live at the bottom of an elastic medium, everywhere

presenting the same general composition, and exactly adapted to the exigencies of animal life. The least artificially-produced impurity of the atmosphere tends to disturb the balance of health. Oxygenation of blood is the object of respiration; and as the object of digestion is the replenishment of the same fluid, we obtain a clue to the mode by which impure respiration reacts injuriously on digestion. Ill-ventilated workshops and crowded sleeping-rooms amongst the poor, the over-heated and impure atmosphere of assemblies and public places of amusement amongst the upper classes, are constantly acting causes of dyspepsia.

But besides chemical alterations of the atmosphere, there can be no doubt that many invalids feel their symptoms aggravated by changes of weather. Easterly winds cause a general feeling of discomfort even in the healthy, so that we can easily conceive an existing disorder to be greatly aggravated by them. Rheumatic patients are especially susceptible of the influences of damp or cold winds, and many dyspeptics are hardly less so; while others have their symptoms intensified by an unusually dry atmosphere.

The quantity and kind of food required by the system are much influenced by season and temperature, and the agency of these in causing dyspepsia is therefore not to be disregarded. Some dyspeptics are always better in summer than in winter, others the reverse, while a great many tell us they suffer more in spring than at any other season.

Our bodies are at all times pervaded by electricity, the condition of which often completely changes. The clear, serene atmosphere is usually charged with positive electricity, and this by induction causes our bodies, as well as the earth itself, to be negative. In wet or stormy weather, the converse of this state of things is usually the case; the atmosphere is negative while our bodies are positive. We are unable in health to detect these electrical changes; but we might reasonably suppose their effects would be sometimes manifested when disease had rendered the body less capable of resisting external impressions. I shall again refer to the probable effects of electricity in dyspepsia.

We have still to consider instances in which the food may be suitable, and the digestive organs healthy, and yet an immediate

and accidental change in the latter may induce dyspepsia.

There are certain stomach sensations, of which nausea is a remarkable instance, not obviously assignable to any of the five senses; and these sensations seem all capable of being excited by mental influence. We are all conscious that the stomach is a region of sympathy; and Van Helmont placed here the seat of the soul itself. With the stomach, or, with the bowels easily confounded with it, various passions, as joy, sorrow, compassion, and indignation, have been in all times associated.

It is universally known that bad news received at or preceding a meal, will spoil the best appetite. But a disagreeable mental impression sometimes produces severe dyspepsia, with epigastric pain and sense of oppression, nausea, or even vomiting. The intimate nervous connexion between the stomach and the brain leaves us at no loss to explain this, and an arrest of the secretion of gastric juice is probably in general the immediate cause. It is, no doubt, for the same reason that dyspepsia is sometimes produced, and frequently aggravated by severe mental exertion imme-

diately after meals. Violent bodily exercise when the stomach is full, is also a well-known cause of disturbed digestion: and probably in this case the disturbance is chiefly mechanical. The motions of the stomach cannot be favourably carried on while its contents are tossed about by rapid movements of the body; for we know it is essential to the due solution of food that it should be all in turn brought into contact with the stomach's surface.

A cold bath after a full meal will frequently disturb digestion. A hot bath will do so with still more certainty—a fact well known to and acted upon by the epicures of old Rome, who thus produced vomiting in order to renew the pleasures of the table.

Dyspepsia from warm and cold baths, occurs, I think, in each case on the same principle, but for opposite reasons. It has been proved from observations on Alexis St. Martin, that congestion of the stomach is most unfavourable to the secretion of gastric juice. Now, the shock of cold bathing produces congestion, by driving the blood from the surface to the viscera; on the other hand, a certain afflux of blood to the stomach is equally indispensable, and *that*

would be interfered with, by the hot bath. Free blood-letting soon after a meal, is commonly succeeded by vomiting, and this affords another example of the effect of sudden withdrawal of blood from the digestive organs.

If we regard dyspepsia as a symptomatic affection, it is probably the most extensive subject of pathology. There is hardly a specific disease unattended by chronic digestive disturbance. Phthisis is often ushered in by a peculiar form of dyspepsia, and in certain diseases, as the remittent fever of children, the stomach appears the *fons et origo mali*. But in the last-named disease, as well as in many others, digestive derangement is essentially part of the disease with which it is associated, and must be described and treated as such.

Organic changes in the alimentary tube itself, as cancer and simple ulceration, are productive of the gravest forms of dyspepsia. The plan of this treatise, however, includes only those disorders which in the present state of knowledge we call functional; and I shall chiefly confine my observations to those derangements of which the stomach is the seat. Even with this limitation, dyspepsia is the most frequent malady

of civilized life; although fortunately not equally a cause of death. It cannot be affirmed that idiopathic dyspepsia does not sometimes shorten life, by producing another disease, or even proving fatal of itself; yet it is certain, that digestion is performed with difficulty throughout the greater part of life, without more serious results than proverbial suffering and discomfort.

CHAPTER III.

THE SYMPTOMS OF DYSPEPSIA.

TAKEN as a whole, the symptoms of dyspepsia are extremely numerous, and liable to be confounded with those of other diseases; while such as are peculiar to it are comparatively few. This makes the diagnosis of dyspepsia a matter of great moment, and often one of much difficulty. I shall proceed to describe those symptoms which are most important.

One of the most common and direct of all is an uneasiness in the region of the stomach, felt soon after taking food, and proportionate to its amount or nature. This uneasiness is variously described as fulness, tightness, weight or oppression—a feeling as if the stomach was not large enough for the meal, &c., probably more according to the fancy of the narrator than from any intrinsic difference in the sensation. It always indicates a real defect; but to assume, as it has been by some,

that it is exclusively due to retardation of the solution of solid food, is certainly incorrect. The same symptoms frequently occur after liquid food; and I have known them produced in certain cases by simple water.

Flatulency, or gaseous distension of the stomach and bowels, is another common and very troublesome symptom. As gases are natural to the stomach, flatulency is in one sense rather an exaggeration of a natural condition than a new occurrence. But as regards the kinds of gas, the matter must be viewed differently. As I have elsewhere said, the natural source of the stomach's gaseous supply appears to be external air, and this gradually loses oxygen until in the small intestine the atmospheric proportions are greatly altered. Nitrogen, therefore, seems chiefly the natural distending medium which mechanically aids digestion, and which, by incorporating with the fæces, facilitates their transit through the intestines.

But upon the progress of the semi-vital, semi-chemical process of digestion, presses another process, that of fermentation. So closely, indeed, does it follow, that the least delay or fault

in the solution of the alimentary mass, or arrest of its proper rate of progress through the tube, seems inevitably to induce it. Here, then, we have a new gas-producing element. Now, too, we see that flatulence will be proportionate to fermentation, and fermentation to the hindrance of digestion. A notion may be formed of the production of gas in this way under favourable circumstances, from the following. It has been proved by experiment that during fermentation an apple will evolve 600 times its bulk of gas. It is difficult to say whether, even within the limits of natural digestion, some amount of gas may not be formed by fermentation; but I am inclined to regard it as foreign to the perfectly healthy organism.

I shall afterwards have occasion to mention that, under certain circumstances, an almost instantaneous gaseous distension of the stomach occurs in dyspepsia; a similar kind of flatulence happens in hysteria, and then the bowels are also usually involved. From the suddenness with which flatus is produced in these cases, as well as the frequently empty state of the stomach at the time, I am forced to decide against fermentation as the cause. And we

have direct evidence that the tasteless gas evolved in general, consists mainly of nitrogen, which is not a product of the process in question.*

Eructation, or the free discharge by the mouth of gas from the stomach, usually occurs voluntarily. In a smaller degree it is, however, often involuntary, and the gas is apt to be flavoured by some substance that happens to be in the stomach, as fish, onions, celery, cod-liver oil, &c. This is what is meant by patients when they tell us that what they eat "repeats itself;" it is sometimes a source of great annoyance.

The derivation of nausea, from *vaῦs*, a ship, is sufficiently expressive. In sea-sickness, as in

* Dr. Brinton ("Diseases of the Stomach," p. 75) denies the evolution of gas by the mucous membrane, and is of opinion that the sudden occurrence of flatus is due to gaseous expansion, consequent upon an equally sudden relaxation of the gastric coats. This ingenious idea is founded on the compressibility of gases, and presupposes a considerable amount of pressure. I cannot, however, in the first instance, admit any such pressure; nor do I think the forcible expulsatory efforts usually associated with flatus consistent with a condition of temporary paralysis. For further observations on this subject, see Appendix A.

many other instances, nausea always precedes vomiting. In some cases of chronic vomiting, however, no nausea is experienced; and, on the other hand, nausea may be habitual, although unaccompanied by vomiting. Debilitated persons, in whom digestion is weak, often suffer severely from nausea alone, and in these cases after the nausea has subsided the stomach often becomes suddenly distended with gas.

Vomiting is much oftener a result of accidental than of chronic dyspepsia, and when habitual generally indicates organic disease of the stomach. Whether or not vomiting is mainly caused by active contractions of the muscular fibres of the stomach, my limits will not allow me to consider. But such contractions do appear to take place, and retchings or ineffectual precursory efforts to be due to the obstinate closure of the cardiac orifice of the stomach, the natural condition of which is that of a door opening inwards with ease, but outwards with difficulty. Instances are, however, recorded of persons possessing the power of vomiting at will.

When vomiting is frequently repeated, bile and tenacious mucus at length only appear. Bile, which is not natural to the stomach, is

introduced into it, by the extension of the action of vomiting, to the part of the duodenum into which the bile is discharged; and this appears to me an evidence, that vomiting is the result of true contractions of the stomach. As for the mucus, a certain quantity of it is natural to the empty stomach; and it is probable that the irritation of vomiting, induces an unusual flow of the secretion. In rare cases, however, the mucus, by oppressing the stomach, appears to be the cause of vomiting. But gastric catarrh, as such a flux of mucus has been termed, is almost always associated with a similar affection elsewhere; thus, in chronic bronchitis, and in hooping cough, a copious discharge of mucus from the stomach is common.

Allied to vomiting is Regurgitation, usually an involuntary and feeble action, but one by which both fluids and solids, with or without gas, are raised from the stomach to the mouth. The mechanism appears to consist in a reversal of the movements made by the gullet in swallowing; and this being extended to the cardiac opening of the tube, small portions of the contents of the stomach are brought up.

Natural regurgitation occurs in the case of

the cud-chewing animals, but instances are recorded of habitual cud-chewing in the human subject, and one has fallen under my own notice. It happened in the person of a young man of much intelligence, who was troubled with dyspepsia; regurgitation was one of the symptoms, and it became, at last, considerably under control of his will. He discovered that, however disgusting, the best mode of avoiding other digestive suffering was to re-chew the food when raised into the mouth. On swallowing this, another portion was transmitted from the stomach, and thus the process commenced soon after a meal, was considerably prolonged.

Pyrosis, or water-brash, sometimes exists without other symptoms, on which account Dr. Cullen described it as a distinct affection, chiefly belonging to cold climates. In this form it is also most prevalent in the spring season, and occasionally appears as an epidemic. Certain kinds of food, as oaten diet, in Scotland, appear to be the exciting cause of pyrosis. Probably the constant irritation of the gastro-intestinal surface by the indigestible parts of the grain induces it. In Ireland, even when

potatoes were the almost exclusive food of the peasantry, the same prevalence of pyrosis was not observed. Nevertheless, coarse diet in general appears to produce it, as the indigent classes are most liable to it. Pyrosis is frequently symptomatic of organic disease of the stomach, but is not unusual in functional dyspepsia.

Water-brash, in its mildest form, consists in the ejection from the mouth of a limpid, tasteless secretion. There is a distinct perception that it comes from the œsophagus, and a sense of constriction at the pit of the stomach precedes the discharge, which is generally followed by relief. The fluid varies in quantity from less than a mouthful to more than half a pint; and is often described by the patient as feeling perfectly cold in the mouth. Sometimes the secretion is neutral to test paper, at others alkaline or acid. In severe cases this fluid often possesses very irritating properties, and some describe it as even corroding the gullet and throat. The epigastric constriction is also frequently accompanied by pain, which is increased by standing erect; relieved by stooping, and by pressure over the stomach.

It is, therefore, a common practice with patients to press the stomach strongly against the edge of a table or other hard body.

Water-brash occurs at all times of the day, but most commonly when the stomach is empty. The fluid is derived from various sources; that the stomach sometimes contributes to it seems proved by the fact of its acidity, and that portions of half-digested food are occasionally seen in it. Some patients are conscious of an increased flow of saliva during the attacks, and Dr. Chambers has suggested that certain glands situated in the lower portion of the œsophagus are the chief sources of the compound.* We must, however, suppose the cardiac orifice of the stomach to become unnaturally closed, or no such collection of fluid could be formed.

Another affection, Heartburn, has been confounded by some authors with water-brash. I have already spoken of the occasional acridity of the ejected fluid and its effects; but heartburn without pyrosis is very common. Heartburn, in the popular meaning, is a disagreeable

* Digestion and its Derangements, p. 337.

and peculiar burning sensation in the course of the œsophagus, sometimes distinctly commencing in the cardiac portion of the stomach ; and its name has been derived from this circumstance. The term cardialagia, in scientific nomenclature, ought, therefore, to be confined to this gastro-œsophageal affection. I cannot agree with Dr. Chambers that the sensation is the result of spasm. The sensation progresses from below upwards ; but that can be explained by the progress of an acrid fluid from the stomach to the mouth, as well as by spasm. It is very generally affirmed that a small quantity—a drop or two—of fluid issues from the throat, and that a most disagreeable bitterness and pungency is afterwards experienced in the mouth. From my own experience, I compare the taste to that of very rancid butter. This taste, and the circumstance that pastry and certain other articles which, either directly or indirectly, yield butyric acid, are apt to induce heartburn, lead me to believe that acid to be the cause of it.*

Pain is a constant, but not an invariable

* See Appendix B.

symptom of dyspepsia, and in some, otherwise severe cases, no pain is experienced.

Dyspeptic pain may be practically divided into centric, or that of which the stomach itself is the seat, and eccentric, or that which affects parts more or less distant.

Pain at the pit of the stomach after meals is usually of a dull, aching, character, and a tenderness of the part is its usual accompaniment.

Flatulence appears to have its own peculiar form of pain, for patients frequently speak of a "windy pain of the stomach."

The pain of the empty stomach is generally more severe than either of the foregoing; indeed, sometimes it is insupportable.

It is difficult to say whether cramps, like those of the limbs, ever occur in the stomach; but pain bearing a close resemblance to that of cramp, certainly does. Gout seems especially capable of producing cramp-like pains of the stomach.

Even if it were possible, it would be tedious and unprofitable to enumerate all the vagaries of dyspeptic pains. Those which shoot from the epigastrium as a common centre towards the spinal column, the shoulders, or lower

angles of the scapulæ, are amongst the most common. Pain in the region of the heart, and in various parts of the chest, are also frequent. Nor is it affirming too much to say that pain, caused by dyspepsia, occurs in all parts of the body.

The headache of dyspepsia is of every variety, from the dullest and least defined to the most acute pain. Its position is equally variable. Sometimes the whole mass of the brain itself seems racked with anguish; at others it is confined to the back or the front part of the head, to one or both eye-balls, or to the regions of the ear; and in these cases the parts frequently feel sore on pressure. Great intolerance of light and noise is sometimes experienced, and increase of pain on stooping is peculiarly a feature of dyspeptic headache.

A practical division may be made of dyspeptic headache into that which occurs during, or very soon after digestion, and that which occurs after a considerable interval.

The first kind, usually attended by nausea and other gastric symptoms, is manifestly connected with the state of the stomach itself. This form of headache is usually of a dull, con-

fused character, sometimes marked by suffusion of the eyes, with dimness of vision, and accompanied by a sense of general chilliness and coldness of the feet. It rarely continues longer than a few hours.

We have an instance of the close nervous relations between the head and stomach in that sharp brow pain which attacks some people soon after eating ices.

The second, and usually the severer and sharper kind of headache, of which I shall have more to say hereafter, generally occurs on the day following the meal which has caused it. From this relation of time, and because it is frequently associated with tenderness over the track of the duodenum, it seems highly probable that this form of headache is due to an unnatural condition of the upper part of the small intestine. In some cases, in which headache had been a prominent symptom, the duodenum has alone presented morbid appearances on post-mortem examination.

As in the case of the stomach itself, a great variety of head sensations might be described as symptomatic of dyspepsia. There is greater uncertainty about them, however, as they are

easily confounded with those arising from other causes; while in some cases in which their relation to the stomach is clear, it is difficult to say whether that relation is one of cause or of effect.

A "swimming sensation," or "lightness" in the head, dizziness or illusory motions of the body, and the same, with fear of falling or vertigo, are often experienced by the dyspeptic.

A burning sensation, generally referred to the vertex, and sometimes described as confined to a spot just under the skull, is not uncommon.

Occasionally the sufferers describe a tightness of the whole skull, as if an iron cap were compressing it; and this sensation, they say, is worse than actual pain.

The skin generally suffers in severe dyspepsia. A dry, harsh, state of the integument is usual when the gastric mucous membrane is in an irritable condition, while in other cases the skin is greasy from an excess of sebaceous secretion. Eczematous and other eruptions are common dyspeptic results, which I shall have to speak of afterwards.

The medical man who would omit to examine

the tongue in dyspepsia, would justly incur the blame of negligence; nevertheless the importance of the examination must not be overrated. A clean tongue, by which is understood a condition of sufficient moisture, its mucous surface being of a natural red colour, is one of the best indications we possess of a good state of the general health. In a word, this impressible organ is more an index of the general condition of the body than of the stomach in particular. Any febrile indisposition, by which the pulse is raised and the secretion of the skin interfered with, will usually affect the tongue. It may be objected that the tongue is then affected through the stomach; but in such cases we frequently find less direct evidence of gastric affection than we do of functional affections of the other viscera, as the heart, the kidneys, or the lungs. There are many persons, in all respects free from stomach disorders, in whom the tongue, especially on rising in the morning, is habitually foul. The habit of sleeping with the mouth open appears generally to be the cause. Exposure to air and the passage of the breath dries the tongue's epithelial covering, which

takes the appearance of a brown coating. In fevers the same, in an exaggerated degree, generally occurs.

No special knowledge, then, can be arrived at by mere inspection of the tongue, but in conjunction with other symptoms much may be learned from it. Even when the indication it affords as to the state of the stomach is not complete, the amount of evidence supplied may correctly guide our treatment. The sum of medical experience largely consists in the right appreciation of small but essential differences, too complicated or too minute for exact description in words.

The following are some of the well-marked morbid conditions of the tongue connected with dyspepsia. An unnaturally red condition of the organ is caused by deficiency in its epithelial coating, and probably indicates the same condition of the gastric digestive surface. The redness is usually most marked at the tip; and when the papillæ situated there are prominent, its resemblance to a red strawberry is striking. As a symptom, no condition of the organ is more reliable than this. It indicates an irritable condition of the gastric surface, and there

is generally associated with it epigastric tenderness, loss of appetite, and thirst.

When the back part of the tongue is smeared with a creamy-white or yellowish coating, a foul state of the gastro-intestinal tube is indicated, and alkalies, mild mercurials, and purgatives, generally do good.

A brown tongue is more generally associated with dyspepsia from temporary excess than with the habitual disorder.

When the tongue is broad, flabby, and pale, it indicates an anæmic and debilitated condition of the whole system, accompanied by weakness of digestion. It is not often foul in these cases, but owing to loss of elasticity and its increased width, indentations made on its edges by the teeth may be commonly observed. Preparations of iron and the mineral acids are then the best remedies.

Sometimes the large papillæ (*papillæ circumvallatæ*), from fifteen to twenty of which exist at the back of the tongue, besides losing their epithelia, become very turgid. They look like inflamed warts, and are usually associated with severe and long existing dyspepsia.

We often observe a foul streak along the

middle part of the tongue's upper surface, while the edges are clean, or, *vice versâ*, the middle part is clean, while one edge is coated, or both edges are in that condition. No great importance is to be attached to these variations. They can generally be accounted for by the mode in which the organ comes into contact with the mouth and its contents. Thus, when owing to the state of the teeth, the patient is compelled to eat at one side, it is easy to point it out from inspection of the tongue alone; it is cleaner at that side than at the other. Island-like clean spots are sometimes seen in the midst of the coating: they are the seats of former ulcerations, and are due to permanent loss of the epithelial covering.

Fissures of the tongue are frequently dependent on digestive disturbance. These solutions of continuity are most common in dyspeptics of dissipated habits, and profuse bleeding is sometimes the consequence.

White particles of lymph or aphthæ, often beginning as minute pimples, are common to the mucous membrane of the mouth and to the tongue; their favourite seat is the sides

and under parts of the organ, as seen in front of the frænum, when the tongue is protruded, or else on the inside of the mouth, near the junction of the lips. After some days, these patches seem to attain their full size, and then disappear, leaving troublesome ulcers in their place. According to my observation, aphthæ generally indicate acidity, and the gouty tendency. I do not include in the present consideration the formidable disease especially met with in hot countries, in which an aphthous condition of the digestive tube appears the leading symptom.

The throat of the dyspeptic should always be examined; in fact, attention is commonly drawn to it by complaints of a slight soreness or stiffness, as if the mobility of the parts was impaired. On inspection, we generally find a turgid state of the vessels of the fauces; and the space between the tonsils occupied by tenacious mucus, which the patient troubles himself by fruitless endeavours to expel.

I have often noticed in dyspeptics another condition of this part: it is dotted over by small pimple-like elevations of the mucous membrane; and I believe the analogy with

pimples of the skin is complete—the difference only arising from difference of the structure in which they are seated. Relaxation of the uvula is constantly associated with these conditions of the fauces.

Certain symptoms connected with the sense of taste deserve notice. They are connected with the state of the saliva, and probably the latter is always affected secondarily when the stomach is disordered. But as the functions of saliva are so important, it is possible that certain forms of dyspepsia may be themselves due to the presence of morbid salivary essences, of which we as yet possess no exact knowledge.

A sour taste is the most common of these symptoms, and its gastric connexion is so marked, that a *sour stomach* is the popular phrase for it; the saliva is then frequently found to have an acid reaction, and this state of the secretion is most destructive to the teeth. A bitter taste is not uncommon, and is generally associated with constipation. Occasionally, we hear a sweet taste complained of, and this is usually accompanied by an increased secretion of saliva. It is generally symptomatic of stomach disorder, but what

its particular indications are, I have not satisfied myself. It seems to have no connexion with diabetes, for although a saccharine smell of the breath is usual in this disease, sweetness of the saliva is not common, nor is sugar found in it. Clamminess of the saliva, with an unnatural sense of heat in the mouth, especially on awaking in the morning, is a common dyspeptic symptom.

There is much misconception about the connexion between constipation of the bowels and dyspepsia. By many persons the two affections are regarded as identical, and it is common to hear a dyspeptic say, "My digestion must be all right, for my bowels are quite regular." On the other hand, simple constipation is commonly designated as "indigestion." But although generally associated, the one may exist independently of the other.

I shall have occasion hereafter to show in detail, that the tendency to constipation of the bowels varies with the particular kind of dyspepsia present. Diarrhœa, like constipation, is essentially an affection of the large intestine. But diarrhœa is by no means so frequent a symptom of dyspepsia as constipation. In foul

digestion, if the undigested matters are not thrown off by vomiting, diarrhœa generally ensues. The putrefactive changes which occur, appear to be the cause of it.

We are now and then consulted on account of a very troublesome kind of looseness of the bowels. After any principal meal the bowels become disturbed; and in some instances so close is the connexion of cause and effect, that the person is compelled to rise precipitately from the breakfast or dinner table. No other indication of dyspepsia may be present in these cases, but this symptom shows the intimate relation between the stomach and lower bowel. The commencement of digestion in the one, is the signal for increased peristaltic action in the other. And so in dyspepsia it probably happens that the weakened action of the stomach produces its counterpart in the colon, the result being constipation.

A very important but neglected source of knowledge lies in the condition of the fæcal evacuations. There is a natural repugnance to their examination, but everything should yield to a scientific necessity. For chemical tests the fæces are not as available as the urine, but

even careful inspection is often a great assistance; and by the aid of the microscope important results are easily obtained. The size, shape, and consistence of the fæcal masses reveal to us a good deal of the inner movements. Pellet-like lumps of fæcal matter are formed in the cells of the colon, and are probably often due to spasmodic contraction. Small elongated and flattened portions of fæces are frequently met with, independently of organic disease of the bowels, and I refer them to a spasmodic action of the rectum.

A more or less liquid state of the fæces is a common symptom of dyspepsia. They sink in water because the gases, which ought to be mechanically retained in them, are wanting.

Scantiness or redundancy of bile is announced by the relative amount of its characteristic colour in the fæces. But a more or less black colour is a common occurrence in some forms of dyspepsia. An unnatural and peculiarly offensive odour is its usual accompaniment.

With the naked eye alone we may frequently learn a good deal of the composition of the

fæces, and the nature of the food from which they are formed. Occasionally we may see the latter nearly unchanged as in lientery; that form of diarrhœa in which the digestive functions appear to be almost suspended. Husks of seeds, kernels, woody fibres, pieces of bone and gristle, fragments of arteries and other indigestible débris, may be commonly observed, and naturally go to form the fæces.

But substances too minute for recognition by the unaided eye, yet present in quantities sufficient to have caused bad effects, are easily determined by the microscope. The ripest pears abound in gritty and wholly indigestible particles, which are easily detected by their peculiar cell formation; and so it is with many other substances. By this method something may be also learned of the derangement of particular functions: thus the detection of starch granules would prove the imperfect digestion of this aliment, since these particles are not present in the fæces of health.

As dyspepsia may depend on worms, the discovery of their ova in the fæces would settle the question of the presence of parasites, even though previously unsuspected.

We may learn a great deal from the state of the dyspeptic's urine, but my limits will not allow me to do justice to this extensive subject. In all refractory cases, careful and repeated examinations of the secretion, by the various and precise means which science has placed at our disposal, are indispensable. The determination of sugar or of albumen will sometimes clear up doubts, by showing that the dyspepsia is but secondary to a graver disturbance of the general system. But when dyspepsia is itself the primary disorder, we may generally glean from the examination much that is important to diagnosis as well as treatment. Thus a copious deposit of uric acid forbids the use of acid remedies; on the other hand, a deposit of phosphates forbids the use of alkalies. A deposit of yellowish lithate of ammonia is a common result of dyspepsia; it generally occurs during an aggravation of the disorder, or as a result of dyspepsia from impropriety of diet. On the whole, it is an unimportant symptom. Red lithate of ammonia is almost invariably the result of a febrile or inflammatory condition of the system.

Crystals of oxalate of lime are abundant in

the acid urine of many dyspeptics. They seem especially so in that of hypochondriacal, irritable, and nervous patients; and Dr. Prout believed in the existence of a true oxalate of lime diathesis. But all who have had much experience in the examination of urine are aware that oxalate of lime in minute quantities is very frequently present, and sometimes to a considerable extent without any associated symptoms.

It is well known that it exists ready formed in some articles of food, as rhubarb-stalks, tomato, &c.; while many other articles, as sugar, easily yield it from their elements. While, therefore, I recognise a considerable and persistent deposit of oxalate of lime as a symptom of severe dyspepsia, I deny the importance of this deposit when it occurs in minute quantities, or only at intervals.

Alkalinity of the urine, with phosphatic deposits, is common in dyspepsia; and it not unfrequently happens in these cases that, in addition to flatulence and nausea, there is marked acidity of the stomach. Here the state of the urine is an important guide to treatment, as the mineral acids, contrary to what might

be otherwise expected, are generally found useful.

Dr. Bence Jones has shown that for some hours after a meal the acidity of the urine is constantly diminished, so that it may become neutral, or for a short time even alkaline. In connexion with dyspepsia this is an interesting matter, and further observations may yet lead to important practical results.

A persistent excess of urea in the urine is a more common accompaniment of stomach disorder than is generally supposed. I have seen some well-marked instances of this excess in cases of organic disease of the stomach.

In several cases of dyspepsia in men, I have observed a symptom to which I have not seen any allusion. It consists in a sensation in the urethra variously described: in some instances it is a mere uneasiness; in others, a scalding or smarting, either when urine is being passed or without it. In others, again, as in a case I have recently met, "a constant sensation of something which ought to come away" teases the patient considerably. In this case the patient was habitually constipated, and told me that he experienced the urethral annoyance

most when the bowels were distended with gas. It must be observed that I have satisfied myself that this symptom may exist independently of the irritation caused by urinary deposits, and I suspect that it is sometimes associated with a morbid urethral discharge.

The generative functions often suffer severely, spermatorrhœa being not merely kept up, but induced by dyspepsia.

The connexion by means of the pneumo-gastric nerves between the lungs and stomach, is so intimate that we cannot be surprised if they react on each other. We generally find some truth in wide-spread and traditionary ideas, and one is preserved in the popular term "stomach cough."

But great mistakes are constantly made on this subject, and the physician is frequently obliged to assign to the lungs themselves a cough which the patient with some pertinacity attributes to the stomach.

The stomach disorder which frequently accompanies chronic bronchitis, as well as the vomiting which sometimes occurs in advanced phthisis, teach us how the lungs may affect the stomach.

More rarely, on the other hand, we meet cases in which the stomach as unequivocally affects the lungs, but there is always in the latter case more difficulty in deciding. The association of cough with well-marked stomach symptoms, and the absence of sufficient local cause in the lungs, proved by physical examination, will essentially aid our diagnosis. Stomach cough is generally unattended by expectoration, being usually of a short and dry character. Conditions of the throat, and especially of the uvula, already described, are fruitful sources of cough.

Asthmatic symptoms, and difficulty of breathing in general, are amongst the most usual direct effects of dyspepsia; but reflected nervous influence is often less concerned than mechanical pressure of the flatulent stomach against the diaphragm.

The circulation of the blood is very frequently disturbed, often suddenly and with violence. By far the greater number of what are called functional diseases of the heart are referrible to dyspepsia. Palpitation and intermittent action are common symptoms; sometimes the action of the organ appears

to be temporarily arrested, and only to recover itself by a struggle. This symptom frequently attacks the patient when in bed, and causes great alarm.

General arterial excitement constituting a pseudo-febrile condition is common, and a remarkable instance of local excitement often happens in that form of dyspepsia which depends on an irritable condition of the mucous membrane. A throbbing sensation in the epigastrium is complained of by the patient; and if the hand of the observer is pressed upon the part, strong pulsations of the abdominal aorta are distinctly felt, although the heart itself and other parts of the arterial system remain tranquil.

There are few persons who are not familiar with an affection popularly termed "fidgets," either from having themselves experienced it, or, what is almost as disagreeable, from having witnessed its effects in the person of some friend. It consists in an uncontrollable tendency to motion in the lower limbs, the position of which the patient continually changes, accompanied by a sense of fatigue and a strong desire for rest. No one can exactly describe

the sensations experienced, but all agree that they are distressing. This state is generally referred to a defect of circulation; but, irrespective of any other cause, I feel certain that it is frequently a result of dyspepsia. The symptom almost invariably comes on after dinner, and is more likely to attack the dyspeptic should fatigue have been previously incurred.

Another singular sensation that I do not hesitate to refer to dyspepsia, as the primary cause, is the fancied unnatural size of the limbs or other parts of the body. Although it is frequently met, I do not think it has been hitherto described. It generally comes on at night when the patient awakes from sleep, and disappears on moving the affected part, and when reflection has corrected the erroneous impression. I have met an instance, however, in which the delusion continued during the day. One or more of the limbs, or even the head, is *felt* to be of gigantic proportions: the hand to rival that of an Egyptian Colossus; or the head, that of the Sphynx itself. Sometimes the tongue alone is affected, and then the patient has the sensation of an enormously dispropor-

tionate mass occupying the ordinary limits of the mouth.

That dyspepsia will not only disturb but pervert the senses of sight and hearing, is well known to those who make these functions a special study. The patient may be simply deaf, or may experience at the same time all sorts of illusory sounds; such as the ringing of bells, beating of drums, or the thumping of hammers. Simple dimness of vision may be complained of, or imaginary objects seen. One of the commonest results of stomach disorder is the appearance of dark bodies or flies (*muscæ volitantes*), close to and in front of the eyes. Flashes of light, transient darkness, and actual spectra, all own the stomach as their source.

More inscrutable than all, are the various disturbances of the operations of the mind, from which many dyspeptics suffer; while in some, on the other hand, these symptoms are entirely wanting. Many patients would find it impossible to convey by words a vivid impression of their morbid thoughts and feelings, nor could any language make them really understood by others. With these differences there can be no doubt physical conformation has much to

do, and we recognise it in the aspect of the individual. The man of nervous temperament is proverbially more a prey to mental impressions than the lymphatic; the sanguine more excitable than the bilious. But here I take occasion to observe, that these outward differences are less to be relied on than is commonly supposed. Very often the vigorous physique is but the mask of a disordered mind. Experience teaches us that it is only when the patient begins to recognise in his medical attendant a sympathising friend that any allusion is made to his mental woes. And do we not often find reason for surprise at the revelations then made to us?

Looking at the brain as the connecting medium between the material and the immaterial worlds, between the functions of animal life and the functions of mind, we can in a general way conceive how the mental faculties become affected. It is a bridge on which the physician and psychologist may meet; but, like the bridge in the "Vision of Mirza," one which is to both impassable.

Nothing is more difficult than a description of the morbid mental impressions of the dys-

peptic, which probably vary in almost every case. As far as I have been able to collect, they embrace simple obtuseness and confusion of thought, indecision of purpose, and total inability to fix the attention. In extreme cases we find all that constitutes complete prostration of mind.

On the other hand, a morbidly acute and over-sensitive mental condition is perhaps more common. The patient feels undue anxiety on every subject, is absurdly alive to the slightest touch of ridicule, and finds insult where none was meant. He is constantly apprehensive of danger; and if his mind dwells on religion, he sees in it nothing but dark threatenings unrelieved by a gleam of hope. But worse, perhaps, than all, are fears and forebodings about health. Sometimes the mind becomes concentrated on a particular organ, often on the stomach itself, and there is every reason for believing that injurious reactions result. In other instances, a condition of causeless irritability seizes upon the sufferers, and a peculiarly distressing sensation is sometimes complained of, which, as far as I have been able to form an opinion, is a sort of consciousness of the opera-

tions of the mind, as if it were external to itself.* Associated with this, there is a sensation of oppression in the head, frequently ending in head-ache.

That insanity in those predisposed to it may be excited by dyspepsia, no doubt need be entertained. Here, as in other cases, extremes meet; and I have myself known instances in which the most complete depression clearly caused by dyspepsia has suddenly changed to excitement. Sometimes an ungovernable, or even a vicious, impulse is experienced.

A general sense of weariness, heaviness, or sleepiness, without adequate cause, is a very common complaint with the dyspeptic. He experiences all the sensations which over-exertion of body or mind produces. But between such apparent and real exhaustion, there is this difference: the sense of fatigue, which is merely a symptom of dyspepsia,

* It has been well observed, that when digestion is perfect, we are not conscious that we possess a stomach. It is, in fact, from the action of disease that we become conscious of the performance of many of our functions which then are felt irksome. Close observation leads me to believe that the functions of the brain are not in this respect exceptional.

is in general diminished by real exertion. We sometimes see remarkable instances of this. Thus a patient, who a short time previously declared his inability to walk a short distance, will presently be found ardently engaged in some athletic game. Another who has complained of a degree of mental prostration, that it was a trouble to him to *think*, will immediately after become brilliantly argumentative. Another set of symptoms generally traceable to the stomach, involve the function of sleep. Sleeplessness is an ordinary effect of dyspepsia, and heat and dryness of skin its usual accompaniments, especially if a late supper has been taken. There are few who have not experienced a night of discomfort from this cause. The feet are so hot that the patient keeps constantly moving them in search of a cooler position, the hands are dry and burning, the mouth parched, the mind incapable of repose, and thus the weary hours drag on until sleep ensues from mere exhaustion.

But the confirmed dyspeptic is liable to suffer in a different way. Sleep comes at its accustomed time, but does not bring with it real repose. Dreams in which fear, distrust,

and other disagreeable emotions take a leading part, make a mockery of his rest. Nightmare, with its horrors of overwhelming waves, falls from precipitous heights, or infuriated bulls, and other implacable monsters, are generally traceable to an enfeebled stomach. The same may be said of talking during sleep, and of somnambulism itself. Grinding the teeth is an ordinary symptom of gouty dyspepsia, and in some instances becomes so habitual, that the organs are worn by the friction.

CHAPTER IV.

ACCIDENTAL DYSPEPSIA.

Having traced the causes and the symptoms of dyspepsia, I shall now proceed to describe the various forms of the disease itself; taking first those which may be termed accidental, because they are produced in the healthy subject by accidental causes.

It may be safely affirmed, that every one has suffered at one time or another from transient difficulty of digestion; who is not conscious of having experienced bad effects from one of the following causes?

Simply eating in too large a quantity.

Indulging the appetite with too great a variety of food.

Partaking even moderately of a single kind of food, against which there is a constitutional repugnance.

Now, as is plain enough, these causes are likely to be mixed together, and the symptoms which

result will often be more or less confounded. It appears to me, however, that sufficient distinction usually exists, to admit of their being so grouped as to constitute three distinct forms of dyspepsia.

If dyspepsia occurs in a healthy person from eating too largely, but without deviation from his accustomed diet, he is apt to be troubled as follows. There is a sense of weight, fulness or other uneasiness in the stomach. Flatulence frequently succeeds, but the eructations are tasteless, as carbonic acid is chiefly the gas evolved.

Sometimes, and particularly in children, there is nausea, and vomiting of almost unchanged food. If the symptoms have not previously subsided, sleep is likely to be disturbed, and nightmare or palpitation of the heart to ensue. Here we have the simple effects of more material than is required for the sustenance of the body. Digestive trouble is no doubt due to *relative* deficiency of gastric juice, the delay of food in the stomach giving rise to fermentation. This form of repletion is very favourably regarded by some Asiatic nations. The noisier the escape of gas from the stomach, the better the breeding of its proprietor, and

the greater the compliment from the guest to the entertainment of his host.

But even amongst people who are careful not to take too much at a single meal, this kind of dyspepsia is frequent, and may become chronic. In these cases the meals are taken without sufficient intervals between them, or else the quantity of food consumed is as a whole too great. Perhaps a late and substantial breakfast is succeeded by a meat luncheon, and dinner is followed by a heavy supper. To supply the waste of the body, so much material is seldom required, and still more seldom taken without injurious consequences.

The dyspeptic attacks produced by mental emotion, by exercise after a full meal, by the hot or cold bath, or any cause that violently disturbs the balance of the circulation, are similar to that just described, and may be classed with it.

The following is an example of the second kind of accidental dyspepsia: popularly it would be termed a "bilious attack."

A person partakes of a great variety of those dishes which luxury has made inseparable from a modern feast. Soup, fish, rich ragouts,

numerous sweetmeats, fruit, fresh and dried, nuts, &c., and these are followed by an almost equal variety of drinks. The immediate effects may not be so marked as in the preceding kind of dyspepsia, but night brings retribution. A restless and feverish night is passed, or if sleep comes it is troubled and fitful. Towards morning the patient sleeps heavily through mere exhaustion, but wakens to begin the business or pleasure of the day more fatigued than when he retired to bed. There is a foul taste in the mouth, and an unnatural sensation of heat causes a craving for cold water;—soda water, from its coldness and sedative nature, is often substituted. Slight headache is felt; and constant eructations, the flavour of which is well compared by the patient to rotten eggs, give great annoyance. The headache, which is chiefly in front, is worse on rising from bed, and increased by stooping. Breakfast is almost untouched, the bowels are unmoved, and the pain and discomfort continue until dinner-time; then, if food can be taken, relief sometimes immediately follows. This relief after taking food is analogous to what occurs in another instance. A stimulating draught is the best

remedy after excess in drinking, and "a hair from the dog which bit you" is the vulgar but appropriate term for the remedy.* But very often the symptoms are more severe; the headache is excessive, and described as "splitting the head." There are nausea, and vomiting of foul smelling, frothy masses, in which yesterday's dinner may be recognised. Severe, and at first ineffectual retchings ensue; and bile almost pure at last makes its appearance.

After, or coincident with this stomach distress, relaxation of the bowels often happens.

The taste and smell of the eructations, and the time at which the symptoms occur after the meal, prove that the fermentation in the stomach is of the kind which accompanies putrefaction.

One, at least, of the gases evolved is sulphuretted hydrogen, and to this the fetor is due. It would be useless to waste time in speculating on the remote causes of this form of dyspepsia; but why, we may ask, should a great variety of

* In the *Medicina Statica* of Sanctorius the same advice is given, as follows:—

"*Si nocturna tibi noceat potatio vini,*
Hoc tu mane bibas iterum, et fuerit medicina."

food be more productive of it than the same quantity of any one or a few of the same articles?

Some clue may be gained from the fact that different secretions are employed in the digestion of different elements of food, and that food, although consisting of the same elements, may differ much in digestibility. When, therefore, the articles taken into the stomach are both numerous and varied, great digestive confusion must result. Probably the gastric juice expends itself on those substances which are easiest of reduction, leaving others comparatively unaffected; while these, under the influence of heat and moisture, rapidly undergo putrefaction.

What causes the alleviation after dining? This appears to me the explanation. The stimulus of newly-arrived food causes the stomach and duodenum to contract, whereby offending matters are expelled; and the antiseptic properties of gastric juice freshly drawn out by the same stimulus, probably assists by neutralizing the semi-putrescent remnant.

Habit reconciles the digestion to changes of diet which were at first repugnant. For example, people often suffer from the kind of

dyspepsia just described when beginning continental travel; but after a while, although the diet is the same, the stomach becomes accustomed to it, and ceases to suffer.

The third variety of accidental dyspepsia may be thus exemplified:—healthy persons sometimes tell us that *certain things* "disagree with them," and it may be a single article of diet that so affects them. It would, perhaps, be impossible to enumerate all these peculiarities. Substances of reputed indigestibility are generally, but not invariably, the offenders. Many declare they can digest anything but pork, but I have known the same complaint to be made against mutton; others cannot take fat of any kind, or pastry, without bad effects.

The symptoms in these cases are various. A foul taste in the mouth, nausea, and vomiting, are probably the most frequent.

But there is a symptom which deserves more particular notice. An eruption of the skin appears after eating some particular article of diet. When partial, it sometimes takes the eczematous form, and a crop of vesicles appears round the lips: more frequently it is diffused over the surface of the body, and, in the latter

case, it takes the form of urticaria, or nettle-rash. This affection, the name of which is very descriptive, usually comes on within a couple of hours after eating the food which causes it. Sometimes the face, especially about the eyes, is swollen, as well as intensely red, and the itching of the body is often very distressing. A smothering sensation, unnatural heat, thirst, and general febrile disturbance, nausea, and vomiting may accompany it.

The number of articles known to produce nettle-rash is considerable. Oatmeal in any form, cucumbers, mushrooms, shell-fish and especially mussels, appear particularly productive of it. I know a lady who is always affected with eczema of the face from eating lobster. But the most severe case of nettle-rash which has occurred to me was that of a young woman from eating mackerel. An alarming degree of prostration alternated for some time with violent palpitations of the heart; and the entire skin, except where dotted with wheals, was of a vivid red colour.

I was lately informed by a patient, that removal from town to her villa in a metropolitan suburb, is always accompanied by an eruption

on the face. As the same does not occur elsewhere, there can be no doubt that the water of the neighbourhood, which is charged with lime, is the exciting cause.* The sympathy between the lining membrane of the intestinal tube and the exterior of the body, between skin and mucous membrane, is highly interesting. Here we see it in its acute and direct form, and it helps us to understand the dependence of certain chronic skin diseases on confirmed dyspepsia. In its physical application, however, the term sympathy is incapable of exact definition, and it is used above only for want of a clearer expression.

The eruption of the skin, in these cases, is probably a manifestation of true blood-poisoning. To this poisoning is due the highly deleterious effects of some articles of food,

* That a similar effect may be caused by the direct contact of impure water, the following extract proves :—

"We repaired to a neighbouring well, and found the water so hard that it raised lumps like nettle-stings in the bathers' skin. The only remedy for the evil is an unguent of oil or butter, a precaution which should never be neglected by the African traveller."—*First Footprints in East Africa*, by Lieut. Burton, p. 232.

as sausages which have undergone certain changes.

Dyspepsia induced in healthy persons by unwholesome food, or by simple though coarse and unaccustomed diet, will come under the head just considered.

CHAPTER V.

HABITUAL DYSPEPSIA.

What has been said about accidental dyspepsia, must be borne in mind and applied in considering habitual dyspepsia. The relation between them is frequently of the closest kind, while occasionally the difference is merely this:—in the habitual disorder an increased susceptibility leads to a constant repetition of digestive disturbance, and this constitutes a true chronic disease. It is noticeable, that dyspeptic symptoms, when chronic, are usually less severe and urgent than when the same symptoms occur in the accidental form. Thus, the vomiting and retching of a mere surfeit are generally more aggravated than when they constitute symptoms of confirmed dyspepsia. Sometimes, indeed, the invasion of the disease is so gradual, and it continues so long undeveloped, that we find difficulty in determining its existence; and common sense can alone decide.

Thus, if a moderate indulgence of appetite is habitually followed by sensations similar to those naturally caused by excess, it is plain that something more than the amount of food is at fault. If the repugnance of the system extends to a number of ordinary articles of diet, there must be more than mere idiosyncrasy in question; and the same argument applies to other causes of accidental dyspepsia.

Habitual dyspepsia mainly consists in constantly recurring uneasiness, of various kinds and degree, caused by food, ordinary both as to quantity and quality.

But, besides the symptoms common to both accidental and habitual dyspepsia, there are, as we shall see, a great many peculiar to the latter. Chronic dyspepsia has been variously classified by authors; all the divisions of the subject, however, that I am acquainted with appear wanting, either in distinctiveness or in comprehension.

One form of classification is that which has regard to the particular states of constitution or diatheses, upon which dyspepsia is supposed to depend.

Great improvements in practice must arise

out of a more perfect knowledge of the relation which many chronic diseases bear to the various diatheses. It cannot be doubted that malaria, scrofula, gout, syphilis, and scurvy, are respectively associated with, or productive of certain forms of dyspepsia. We are at present acquainted with the characteristics of some of these, and in others the results of treatment almost convert conjecture into certainty, as in the case of quinine for dyspepsia dependent on malaria. Nevertheless, a division of the subject founded on diatheses would at present be most imperfect.

It would not be possible to include many cases under any of the heads mentioned, and probably some diatheses are as yet altogether unrecognised. We can only expect greater precision when facts have been accumulated in sufficient number, and chemistry has contributed to medicine more of the nature and derangements of the blood.

There is every reason for believing that dyspepsia in many cases consists in derangement of one or more of the separate processes of digestion. What these morbid changes are, and where they are situated, are points of great

importance to determine, and a very perfect basis of classification might thus be obtained. There are, however, serious difficulties in the way. Thus, a sense of oppression in the stomach after meals is probably often due to a deficiency of gastric juice. But the evidence is never conclusive, and in many cases the symptoms may be really due to impairment of the muscular structure of the stomach, by which the action of the solvent is prevented and the food delayed in the stomach, as well as to other causes.

In order to avoid the evils of speculation and the possible substitution of theory for facts, a more practical course is desirable. In the present state of knowledge a close observation of the various symptoms of dyspepsia, and the manner in which they group themselves, is most likely to yield the classification required.

According to my observations, five kinds of habitual digestive derangements may be ordinarily recognised. For sake of convenience, I name them as follows; partly according to the essential nature of the affections, and partly from certain symptoms which characterise them.

Slow Digestion—or Simple Dyspepsia.

Undue Acidity in Digestion—Dyspepsia with Acidity.

Painful Digestion — Dyspepsia with gastric pain; and frequently tenderness on pressure.

Foul Digestion — Dyspepsia with fetid eructations.

Imperfect Digestion, with Mental Disturbance—Dyspepsia in which mind symptoms predominate.

Slow Digestion.

This constitutes the most common form of dyspepsia. It is the bane of those who ignore natural laws and forget that the healthy action of the stomach is dependent on a natural condition both of body and mind. Those whose pursuits oblige them to pass much of their time within doors—men of letters, and of business, whose minds are seldom perfectly relaxed; administrators, speculators, and the various professional men, whose callings chain them within the excitement of London life—fall ready victims to it. Women, as might be expected, are less liable to it than men.

It occurs in all habits of body, but oftenest in persons of an irritable or anxious aspect, popularly recognised as "dyspeptic looking." It is comparatively unknown amongst those who associate even a free indulgence at table with the healthy pleasures and pursuits of the country. Eating too rapidly is a common exciting cause in those predisposed to this disorder; as is also imperfect mastication from loss of teeth.

This kind of dyspepsia in its milder degrees most resembles the effects upon the healthy stomach of more food than the system requires; but there is this notable difference:—in the diseased stomach the requisite amount of nutriment is with difficulty digested. "I should be quite well if it were not necessary to eat," is a statement commonly made by sufferers. A dinner not exceeding ordinary limits is followed at varying intervals, but usually within an hour, by a feeling of weight and oppression in the stomach. For several hours afterwards the patient experiences discomfort, which in some cases subsides before bed-time. Should even a light supper be indulged in, nightmare or troubled dreams are almost certain to result.

But the symptoms vary in number as well as severity; sometimes there is great flatulence, accompanied by shooting pains in various parts of the stomach. In these cases the gases are undoubtedly products of fermentation, and the eructations, consisting chiefly of carbonic acid, are tasteless. Palpitation and irregularity of the heart, coming on principally during the night, frequently cause great anxiety. Constipation is often troublesome, but by no means invariably present, and another statement made by patients is, "I can hardly suffer from indigestion, my bowels are so regular." In some cases the tongue is foul, especially on awaking in the morning, but in others that organ is little, if at all altered. The appetite is frequently as good as in health; in some instances, indeed, it seems greater.

All the symptoms of this form of dyspepsia are referrible to undue delay of food in the stomach; and I have already considered the probable immediate cause of the sense of oppression.

I shall now present the reader with a typical case.

A man of middle age, busily engaged in commercial pursuits, consults us. His habits

are temperate, and it would be difficult to persuade him that he is not in all things a man of moderation. Except for a slightly careworn expression, his naturally dark face looks healthy. But there is a restlessness about his eye as if he thought it losing time to speak of his health. He says he has been from boyhood wholly engrossed in the routine of business. Improvement of fortune and perfect freedom of action brought with them no change.

He lives or rather sleeps out of town, and in consequence entertains a notion that no matter how he treats himself he has no right to feel unwell. He manages himself in some respects as if he were an iron locomotive rather than a creature of flesh and blood; indeed his principal movements during the year may be found on certain railroad time tables. After an unsubstantial breakfast he hastens to catch a certain train by which he invariably comes to London. Ten o'clock begins the business of the day, which is steadily persisted in until one. He now leaves his office for a few minutes, and swallows hurriedly, rather than eats, a chop—on busy days he has no chop, and no substitute for it.

It is past six when our patient finds himself at the dinner-table. He has then a feeling of exhaustion, which a glass of sherry somewhat lessens. He now eats largely of various dishes, including pastry, and perhaps takes malt drink freely, winding up with a fair allowance of port. Soon after dinner his troubles commence, but not always to the same extent. On bad days he suffers from an almost intolerable sense of weight and tightness about the stomach. For the relief of this he unbuttons his waistcoat, but always arrives at the conviction that *it* had nothing to do with his distress. He also paces the room, and beats or chafes over his stomach as if to allay the brooding storm. It is a vain hope. Very soon a closed windbag of Æolus would fitly represent our patient's stomach. Struggle as he will he cannot cause it to collapse, and at length he sinks exhausted into a chair. Hot tea is now indulged in freely, as he fancies it gives relief by displacing the gas.

Our patient further states that he sleeps heavily, though uneasily—that he wakes in the morning unrefreshed, and is very averse to rising—that his mouth is clammy and tongue

covered by a creamy coating. He also notices that his urine often contains a thick reddish brown or yellowish sediment.

Undue Acidity in Digestion.

That form of dyspepsia in which acidity is a prominent symptom, must be regarded as a more serious disorder than mere slowness of digestion. We have now depraved secretions to deal with: in some cases constantly, in others only at intervals, a sour taste is experienced in the mouth. The saliva frequently has an acid reaction; acid eructations occur, and the breath has a sour smell. This general condition is greatly influenced by the nature of the food. A diet consisting chiefly of vegetables, is much more productive of acidity than one in which animal food predominates. The appetite is generally very bad; farinaceous food is ill borne, yet there is often a loathing of animal food. Flatulence is in some cases troublesome, while in others it is not complained of.

The chemical explanation of an unnatural production of acid from farinaceous food is reasonable. By the natural functions, starch is

converted into sugar; while by fermentation, a process foreign to the organism, the sugar becomes acetic acid. This acid is, however, by no means the only one which is abnormally present in the stomach; and marked acidity is sometimes found to exist after an exclusively animal diet. It was, therefore, long ago maintained by Dr. Graves, that the acidity was due to hyper-secretion of the natural acid of the stomach, which he affirmed to be lactic acid.* The question is certainly a difficult one; but it will probably be found that the acidity of dyspepsia is derived partly from the food, and partly formed by secretion.

According to my experience, acidity is a prominent feature in two very opposite habits or states of constitution. One is characterised by debility—the anæmic tendency, and a general want of tone; in the other plethora is more or less marked, and the vital functions are vigorous.

Now the acidity of the latter class is generally a symptom of the so-called gouty dyspepsia. But in some cases of gout the aspect of the patient closely coincides with that of the

* Clinical Lectures, edited by Dr. Neligan, vol. ii. p. 209.

anæmic class of sufferers from acidity. Gout is greatly modified by the constitution of the patient. In robust persons it has generally a tendency to expend itself in inflammation. I use the word expend, because, after an inflammatory attack, relief of the dyspeptic and other symptoms is commonly experienced, and thus the impression has arisen that a fit of the gout does the individual good.

In delicate people, on the other hand, inflammatory gout is much less frequent than in the more robust, and in women than in men. The imperfection of a classification founded on diatheses is here illustrated; for it is certainly more probable that dyspepsia causes, than that it is caused by, gout. And it may be that all cases of dyspepsia with undue acidity have an alliance with gout, which, however, is only fully developed when other circumstances are favourable.

A form of dyspepsia characterised by extreme acidity, accompanied by cerebral symptoms, almost always terminating fatally, occurs in France.* This disease I have not seen.

I shall now try to illustrate from my own

* Des Dyspepsies, par M. Chomel, p. 96.

experience the forms of dyspeptic acidity commonly met.

The anæmic subjects of acid dyspepsia are frequently found amongst our hospital out-patients. Let us take an example: it is that of a languid-looking, ill-nourished woman of middle age. She is the wife of an artisan, has reared a family, and looks prematurely old. Amongst other causes, over-lactation has probably injured a constitution originally good. She says, and not without reason, that she has never been so well in town as she was in the country, whence she came, but where she has not been for years. Her married life has been one of unvarying toil; no autumnal change of air; no yearly seaside sojourn for her; and yet the pallid face and dusky semicircles beneath the dull eyes tell of other causes of depreciated health: she lives in an ill-ventilated house situated in a close court. Often, during the heats of summer, she turns in disgust from the window opened "for air," but which admits noisome effluvia from badly-constructed drains. So tied is she to domestic duties that she seldom gets out of doors. Her appetite is so bad that she eats with difficulty a bare sufficiency of ordinary food,

and her scanty means allow no indulgence of the palate. To avoid a painful sense of exhaustion and to relieve headache, to which she is subject, she is in the constant habit of drinking tea; and this without solid food is often a substitute for dinner. What is most complained of is, that "every kind of food turns sour on her stomach." She is aware of this from sour eructations and the taste in her mouth. Heartburn annoys her, and sometimes a small quantity of very disagreeable, rancid, oil-like fluid rises to the mouth; vomiting of "stuff so sour that it sets her teeth on an edge" occurs occasionally, and is followed by temporary relief. She is always worse after vegetable diet; even bread disagrees with her. She wonders, too, that arrowroot, sago, or any such farinaceous food, ever so carefully prepared, are especially unsuitable, although these articles have been recommended to her. Her tongue is white and flabby, the edges being indented by the teeth. The teeth themselves, discoloured and carious, are in a wretched condition—a circumstance to be attributed to the acid state of the saliva. The bowels are sometimes constipated, and sometimes relaxed.

I shall now give an example from a very different class of sufferers from acidity :—

He is a stout, rubicund, good-tempered gentleman, in easy circumstances, and at peace with the world in general. People regard him as "a picture of health," and often congratulate him on his good looks. And yet this gentleman is not without his sufferings: he has already felt the anguish of gout, and knows there is more of it to come. But notwithstanding occasional and even more permanent drawbacks, to be presently mentioned, he enjoys life famously. He dines freely off a variety of rich dishes, and drinks without stint old port and claret. On all these matters he is an authority at his club. He seldom suffers from weight or oppression after meals, but he is sadly troubled by acidity. Sometimes it annoys him after any kind of food; but certain articles, such as fruit and pastry, are most productive of it. He tells you, "I know exactly what suits me—exactly what causes acidity, and what does not." Strange enough, too, it occurs day after day, although he says he is ready to make any sacrifice to get rid of it. The truth is, our friend is disposed to be dog-

matical on the subject of diet, and looks with great suspicion on any interference with it. Advice on the subject must be very much in accordance with his own inclinations, or there is little chance of its being followed. This makes it difficult to be of use to him. He complains of occasional oppression, fulness or confusion in the head, and has a habit of grinding his teeth during sleep. The bowels act regularly, and his tongue, although it may be foul on rising, recovers itself completely during the day. He notices "red sand" in his urine, and is liable to pain of the loins. He recognises these symptoms as constituting "gravel," and the dread of this disturbs him more than anything else.

Painful Digestion.

No kind of dyspepsia is better marked than that next to be described, and it is also a common affection. Pain after meals, generally of a dull character, is experienced in the stomach; along with the pain, soreness of the epigastric region almost always exists, and sometimes the soreness is permanent. The tenderness is com-

monly restricted to a spot in the middle line of the body, immediately below the breast-bone. In some cases, indeed, this spot can be covered by the tip of the finger; while, in others, it is much more diffused. It often extends upwards under the bone, which consequently feels sore on pressure, or the tenderness is felt towards either side. When the right side is affected, it is usually in the direction of the cartilages of the ribs. In these cases, it is frequently supposed that the liver is involved, but the duodenum appears to me the part usually at fault.

This tenderness is commonly associated with an unpleasant feeling of heat—"a burning sensation," as it is often termed by patients; "tearing," "rasping," "gnawing," "dragging," as well as various anomalous sensations under the breast-bone, are also complained of at varying intervals after taking food, but generally within a quarter of an hour.

As might naturally be supposed, the intensity of the symptoms is proportionate to the quantity and quality of the meal.

When the stomach is empty, a sensation of craving or emptiness gives most trouble.

This often causes a false appetite, which, by inducing the patient to eat heartily, aggravates his sufferings. Thirst generally causes much annoyance; heartburn and water-brash, with or without acidity, nausea, vomiting, and headache, are not unfrequent attendants. The state of the tongue is very characteristic. The body of the organ frequently presents a white coating, but its extremity is almost invariably redder than is natural; while the large papillæ situated there are prominent, and have a peculiarly irritable appearance. From mere inspection of such a tongue in the adult, we can with tolerable certainty predicate epigastric pain and tenderness. But in children the state of the tongue can with less certainty be relied on; for, owing to the greater impressibility of the organ, it assumes an irritable appearance from trifling stomach disorders. In this form of dyspepsia the bowels are generally constipated.

There are different opinions as to the cause of the epigastric tenderness, some writers believing it to be produced by mere irritability of the mucous membrane, while others describe it as the result of chronic inflammation. If we

consider how exposed the stomach is to injury from without, and still more to bad treatment within, we must conclude that it enjoys greater immunity from inflammatory attacks than any organ in the body. The stomach has been known to tolerate for years rough and hard substances of considerable size. Even the effects of molten lead and boiling water have been endured for a time by this delicately constructed but highly resistive organ. In fact, concentrated mineral acids, or other strongly corrosive agents, appear alone capable of producing a rapid and fatal inflammation of the stomach.

There can be no doubt, however, that subacute gastritis is of comparatively frequent occurrence, for it is certainly present in the so-called gastric fever. It is therefore possible that a slight gastric inflammation, manifesting itself merely in dyspeptic symptoms, may long exist without developing itself further.

A chronic inflammation of the mucous lining of the eyelids is often met, which, if not arrested by proper treatment, may continue for months or for years, and we may fairly infer a similar

condition of a mucous membrane not within reach of observation. Few opportunities are offered of inspecting stomachs in which such changes are suspected, and then it is not easy to decide between the effects of inflammation and congestion. I exclude, of course, inflammation accompanying chronic ulceration of the stomach; an affection not only recognised with precision after death, but frequently during life.*

The question remains to be answered,—Is epigastric tenderness a proof of inflammation? I believe not generally. The natural susceptibility at this part of the abdomen is very variable. In some healthy persons, moderate pressure is attended by a feeling of soreness. In all, the epigastrium is a sensitive part. Even violent throbbing at the pit of the stomach, coincident with tenderness, affords no proof of inflammation. Frequently in these cases the heart itself is tranquil, and the nervous relations between the stomach and the abdominal aorta are sufficient to explain the local arterial excitement. We can generally identify the

* See on this subject the excellent work of Dr. Brinton, "On Ulcer of the Stomach."

soreness caused by gastritis, by its being more continuous; by the greater dryness of skin, more thirst, a quicker and harder pulse,—in short, greater disturbance of the general health than in cases of mere morbid sensibility; which term I therefore consider appropriate in most cases of dyspepsia with epigastric tenderness. Morbid sensibility of the stomach may be reasonably explained. It seems to be occasioned by a deficiency in the epithelial lining of the gastric mucous membrane. From some unknown cause the epithelial cells are either formed imperfectly, or too rapidly removed. In this form of dyspepsia, the connexion between the state of the stomach and that of the tongue is remarkable; and we know that the unnatural redness of the latter organ is due to epithelial deficiency.

This kind of dyspepsia is probably more common than any other to all classes and to every constitution. It, however, attacks women more frequently than men.

The following is a typical case. A young lady of delicate conformation and of luxurious habits, complains as follows:—From ten minutes to a quarter of an hour after each meal, but

especially after dinner, a dull pain of the stomach is felt; sometimes the pain has a twisting or rotatory character, which is particularly distressing. The appetite is strangely capricious. Forgetful of consequences, she at times indulges it freely, while at others she can scarcely be induced to take the needful amount of nourishment. Farinaceous substances agree better than animal food, and certain meats, as veal, are particularly injurious.

During hours of pleasurable excitement, she often remains long without eating or feeling any want of food, but at other times suffers from sudden fits of exhaustion. A sinking sensation, accompanied by pain or spasm of the stomach, coldness of feet, and general chilliness, succeed; but a glass of wine, together with artificial warmth, generally restore her. When the pain is severe, it is plainly indicated in the countenance, and, what is far worse, an eruption of small vesicles around the lips is liable to appear in a few hours after a bad attack. The noisy rumbling of gas in the intestines is also a source of great annoyance. There is a constant soreness at the pit of the stomach, felt from the slightest pressure,

or on any sudden movement. The appearance of the tip of the tongue is so peculiar as to have arrested the patient's own attention. The bowels are habitually constipated.

Late hours, over excitement, and general neglect of the laws of health may be assigned in this case as the exciting causes. Happily, better ideas are gaining ground amongst educated women than prevailed even a few years since; tight lacing, a fruitful source of stomach disorder, has been condemned by good taste, and it is to be hoped that other reforms will follow.

Foul Digestion.

I have already spoken of the occurrence in the healthy of foul digestion from eating a great variety of food at a meal, especially food of a rich nature. Similar symptoms may occur when no exciting cause of this kind is traceable, and we must then, of course, look for the cause in the digestive organs themselves.

Foul digestion is the kind of dyspepsia known as *biliousness*. It is common in persons of sedentary habits, and it is probably for this reason that women are more subject to

it than men. Tailors, shoemakers, and all who live by the needle, are its frequent victims. In the higher ranks of society it is also frequently met.

In all the kinds of dyspepsia previously decribed, the symptoms appear soon after a meal, but, in the present case, they usually come on in the morning before food has been taken. From this circumstance, and the constant presence of fetid eructations, there can be no doubt that putrefactive fermentation occurs in the stomach. Headache of a peculiarly throbbing kind is a constant symptom. Sometimes the centre of the brain, from which the pain radiates in all directions, appears to be its seat; at other times it is confined to the forehead—sometimes to one or both eyeballs, but in every case the pain is remarkably increased by stooping. There is great nausea, succeeded by vomiting of half-digested, half-putrefied food. After this vomiting has been frequently repeated, bile, sometimes in considerable quantity, mixed with mucus, is brought up. It is clear that the action of vomiting is then communicated to the duodenum, and it is probable that an accumulation of bile frequently exists there. That ob-

struction in the small intestine is the proximate cause of the disorder itself, seems proved by the fact that a timely purgative will frequently avert an attack. A local sluggishness of action in the intestine would account for a temporary obstruction.

In this form of dyspepsia, the bowels are usually constipated; nevertheless, diarrhœa, during an attack, is not unusual, and is more often than vomiting attended by marked relief.

A peculiarity in the present disorder is its marked intermittent tendency. It comes on, in many cases, at intervals which appear to have some relation to an accumulative force. It would seem that when this has expended itself, the attack is for a time less capable of being repeated. I remember the case of a gentleman, now deceased, who for many years of his life was the subject of severe attacks of the kind. They took place at intervals of from a fortnight to three weeks, and, being so habitual, never caused alarm; resigning himself to his fate, he remained in bed for the day or two during which his illness lasted.

I shall offer in illustration of this form of dyspepsia the following case:—

Our patient is a stout gentleman, a public *employé*, and, both from necessity and choice, of sedentary habits. He is a *bon vivant*, a whist player, and a man of late suppers of the more substantial kind. He tells us, however, very complacently, that these things do not interfere with his health: he adds that he is not at all dyspeptic, but that he is "bilious."

Now, by the latter term he means that he occasionally awakes in the morning, feeling a slight headache. There is a disagreeable taste in the mouth, and his tongue is so foul that he is obliged to scrape it. He is thirsty, too, at such times, and drinks water freely. In stooping over the basin, he notices a number of phantom black spots floating between the bottom of the vessel and his eyes. Breakfast is scarcely touched, and all the symptoms become worse. Eructations, the taste of which he compares to rotten eggs, annoy him. An almost insupportable headache, with nausea, followed by vomiting, ensues. The vomited matters at first consist of the contents of the stomach, and portions of the preceding night's supper may often be distinctly recognised. As the retching continues, matters which he compares to the white

and yolk of egg, come up. These are mucus from the stomach, and bile from the source already mentioned. After some hours of suffering, the headache and other bad symptoms subside, and he finds himself the day following as well as if nothing had occurred.

But the patient has ascertained that these attacks can sometimes be prevented. When he feels lethargic and drowsy, has a sense of confusion in the head, and is, as generally happens at the same time, constipated, he takes a blue pill at night, and a black draught on the following morning. This plan, he says, sets him all right. But it does not occur to him that the preventive system would be infinitely better —that moderation in diet, including a rejection of suppers, would be more beneficial than having recourse to remedies, a repetition of which, there is every reason to believe, assists in perpetuating his disorder.

Imperfect Digestion, with Mental Disturbance.

To the late Dr. James Johnson must be assigned the credit of having forcibly maintained that dyspepsia may be often recognised exclusively by its mental symptoms. He pointed out that when digestive disturbance is least apparent, that of the functions of the mind is usually greatest.

Experience leads me to concur in this, although I do not accept his view, that morbid sensibility of the gastro-intestinal mucous membrane is always the cause. There is often no positive proof that any such morbid sensibility exists; and notwithstanding the direct nervous connexion between the stomach and the brain, it would certainly be erroneous to ascribe all the dyspeptic affections of the latter to reflected local irritation.

Nevertheless, the head symptoms of dyspepsia sometimes appear direct results of transmitted irritation. In some instances, these symptoms follow so closely upon stomach disturbances, that we cannot hesitate in coming to this conclusion; and it seems reasonable that the mind may in the same way be affected through its

material instrument, the brain. We know that conversely the stomach is affected by the mind; for, as I have said previously, bad news may spoil a good appetite, or even bring on dyspepsia.

But from the fact that we can in many cases recognise dyspepsia solely by the affection of the mental faculties, I conclude that we must look further than direct irritation. We shall find that an imperfect elaboration of chyme without the usual symptoms of impaired digestion, will afford the explanation.

The stomach is the alembic of life, and to renovate and sustain the blood is the end and purpose of digestion. The framework of the body, its locomotive and secreting organs, their springs of action and the very instrument of thought; bones, muscles, viscera, nerves, and brain,—are all formed from blood, and without it their functions cease. Whatever therefore interferes with health, and consequently with nutrition, as a rule depresses the mind through the brain. Whether the blood be deficient in nutrient qualities, or whether it be infected with properties that are noxious to the brain, the effect appears the same.

In dyspepsia more than in any other disease we can predicate a physical disorder from the condition of the mind alone.

From the days of Galen to the present time, the exact seat of hypochondriacism has been a point of dispute. Writers of eminence have referred it to the brain; while distant organs, as the name implies, have been supposed by others to be the source. The stomach, the spleen, the liver, and mesentery, have been in turn accused; nor has the blood itself escaped. Hypochondriacal affections are not uncommonly attributed to sexual indiscretions; and no doubt abuse of the passion in question is sometimes an exciting cause. But the disease in all its degrees is fairly within the scope of the present treatise; since the effect of light on the eye, or of sound on the ear, can no more be questioned than the connexion usually existing between dyspepsia and hypochondriacism. The disease in this respect may be compared with hysteria in the female, where the connexion with the uterine system is generally plain. We meet cases, however, in which the diagnosis between hypochondriasis and that mental condition which is the index

or forerunner of actual insanity is extremely difficult.

It will be found convenient to group together those affections of the mind which appear results of dyspepsia. There is, of course, a wide range between the most marked hypochondriacism, or virtual monomania, and mere depression of spirits; between the most active self-torment on account of an imaginary ill, or grossly distorted real annoyance, and the most passive melancholy, the merest "tedium vitæ," incapable of explanation or definition.

Let us hear Dr. Cullen's graphic description of the hypochondriac. He says:—

"In certain persons there is a state of mind distinguished by a concurrence of the following circumstances. A languor, a listlessness, or want of resolution and activity with respect to all undertakings; a disposition to seriousness, sadness, and timidity as to all future events, an apprehension of the worst or most unhappy state of them; and therefore, often upon slight grounds, an apprehension of great evil. Such persons are particularly attentive to the state of their own health, to every the smallest change of feeling in their bodies; and

from any unusual feeling, perhaps of the slightest kind, they apprehend great danger, and even death itself. In respect to all these feelings and apprehensions, there is commonly the most obstinate belief and persuasion."

Hypochondriacism is stated by some authors to be a disease of middle and of advanced life, and as being apt to increase as life progresses. But many exceptions may be observed. Some old people tell us, that with advancing years they lost their dyspepsia and their melancholy together. And as I have before said, youth is more frequently oppressed by mental suffering than is generally supposed.

A feeling prevails that hypochondriacism is purely an imaginary disease, and that its painful impressions are under the control of the will. A certain amount of disgrace is therefore attached to the complaint, and the physician who would plainly tell his patient that he was hypochondriacal would in some instances incur the penalty of dismissal. Now, although the disease, like hysteria, is capable of being considerably checked by volition, both are true diseases, and in both cases the sufferers deserve every compassion.

One might fill volumes with the detail of sensations and the perverted ideas of hypochondriacal sufferers. Some believe themselves slighted by their friends and the world; extreme sensitiveness makes others voluntary exiles from both. This is a very common form of hypochondriacism; the most groundless suspicions are excited in the patient's mind, causing him to fancy himself the object of disagreeable criticism. From this state of suspicion there is an easy transition to excessive irritability of temper, which is the bane of many dyspeptics. General indecision of purpose, and a combination of irritability and irresolution, often mistaken for bashfulness, are usual: I have known instances in which patients declared their total inability to make up their minds on the most ordinary subjects. Fear of sudden death, or of death from some specific accident, makes others miserable. Lightning is the bugbear of many, and I know individuals to whom, from this cause, the most joyous part of the year is a period of trial and anxiety. Every "summer cloud" really "overcomes" them. No array of statistics to show the infrequency of deaths from lightning

will here avail. The sufferer listens and would gladly be comforted, but his morbid terrors are stronger than any reasoning that can be brought against them.*

The intrusion of unbidden thoughts is a common and very troublesome annoyance; too often indeed they cause indescribable misery to the patient. Sometimes they take a blasphemous form; at others they are morally wrong, and occasionally they are merely whimsical, although of no less real annoyance to the patient. In the case of a gentleman, related by Dr. J. Johnson, life was rendered miserable

* It cannot be doubted that the electric disturbance which precedes or accompanies a thunder-storm has a specific effect on some constitutions. Individuals assert that their sensations warn them of an approaching storm when external indications are altogether wanting, as when in bed at night. I allude above more particularly to those cases in which inordinate fear of thunder and lightning, like other groundless apprehensions, is a manifestation of deranged digestion.

I know a gentleman in whom fear of lightning is so strongly developed, that it makes him ill to mention the subject of electricity; and when a thunder-storm comes on, he is always affected with a copious evolution of gas and other evidences of stomach disturbance. A specific electric agency, as well as fear, appears to act in this case.

by the intrusion of a *certain number* upon the patient's thoughts.

Those cases are especially difficult to deal with in which true conceptions are either painfully exaggerated, or grossly distorted. This was exemplified in the following instance which occurred within my own experience.

The patient was a clergyman, a man of mature years, and, in most matters, of sound judgment. He had been long an invalid, and was plainly dyspeptic, although not aware of it, as his attention had been otherwise directed. He complained most of the constant domination of one thought. It concerned a matter of church discipline, not, as he was obliged to confess, of much real importance; yet the idea of suicide, as the only solution of it, was also constantly before his mind.

There is a phase of religious despondency the subjects of which are generally of the same sex that from a like cause are frequent victims of insanity. Dyspeptic religious melancholy is common amongst women of educated and sensitive minds; and it may be asked, why does not a truly consistent religious education check, rather than induce, this manifestation of

disease? Is it that the dark side of the picture is so much dwelt upon that the dread of retributive justice outweighs, or even effaces, all hopeful contemplations?

Hypochondriasis very frequently takes a form, which, for obvious reasons, comes more fully than any other to the knowledge of the physician. It is that in which the patient fancies himself the subject of some severe disease, or combination of diseases. All medical men are familiar with the difficulty of managing these cases. Active treatment is out of the question, and equally must the prudent practitioner avoid the risk of offending the patient by "making light of his complaints."

One difficulty is that the pain or other uneasiness is often really experienced, for I have already shown that dyspepsia is the source of morbid sensations in every region of the body. The nicest tact is necessary to reassure, without risking the confidence of, the patient. This relief of mind is the first step towards a cure, and time is gained for the employment of remedies against the fountain of his ailments.

It would be quite useless to attempt many

illustrations of a disease, the varieties of which are innumerable. I will, however, give one from the class last considered, and think all practical men will remember to have met such a case.

The patient is a tall, thin man, unmarried, and of middle age. Possessed of a cultivated mind, he expresses himself fluently and well both in conversation and in writing. This he has proved in former consultations and in letters, by graphic descriptions of his sufferings. He is an agreeable, and can be a most amusing, companion. No one from casually meeting him in society could suppose that he laboured under any secret grief or physical suffering. But the man is in reality most unhappy. When alone, his thoughts are constantly fixed on himself; he notices and mentally records all his sensations. At one time he fancies that he has disease of the heart, at another of the lungs, then of the liver or kidneys. Sometimes, in despair of being able to fix on any particular organ, he concludes they must be all in fault—that, in fact, he has a complication of the gravest disorders. Yet he has been assured by various eminent physicians

and surgeons that all the organs in question are sound. He reiterates his tale of woe with singular complacency, and puzzles sorely by asking questions in rapid succession. How do you account for this? and how do you account for that? follow every fresh statement. Still there is an air of mystery about the patient; he has evidently something else to say, regarding which he feels diffident. At length it comes out that, caught by a class of advertisements too well known to need description, he was lately induced to read a certain publication. From that hour his wretchedness has been greatly increased. With bitter remorse he now attributes all his ills to habits of indiscretion, not merely long abandoned, but that had been almost blotted from memory. He has become a perfect self-tormentor.

It now requires patience to listen to the entire story, while he repeats an account of his sensations and details his unhappy thoughts. He states that, before he met the publication in question, he was ignorant of the cause of his ailments, which is now too plain to him. In accordance as he supposes with his late views, he dwells, as a matter of especial import-

ance, on a sensation of heat and unpleasantness in the urethra. It seems as if something existed there which ought to come away; yet he passes over other symptoms until questioned. We find that he has occasional uneasiness of the stomach—that his tongue is foul and his mouth clammy in the morning. Sometimes he scarcely eats anything; at other times he eats heartily, but with little appetite. He is much troubled with constipation of the bowels, the fæces are generally very dark, and have an unnaturally offensive smell.

Sometimes, in a case like the present, the patient altogether refuses to take his digestive organs into account, and the chance of successful treatment is thereby greatly diminished.

CHAPTER VI.

HABITUAL DYSPEPSIA (*continued*).

In the preceding pages neither the list of symptoms nor varieties of dyspepsia have been exhausted; and some of those which are either of less frequent occurrence, or come less within my present scope, shall be next described.

That is a grave form of dyspepsia in which vomiting is a leading feature, and in which the vomited fluids contain the peculiar vegetable organisms Sarcinæ ventriculi. I have treated several cases of this sort, and all were complicated with organic disease of the stomach. Sarcinæ have been supposed to be always associated with enlargement of the stomach; but in one case which ended fatally I found the stomach to be unusually small.* Nothing peculiar has been determined regarding the fermentation which accompanies sarcinæ; nor

* Medical Times and Gazette, November 14, 1854.

does fermentation appear essential to their development. Torulæ cerevesiæ, the common yeast plants, are sometimes but not always associated with them. The vomiting in cases in which sarcinæ are found is generally remarkable; it occurs in gushes almost without strain or effort. The vomited matters are of a dark brown colour, and in a state of active fermentation, which continues for a considerable time after their ejection. These circumstances are generally sufficiently marked to indicate the existence of parasites, before it has been proved by the microscope.

We meet occasionally with the following singular kind of dyspepsia :—

Dry food produces little or no uneasiness, but taking even a moderate quantity of fluid is followed by distressing results. There is a fulness or feeling of oppression in the stomach, sometimes accompanied by pain; gas is evolved, and the mouth becomes hot and dry. A splashing sensation is felt in the stomach a long time afterwards on any quick movement, and especially when lying down. The same may be made appreciable to the observer by placing one hand on the patient over the cardiac extremity

of the stomach, while a few quick strokes are given on the corresponding part of his right side with the fingers of the other hand. It is almost needless to remark, that immediately after a patient had drunk freely, a splashing effect would be thus always experienced; but fluids are rapidly absorbed from the healthy stomach. The symptom in question, also, too often indicates serious disease; not long since I was consulted by a gentleman in whom it was very marked; he expressed surprise that liquids distressed him much more than solid food, and that a simple glass of water produced "wind" and other unpleasant symptoms. He died lately of organic disease of the stomach. We may frequently observe modifications of this kind of dyspepsia. Patients say that slop and soup diet does not agree with them nearly so well as a mutton chop or some equivalent solid. Liquid diet has been too indiscriminately recommended for dyspeptics by some authors.

There is an affection of the empty stomach, the subjects of which are usually persons exhausted by excessive mental exertion, or depressed by severe affliction. Agonising pain,

generally called a cramp, suddenly comes on; and marked epigastric tenderness, coldness of surface, failure of pulse and other indications of general collapse accompany it. The intermittent nature of the attacks is remarkable; during the intervals, which are of very uncertain length, the appetite and digestion in some cases appear unaffected. Delicate people often complain of "a sinking sensation" in the stomach when empty, accompanied by a feeling of general exhaustion. If, as usually happens, these symptoms come on during the night, complete sleeplessness ensues, and the feet become unnaturally cold. Much distressing wakefulness is due to this unsuspected cause; the sensation in question has no resemblance to hunger, and yet a biscuit and glass of sherry or a draught of porter will often cause sleep more promptly and beneficially than an opiate.

Another stomach sensation is experienced on the day succeeding an unaccustomed indulgence in wine or other stimulants, especially if various kinds have been taken: some describe it as a feeling of "rawness," others of heat; and soda water, on account of its cooling and sedative properties, is eagerly swallowed. There is no

appetite for food, and if taken in the usual quantity, dyspepsia is experienced. There can be no doubt, that in these cases the delicate gastric surface suffers direct injury. Dr. Beaumont's account of the appearance of Alexis St. Martin's stomach under such circumstances entirely confirms it. This sensibility to injury becomes lessened by repetition, and a false sense of security sometimes results; but the flabby, tremulous tongue, irritable stomach, and irregular bowels of habitual indulgence impend. Too often these symptoms usher in the *apepsia* of delirium tremens.

In pointing out the importance of intestinal digestion, I had occasion to remark, that our knowledge of the process was limited; and intestinal dyspepsia is consequently less understood than that which has its seat in the stomach. As compared with the stomach, the bowels are characterised by much greater sensibility; this is exactly what might be expected, since the one is a receptacle for crude substances, while the other is intended to receive them only after their conversion into a bland fluid. The passage of food imperfectly re-

duced by the stomach, over the intestinal mucous surface causes local as well as distal pain and other distress in adults, and from the same cause convulsions are not uncommon in children. The manner in which the bowels are surrounded by an intricate network of the sympathetic system of nerves, and their connexion with the nerves of common sensation, explain this. As, however, intestinal dyspepsia may be due to a defect in the digestive fluids proper to the small intestine, it must be considered independently of gastric dyspepsia. Some forms of stomach dyspepsia are more frequently associated with that of the intestines than others: that which I have described as foul dyspepsia is especially the cause of intestinal trouble and diarrhœa. The imperfectly digested semi-putrescent aliment frets the sensitive surface of the bowels, and a salutary diarrhœa is excited, just as, under similar circumstances, vomiting occurs in the case of the stomach. In that form of dyspepsia in which mental symptoms preponderate, the bowels certainly appear to be involved; obstinate constipation is a common

symptom, and also a very dark colour and an unnatural odour of the fæces.

The symptoms of intestinal dyspepsia are not always distinctly marked. One great source of confusion, of course, arises from its frequent complication with the stomach affection. The lower position in the abdomen to which the suffering is referred, is an indication not to be neglected. We have generally another clue in the time at which the symptoms occur; the intestinal distress begins when that of the stomach has subsided; that is, when the chyme is transmitted from the stomach into the intestines.

There are many reasons for concluding that disorders of the duodenum are capable of distinct recognition. One is, that the track of this part of the small intestine, beneath the cartilages of the ribs, on the right side, is frequently the seat of tenderness and pain. Many dyspeptics experience acute pain and rigors at the time when the contents of the stomach appear to be passing into the duodenum. Its sympathies are also remarkable; a common result of fatal burns being ulceration of its mucous surface. The so-called bilious headache, "blacks before the eyes," nausea,

and, in short, all the symptoms commonly known as biliousness appear to be, at least, as referrible to the duodenum as to the stomach.

A common symptom which I attribute to intestinal dyspepsia, is a burning sensation at the anus when fæces are being passed, sometimes compared to the effect of melted lead, or scalding water. It is a symptom of good omen, as general relief usually follows. One of the best examples of dyspepsia attributable to both stomach and bowels, is that accompanied by a peculiar kind of diarrhœa—the lientery of authors. Sometimes in this disease the aliment is passed almost unchanged from the bowels. Besides defects in the solvent fluids, an unnatural irritability of the alimentary tube, which causes the food to traverse it too quickly, is probably here concerned.

Acute pain is more characteristic of intestinal than of gastric dyspepsia; faintness, cold perspirations, and shivering are also more commonly present. The rumbling and twisting sensation in the region of the navel, described by patients, is distinctly referrible to the small intestines. These last symptoms are sometimes

accompanied by great but transient tenderness, which is generally relieved by pressure or by friction, and the absence of inflammation is also thus determined.

CHAPTER VII.

THE TREATMENT OF DYSPEPSIA BY GENERAL HYGIENIC AGENTS.

As the treatment of the different varieties of dyspepsia is in many respects so similar, placing them under different heads appears unnecessary; to mention special adaptations will be sufficient.

I have shown that accidental dyspepsia is more the expression of a temporary disturbance of functions from an unusual cause than a disease, and therefore its treatment need not detain us. The treatment of habitual dyspepsia is, however, of the highest moment, because we have to combat an unnatural susceptibility in the functions themselves.

Proper regimen and diet are, above all things, necessary; and yet it is so easy to incur the imputation of needless repetition, and of asserting self-evident truths, that I approach the subject with hesitation. But I should equally err in being too general, and must endeavour

concisely to lay down certain indispensable rules and particulars. I promise not to afflict my readers with the story of the famous Cornaro,* nor uselessly to occupy time in details which experience is teaching, or has already taught, every intelligent man.

Attention to diet is so essential that we must be despotic on this subject, as half measures rarely succeed. It is obvious that great judgment and due consideration are required in each individual case; and even when these have been fully exercised, the grand difficulty remains of having our advice strictly carried out. It is easier to have any amount of medicine swallowed, no matter how nauseous, than to insure perseverance in a course of diet. Not only are good preliminary reasons necessary, but the patient becomes discontented if the desired results do not immediately follow. But while full co-operation with the medical adviser is necessary, much must be left to the discretion of the patient, since even in health no general rules apply; for, as I have

* The noble Venetian's life and experience may be profitably read *in extenso*. But they have been quoted by writers on dyspepsia almost *usque ad nauseam*.

elsewhere said, the requisite quantity of food varies with the period of life, constitution, and habits of the individual, as well as with other conditions. In quantity is also involved quality, as a much smaller amount of one kind of food will satisfy the appetite than another.

When a sense of fulness and other uneasy sensations already described are only experienced after dinner, less should be eaten at that meal, and the deficiency made up at another time. The patient should take something substantial and nourishing at breakfast, such as a mutton chop; and if he dine late, something light for luncheon, as a biscuit with a glass of wine or bitter ale, if liked, and they are found to agree. The effect will be a more moderate dinner and a diminished stress upon the stomach, with accompanying good results. No single dietetic rule is of more importance than this, yet, simple as it appears, it is one not easy to enforce. Patients persist in saying, "I can never eat breakfast," and others are equally positive in the assertion, that if "they take luncheon they can eat no dinner;" the fact is, that the habit of eating largely at dinner has so grown upon them that they are virtually

supported by that meal, and have no appetite for substantial food at any other time. Let the quantity taken at dinner be resolutely diminished, and breakfast will soon be appreciated. It is certain that many dyspeptics digest with less difficulty the same quantity of meat taken at breakfast than at dinner. Not only is digestion better performed soon after the repose of the night, than when the nervous energies are more or less exhausted by mental and physical exertions during the day, but better gastric juice is provided for the digestion of dinner.

The waste of the fluids of the body during the night makes drinking at breakfast a necessity. But too large a proportion of tea or other accustomed beverage will either spoil the appetite for substantial food, or interfere with its digestion. Authorities differ as to whether it is proper to drink at dinner: it has been contended that to do so hinders digestion by diluting the gastric juice, while, on the other hand, Lehman states that its action is increased by dilution. A moderate quantity of liquid is not generally hurtful even to the dyspeptic.

Tea is best taken at the time when digestion of dinner is considerably advanced.

In the severer forms of dyspepsia, however, as when pain is experienced, an absolute diminution of the total amount of food is indispensable. Our practice must, of course, be regulated by the severity of the case; it will frequently be proper to advise the patient to diminish the quantity of his food by one-half, or even more. But the nicest discrimination is necessary: the point to be ascertained is how much food can be digested with comparative freedom from pain, yet to stop short of such privation as would induce debility; it must be always borne in mind that *too great* a diminution of food must, by impairing the blood, lead indirectly to increased dyspeptic mischief.

We must be mainly guided by the sensations of the invalid, on whom should be impressed the necessity of avoiding an amount of food previously found to cause suffering. It is true that in bad cases the most moderate quantity causes distress; in other cases, however, the patient is literally a self-tormentor. Sometimes nothing more is necessary to effect a cure than the correction of an alimentary vice—*sublatâ causâ tollitur effectus.* When the digestive organs are defective, it is absolutely necessary to

diminish the food to meet their limited powers. We live by what we digest, not by what we merely eat. An overplus of food is poison to the enfeebled stomach, because it prevents the digestion of even a moderate quantity.

When we have reason to suppose the small intestine the seat of dyspepsia, caution in diet is equally necessary. The stomach may remain unaffected, and the appetite unimpaired, and yet the intestines be unfitted to receive the chyme transmitted to them.

The distribution of meals is of the greatest importance. We know that the natural action of the human stomach is intermittent, and that the organ, when properly charged with aliment, should be allowed to dispose of its contents before any addition is made to them. The period of gastric digestion in health varies with the constitution of the individual as well as the nature of the food, but five or six hours may be taken as its average duration. Thus the usual interval between our meals which might appear arbitrary is founded on physiological principles.

When during waking hours the stomach is empty, hunger or a feeling of exhaustion its

substitute in the dyspeptic, soon ensues, and dictates the necessity of refreshment. Breakfast, therefore, should be taken by the invalid soon after rising.

Some physicians will have it, that every dyspeptic should dine early, but I am not of that opinion. The time of the principal meal has in this country a wide range, from one o'clock with the lower and a portion of the middle classes, to the aristocratic hours of seven or eight. There is an obvious adaptation in this: early dinners are adopted by those whose hours of rising from and retiring to rest are early; late dinners are associated with late rising, and are suitable for those by whom, for purposes of pleasure or business, night is turned into day. In the latter case, not only is the body better sustained by the recent accession of a meal, but the inconvenience arising from going to rest with a full stomach is not experienced.

I cannot, however, too strongly insist on the necessity of regularity in the hours of meals on the part of the invalid. The stomach should not be disappointed when it expects to be replenished. If disappointed, either from the action of its own secretions, or from a want of

sustainment in its muscular action, even a diminished amount of food will be taken without appetite, and will be sure to cause bad symptoms. All changes in the time of meals should be gradually made. In the case of the confirmed invalid, two o'clock in the afternoon is the best hour for dinner, supposing him to have breakfasted at nine in the morning. Breakfast and dinner should embrace the chief sustenance of the invalid; luncheon should be employed to allay, rather than to satisfy the appetite, and is to be omitted when dinner is taken early; in that case, however, a light supper at seven or eight o'clock, of arrow-root, sago, or other farinaceous substance, or else an egg and toast, or a biscuit and glass of wine, according as they are found to agree, will be required, but meat at this time is improper.

The properties of the various kinds of food are foreign to this work, except in so far as belongs to the prevention and treatment of dyspepsia. So varied is the diet of man that even this is a wide subject, and too much must not be attempted.

The diet generally suitable to the dyspeptic is that which combines most nutriment

with least bulk. In a state of health, and especially when much exercise is taken, a certain bulkiness of food is necessary; but in proportion to the degree of dyspepsia concentrated nutriment answers best, the object being to nourish the body without oppressing the digestive organs.

I shall now lay before the reader the results of Dr. Beaumont's well-known experiments on Alexis St. Martin: they possess great interest in themselves, and may be usefully compared with the results of individual experience.

TABLE SHOWING THE MEAN TIME OF DIGESTION OF THE DIFFERENT ARTICLES OF DIET.

Articles of diet.	Mode of preparation.	Time required for digestion.	
		h.	m.
Rice	Boiled	1	0
Sago	Ditto	1	45
Tapioca	Ditto	2	0
Barley	Ditto	2	0
Milk	Ditto	2	0
Ditto	Raw	2	15
Gelatine	Boiled	2	30
Pigs' feet, soused	Ditto	1	0
Tripe, ,,	Ditto	1	0
Brains	Ditto	1	45
Venison steak	Broiled	1	35
Spinal marrow	Boiled	2	40
Turkey, domestic	Roasted	2	30
Ditto, ,,	Boiled	2	25
Turkey, wild	Roasted	2	18
Goose	Ditto	2	30
Pig, sucking	Ditto	2	30
Liver, beef's, fresh	Broiled	2	0
Lamb, fresh	Ditto	2	30
Chicken, full grown	Fricassee	2	45
Eggs, fresh	Hard boiled	3	30
Ditto, ,,	Soft ditto	3	0
Ditto, ,,	Fried	3	30
Ditto, ,,	Roasted	2	15
Ditto, ,,	Raw	2	0
Ditto, whipped	Ditto	1	30
Custard	Baked	2	45
Codfish, cured, dry	Boiled	2	0
Trout, salmon, fresh	Ditto	1	30
Ditto, ditto	Fried	1	30
Bass, striped, fresh	Broiled	3	0

Articles of diet.	Mode of preparation.	Time required for digestion.	
		h.	m.
Flounder, fresh	Fried	3	30
Catfish ,, ...	Ditto	3	30
Salmon, salted	Boiled	4	0
Oysters, fresh	Raw	2	55
Ditto, ,, ...	Roasted	3	15
Ditto, ,, ...	Stewed	3	30
Beef, fresh, lean, rare.....	Roasted	3	0
Ditto, ,, dry	Ditto	3	30
Ditto, steak	Broiled	3	0
Ditto, with salt only	Boiled	2	45
Ditto, with mustard, &c. ..	Ditto	3	30
Ditto, fresh, lean.....	Fried	4	0
Ditto, old, hard, salted	Boiled	4	15
Pork steak	Broiled	3	15
Pork, fat and lean	Roasted	5	15
Ditto, recently salted	Boiled	4	30
Ditto, ,, ...	Fried	4	15
Ditto, ,, ...	Broiled	3	15
Ditto, ,, ...	Raw	3	0
Ditto, ,, ...	Stewed	3	0
Mutton, fresh	Roasted	3	15
Ditto, ,, ...	Broiled	3	0
Ditto, ,, ...	Boiled	3	0
Veal, fresh.....	Broiled	4	0
Ditto, ,, ...	Fried	4	30
Fowls, domestic	Boiled	4	0
Ditto, ,, ...	Roasted	4	0
Ducks, ,, ...	Ditto	4	0
Ducks, wild	Ditto	4	30
Suet, beef, fresh	Boiled	5	3
Suet, mutton.....	Ditto	4	30
Butter.....	Melted	3	30
Cheese, old, strong	Raw	3	30
Soup, beef, vegetables, bread	Boiled	4	0
Ditto, marrow bones	Ditto	4	15
Ditto, beans	Ditto	3	0
Ditto, barley.....	Ditto	1	30
Ditto, mutton	Ditto	3	30

Articles of diet.	Mode of preparation.	Time required for digestion.	
		h.	m.
Green corn and beans	Boiled	3	45
Chicken soup	Ditto	3	0
Oyster soup	Ditto	3	30
Hash, meat and vegetables..	Warmed	2	30
Sausage, fresh	Broiled	3	20
Heart, animal	Fried	4	0
Tendon	Boiled	5	30
Cartilage	Ditto	4	15
Aponeurosis	Ditto	3	0
Beans, pod.....	Ditto	2	30
Bread, wheaten, fresh	Baked	3	30
Ditto, corn	Ditto	3	15
Cake, ,, ...	Ditto	3	0
Ditto, sponge	Ditto	2	30
Dumpling, apple	Boiled	3	0
Apples, sour and hard.....	Raw	2	50
Ditto, ,, mellow	Ditto	2	0
Ditto, sweet, ,, ...	Ditto	1	30
Parsnips.....	Boiled	2	30
Carrot, orange	Ditto	3	15
Beet	Ditto	3	45
Turnips, flat	Ditto	3	30
Potatoes, Irish	Ditto	3	30
Ditto, ,, ...	Roasted	2	30
Ditto, ,, ...	Baked	2	30
Cabbage head	Raw	2	30
Ditto, with vinegar	Ditto	2	0
Ditto, ,, ...	Boiled	4	30

Unfortunately, Dr. Beaumont did not take into account various circumstances which influence the digestion of the same articles of food at different times; and it may be that St. Martin possesses idiosyncrasies as regards some articles,—thus, mutton is not foremost in the list of easily digested substances. But, notwithstanding some exceptions, the table generally bears out the results derived from common observation.

It may seem that the secrets of digestion have been laid bare, because by means of pepsin we can dissolve albuminous compounds out of the body; and, certainly, if a chemical action were alone concerned, we might tabulate the digestibility of different kinds of food from exact experiments. So limited and imperfect, however, is artificial digestion compared to what occurs in the living body, that even complete gastric digestion must be regarded as a result of the action of pepsin *plus* life. In short, there seems a special affinity between the individual living body and certain articles destined to repair it; why otherwise should mutton, which to most persons is one of the most digestible of viands, prove the least so in a few cases,—or, on

the other hand, should pork, which to the many is the most refractory animal food, prove in a few cases the very reverse?

In the following pages most of the common alimentary substances are arranged in groups. The first contains the articles most suitable for the dyspeptic, the second those only admissible in less severe cases, and the third may be considered a dietetic Index Expurgatorius, since few of the articles comprised should ever be taken by the invalid, while those to which an asterisk is attached should be regarded by him more in the light of poison than food. With the view of correctly indicating the general experience, I have adopted this classification, as most of the articles about which difference of opinion is likely to arise will be found holding a medium position:—

First Group.—Articles easy of Digestion.

Mutton, venison, hunted hare, sweetbread, chicken, young pigeon, partridge, pheasant, grouse, beef-tea, mutton broth, milk.

Whiting, turbot, haddock, flounder, sole.

Stale bread, rice, tapioca, sago, arrowroot.

Asparagus, seakale, French beans, cauliflower.

Baked apple, oranges, grapes, strawberries.

Toast water, black tea, claret, sherry.

Second Group.—Articles moderately easy of Digestion.

Beef, lamb, rabbit, turkey, duck, wild waterfowl in general, woodcock, snipe; soups in general, eggs, not hard boiled, butter.

Turtle, cod, pike, trout, raw oysters.

Potatoes, turnips, cabbage, spinach, artichoke, raw vegetables, especially lettuce; apples, peaches, apricots, pine-apple, gooseberries, currants, raspberries, mulberries; bread, and other farinaceous puddings; jelly, marmalade, rhubarb, and cooked fruits in general.

Cocoa, coffee, malt drinks, port wine.

Third Group.—Articles difficult of Digestion.

*Pork, *veal, goose, the liver, heart, kidney, and brains of animals, salt meat, sausage, *hashed or *stewed meats.

*Mackerel, eels, salmon, herring, sprat, skate, halibut, salted fish in general, lobster, crab, prawns, shrimps, cray fish, *mussels, cockles, scallops, and oysters cooked.

Oil, melted butter, hard boiled eggs, cheese;

new bread, muffins, and buttered toast; *pastry in general, *suet puddings, pancake, custards.

*Nuts of all kinds, pears, plums, cherries, dried fruits; *cucumber, beetroot, Jerusalem artichoke, onion, carrot, parsnip, peas, beans, mushrooms, pickles.

Chocolate, champagne, liqueurs.

Certain things connected with diet may be appropriately introduced here, although some of them are commonly known :—

The flesh of young animals is less easily digested than that of full-grown animals.

The flesh of wild animals is more digestible than that of domestic animals.

The flesh of animals killed by hunting is more digestible than that of such as have been shot.

Land birds are more digestible than water-fowl.

The dark parts of the flesh of certain birds are more digestible than the white.

The visceral parts of animals, as liver, heart, tongue, kidneys, are very indigestible, but the sweetbread is the reverse.

White-fleshed fish are more digestible than the red fleshed.

Fish containing much oil, as the eel, mackerel, &c., are difficult of digestion, as are shellfish in general.

Fat is in general obnoxious to the dyspeptic; but while the lean of meat is rendered less digestible by salting, the reverse is true of the fat: hence the fat of bacon broiled is not only easy of digestion, but has obtained a reputation in the treatment of dyspepsia.

Olive oil is usually difficult of digestion; whereas cod-liver oil, and perhaps other raw animal oils, are the reverse. Oily fish is very injurious, on account of the empyreuma and other changes effected in the oil by cooking. For the same reasons, melted butter, and especially butter used in frying, is much more objectionable than uncooked butter.

Man has been defined as a "cooking animal," and certainly in the present state of society his good digestion greatly depends on culinary art. A good cook is, therefore, invaluable to the dyspeptic. Before cooking meat sufficient time should always elapse, as its tenderness is thereby greatly increased; but high meat or game should be scrupulously avoided. Of the ordinary modes of cookery, broiling is best,

roasting next, while frying and baking are the worst.

Hashes, stews, and rich made dishes are especially productive of foul dyspepsia. In this affection simplicity of diet should be especially studied. Vegetable is generally less easy of digestion than animal food; many vegetables, as peas, beans, cabbage, are very productive of gas, owing to their tendency to ferment—a circumstance taken advantage of by the Germans in the preparation of sauer-kraut. Although salads are seldom admissible in dyspepsia, raw vegetables are not so indigestible as is generally supposed,—they are frequently blamed for what is really the effect of the oil used with them. The patient should carefully avoid swallowing the skin, core, and kernels of all fruit. There is one fruit, indeed, which I must single out for condemnation, because it is commonly regarded as harmless. I have known dyspepsia greatly aggravated and even apparently induced by eating pears, which in their ripest state contain an abundance of gritty material which cannot be separated in the mouth.*

* See page 67.

In dyspepsia with acidity, vegetables, fruit, and even farinaceous food, are especially likely to disagree; and the two first should either be abstained from altogether, or very sparingly taken now and then in an experimental way. With farinaceous food the case is different. Bread in some form is an indispensable article of diet, and it is therefore important that it should be of the best quality, and adapted as much as possible to the invalid. Unfermented bread, which is now to be commonly had in London, certainly appears to agree better with some dyspeptics than the ordinary kind; but, on the contrary, others find it heavy and disagreeable. The bread taken by the invalid should always be two days old, and toasting diminishes its liability to become sour in the stomach.

In bad cases of acidity, great advantage will be gained by substituting simple flour biscuit for bread.

If there is one thing which disagrees more than any other with all dyspeptics, it is pastry —with which may be classed sweetmeats of all kinds.

Sugar should be used sparingly in all forms

of dyspepsia, but in that attended with acidity it should be abstained from altogether.

In painful dyspepsia farinaceous substances are usually our main dependence. Preparations of arrow-root or sago, &c., may sometimes be taken without inconvenience, when the smallest portion of meat would be the cause of dire suffering.

Although there are remarkable exceptions, broths, and fluid nourishment in general, are adapted to a large proportion of severe cases. As milk contains all the materials of the body, it is one of the best forms of liquid diet; but unfortunately it frequently disagrees with the delicate stomach. Good black tea, not too strong, with little milk or sugar, is generally unobjectionable. Coffee is more apt to produce acidity, and the same observation may be made of cocoa. Chocolate is inadmissible, on account of the quantity of vegetable oil which it contains.

Except in painful digestion, hot spices and condiments in moderation are not generally objectionable. Mustard and pepper are useful in slow digestion: hence Cayenne pepper has long been an ingredient in dinner pills.

Vinegar aids the digestion of many substances, and I have been told by patients that they found it a good preventive of "biliousness." Salt is the natural relish, being indispensable to health.

In a large proportion of cases, water alone should be the habitual drink; its quality is therefore of great importance. The digestive organs of some persons are so susceptible of the impurities of this element, that they feel unwell if circumstances oblige them to drink water to which they are unaccustomed. Various earthy salts, especially sulphate of lime, are common impurities. There is considerable difference of opinion as to whether wine or other stimulants should be taken in dyspepsia, which I think has arisen from not sufficiently discriminating the various forms of the disease. The following is the sum of my own experience in this particular. A glass or two of good sherry is generally useful in simple slow digestion. The contractions of the stomach are encouraged by the stimulant, while any tendency to fermentation is checked.

In digestion with acidity, weak brandy and

water is frequently appropriate, but it sometimes adds to the symptom in question.

In painful digestion stimulants are generally injurious, and in many cases a single glass of wine will severely aggravate an attack, but claret is least objectionable. For the painful affections of the empty stomach stimulants are useful, and the patient has recourse to them intuitively.

In foul digestion stimulants are more likely to do harm than good, and especial care should be taken not to mix different kinds in the stomach.

In dyspepsia in which mental symptoms predominate, there should be a fair allowance of generous wine. The nervous energy and circulation of the patient are usually below par, and they, as well as the stomach, require stimulation. Good port sometimes agrees well, but there are many with whom it is quite the reverse, and in some cases a glass taken immediately before or with food completely disturbs digestion. Effervescing wines generally disturb the weak stomach, as they give rise to fermentation, owing to the process being in themselves incomplete.

I may remark of spirits that brandy has astringent properties, so that many complain that it makes their skin hot and dry. Whisky has the contrary tendency, and frequently acts as a diaphoretic; while gin is decidedly diuretic.

Malt drinks combine nutritive with stimulating properties, and are particularly useful in sustaining the strength between breakfast and a late dinner. A glass of good ale or porter, with a biscuit, often act as a substitute for substantial food, when the object is to avoid overloading the stomach. Care should, however, be taken that the satisfying qualities of malt drink are not injudiciously allowed to take the place of stronger nourishment.*

In all dyspeptic cases much benefit is derived from attention to the state of the skin, and the frequent use of the tepid bath, while at the same time a hard brush and soap are applied to free the choked-up pores, is very salutary.

There is no remedy more valuable in the treatment of dyspepsia than the cold bath, and

* General experience shows that the malt drinks best adapted to the delicate stomach are, of the lighter kinds, the bitter ales of Allsopp and Bass, and of the heavier, the so-called XX of Guinness.

yet it is difficult to explain its immediate action, except by a sympathy existing between the skin and mucous membrane. Most people are familiar with the quick increase of appetite after a sea bath; and the dyspeptic patient, long a stranger to the sensation of hunger, will sometimes not only experience it after a cold bath, but will digest without difficulty what at another time would have caused distress. It must never be forgotten, however, that the success of all bathing depends on the completeness of the subsequent reaction. If the patient feels cold and uncomfortable after bathing, harm, and not good, has been done; the matter, therefore, requires the medical attendant's close attention.

Sea-bathing is best adapted for those who are at least moderately robust, and can endure without chill a limited exposure to the open air. The effect of the wind during transit into and out of the water is sometimes objectionable, and even the discomfort of dressing in a bathing machine, by preventing or delaying salutary reaction, may be injurious. Another question is the time at which the sea bath should be taken. A common impression prevails that all bathing is best done before breakfast. Those

who are sufficiently robust may bathe and subsequently enjoy breakfast, but for those less strong I am decidedly opposed to the plan. As a rule, the best time for the sea bath of the dyspeptic is about noon, when the stomach is sufficiently empty, and the action of the sun has cleared away all sea mists. The bath should never be prolonged, and exercise should be immediately taken to encourage the glow of heat and pleasurable sensations characteristic of complete reaction.

When the patient is weakly, bathing in the house is preferable, and it has the advantage of being available in every locality and season. Immersion of the whole body, the shower and sponge baths, may be regarded as degrees suitable in different cases. Total immersion in water at the temperature of the air, or lower in summer, ranks next to sea-bathing; next follows the shower bath, and for those too delicate for either, the sponge bath is the substitute. In using the shower bath it is often useful to protect the head from the shock; and it must be remembered that, in addition to the action of cold, there is in this a stimulating effect unsuitable to some constitutions.

In all cases of bathing in the house, if exercise cannot be taken soon afterwards, brisk rubbing with coarse towels should be practised for some minutes. When the weather is damp or cold, this rubbing, as well as dressing, should be done in a well-warmed room.

Exercise and good digestion are inseparable, because changes in the blood are promoted by the former, which without it are sluggish; and the digestive secretions are in consequence less perfect. Moreover, the due performance of those silent and unfelt motions of the alimentary tube, so essential to the solution and propulsion of the aliment, are greatly dependent on exercise of the voluntary muscles. I have frequently proved by experiment, that if a person lie extended on his back his pulse will be quickened by the elevation of a single limb. This may be due to an action on the heart through the circulation, but it shows the connexion between the voluntary and involuntary muscular systems, and affords some support to the idea that the contractile motions of the stomach and intestines are as easily influenced by bodily exercise.

It is a matter of ordinary observation that

men who labour, eat more largely than those who do not. And we are individually conscious of the increase of appetite which a single day's exercise induces when it has been preceded by a period of sedentary occupation. By exercise, then, waste and repair are notably promoted, and an active condition of both is necessary for health. Out-door exercise is incomparably best, and the invalid should remain in the open air at least two hours daily. The weather must not be allowed to interfere too much with this rule, but be met by appropriate clothing. There is far more danger to be feared for the dyspeptic in sedentary habits, than in a little increase of damp or cold, when properly encountered. A broad belt of flannel should be worn round the abdomen if the bowels are susceptible. The kind of exercise must be adapted to the character and intensity of the case, but should always stop short of fatigue. In severe cases passive exercise in a boat or open carriage is best, but for those who are stronger, walking at a sufficiently quick rate to produce a glow of heat is highly beneficial. I have satisfied myself by numerous instances, that riding on horseback is the exercise most generally useful

for the dyspeptic. There is much benefit in the rapid change of air,—in the abstraction of mind, owing to the unconscious attention bestowed on the horse, and the sense of easy, independent action which horse exercise gives. But I think the benefit is still more due to the particular effect on the chylopoietic viscera. Their peristaltic movements are stimulated, and the abdominal muscles made to act on them in a continuous and peculiar manner.

Those who are sufficiently robust will be greatly benefited by athletic exercises, as rowing, cricketing, and field sports in general.

Ought dyspeptics to exercise before breakfast? Experience leads me to say, No; although, as in the case of bathing, a contrary opinion is not uncommon. What has been termed the hardening system has its advantages, but if indiscriminately employed, proves very injurious.

People of robust habit may increase appetite and digestion by out-door exercise before breakfast; but from the same cause less vigorous persons generally lose their relish for food, and experience discomfort if they persist in swallowing the usual amount.

When the weather entirely forbids going out

there are many exercises which can be beneficially used in-doors. Walking up and down a large room is sufficient for some, while fencing, dumb-bells, &c., may be resorted to by another class of invalids. Persons of sedentary habits should avoid stooping, and any pressure against the stomach is very objectionable. In the occupations of the office, standing at a desk of sufficient height to prevent stooping, should alternate with sitting.

The beneficial effects of change of air are so universally felt that little need be said to recommend it. There appears to be some subtle influence connected with the change quite independent of mere climate; but much is also attributable to mental causes. I have already sufficiently insisted on the close relation between the stomach and the brain; and in bad cases the importance will, therefore, be admitted of giving perfect rest to the brain, and, if possible, changing the whole current of thought. This can be most successfully done by change of place and outward association. There is something in travelling calculated to take a man out of himself, and to lessen his self-consciousness; for although a few individuals carry

everywhere with them their own moral and social atmosphere—live in their own narrow circle of thought and feeling, no matter what the climate or associations may be—these instances are happily rare.

For the reasons assigned, travelling is especially desirable for the hypochondriac.

In a change of residence climate should be a chief consideration. According to my expeperience, most cases of dyspepsia are benefited by a cool and bracing atmosphere. I speak now of the uncomplicated disease, for where the lungs are concerned, we must generally give these organs paramount thought, and a more moist, and warmer atmosphere may be desirable. If gastritis is present that must claim precedence; the latter kind of climate will be suitable, and so in other cases. But there are many reasons why in dyspepsia cold is generally preferable to heat. Appetite is greatly influenced by temperature, cold being more conducive to it than heat, while exercise, so necessary for the dyspeptic, can be taken with greater ease in cold than in warm weather.

I have already spoken of the beneficial effects of the sea bath, and have now to speak of resi-

dence by the sea-side. It is no doubt a true instinct which causes so many thousands to rush thither in autumn, and so many more thousands vainly to wish to go. Sea air is in itself most invigorating, and perhaps the ceaseless changes and regular flow of the ocean, joined to the many objects of interest for young and old, learned and unlearned, which the sea-side affords, contribute much to its healthy influence. The inhabitant of a city is there less likely to be oppressed by the monotony of the country, so often complained of as counteracting the good effects of pure air and quiet.

The evil effects of an impure atmosphere having been dwelt upon, it is only necessary here to mention the necessity of good ventilation, especially where gas is used. Bed-rooms, where so much of life is passed, should be as large and lofty as possible, and always have free communication with the outer air.

Two habits, smoking and taking snuff, when carried to excess, are productive of dyspepsia, and require to be moderated, if not abandoned, to ensure successful treatment. Snuff-takers are particularly liable to be affected, the constant irritation of the nasal passages

appearing to become injuriously extended to the stomach.

I have now to speak of the mental treatment of dyspepsia, and of the moral consolations which, in many cases, are powerful aids to recovery. But I have already pointed out that great individual differences exist, and that with one class of patients moral interference is altogether unnecessary.

The task of consoling hypochondriacal sufferers is usually very difficult,* and always requires nice discrimination. The judicious physician may effect much by assuring the patient of the groundlessness of his fears, or of the over-severity with which he has judged himself, and his mind may be relieved of imaginary terrors, or frightful anticipations. It is true, however, that mental relapses are frequent, that what is believed one hour is questioned the next, and again altogether doubted. But even the temporary remission gives tone, and a facility of

* The difficulty of giving mental solace is finely expressed in the following passage:—

"Words are words. I never yet did hear
That the bruised heart was pierced through the ear."

Othello, Act I. Sc. 3.

resuming a healthy train of thought is acquired by repeated efforts. In this way the advice of the physician is valuable. He should encourage his patient to speak freely, to unburthen his secret grief, and then judgment and discretion must be used in applying the remedy. To treat any statements, however startling or improbable, with levity is seldom judicious. Few, if any, can be laughed out of their fancies, and a passing smile of incredulity will, in many cases, lose for ever the confidence of the patient. Without pitying, we must sympathise: to sensitive minds the pity of a stranger is generally repulsive; and there are minds so constituted that it is intolerable even from their nearest friends. He must feel with the patient and for him, but the demonstration must be one of manner rather than of words. In approaching the subject of his diseased fancies, we may often find it necessary to expose their fallacies, but we must do this delicately, and with the assurance that his delusions form part of his disease, and therefore deserve full consideration. Above all, we must not only avoid exaggeration, but what may seem to the patient in any way to resemble it. Nor must we good-naturedly

promise too much, nor too speedy results from treatment. We must ever remember that the mind of the hypochondriac, though it may be weak and warped in certain directions, generally preserves its full force and clearness in others. The patient is generally more suspicious than when in health, and yet as capable of detecting imposition as ever. Trust is the growth of truth, and trust in the medical attendant, which is always essential, is here indispensable.

CHAPTER VIII.

THE TREATMENT OF DYSPEPSIA BY MEDICINES.

In placing medicines after general hygienic agents, their true place in the treatment of dyspepsia has been assigned them. But no diseases are more capable of receiving benefit from medicinal agents than the functional disorders of the stomach. A rational explanation can be offered of this. While in almost every other instance the organ is merely a medium of transmission, in the present instance our remedies come directly into contact with the affected part. The action of medicines on the stomach may, in this respect, be compared with the effects of external remedies on diseases of the skin, the difference being in favour of the more impressible gastric mucous membrane.

The patient should, however, be always instructed what is really to be expected from

medicines. He should be assured that their efficacy consists rather in rectifying morbid conditions, than in preventing their recurrence. That recurrence can only be averted by attention to dietetic and hygienic rules, which no medicines can supersede.

We possess in alkalies a class of medicines which act in the body precisely as they do out of it. In the stomach, or elsewhere, a given quantity of acid is saturated by a proportionate quantity of alkali; from alkalies great advantages are therefore to be derived. But of all our remedies none are more transient in their effects; and we must generally regard antacids in a palliative rather than a curative light.

Sometimes alkalies appear to fail in even temporarily correcting acidity in the stomach. It is, however, to be borne in mind, that acid may be so greatly in excess, as to be little affected by ordinary doses of alkaline remedies. Probably, too, the reproduction of acid is so rapid that any good effect is almost immediately lost. Considerable judgment is required in the recommendation of alkalies, for in many cases their repetition appears only to produce an increased amount of acidity. In others, the tem-

porary relief afforded is so much valued by the patient, that alkalies become a daily want, perhaps resorted to after every meal, and their long-continued use sometimes proves very injurious. A condition of the blood analagous to that induced by scurvy results, and in this indirect way digestion, instead of being improved, may be seriously injured.

Alkalies are particularly useful in dyspepsia with undue acidity, when there is a deposition of lithic acid, or lithates, in the urine. But in the other form of the same disorder mineral acids often succeed better. By improving the condition of the stomach they act indirectly as antacids, and if slower in effect, have the advantage of being far more permanent.

The doses of alkaline medicines should be carefully regulated by observation of their effects in checking acidity; so much only should be given as from the sensations of the patient appears to be sufficient,—any excess being in itself injurious. Here the remark holds especially good, that it is sometimes more difficult not to pass the goal than to reach it. Dr. Prout has pointed out that the best time for administering alkalies is three or four hours after

a meal, or when the food, already or almost digested, is about to pass into an unnaturally acid condition. Experience proves this view correct. Alkalies taken immediately after a meal, more or less interfere with digestion, by neutralising the acid of the gastric juice.

The urine should be examined from time to time during a course of alkaline treatment, and it should be a rule of practice to suspend it should phosphates make their appearance. In a few instances alkalies are inadmissible, owing to the nervous excitement which they induce.

In the use of alkalies certain differences are observable. Soda is less disagreeable to the taste than potash, and I concur in the observations of Dr. Budd, that soda is especially useful when the tongue is furred or coated. According to the same authority, soda exercises a special action on the liver, by increasing the secretion of bile. It is certain that soda has less action on the kidneys than potash. The carbonates of soda may be given in the form of lozenges as well as in solution.

As far as the stomach is concerned, potash is very similar in its effects to soda ; but potash is superior when lithic deposits prevail in the

urine. Bicarbonate of potash is to be preferred to the solution of potash, or to that somewhat weaker preparation known as Brandish's alkaline solution. The caustic properties of potash are so energetic, that the delicate epithelial surface of the stomach is exposed to injury should it happen to be insufficiently protected by mucus, or unless enough acid is present to neutralise the alkali. This statement is not made from theory alone, as I have met cases in which the stomach was injured by liquor potassæ taken in large doses.

Magnesia is devoid of caustic or irritant qualities, and is almost tasteless. When in conjunction with acidity there is much irritability of stomach, it will therefore be found preferable to either soda or potash. Its laxative properties are also often advantageous, and its action on the urine is scarcely inferior to that of potash. Magnesia also possesses sedative properties; it is an efficient remedy in gastrodynia, and is often valuable in combination with bismuth, in cases of dyspepsia with epigastric tenderness. Inconvenience has occasionally arisen from the concretion in the large intestine of magnesia taken continuously in large

doses. A solution of magnesia in water impregnated with carbonic acid, is a valuable preparation. No remedy is more effectual for headache and nausea arising from errors of diet, and it is also a useful laxative in the treatment of dyspepsia with foul eructations.

Lime-water is a good remedy in cases of severe dyspepsia attended with nausea and vomiting, when solid food can hardly be taken. A mixture of lime-water, with an equal proportion of milk, will frequently be retained by the stomach, when milk itself would be rejected. Lime possesses astringent and desiccant properties, and the solution is useful in the treatment of pyrosis with acidity.

Besides being alkaline, the stimulant qualities of ammonia make it an excellent and speedy remedy in spasmodic affections of the stomach; the spiritus ammoniæ aromaticus is one of its most useful preparations. Sufficient dilution of such pungent remedies is especially necessary.

Various acids are of great service in dyspepsia. I have already pointed out that in certain cases, where acidity itself is a characteristic, the best remedies are diluted mineral

acids. They are frequently highly useful in slow digestion, especially when the tongue is pale and flabby.

As hydrochloric acid is a constituent of gastric juice, it might be inferred on theoretical grounds that it would prove the most useful acid, and practically it does appear to be the best. But the nitric, either alone or in combination with hydrochloric acid, is also efficient, and the nitro-hydrochloric is by many supposed to exercise a special influence in chronic disorders of the liver. A deposition in the urine of uric acid, or any considerable quantity of urates, should be sufficient reason for a discontinuance of acid treatment, and in the gouty habit it is generally inadmissible. The gastric juice usually contains lactic acid, and the latter has been greatly praised in the treatment of dyspepsia; but I have not discovered any advantage in the lactic over other acids. We may sometimes observe a fondness in the dyspeptic for lemons, vinegar, &c., and they tell us they take them to assist digestion.

It must be remembered that all acids, and particularly the mineral, are very injurious to

the teeth.* Patients get tired of taking medicines through a tube, but the mouth should be invariably well rinsed after acids, and it is a good precaution to order a weak alkaline solution to be used for this purpose.

It is a problem as yet unsolved, why many vegetable substances containing a bitter principle exercise, by virtue of it, certain actions in the system.

All these substances appear to be more or less febrifuge, and for this purpose one at least, cinchona bark, has long been regarded a specific. But what concerns us at present is, that bitters are not only useful in dyspepsia by invigorating the entire system, but they act locally on the digestive tube. So generally known is this, that the use of bitters in some countries, as France and Holland, must be regarded as dietetic rather than medicinal. It would seem that some want of the system is supplied by indulgence in bitter-flavoured drinks. The almost universal taste

* I have proved by experiment that the enamel of a tooth placed for a few hours in a mineral acid mixture of ordinary strength, becomes so softened that it may be easily cut by a knife.

for beverages containing hops or like substances can hardly be explained otherwise. It is curious, too, that bitter principles exist in various grasses and other vegetables which form the support of herbivorous animals. And it has been proved experimentally, that they will not thrive if these principles are wanting in their food. Although the bile contains a principle of extreme bitterness, it affords no clue to the medicinal action of bitters. Animals, as I have elsewhere said, whose bile is directed outwards through fistulous openings, may continue to live; and the appetite, although increase of this is attributable to the use of bitters, instead of being impaired, is usually voracious. Again, the composition of bitter substances is extremely variable; some like that of the bile containing nitrogen, as quinine, while the great majority of vegetable bitter principles contain none. On the whole, it does not appear that we possess any facts which enable us even to speculate on the subject.

Bitters are useful in most cases of dyspepsia, in which the stomach partakes in a general debility of the system. They are well adapted for the phlegmatic, and for persons of languid

circulation, not so much so for the plethoric, and those of the inflammatory tendency. But considerable differences are traceable in the nature and adaptations of this class of medicines.

In simple slowness of digestion bitters are frequently very useful. In painful digestion, when the pain has been alleviated or removed by other means, they are generally advantageous. In acid dyspepsia, accompanied by debility, they are useful in combination with alkalies or mineral acids. But in the acid dyspepsia so frequently connected with latent gout, and in which there is a feverish tendency, bitters are often hurtful. In the intervals between the attacks of foul dyspepsia bitters are available. It will often be advantageous to change the bitter tonic, and it is therefore well to bear in memory the properties of several.

Calumba, from its sedative properties, and from its not astringing, owing to the absence of tannic acid from its composition, is a valuable remedy, being sometimes admissible when other bitters would be injurious, as when nausea or even vomiting are present. In such cases

infusion of calumba may be advantageously prescribed in the effervescing form.

Cascarilla resembles calumba in being hardly astringent, but it is more stimulating and aromatic. It is usually well borne by the delicate stomach, and may therefore be alternated with calumba.

Quassia is a simple bitter, unstimulating and non-astringent, and, therefore, like calumba, suitable for combination with preparations of iron.

Gentian, although in general use, is certainly inapplicable in many cases, as it is apt to irritate the gastro-intestinal surface, and sometimes to purge. It also excites the circulation, astringes the skin, and occasionally seems to affect the brain. But gentian may be employed with good effect in mild cases, chiefly marked by want of appetite and constipation of the bowels ; it is best adapted for persons of sluggish circulation and of phlegmatic habit. Gentian is the bitter of the Swiss mountaineers, and they also prepare from it a spirit.

Allied to gentian is chiretta, the bitter used by the natives of India. It is said to be useful in gouty dyspepsia, and to diminish acidity. Its

effect upon the bowels is relaxing rather than astringent.

In some parts of the country the leaves of marsh trefoil, or buck-bean, *menyanthes trifoliata*, are popularly used for dyspepsia; and in Germany, they are employed as a substitute for hops, in brewing. The plant contains much bitter extractive, and is somewhat astringent: it is deserving of more notice than is at present bestowed on it.

The rind of the Seville orange forms an agreeable addition to bitter infusions; but, besides a bitter principle, it contains too much of a pungent essential oil to be employed by itself.

Chamomile flowers contain bitter and aromatic principles, which are useful in strengthening the stomach; and an infusion of the flowers is a domestic remedy for the purpose. There is a variety of chamomile in the Levant which makes a much more agreeable infusion than that found in this country.

All the foregoing medicines are best given as fresh infusions; and, as a general rule, bitters are most advantageously taken a short time before meals.

Taraxacum is a medicine about which there is much difference of opinion, some praising while others repudiate it. Something may be placed to the account of the variable nature of its extract, the form in which it is administered. It certainly improves digestion in some cases; while, on the other hand, it is at times positively injurious to the stomach and bowels. It is diuretic, but acts with no certainty, and it is very questionable whether taraxacum possesses any action on the liver, although its reputation is greatest against disorders of this organ.

Quinine is useful in various forms of dyspepsia; but it generally does harm when, from the state of the tongue, we have reason to think the gastro-intestinal surface irritable. Even when digestion is healthy, there is, in some instances, an intolerance of this valuable tonic—nausea, pain of the stomach and bowels with diarrhœa, result from its use.

Strychnia acts not only as a bitter, but possesses other valuable properties in dyspepsia.

It need hardly be urged that this energetic drug requires to be cautiously administered, but

its effects will amply repay the care. Speaking from extensive experience, I know no single medicine of more value in this disease. Strychnia is particularly indicated in dyspepsia attended with nervous debility. In that numerous class of cases in which abnormal sensations in various parts of the body—as the throat, the head, or the limbs—are experienced, it will generally be found useful. It is the best tonic for the class in which mental symptoms predominate. But it also possesses excellent local effects, and acts by increasing the tone of the muscular coats of the stomach and intestines. When these coats are relaxed, gases are generated, mainly owing to retardation of the aliment in the cavities. No remedy has in my hands proved so permanently effectual as strychnia against this inconvenience. In the case of a gentleman who suffered most severely from sudden and almost daily accumulations of gas in the stomach and bowels, these attacks were attended by great mental oppression; often by fits of crying. The symptoms, in fact, resembled those of hysteria very closely. I mention the case particularly on account of its severity, and because the patient was cured by

strychnia; and some time has now elapsed without a return of the attacks.

Strychnia should always be given in solution for sake of its more effective diffusion in the stomach, and for sake of greater certainty in apportioning the dose. A proportion of some acid, as a drachm of dilute acetic acid to a grain of strychnia, should be prescribed with it, as the action of strychnia is greatly favoured by association with acids. The discrepant accounts given of it, in all probability depend on different degrees of acidity in the stomachs into which solid strychnia was introduced. As a bitter tonic, the fortieth part of a grain is a sufficient dose. When it is desired to insure specific action, the twentieth part of a grain may be given; but it will seldom be necessary to exceed this, as the good effects of strychnia on the gastro-intestinal muscular fibres are usually secured by a quantity that does not affect the voluntary muscles. A solution of strychnia of definite strength that will keep, which that made with acid will not do, is a desideratum in the forthcoming national pharmacopœia.*

* Ever since the notorious poisoning cases in which

A preparation of citrate of iron and strychnia has lately been introduced, but it has no claim to be regarded as a chemical compound. It is simply a useful mixture; but the variable proportions adopted by the makers, within my own knowledge, ranging from one part of citrate of strychnia in ninety parts, to one part in one hundred and fifty, is highly objectionable.

Cod-liver oil acts beneficially by repairing the effects of imperfect nutrition, and thus improving the general condition of the body. But it can hardly have escaped the notice of any one who has prescribed the oil extensively, that certain symptoms of dyspepsia are often directly removed by it. Many cases of painful digestion, some even attended by water-brash, may be cured or greatly relieved by the oil, and,

strychnia was employed, its effects have become universally known and dreaded, and this frequently causes a difficulty in ordering it. When patients see it in their prescriptions, sensations are sometimes complained of, which are really due to imagination. Thus a correspondent of the *Times* assured his readers that twitches all through his body were the invariable result of indulgence in a glass of bitter beer. A charge of containing strychnia—unfounded, as was afterwards proved—had been made against this popular beverage.

contrary to what might be supposed, it is an excellent remedy for heartburn.*

Occasionally, however, the oil is itself the cause of nausea, flavoured eructations, and epigastric pain. Olein, freshly prepared from the oil, should then be substituted. It seldom fails in obviating the inconveniences mentioned; and the active principles of the oil, as the iodine, bromine, &c., adhere to the olein in its separation from the margarin.†

Some preparations of iron are valuable remedies in slow digestion occurring in persons of nervous and lymphatic habits, and in the dyspepsia dependent on anæmia. They improve the digestive secretions by improving the blood. The preparations most easily borne by the stomach, and least likely to constipate the bowels, are the ammonio-citrate, the ammonio-tartrate, and the lactate of iron. The pernitrate and the persulphate of iron and ammonia, or iron alum, on account of their astringent qualities, will be found useful in atonic pyrosis.

* For an explanation of its action see Appendix B.

† See my paper in *Medical Times and Gazette*, July 21st, 1855. Also Dr. Garrod, on cod-liver oil in *British and Foreign Medico-Chirurgical Review* for January, 1856.

Several substances possess the power of exciting the action of the stomach; and from this the almost universal use of pepper, mustard, and other stimulating condiments, with certain articles of food, has doubtless arisen. Some persons, indeed, tell us that cayenne pepper is necessary to enable them to digest with ease almost any kind of food.

In cases of slow digestion, ipecacuanha is often very useful, if taken shortly before the principal meals. Dr. Budd supposes that it acts by increasing the secretion of gastric juice; but it appears to me as probable that it benefits by increasing the movements of the stomach. The dose of ipecacuanha must be regulated by experience: a quarter of a grain will spoil the appetite and cause nausea in some persons, while one or two grains may be advantageously taken by others.

Rhubarb in small doses appears to have similar effects to ipecacuanha, but inferior in degree. The root of rhubarb, like that of ginger, is not uncommonly carried in the pocket by dyspeptics, and advantage is said to be derived from chewing fragments of it.

In an old formula for dinner-pills, aloes and

mastic are chief ingredients. The use of the mastic is said by Pereira to be "to divide the particles of the aloes." But in the Levant, spirit in which mastic has been dissolved is much valued, and is generally taken immediately before dinner, in the belief that it promotes appetite and digestion. Remedies which quicken the action of the sluggish stomach are useful in the treatment of nettle-rash.

Various essential oils and aromatic tinctures are in popular use as stomach remedies. They are chiefly employed in flatulence, and cause expulsion of gas by the contractions which they induce. Brandy, sulphuric ether, and ammonia are used with the same intention, and with equal benefit.

A medicine alleged to have the power of assisting digestion in a very direct manner has been lately introduced. It is a substance obtained from the stomachs of ruminants, believed to be the agent by which albuminous compounds are reduced, and has been extensively used in this country and in France. After having given it a fair trial, I am obliged to decide against the so-called pepsin. If it were pos-

sible to collect gastric juice itself in considerable quantities, from living animals, I can, *cæteris paribus*, conceive that an efficient preparation might be obtained. But experience shows that this is not supplied by a preparation obtained from mere infusions of dead stomachs.*

Certain salts of bismuth, silver, and zinc, possess tonic and sedative actions on the stomach. They seem to blunt over-sensibility of its mucous membrane, and thus to render it more tolerant of contact with the food.

Nitrate, and the recently introduced sub-carbonate of bismuth, are almost specifics for pain after food and epigastric tenderness due to this hyper-sensibility. Under their use, the pain and tenderness disappear, the papillæ of the tip of the tongue become less red and elevated, and the appetite improves. When, however, subacute gastritis is the cause of the symptoms, bismuth will be injurious. After a fair trial, I give the preference to the sub-carbonate of bismuth; and as it is to some extent soluble in the acids of the stomach, it may be that its

* For further observations on this subject, see Appendix C.

advantages are due to this. When, however, we wish to combine astringent with sedative effects, as in water-brash, and in cases of intestinal dyspepsia with a tendency to diarrhœa, the nitrate is to be preferred. The tastelessness of these preparations is a great recommendation, as they may be easily swallowed without any disguise, and some patients will even take them sprinkled between thin slices of bread and butter; or they may be given suspended in mixture by the addition of compound powder of tragacanth. Bismuth frequently requires to be used in considerable doses, as fifteen to twenty grains, and to be continued for some time, to ensure the proper effect. It should be taken when the stomach is empty. Bitters, opiates, hydrocyanic acid, and alkalies, may occasionally be advantageously combined with it, but alkalies in solution decompose the nitrate of bismuth. Patients sometimes complain of faintness, with a sense of weight in the stomach, after taking bismuth in large doses. It is also apt to produce constipation, and it should be remembered that it blackens the stools.

Oxide of zinc in much smaller doses possesses properties analogous to the salts of bismuth,

After the continued use of the latter, oxide of zinc may be occasionally substituted with advantage.

From the good effects of nitrate of silver in diminishing undue sensibility of the skin, we might infer that it would prove useful in affections of the gastric mucous membrane. But the empty stomach is sheathed with tenacious mucus, and this, as well as gastric juice, contains elements which combine with the salt, and render its action much less energetic than when applied externally. Nitrate of silver is, however, useful in those cases of painful digestion in which, owing to the great irritability of the stomach, bismuth cannot be taken in sufficient doses. Chronic headaches, dependent on dyspepsia, are said to be benefited by a course of nitrate of silver. It should be given in pills, beginning with a dose of a quarter of a grain three times a-day before meals, and this should be gradually increased to two or three grains, when it will commonly be found to purge. It may be combined with hyoscyamus, opium, or a bitter extract, as circumstances indicate. No danger of blackening the skin may be apprehended from a course of this medicine continued for a month.

The oxide of silver has had strenuous advocates, but experience leads me to think it an inferior remedy. Its action would probably be similar to that of the preparations of bismuth, in doses approaching those of the latter. But, independent of the expense, the risk of affecting the skin renders such doses unsafe.

The compounds of mercury have been much employed in digestive disorders. It appears well ascertained, that these preparations increase the flow of bile; and when we have reason to suspect this to be deficient, mercury should be used. Thus increased size, with or without tenderness, or dull pain of the liver, indicates its employment. Another well-established liver symptom is pain in the right scapular region. The compound calomel pill of the Pharmacopœia is well adapted for liver disorders. Most practitioners will acknowledge the beneficial action of *hydrargyrum cum cretâ* in the cachectic dyspepsia of young children. In certain adult cases of painful digestion its effects are also excellent, and it may often be advantageously combined with rhubarb and soda.

The "blue pill" and "black draught" sanctioned by the great name of Abernethy, are still

in common use. I am well aware of the temporary good effects of this treatment, but observation has convinced me of its ultimate injurious tendencies. Some other remarks on this point will be made under the head of purgatives.

The most useful stomach sedatives are opiates, hydrocyanic acid, and chloroform.

The acetate and muriate of morphia, in doses of from the twelfth to the fourth of a grain, are of great service in painful digestion. But they may be given with advantage in larger doses against gastrodynia and neuralgic affections of the stomach. Sometimes it is intolerant of morphia, and then Battley's solution of opium may generally be substituted with success.

Opium in some form is the remedy for the looseness of bowels occurring after meals, which I have described. The indications are, to allay unnatural activity of the intestinal movements, and to break through the habit of too frequent evacuations; but the latter must be effected cautiously, and with due regard to other conditions of body. In the treatment of pyrosis, opium is highly useful.

Hydrocyanic acid is an efficient remedy in

the painful affections of the empty stomach. Two to four minims of the acid of the Pharmacopœia should be given, and a few doses will sometimes have the effect of long preventing the recurrence of an attack; occasionally, indeed, the cure is permanent. Hydrocyanic acid is also useful against nausea and chronic vomiting.

A solution of chloroform in rectified spirit, the so-called chloric ether, is an excellent stomachic sedative; it allays nausea and vomiting, and may be advantageously prescribed with ammonia when a combined stimulating and sedative action is desirable.

Carbonic acid, as evolved in effervescing draughts, is useful in nausea and vomiting, on account of its sedative properties, and also of the cold produced.

Astringents are not of general application in the treatment of dyspepsia; but in those aggravated cases in which water-brash is a prominent symptom, they are serviceable. Preparations of logwood and rhatany are commonly employed, but tannic acid in solution is the best astringent. I have previously spoken of the astringent effects of nitrate of bismuth,

lime water, and those of certain preparations of iron.

Substances like charcoal, hyposulphite of lime, &c., which interfere with putrefaction and ordinary fermentation, or else the development of vegetable parasites, are sometimes serviceable.

Wood charcoal, freshly prepared and finely pulverised, is a remedy which deserves more attention than it receives. In some parts of the country the scrapings of a burned stick are a popular remedy for flatulence. But charcoal is especially useful in dyspepsia with foul eructations: a circumstance due to its strong antiseptic properties. From its innocuous nature it may be taken in very large doses, but half a drachm will, in general, be sufficient. It may often be advantageously combined with bismuth, magnesia, &c.

Hyposulphite of lime was introduced by Dr. Jenner as a remedy in vomiting, associated with sarcinæ. The hyposulphite certainly destroys the vegetable organisms, and this is usually attended with relief to the patient. But, as I have before said, sarcinæ are almost invariably associated with organic disease of the stomach. I have elsewhere stated that, in

a single case in which it was tried, chloride of calcium was quite as efficacious against sarcinæ as the hyposulphite of lime. I had previously found it particularly suitable in dyspepsia with foul eructations of the less intermittent kind, such as is common in London dispensary practice: it may be given in doses of from half a drachm to a drachm of the pharmacopœial solution.*

Outward applications do not require much comment. In simple slow digestion, friction over the stomach with or without a stimulating liniment, such as the compound camphor of the Pharmacopœia, frequently gives great relief. But in painful digestion, and when there is persistent vomiting and nausea, it will be desirable to employ a liniment containing croton oil or some similar agent. When, owing to extreme irritability of the stomach, medicines cannot be retained, it is advantageous to apply small blisters to the epigastrium one after the other, as long as needed. In severe cases, sprinkling the surface from which the cuticle has been removed, with a salt of morphia finely pulverised, is sometimes useful.

* Medical Times and Gazette, November 18, 1854.

Spasmodic pain in the stomach or bowels is usually alleviated by fomentation with flannel dipped in water as hot as can be borne, the object being to make the heat penetrate to the viscera. Its good effect is much assisted by sprinkling the flannel when taken from the water with spirit of turpentine.

Mineral waters have a high reputation in the cure of disorders of the digestive organs, and, when selected with due care and special application to the particular case, are undoubtedly excellent agents. For anæmic and debilitated patients the ferruginous springs of Bath, Tunbridge Wells, and Spa, are useful. Those of Carlsbad, Wiesbaden, and Ems are good in the treatment of an irritable condition of the gastro-intestinal surface; and that of Vichy, when acidity and other gouty tendencies are present.

I have already dwelt on the benefits derived from change of air and scene, regular hours and exercise, and attention to diet. It must be remembered that these beneficial influences usually accompany residence at a mineral spring, and from this a hygienic moral may be drawn capable of general application.

Purgatives, and the treatment of constipation.

When the lavish use of purgatives by some practitioners is considered, it may seem hazardous to assert, that in treating dyspepsia these medicines are seldom required. That form of depletion which consists in blood-letting has been almost laid aside: that form of depletion which consists in repeated purgings deserves a similar fate. In the constipation of dyspepsia, purgatives may be allowed to aid, but not to substitute the natural calls for evacuation. They should be mild in action, and laid aside when possible, as undue stimulation of the bowels tends to perpetuate their morbid condition.

Although a single daily expulsion of fæces is habitual with most individuals, there are many exceptions. The bowels may be regularly moved twice or oftener in the day, and a departure from this may induce a state of general discomfort: such persons are generally of plethoric habit, the blood-making function and the processes of waste and repair being unusually active. In delicate persons, on the contrary, and in those of the bilious tempera-

ment, the bowels may be habitually unmoved for days together, while the health continues perfect; constipation is, therefore, a relative term.

We should not fail to ascertain the habit of the individual when in health, and to regulate our practice accordingly. It is often desirable to divest the patient's mind of the necessity for moving the bowels daily. Many worry themselves without reason on this subject, and much of the injurions practice of constantly swallowing purgatives arises from it. When, however, constipation is distinctly a result of dyspepsia, great attention must be given to the bowels. On the other hand, in the treatment of some stomach affections, the means we employ are directly productive of constipation; thus, the use of medicines containing tannic acid, and preparations of bismuth, opium, &c., requires us to take the bowels into special consideration.

Those purgatives should always be chosen which, both as to bulk and quality, are least offensive to the stomach. The well-known compound colocynth pill is one of the best of the stronger kind, and aloes, from its special action on the large intestine, is also valuable.

The compound rhubarb pill (L. P.) is an excellent mild purgative. Castor oil, so useful in many cases, is generally inadmissible. The neutral salts stimulate, and waste the intestinal secretions unduly, and increased constipation generally results. When the stomach will bear it, sulphur is an excellent laxative; the stools which it produces have commonly the natural consistence, and it leaves no bad effects. Sulphur is also valuable for hæmorrhoidal affections associated with dyspepsia.

Tonics, either alone or combined with purgatives, sometimes succeed in regulating the bowels, when other means fail. Those best adapted for the purpose are iron and strychnia. Half a grain of extract of nux vomica, half a grain of sulphate of iron, and four grains of the compound pill of colocynth, form a combination which, taken early in the morning, generally induces gentle action of the bowels.

Hyoscyamus has the property of diminishing the griping tendencies of vegetable purgatives, and, in common with several plants of the same order, is itself laxative. Tobacco-smoking is resorted to by many to induce action of the bowels; and Bretonneau pointed out the

especial use of belladonna in constipation. Owing to the variable strength of the extract, caution must be used in prescribing this active drug; it will be well to commence with a quarter of a grain for a dose, twice a day, and gradually to increase to one grain. I can, from experience, report favourably of this remedy.

Diet should, in all cases, be carefully considered: sometimes the liberal use of fresh vegetables will regulate the bowels. In other cases, the substitution of bread containing bran, for ordinary bread, succeeds: the effect being produced by the mechanical action of the bran. It is unsuitable therefore for cases in which the gastro-intestinal mucous membrane is irritable. Some articles of diet, as salted meats and fish, hard-boiled eggs, &c., and hard water, tend to confine the bowels, and should be avoided.

A prejudice exists in this country against the enema apparatus, often difficult to overcome. But the injection of simple water is efficacious, and free from many objections to which purgative medicines are liable.

Nothing is more important than the culture of habit in moving the bowels, nor is there any

greater source of constipation than inattention to them. Efforts of evacuation should, in general, be daily made at stated periods. These efforts may be at first ineffectual; but if resolutely persevered in, restoration of the natural functions generally results. In bad cases the water enema is at the outset a valuable aid towards the formation of habit.

APPENDIX.

A.

I TOOK the following means of testing experimentally the possibility of a sudden and copious flatulence being produced by expansion of gases.

Two globular bags of india-rubber, each being one inch and three quarters in diameter when filled, the sides being about the twentieth of an inch thick, were provided. One of these bags was introduced within the other; and the inner one having been connected with a retort in which carbonic acid gas was generated, both were distended until the diameter of the outer bag measured three inches and two-thirds. The gas was thus, by the elasticity of the bags, subjected to a pressure equal to, if not greater than any likely to be exerted by the stomach. The outside bag was now removed by cutting, when, making allowance for its removal, the diameter of the sphere was found to have undergone no appreciable increase. In this experiment, the removal of the outer covering represented a sudden relaxation of the gastric coats; and any influence from a simultaneous relaxation of the abdominal muscles appears to me

altogether secondary. I therefore infer, that no pressure can possibly be exerted on the gases in the elementary cavities sufficient to produce by its withdrawal the phenomena of marked and sudden *flatus*.

B.

On the Cause of Heartburn.

The term cardialgia or heartburn is variously interpreted both by the profession and by patients. Some understand by it epigastric pain with a sensation of heat; some include under it the pain which accompanies pyrosis; while others restrict it to a peculiar scalding sensation extending from the cardiac orifice of the stomach along the œsophagus to the mouth. The latter appears to me a proper restriction, and my present observations will be confined to the affection as thus understood. Various explanations have been offered of it. Dr. Copland, speaking of heartburn, says, "It is generally attended by acid or acrid eructations, exciting irritation in the throat and fauces."* Dr. Chambers tells us that heartburn may be looked upon as the milder disease of which water-brash is the severer development," † but that fluid is in no case concerned in producing the sensation; which is a "spasmodic pain in the œsophagus."

* Dictionary of Practical Medicine. Article, Indigestion.

† Op. cit. 339.

From the testimony of many patients as well as my own experience, I maintain, however, that heartburn is usually attended by the ejection from the œsophagus of a very small quantity of acrid fluid, frequently described as a single drop, causing a peculiarly disagreeable and occasionally a greasy taste in the mouth. Gas from the stomach sometimes accompanies the drop, and to this is probably due the idea conceived by some patients, that the sensation resembles the "passage of hot smoke."

On considering the taste experienced as well as the conditions under which heartburn comes on, it seemed to me that the cause of it was the presence of butyric acid. This acid is a product of deranged digestion; and the disgusting smell of vomited matters from which I have by distillation obtained butyric acid, in considerable quantity, is chiefly caused by it. Heartburn is very generally induced by eating food in which butyric acid already exists, as pastry, &c., and the acid appears to be also formed out of its elements in the stomach. The removal of heartburn by alkalies also afforded proof that it was caused by an acid.

But if my supposition were correct, heartburn would be produced by the passage of butyric acid down as well as up the œsophagus. To test the matter I obtained some pure acid, and experimented on myself and on two gentlemen, who, from actual experience of true heartburn, were competent judges. The plan adopted was to dip a pill

of manna stuck on the point of a long needle into butyric acid, either pure or diluted. The pill was then carried by means of the needle to the back of the tongue, without touching the interior of the mouth, and swallowed. The taste and sensation produced in the œsophagus were pronounced in every instance to be identical with those of ordinary heartburn, but varying in degree according to the strength of the acid; and in the case of one of the gentlemen, the sensation extended to the cardia. Moreover, as in heartburn itself, a small quantity of alkali at once gave relief.

My explanation of the production of heartburn, founded on the preceding observations, is as follows:—In certain weak conditions of digestion, or when it is overtaxed, butyric acid is set free from food in which it existed, or else it is formed out of the elements of starchy food, as is well known to be possible. The acid being in excess, but not pure, or else it would be soluble, rises to the surface of the contents of the stomach, where it probably combines with melted fat, with which it is so miscible] that it appears to possess an affinity; when, by the motions of the stomach, presented at the cardia, the acrid mixture is instinctively rejected into the œsophagus, and is then by a reversal of its proper movements transmitted to the mouth, accompanied by the sensations of heartburn. The miscibility of fat with butyric acid will explain the relief of heartburn by cod-liver oil. It acts by diluting the acid.

C.

ON PEPSIN.

(*From the Medical Times and Gazette, June 18th*, 1859.)

I WAS lately induced to give pepsin, the new remedy for dyspepsia, a fair trial. Its effects, however, in no way answered the expectations I was led to form. My patients, in general, declared that they derived no advantage from it, and any favourable reports were qualified and inconclusive. In a disorder of such variable intensity as dyspepsia, we are particularly exposed to fallacies of the *post hoc propter hoc* description. Our results should be decisive, and at least tolerably uniform, before we accept them as effects of treatment.

As, however, pepsin is favourably regarded by some physicians of repute in London, I resolved to examine it experimentally, and propose to lay the results before the reader.

The specimen selected for examination, obtained from an accredited source, was labelled "Pepsine de Boudault, No. 1; dose—fifteen grains between thin slices of bread;" and of this preparation it is stated that, being acid, it "possesses all the pro-

perties of gastric juice."* With this preparation I made a number of experiments. Finely minced pieces of roast mutton were introduced into large test-tubes containing either the starch and pepsin powder in distilled water, or else the pepsin alone in solution—the starch having been separated by filtration. The proportions of meat and of pepsin were in every instance accurately noted. The test-tubes were kept as nearly as possible at a temperature of 100° Fah. for forty-eight hours, and were shaken as often as convenient.

It will be sufficient for my purpose to give the results of these experiments.

Fifteen grains of the powder, or a solution made by soaking the same quantity some hours and filtering, were found insufficient to dissolve one drachm of mutton. In order to reduce the meat to the condition of a greyish finely divided deposit, an equal weight of the powder was necessary. When the proportion of the compound was greater, as fifteen grains of it to five grains of meat, the reduction was more complete, the muscular fibrillæ presenting, under the microscope, an appearance resembling fatty degeneration. In no instance was this reduction accomplished in less time than eighteen hours.

Like urine, gastric juice has a wide range of specific gravity. In other words, the solid con-

* On Pepsine, by M. Boudault. Translated by W. S. Squire, Ph.D. Churchill: 1858.

tents in different specimens bear very different relations of quantity to the water by which they are held in solution. But let us take M. Boudault's own statement. He says—"The quantity of water which the gastric juice contains is considerable; it is 97 per cent. of the liquid secretion in its greatest state of purity; there is about 1·25 per cent. of Pepsine. There remains consequently 1·75 per cent. for salts." According to other authorities, the total organic matter of gastric juice contains but a very small proportion of pepsin.

But admitting the organic matter obtained from the gastric juice of animals by M. Boudault to be nearly pure pepsin, or, what is practically equivalent, admitting it to contain a natural proportion of true pepsin, let us examine a little further.

M. Boudault tells us that, after various experiments in reference to the preparation and action of pepsin, he fixed upon its combination with starch. He says—"The amount of starch to be added should always be specially determined, otherwise we should not obtain a product possessing constantly the same digestive power. Now, it is of the utmost importance that a medicine should always have the same properties. I have once more availed myself of artificial digestions to determine the digestive power. I add, in fact, starch gradually in such quantities to the Pepsine, that a gramme (fifteen grains) of the mixture is in a posi-

tion to digest four grammes of dry fibrine, or that it will in the stomach cause the meat of a mutton-chop to be digested." Admitting that it is necessary to determine in the manner related the quantity of starch to be added, M. Boudault should have informed us how much of the active principle combines with the inert starch.

I shall not trouble the reader with details; but the following statement, founded on repeated trials, may be relied on. The specimens of Boudault's pepsin used in my experiments, did not contain more than three grains of soluble matter in fifteen grains of the powder. And M. Boudault informs us that "acidified Pepsine is soluble in all proportions in water." But to meet objections on the score of loss, I shall assume that it contained 3·75 grains.

Modern research has proved that the quantity of gastric juice requisite for the digestion of a meal is very considerable.

According to one estimate, the amount secreted in twenty-four hours is equal in weight to a fourth of the weight of the entire body of the individual.* At all events, the fluid is to be estimated by pounds rather than by ounces, and the total amount of pepsin is proportionately large.

Let us assume then that 3·75 grains of soluble matter or pepsin are contained in 15 grains of M.

* See page 13.

Boudault's powder. To make an artificial juice with the above quantity of pepsin, according to his own analysis of the normal juice, this would be the formula:

Pepsin	3·75 grains.
Salts	5·25 ,,
Water	291·00 ,,
	300·00 or 5 drms.

If, then, we liberally estimate 15 grains of M. Boudault's powder as equivalent to five drachms of gastric juice, how inconsiderable, if any, must be the assistance which such a dose of pepsin can render the stomach. If, on the other hand, we take the low estimate that twelve ounces of gastric juice are required for the digestion of a mutton-chop weighing four ounces, then 285 grains of M. Boudault's powder, or a dose nineteen times larger than he recommends, will be the equivalent.

Notwithstanding the assertion of M. Boudault, that fifteen grains of his powder in the stomach "is in a position to digest" a mutton-chop, I imagine further comment to be unnecessary. Out of the stomach the same quantity of so-called pepsin dissolves with difficulty a piece of mutton the size of the tip of the little finger.

I am forced to the conclusion that any advantages derived from the use of pepsin have been through

the medium of the mind rather than of the body. An organ so impressible as the stomach would probably be sometimes thus indirectly benefited by a remedy of such plausible intention. That, however, is not the legitimate action of medicines.

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THE END.

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