

FOOD, IN ITS RELATION TO HEALTH.

BY A FAMILY DOCTOR.

I. THE ACT OF DIGESTION.—A WORD ABOUT THE MEALS OF THE DAY.



N a short series of papers like that which I now commence, any lengthened dissertation on the physiology of digestion would not be consonant with my intentions.

And my intentions are as follows: to make my articles thoroughly practical and easily understood, so that "they who run may read;" to avoid technicalities as much as possible, and everything that savours of mere theory; and to be useful as well as truthful, keeping ever

before my mind the belief that those who read them wish to be informed, not only how to eat to live, but how, and what, and when to eat in order to live healthfully.

On the other hand, unless the reader possesses some fundamental knowledge concerning the process or act of digestion, anything I may say concerning food in these papers will fall flat and be unprofitable.

Many of my readers doubtless know as much, or perhaps even more, about the subject than I do myself, but for the sake of the few who do not, let me observe—

I.—That the primary act of digestion takes place in the mouth. A simple statement, certainly, but one more important than it may at first sight appear. For in the mouth the food is, or ought to be, slowly and properly masticated. This not only renders it more fit to be speedily acted upon by the juices of the stomach (gastric), but enables it to be well mingled with the secretions of the salivary and parotid glands. And what do these secretions do? The answer is this: The saliva contains a fermentive agent, to which chemists have given the name of "diastase." The property of this diastase is that it changes the starch of the food into sugar, or "dextrine," which is soluble, the former not being so. A portion of this is actually absorbed into the blood from the mouth.

Again, this diastase is only active in an alkaline *versus* an acid medium—another reason why it should be mingled with the food in the mouth, and not in the stomach.

Slow mastication, then, is of the greatest importance if we would live in health and avoid the horrors of indigestion, with the thousand and one ills, physical and mental, that follow in its train.

Take time to eat if you would be happy. Take time to eat if you would be well. Teach your children to do so, and explain to them the reason why. A word or two spoken to a child in a quiet and reasoning

strain, will often make a very deep and lasting impression.

I have a letter before me, from which I will make an extract.

"I am 77 years of age," says the writer, "and have very few teeth, but my appetite and digestion are good, which I attribute to careful feeding. I have found by experience that all kinds of food, whether dry or moist, should not be allowed to pass until reduced to a pulp and mixed with the saliva."

Let me draw the reader's attention to the words "whether dry or moist." The aged but healthful writer does not allow even moist food to pass at once into the stomach. He is right. But is it not the common practice to bolt such food? Take, for example, a supper of porridge and milk, or well-boiled hominy and milk. How long do most people take to eat such a meal?—and mind this: it is a most wholesome one. Why, about five minutes. Can they wonder that it disagrees, that it creates acidity and eructations, flatulence, and all sorts of discomforts, not the least disagreeable of which are restless nights and nightmare dreams?

I am often told that solids for supper agree best. Well, take solids by all means, but still, methinks that Scotch porridge, if taken early in the evening—say eight o'clock—and if eaten slowly and sensibly, would be sufficiently digested before bed-time to permit of a lunch-biscuit being eaten just before retiring.

Parentetically, and lest I should forget to mention it, when there is some heat of skin before going to bed, with slight thirst, sleep will very likely be troubled. The best nightcap in a case of this kind is a bottle of good (so much of it is *bad*) soda-water in which fifteen grains of bi-carbonate of soda has been mixed.

II.—The food, having been well masticated and perfectly mingled with the saliva, passes downwards into the stomach. This is a muscular organ. The muscles in it are placed in almost every direction, so that it is capable, not only of squeezing the food, but of thoroughly churning it, or mixing it completely, so that every portion of the food is not only reduced to pulp, but exposed to the surface of the stomach, thereby receiving its juices, by the action of which, indeed, the reduction is chiefly made.

It is obviously unfair to expect the stomach to perform the duties of the teeth. But many do. Would such people be offended if I advised them to swallow stones, as the ostrich does, or bits of gravel, as do the birds? Even then they would need gizzards instead of stomachs.

The older one gets the more need has he or she to be careful in seeing that those processes of digestion under one's own control are properly performed. I cannot myself yet lay claim to the reverence and

respect due to old men, but I am in the constant habit of talking with the aged, and I do not at this moment remember either an old man or woman who is not, and who has not been, careful in "feeding" since he or she was of the age of forty.

Dyspepsia is a frightful affliction. It renders a person wretched in himself, physically and mentally feeble, and it renders him entirely unfit—through his peevishness and moroseness—to mingle in healthy society. I say that dyspepsia can always be prevented, and in most cases cured, but never by medicine alone.

III.—In due time—from two to three hours—the food leaves the stomach through the pyloric opening, after which—it is to be hoped in most cases—that important organ has a rest. It really ought to go to sleep and awaken hungry. The pulp that leaves the stomach is called chyme; after it receives the secretions from the liver and pancreas, it is changed into chyle, or is taken up by the absorbents in the form of chyle. These unite at last to form the thoracic duct, or great chyle canal, which runs upwards alongside and protected by the spine, till it empties itself at last into one of the largest and most important veins in the body.

IV.—We need follow it no farther, merely adding that the chyle is mingled with the blood, and is received into the general circulation.

In my next paper I propose to consider with some degree of minuteness the elements of food, as they are called—fat, sugar, and the albuminoids, or nitrogenous foods—and their relation to the animal economy.

Let me conclude this paper by a few remarks on some of the principal meals of the day.

To begin with, they ought both in quantity and in quality to accord with the work one has to do, or the duties he has to perform, and these may either be mental or physical.

The first meal of the day, or breakfast, is in this country—with those in health, at all events—a fairly substantial one, although some people try—but, thank goodness, try in vain—to assimilate French and English customs in regard to breakfast. France and its folks are different from England, with its solid men and women; its climate is different from ours; its notions as regards eating and drinking can never be engrafted on British bone and muscle.

Yes, breakfast ought to be a hearty one, eaten early in the morning, and eaten slowly, so as to preclude the possibility of eating too heavily, which would materially interfere with the business of the day.

A man or a woman who is no breakfast-eater must either be a heavy—over-heavy—supper-eater, or be in a bad state of health. A person who requires the stimulus of a cup of tea, or any other stimulus or stimulant whatever, before partaking of solid food, is not in the hey-day of health. I like to see a man have his breakfast first, and then feel round for his cup of coffee, tea, or chocolate. I have known the strongest and healthiest of men positively forget all about the liquid portion of the breakfast, and leave the table without it. I have known men who scarcely ever

touched a drop of liquid of any kind from one week's end to another, and who, nevertheless, were in ruddy and robust health.

What a person eats for breakfast often gives me a clue to the state of his health. One example: if while sojourning at an hotel I see a man come down to breakfast between ten and eleven, and sit down to devilled kidneys with plenty of sauce (piquant), and perhaps one poor puny egg to follow, I would be willing to aver that he carries a white tongue, and that his liver sadly needs seeing to.

Ham and eggs, bacon and eggs, or a beef-steak or underdone chop, with boiled eggs to follow, and *then* a cup of nice tea, is a sensible breakfast for a man who is going away out into the fresh air to walk, or ride, or work till noon; but not for a person who has to sit all day in the same position at *manual* labour. I emphasise the word *manual* because intellectual or mental work conduces to appetite. An author hard at his desk, if his ideas be flowing freely, if he be happy at his work, and time flying swiftly with him, soon gets hungry, which only proves that we must support the body well when there is a strain upon the mind, so that no extra expenditure of tissue may lead to debility.

Cheerful conversation insures the easy digestion of a good breakfast. It is a pity that in this country the custom of inviting friends to the matutinal meal is not more prevalent. It may seem a strange thing to say, but I would ten times sooner go out to breakfast than to dinner. One is, or ought to be, freshest in the morning; he then needs no artificial stimulus to make him feel bright, witty, happy, as he too often does after the duties of the day are over.

The mid-day meal, or luncheon to those who dine in the evening, and who have work to do in the afternoon, should be a light one. I am not sure that I do not quite approve of the City "snack." It puts one past, it sustains nature, it leaves the mind free to think and to do its duty, and, above all, it enables the stomach to have a rest before the principal meal of the day.

Now, about this meal: I have to say that, if partaken of alone by one's self, it ought to be an abstemious one. Even in company it need not be a heavy one. No matter how many courses there are, there is not the slightest necessity for making too free with them.

But it is a fact, which every one must have felt, that even a moderately heavy meal is quickly and easily digested, if accompanied with and followed by witty or intellectual and suggestive conversation.

"I'm a dyspeptic; I must not dine out," I have heard a gentleman more than once remark.

Well, my impression is that it does dyspeptics a deal of good to dine out, if they can eat in moderation and judiciously, never being tempted to call in the aid of artificial stimulus to enable them to do as men of more robust physique are doing around them.

As to suppers: I shall have more to say anon about these. The question of supper is one on which no one can give individual advice in a magazine, and on which it is very hard to generalise. But—I mean to try.

"Come on," he said; "we must get rid of you at once." He woke the girls up, and the three of us were hurried to the side and into a boat, which was manned by a couple of sailors. The hilly coast of the island was not more than a hundred or two yards away. As I passed into the boat, a middle-aged man, in dark clothes and a grey overcoat, laid his hand upon my shoulder.

"Remember," he said—"silence! You might do much harm!"

"Not a word," I answered.

He waved an adieu to us as our oarsmen bent to their oars, and in a few minutes we found our feet once more upon dry land. The boat pulled rapidly back, and then we saw the launch shoot away southward, evidently to avoid a large ship which was steaming down in the distance. When we looked again she was a mere dot on the waters, and from that day to this we have never seen or heard anything of our deliverers.

I fortunately had money enough in my pocket to send a telegram to my father, and then we put up at a hotel at Douglas, until he came himself to fetch us

away. Fear and suspense had whitened his hair; but he was repaid for all when he saw us once more, and clasped us in his arms. He even forgot, in his delight, to scold us for the piece of treachery which had originated our misfortunes; and not the least hearty greeting which we received upon our return to the banks of the Clyde was from old Jock himself, who had quite forgiven us our desertion.

And who were our deliverers? That is a somewhat difficult question to answer, and yet I have an idea of their identity. Within a few days of our return, all England was ringing with the fact that Stephens, the famous Fenian head-centre, had made good his escape to the Continent. It may be that I am weaving a romance out of very commonplace material; but it has often seemed to me that if that gun-boat had overtaken that launch, it is quite possible that the said Mr. Stephens might never have put in an appearance upon the friendly shores of France. Be his politics what they may, if our deliverer really was Mr. Stephens, he was a good friend to us in our need, and we often look back with gratitude to our short acquaintance with the passenger in the grey coat.

SOME FACTS ABOUT SUPPERS.

(FOOD IN ITS RELATION TO HEALTH.—II.)

BY A FAMILY DOCTOR.



IN my last paper on Food, when discoursing on the "meals of the day," I stopped short at supper. Practically, it might be well for many of my readers were they to do the same.

About supper then: only those who dine early require anything of the sort. As I believe and trust that most of my readers are early diners, the few remarks I have to make about the evening meal may not be thrown away.

Well, then, it is a fact, which no one would attempt to gainsay, that the stomach must have an interval of rest between every meal. This period of repose should be granted to it gratuitously. It should not require to take it. But mark me: it *will* do so if weary. If we might personify the stomach we could imagine it saying to its owner—

"That mid-day meal was far too heavy—it was more than I could manage; I have worked away for four hours, and have not yet completed digestion; there is still food here that needs to be reduced to chyme, but my juices are expended; my nervous and muscular energy are exhausted; I can do no more."

And what is the result? Why, that a portion of indigestible food remains in the stomach, or passes through the pyloric opening, unreduced to chyme, fermenting and causing acidity, flatulence, eructations, and many indescribable feelings of discomfort.

But the mischief does not end here, for by-and-by

comes supper-time. The mistaken notion that it is the correct thing to eat at regular times, whether hungry or not, prevails, and more food finds its way into that unhappy stomach. Everybody knows what a ferment is. Well, in eating before the stomach is quite unloaded, you are mixing good food with that which is digesting. Can you wonder if a restless night follows—or a night of lethargy rather than sound sleep—that you toss and tumble, and either wake too soon, without the capability of going to sleep again, or doze longer than usual, and get up at last with a heavy head and an irritable temper?

But stay, though; perhaps you have an appetite for supper. Have you? What! despite the hearty dinner you discussed? Very well; if after that dinner you took a good spell of exercise in the open air, or if you had some lengthened pleasurable excitement, such as enjoying the conversation and company of friends, then this appetite of yours may be a wholesome one. But, on the other hand, if you enjoyed yourself doing positively nothing after dinner; if you have never left the house, nor breathed a gallon of pure fresh air, then I say ten to one your appetite is a false one—a *bullimic* one—born of a slight degree of nervous irritation, not to say fever.

"Bullimic" is a technical word, I know, and I am going to explain it. "Bullimia," then, is an unnatural craving for food. One may suffer from a slight attack of it now and then, or it may become chronic, and is then known to the profession as "bullimic dyspepsia."

"The patients suffer from constant hunger ; and unless they eat immediately after the desire for food comes on they get faint and low-spirited, and especially complain of a painful sense of sinking about the region of the heart and stomach. The desire for food returns almost immediately after a good meal" (Dr. Guipon). I may say parenthetically that the most useful remedies for this kind of dyspepsia are minced raw beef, charcoal, cod-liver oil, and pepsine, with occasional mild aperients if the system cannot be kept free by means of the matutinal tub, open-air exercise, and fruit eaten in the morning.

It but remains for me to say that I consider it a nervous affection, and that occasional attacks of it are brought on by errors in diet and dieting.

The question is asked constantly of medical men : "What *shall* I take for supper ?"

The truth is that too much belief is placed in that usually nonsensical saying, "The system must be supported." Nervous invalids, or that class of persons whom I called in a former article the "only middling," are constantly engaged "supporting their systems ;" therefore, and in consequence, they give themselves no chance to get well : their whole lives are spent in one continued ferment of fever. Were they only to reduce the diet for even a week or fortnight, and to eat and live by rule, they would be simply astonished at the change, and would ask our Editor to thank the "Family Doctor" for his suggestion.

May I state a case? It can do no harm. I do not even give the initials of my patient. Call him John Smith. John Smith, then, was a supper-eater ; he was also a dinner-eater, and a five o'clock tea-taker. Breakfast, though, was but a poor sham with John Smith, only towards eleven o'clock he felt "peckish" (the word is his, not mine), and supported his system by means of a biscuit or two and a glass of sherry. (N.B.—John Smith was, and is, a temperate man, in the ordinary acceptance of the term.)

John dined early, at 2.30. He supported his system at dinner on soup, on fish, *entrée*, joints, pastry, cheese, and dessert ; and he always rose up from the table feeling that he had done enough. His afternoon was not pleasantly spent as regards his bodily sensations, for he felt heavy and drowsy after dinner ; and even a cigar did not banish these feelings, nor a nip of *liqueur*, foolishly taken for digestion's sake. But at five o'clock tea revived him considerably. With this tea John took bread and butter to "support the system." He likewise partook of a heavy supper by way of "supporting the system," and a night-cap to insure a restful night. But that restful night was not insured, for if he went to bed immediately after the night-cap he fell into a state of lethargy—I will not misname it sleep ; and to his great disgust awoke with the larks. If he did not go to bed at once he could not fall asleep for a time, and it was time to get up before he was half rested.

He grew nervous, though he was in good condition to look at ; not to feel : he was soft. The tongue was never over-pink ; he had twinges of rheumatism, "flying pains," a weak and flighty pulse, and a

fidgety manner. He never had actual pain about the stomach, but the slightest blow thereon, or heavy pressure, would have been intolerable.

He consulted me ; and on getting a history of the case, and making an examination, without discovering anything very striking except some slight enlargement of the liver, I told him that the whole internal lining of the digestive organs, and the organs in connection therewith, were in a state of chronic irritability, and that even the liver and kidneys partook of the general irritation, nerves, heart, and brain suffering secondarily. I told him, further, that medicine would be of less value to him than a well-regulated regimen. And he wisely determined to be guided by my instructions.

As cases of this kind are so very common, being nearly always brought on by errors in food and living, I give the treatment here of Mr. Smith's case.

I. *General Régime*.—To rise about 7.30, have a cold sponge bath at once, with sea-salt in it (temperature about forty-five degrees), previously washing the body quickly with warm water and mildest soap. To dress leisurely, and to take a short turn in the open air before breakfast. To take exercise every day in the fresh air, rain or shine, to the verge of tiredness—not fatigue. To take pleasant recreation, and cultivate the society of friends ; but not to sit in stifling rooms, nor *court hospitality*. To sleep on a mattress, have the window down, and a wire gauze screen put up to save the draught. To have the bed-room neither cold nor hot (his age was forty-two), and to use light and only moderately warm bed-clothes.

II. Breakfast, 8.30 : Fruit first—oranges or prunes, or baked apples ; cocoa or cocoatina instead of tea, with plenty of milk ; eggs, fish, or a little bacon, or herring, if it could be digested without causing thirst. Toast and butter.

III. Luncheon, 11 o'clock : Some milk that had been boiled, and a morsel of cold toast and butter, or stale bread. Dinner, 2.30 : No soup, but fish or oysters ; no oily fish ; very little meat, if any ; no pork, but fowl or game (feather) ; potatoes, &c., sparingly ; some easily-digested green vegetables, the best being cauliflower, Brussels sprouts, tender peas, or parsnips ; some cooked fruit, an orange, or handful of grapes ; no pastry, cheese, or salad ; and to eat sparingly of all things.

IV. Tea, 6 o'clock : A cup of cocoa and milk, biscuit or cracknels.

V. Supper, 8 o'clock : Two or three charcoal biscuits, and a very little to drink.

VI. Bed at 10, previously having sponged the body with cold water.

VII. Night-cap : A bottle of soda-water, with ten grains of the purest bicarbonate of soda in it.

In a very few days, even, improvement took place. He felt less nervous : felt lighter, quieter, more buoyant, and fit for the worry and tear of life, and was soon restored to health.

I need not name the medicines I prescribed. At the best they were but auxiliaries ; and, besides, every case requires somewhat different medical treatment. I may mention, however, that as a tonic, when the

liver seems chiefly at fault, the diluted nitro-muriatic acid does good; whereas if nervous symptoms are most predominant, the diluted phosphoric acid will be indicated. Either may be taken in quassia-water, or in the infusion of chiretta.

I had almost forgotten to say that an occasional Turkish bath was prescribed—once a week, if I remember rightly.

I wish, then, to warn all my readers, especially the infirm or invalid, against the pernicious habit and folly that rests in that phrase—supporting the strength or system. If you want perfect health, be abstemious.

But as to suppers: I have always been of the opinion that slops are bad. I have not the slightest doubt that my readers will bear testimony to the truth of what I say from their own personal experience. A fluid supper generates acid, and it is ten times worse if beer is to be partaken with it. Beer and milk food, or soup, would ruin any digestion. No; let the little you do take be solid, and easy of digestion; an egg that has been pretty well boiled and allowed to get cold, with a slice of cold toast and butter, is a simple supper, but one that agrees. Meat should not be

eaten, nor, as a rule, fish. In fact, supper should really be an off-put, if one has dined fairly well.

The food we eat during the day—its quantity and its quality—has a very great deal more to do than most people think with the kind of sleep we obtain at night and the amount thereof; and the *kind* of sleep is of far more importance than its actual amount. Disturbed, restless, or dreamful sleep is not refreshing, no matter how much thereof we obtain. Even pleasant dreams destroy the good effects of sleep.

Now, leaving heart complaints out of the question, I have always observed, then, that species of complaint known to medical men as irritability, with partial congestion of the lining membrane of the digestive organs, whether in whole or in part, is invariably accompanied by restlessness and disturbed sleep. The restlessness by day takes the form of nervousness and excitability; but by night there are often frightful dreams.

Well, would not some portions of indigestible food lying about the system be likely to produce the same nocturnal symptoms?

I leave my readers to meditate upon the question, and answer it for themselves.

HOW TO LAY OUT A KITCHEN GARDEN.



A GOOD deal of sowing and of planting out is done here in April, so perhaps a few words may be said with advantage at this time of the year on the laying out and stocking of a kitchen garden in general.

And first, then, as to the situation and aspect of our kitchen garden;

notice the locality chosen by some of our florists or strawberry growers; perhaps it is the gentle slope of a hill that looks south-west, backed at some little distance, on the north and east, by a plantation of trees, and more dense on the north, perhaps, than on the east. Now, of course, we could not possibly have a thick grove of trees all along the north-east side of our garden itself; but we should certainly contrive, if we can, to avail ourselves, in the selection of a garden, of any moderately distant protection. At all events, a wall should run along the north and east sides of our garden. The next best substitute for a wall is a good stout and close wooden fence, though you must bear in mind that, as time goes along, exposure to weather will decay it; so that really a wall is by far the cheapest in the long run.

And then, also, we must remember that a wooden structure does not absorb heat as the bricks of a wall do; and this is a very important consideration when we meditate the cultivation of wall-fruit trees. There is an advantage, again, in having the

highest part of the wall on the north side, for the double reason of having cut off the north wind, and also to have a greater southern expanse of wall for the growth of our fruit trees.

And drainage is the next important consideration. Nothing can flourish in a damp and undrained swamp; the heavier your soil is, the deeper should be your drain; but a gravel soil, for instance, can have a less deep one. The circumstances, however, of our surroundings must naturally a good deal render us more or less dependent in this respect; but some sort of simple or modified garden drainage we can often, for the most part, contrive ourselves to set up. And this done, for we are of course supposing the case of a garden that has been just taken in hand, and is as yet unstocked, our next step is the preparation of the soil for the various crops. And this must a good deal depend upon the nature of the soil itself. Should it prove to be a free deep loam, the only preparation it will require will be the ordinary deep and regular trenching—indeed, whatever the nature of the soil, trenching will be, of course, necessary. Where, however, clay largely predominates, get away, if possible, some of the stiffest of it, and replace it by any coarse sandy soil, or indeed any mixture of porous material; such, for example, as fine coal ashes, small charcoal, or road sand. All this is heavy, perhaps uninteresting, but very necessary work, when we are, so to speak, laying the foundations of our future gardening hopes. But even when we have the misfortune of an undeniably heavy soil, there is always this consolation: it will become largely modified and improved by the mere operations of trenching and culture, when

THE PHYSIOLOGY OF DIET.

(FOOD IN ITS RELATION TO HEALTH.—III.)

BY A FAMILY DOCTOR.



HAVING in the previous papers of this series said a few words about the chief meals of the day, in practical and, I trust, popular language, it will be well in this to take a step forward and consider what are the elements of food in their relation to the animal

economy. The food that we partake of during any one day might be divided into five distinct kinds: 1. The albuminoids. 2. The fatty elements. 3. The saccharine or starchy. 4. Mineral constituents. 5. Water.

A simpler division of the elements of diet might be: 1. The nitrogenous or flesh-producing foods, such as bread, beef, and flesh of all kinds, fish, eggs, &c. 2. The non-nitrogenous, respiratory, or heat-producing foods, including the starches and sugar.

Let me take the first classification as being apparently more simple to those who have little love for chemistry.

1. *The albuminoids.*—We find albumen in its simplest form in the whites of eggs. It is largely present also in the lean of meat—notably perhaps in beef—while from the bones and ligaments, &c., of animals, we obtain a substance somewhat like albumen, being nitrogenous, and which is called gelatine. It is this that gives to soups their richness and utility in building up and strengthening muscle. These albuminoids, or albuminates, are sometimes termed the proteine elements of the food, and are derivable from caseine, fibrine, &c.; the fibrine is found in both blood and muscle, the caseine in milk.

But we find also in vegetables a good proportion of nitrogenous substances, though remember they are in less quantity than in meat. This has a bearing on vegetarian diet. Let me say at once that I do not quite hold with the extreme views of vegetarianism. At the same time, far too much meat is used by people in this country, to the exclusion of a diet on which they would thrive as well, be lighter in mind, more lithe-some in body, and less subject to inflammations of a painful and dangerous character. In proof of this, I adduce two illustrations that none can gainsay: First, the northern Scotch peasantry are, to a great extent, vegetarians, hardly ever touching mutton or beef, except on high days and holidays, and on the Sabbath. Secondly, the German armies were fed, during the Franco-Prussian War, almost entirely on a kind of pea-meal polonic. We know what they did, and we know also what the Highland Scots used to do, whose commissariat consisted almost exclusively of oatmeal and water.

Practically speaking, there are no better foods to build up and keep up tissue than meat used sparingly, pea-meal, meal of lentils or beans, and oatmeal. And

when you need variety, are there not eggs and fish in abundance in this country all the year round?

2. *The Fatty Elements of Food.*—The principal use of these is—(1) to sustain the animal heat; being burned off as it were, they are the fuel or the oil which keeps the lamp of life burning; (2) to assist in the digesting of the albuminous articles of diet; (3) to assist in the formation of bile; and (4) a portion is stored in the body not only as a stand-by in time of need, but to act as cushions for more easily injured tissues, as the soles of the feet for example, and behind the eyes we find such cushions.

The fat of butcher's meat, butter obtained from the milk of cows, and the oil from many vegetables, are good examples of this important constituent of our daily food. The large quantity of fat consumed by the natives of Arctic regions and of Russia proves the utility of fat, and it gives us at the same time a hint that this element of diet should be less used in summer than in winter. That is an evident and practical deduction.

3. *The Saccharine or Starchy Constituents* of diet are also called carbo-hydrates, because carbon and hydrogen enter largely into their composition. Products of the oxidation of starch and sugar of very great importance are carbonic acid and water, carried off in respiration, and *lactic acid*, which is one constituent of the gastric juice.

The principal use of these carbo-hydrates, however, is the generation of heat. Now heat is convertible into force, and force makes motion.

Here is a table giving the formulæ and percentage composition of sugar, starch, and fat.

	Starch (C ₆ H ₁₀ O ₅).	Fat (C ₅₇ H ₁₁₀ O ₆).	Cane-Sugar (C ₁₂ H ₂₂ O ₁₁).	Glucose (C ₆ H ₁₂ O ₆).
Carbon	44'44	76'85	42'10	40'00
Hydrogen	6'18	12'36	6'44	6'67
Oxygen	49'38	10'79	51'46	56'33
	100'00	100'00	100'00	100'00

Now, although, as is evident from this table, carbo-hydrates are similar in their chemical composition to fatty constituents, experience goes to prove—and this is well worthy of being remembered by those who wish to live judiciously and in accordance with common sense—that fatty matters are producers of heat which is not always converted into action or motion, whereas on the other hand the carbo-hydrates, starchy matters and sugar, are easily convertible into force. Would not this account for the prowess of the Scotch and Germans; or of the Soudanese Arabs, who on a meal of dates and rice are all force and fire? I think

such may be deduced. If so, and if one's work demands great muscular activity, he knows what to eat and what to avoid.

The vegetable world supplies us with our starch for food, and this almost alone. But even the cereals contain also albuminoids. However, the great value of potatoes, oatmeal, flour, pea, bean, and lentil meal, Indian maize, arrowroot, sago, tapioca, &c., depends upon the starch they contain, while we get sugar from various roots, such as beet, and from ripe fruits, &c.

I may mention here, as regards vegetable food, that while meat lies longer in the stomach, the former passes more quickly into the other portions of the digestive canal, there to be assimilated; hence the use of green vegetables in cases of torpidity of the system, their beneficial action being of course aided by the salt they contain.

4. *Mineral Constituents.*—Many savage tribes and nations never use salt at all with their food, but they eat very largely of vegetables of all kinds, and these supply nature with all that is desirable.

These mineral constituents of our food are quite as necessary for the maintenance of health as even the albuminoids and other elements.

We find in the body, for example, lime, iron, sodium, potash, sulphur, phosphorus, &c.

In the blood we find phosphate of potash, and also iron; phosphate of potash in the tissues also, and in the bones phosphate of lime, &c.

There are also various acids, and we find chloride of sodium in the secretions.

5. *Water.*—This is a most important element of food. The greater part by far of our bodies consists of water. It would astonish many who are of portly bulk and pleasant appearance, and who scale well, to be told how very little they would weigh and how puny they would look, were the water to be evaporated from their bodies—and life left, which would of course be impossible.

With our diet we take water when we are not aware of it. We do not drink it, we eat it.

Thus: while wheat-flour—I am not talking of loaf-bread, which some bakers know how to water to cause it to weigh well—contains but 15 per cent. of water, potatoes contain 75 per cent.; cabbage and greens, very much more; beef, about 50 per cent.; good rich milk, 80 per cent.; good veal, 60 per cent.; lamb, 45 to 50 per cent.; mutton, 44 or 45 per cent.; streaky bacon, 30 per cent.

It is a necessary of life, this water, and in the shape of soup, tea, coffee, cocoa, &c., is very largely used, an instinct causing us to take these hot, for thus they really aid digestion. Iced water cools the body, and to some extent calms the mind, but it positively retards digestion. Some Americans in their own country drink a cup of hot water some time before they sit down to their meals. This is a good plan. The draught may be rendered palatable enough by a squeeze of lemon and a morsel of sugar. It soothes the stomach and assists the digestive canal to secrete mucus; it is therefore to some extent a laxative. Hot-

water drinking, however, may be over-indulged in, and thus fail in its effects.

On the other hand, the Americans use far too much iced water.

We ourselves, as I have said more than once during the last ten years of my career as a Family Doctor to this Magazine, use too much fluid with our meals; we are apt to forget that if we use plenty of vegetables, and if we have partaken of soup, we have nearly all the water that nature requires. It would be well to remember the following advice:—

1. Whether it be breakfast or dinner or supper, eat before drinking.

2. Let the desire for fluid in some measure guide you as to the quantity you are to drink.

3. Too much fluid taken with or before the food dilutes the important gastric juices, and really the water so swallowed must be absorbed before these juices have much power to act.

4. There is no necessity for drinking at all if you feel you are better during the meal without fluid. In this case, however, nature will generally call for a slight refection in the shape of water soon after food.

I must conclude this health-sermon by saying a word or two about the use and abuse of condiments or accessories of diet.

In the use of these, we as a rule allow instinct to guide us. This is not a bad idea for a healthy man; unfortunately the use of condiments very often leads to their abuse by depraving the appetite.

There stand the cruets, and there the extra sauce bottles. The cruets as a rule are honest and straightforward. There is no humbug about mustard, about black and white pepper, about cayenne, about salt, or about vinegar, though too much of any of these good things must be carefully avoided if we do not want to ruin the digestive organs, including liver and pancreas.

Mustard is very delicious with beef. It seems to assort well with it, and, if the beef be cold corned, a pickled onion—which contains sulphur—will be in *bon-accord* also.

A scraping of horse-radish is a tonic and stomachic with roast beef.

Salt is the simplest of all condiments.

Black or white pepper is one of the least hurtful. Vinegar goes well with fatty fishes, with the salmon, the mackerel, the delicious gowdie, the plaice, or with oyster and crab.

And cayenne? Well, it can be friend or foe. Taken in large quantities it has an evil effect on the liver. Taken in moderation, and free from brick-dust, and especially if mixed with a little sugar previously, both being ground together in a mortar, it is an excellent and healthful condiment, and possesses in conjunction with mustard the power to keep off attacks of chronic rheumatism in those who are subject to such. But much depends on individual cases, for there are some in which the use of cayenne is positively injurious; and cooks should be warned against the indiscriminate employment of this pungent condiment in soups or other preparations for the table.

A hasty meal at three o'clock; to the House at four, his daughter and some other lady friends finding places in the ventilator—the only spot where in those days ladies could witness the proceedings. As they look down on the members they cannot see him for a long time. It turns out that he had been sent for by Lord Althorp, for a last, but still ineffectual, attempt on the part of the Government to get him to yield. The petitions are presented—many being anti-slavery, including a huge petition from the West Indies; at last the order of the day is reached, and he rises to move his resolution.

Happily his style of speaking is mainly a dealing with facts, telling in themselves, and carefully arranged for the desired effect, so he escapes all risk of nervous confusion. He makes an excellent use of his materials, pressing some facts regarding the decrease of the population which have been questioned, with increased earnestness and decision. Mr. Macaulay follows with a brilliant oration. Lord Howick does not attempt oratory, but he tells the House that last year Mr. Buxton's assertions had surprised him, but he had made inquiry into the facts, and he found them undeniable. Then up rises Lord Althorp on the part of the Government. He is in sympathy with Mr. Buxton as to his object, but not quite as to his method, and he proposes an amendment which simply adds to Mr. Buxton's motion that regard be had to the resolutions of 1823. And now comes the tug of war. Members and friends of the Government beseech him not to divide on a trifle; they hate going against him when their hearts are with him; he is sure to be beaten, and in place of helping his cause, he will make a mess of it, and throw them all into trouble. Almost every friend he has in the House makes the same request. He said afterwards he thought there were a hundred who spoke to him. One member went to him four different times. Friends under the gallery were entreated to use their influence to persuade him to accept the one word "interest." Fancy his poor daughter in the ventilator, witnessing and watching the scene! And fancy her recalling his words so late as that very morning, when he told her it was so painful he could not possibly hold out!

Poor child! she knows him to be but mortal, and she can only make her appeal to the God of heaven to send him help from the sanctuary and strengthen him out of Zion. At last the debate comes to a close—he rises to reply. Thank God, after all, he stands

firm to his motion—alone, one would think, against the world. The Speaker puts the question—the Noes have it? Loud and firm is Buxton's almost solitary word of dissent—"No, Sir."

After an eight hours' debate, the House divides at two in the morning—the numbers are announced—90 for the motion, 136 against. It is a great minority in the circumstances, a moral victory, in fact; but Buxton has offended all his friends.

For days after many of them cut him right and left. Never mind, thou fearless warrior! Lord Althorp says to T. B. Macaulay, two or three days afterwards, "*That division of Buxton's has settled the slavery question.* If he can get ninety to vote with him when he is wrong, he can command a majority when he is right. *The question is settled;* the Government see it, and they will take it up." And the Government did take it up, and in a year *British slavery was abolished.* How he continued to resist all the pressure was a wonder to himself. He felt with intense keenness the disappointment and pain he was giving to his friends. This was his weak point, and he knew it. But he had found a passage in his Bible which he read so often that the book would itself have opened at the place: "We have no might against this great company that cometh against us; neither know we what to do; but our eyes are upon Thee" (2 Chron. xx. 12). "I sincerely believe," he said, "that this passage was the cause of the division."

There were yet other fields where the battle on behalf of the slave remained to be fought. Buxton's attention was more and more called to Africa. Though the slave trade was now unlawful by British law, there were other nations that sanctioned it, and the horrors still prevailing were equal to any that the Parliament of Britain had dealt with. Buxton contributed his share to the measures deemed most expedient for suppressing the slave-trade throughout that continent. But never again did a day come in his life like that 24th of May. He helped on the good cause by his powerful advocacy, as other good men did, and more, perhaps, than any one else. But never again did he receive, Ajax-like, on his single shield the weapons of a whole hostile army; never again, like Horatius, had he alone to defend the bridge. The firmness of one night secured the triumph of a noble cause, and earned the gratitude of 700,000 of his fellow-creatures, whom it rescued from the bondage of ages.

W. G. BLAIKIE.

ON THE NUTRITIOUS VALUE OF CERTAIN FOODS.

(FOOD IN ITS RELATION TO HEALTH.—IV.)

BY A FAMILY DOCTOR.

IN a former paper in this Magazine, I treated all too briefly on the adulterations of food. It is a subject to which I do not care to return at present, for it is by no means an inviting one. It

would be difficult indeed to name any kind of marketable commodity of an edible nature, that is not liable to be mixed or mingled with something or other which may render it more profitable to the vendor,

though less nutritious to the consumer. We have reason to be thankful when the adulteration is not altogether poisonous.

It has come to this: that the simplest articles of diet are the safest, and that is, in my opinion, another argument in favour of plain living. Yes, the simplest are the safest, and let me add, the best are the cheapest. The butcher, for example, or the egg-merchant cannot adulterate his wares, but he may have several qualities; and there is a stage at which all animal foods arrive, when kept in shops, which renders them to a large extent poisonous, and this is as bad, if not worse than adulteration.

We often hear it said that shop eggs, as they are called, are good enough for frying, with bacon for example. This is a positive mistake; an egg that has even a suspicion of staleness about it is deleterious to health, not to say dangerous, no matter whether it be fried or boiled. And the same may be said of flesh meat of all kinds, and I will not even except hare, nor venison. I am quite prepared to have this latter sentence pooh-poohed by the robust and healthy; I only add that I adhere to it, that I have the courage of my convictions, and furthermore, that I have invalids and dyspeptics, and those with delicate digestions, in my thoughts as I write.

I grant you, my healthful athlete, who can tramp over the moors with gun and bag from morning dawn till dewy eve, and never feel tired, that the eating of long-kept game may not seem to injure you, but the bare fact that piquant sauces and stimulants are needed to aid its digestion is exceedingly suspicious. There are two animals in particular that like their food high and tender: one is the crocodile, the other our friend the dog; but both have wonderfully strong digestive powers, little inferior, in point of fact, to that of the ostrich, about which bird so many fanciful stories have been written and told.

It may be said, without much fear of contradiction, that any kind of food or any mixed diet or meal which requires the aid of stimulant, either of the nature of condiment or wines, is not salutary. Such diet as this is a tax upon the whole system, and causes heat and discomfort, and a feverish state of the blood, which can only end in debility of the nervous system, and more or less of prostration.

But those who would obtain the greatest amount of health and comfort from the food they eat must be most careful in its selection. Leaving idiosyncrasy out of count for the present, although every one ought to know what agrees with him and what does not, there are many things connected with the value and digestibility of food obtained from various sources that I do well to remind the reader of.

Change of diet, frequent change, is a *sine quâ non* of health with every one, but more especially with the dyspeptic. Pray bear that well in mind.

"There is a hantle o' miscellawneous eatin' about a pig." This was the sage after-dinner remark made by a Scotch laird. But let the pig stand on one side for a minute or two, and give place to his betters, the sheep and the ox. "There is miscellawneous eatin'" enough

about either. The sheep's head is considered the humblest portion of the animal, and yet, if young and tender, with brain sauce and a sprinkling of sweet herbs, it makes a most wholesome dish. The tongues of sheep eaten cold make a nice breakfast change. The neck contains tender, easily-digested lean, either for a curry or for an Irish stew for lunch, only dyspeptics must be cautious not to use too much of the fat.

By the way, they make a most nutritious soup from the sheep's head and trotters in Scotland, which I recommend to dyspeptics, owing to the large amount of carbon it contains. The head and trotters are not skinned, but singed carefully with a red-hot iron, then as carefully washed, and cooked till tender.

Well, legs and shoulders, chops or saddle, are good and easily digested, if too much of the fat be avoided. The liver is delicious when fried with a little bacon, the slices of the former being somewhat thick, and the bacon cut thin.

But much of the value obtained from mutton depends upon its cooking and previous tenderness. It should be kept till tender, and the time will depend upon the weather.

The tenderness of meat and its cooking cause the fibres thereof to be more easily broken up in the stomach; it is thus digested without delay. Beef-steak should be most tender before being submitted to the process of cooking. It should always be done—or rather underdone—over a clear fire of coal cinders or coke, which is better still.

The dyspeptic will do well to give hashes and stews a wide berth, unless they are exceptionally well cooked.

Tripe is an easily digested and most succulent supper dish.

Now as to pork. For a man who is in good health, and has the opportunity of taking constant exercise in the open air, this food is good and nutritious, but the invalid and dyspeptic must beware of it. Ham or bacon, with eggs, in the morning, however, is tolerably easily digested. So is pig's liver with bacon; and cold pig's cheek is good either as a supper or breakfast dish to those in ordinary health.

After pork comes veal in the scale of indigestibility, so that, on the whole, my best advice to the dyspeptic is to leave both alone, with the exception of frizzled thinly-cut bacon as a relish in the morning.

Sweetbreads, whether calves' or sheep's, are very nutritious, and assist in the digestion of other foods.

On the whole, the health-seeker will do well to make the flesh of the sheep and ox, in moderate quantities, his staple, so far as albuminoid food is concerned, but he must vary this constantly with chicken, game, and fish, when in season.

He will hardly need to be told that beef and mutton, when good and properly cooked, give him life and energy, and therefore comfort, and to a great degree happiness; but I may remind him that an undue proportion of animal food renders him more liable to inflammatory troubles, whether acute or chronic; and again, if subject to rheumatism or other blood complaint, he must be cautious in the use of such viands.

As to tinned provisions, a few words will suffice. First, then, they are over-cooked, and there is always the suspicion that they may not be what they seem.

There are brands and brands, however, and many respectable firms would not put up a bad article. Tinned mutton or beef I cannot personally endure: my taste tells me to avoid them, and I do; but tongues tin well, if properly put up, and are nice for lunch or breakfast.

As a rule, with few exceptions, fish is more easily digested than flesh. It also makes a delightful change.

There is, weight for weight, however, less nutrition in fish than in fowl or flesh, owing to the former containing a larger quantity of water. As I shall have more to say on fish another day, I may here merely warn the dyspeptic against the stronger, oilier fishes—salmon, mackerel, &c.—and add that fish agrees better if eaten in the fore part of the day.

Without going far in the direction of vegetarianism, I must say again, as I have always said, that too much meat and too little of a vegetable nature is consumed by the people, and that if the reverse were the case, we should be, as a race, far hardier and healthier, and better able to battle against the wear and tear of life. Moreover, our death rate would be considerably diminished, and many ailments that now are rife would be almost unknown. Farther even than this I will go, and say that if more vegetable food and less animal were used, there would be less stimulants partaken of, because people would not feel the need of them.

Over and over again have I advocated the use of oatmeal in these columns. For breakfast or supper, what a stay and support to life is good porridge! Not over-long boiled, however; and made of a medium oatmeal, and eaten with butter or milk, or both.

Oat-cakes again—not the horrid imitation they sell at the confectioners'—but wholesome home griddle-baked cakes, with nothing in them but oatmeal and salt and a pinch of carbonate of soda, are excellent.

As to flour-bread I am, of course, a firm believer in the whole-meal bread, in which there is more nutriment and less binding qualities. Bread should never be eaten new. It should be a day old at least. Even toast ought to be made from stale bread. Toast should be thin and allowed to cool, if for breakfast. But toast for tea may be, and is better, thick. Here is my receipt: Cut the slices from a loaf a day old, with a strong sharp knife; let the slices be one inch thick or more. Toast them slowly, then butter abundantly, pricking the surface with the knife's point that the butter may run well in. Crush the edges of the toast with the back of the knife, sprinkle a little salt over the surface, and eat while hot.

But independent of oatmeal and flour, there are many valuable farinaceous foods which are, unhappily for our population, made to take a back seat in the scale of diet. Lentils, peas, beans, and maize are among the number.

If those who suffer from dyspepsia could only be got firmly to believe that frequent change of diet is most essential to well-being, and believing this, were to give these farinæ a fair trial, thousands among them would be restored to health, and be dyspeptics no longer.

There was a pamphlet written some years ago, called "One Hundred Ways to Cook Eggs." I have no idea what these hundred ways were, nor even a tenth of them, but as eggs are so very nutritious and easily digested, dyspeptics would do well to learn some of the many methods of rendering them palatable.

THE GARDEN IN OCTOBER.



THE last of the harvesting months is upon us once more, and our attention is therefore naturally turned to the harvest field under the trees, and to ladders and hampers in place of the sickle, for we are busy over the collection and storing of our apples and pears.

A few words, then, about the orchard in general will be advisable before entering our flower-garden; and we have chosen the best possible month in which to talk about these popular fruit-trees, for October is the time for garden changes, and tree-planting in particular.

First, then, as to the best site for our proposed orchard; and as to how *not* to do it, let us say, avoid any aspect that looks or slopes towards the north. Indeed, such a caution will hold true in most of our

gardening operations, while any one must have remarked of late years the greater prevalence of north winds.

We shall decide, then, to be as shy as possible of this bleak and gloomy quarter. Almost as ineligible, too, is a slope having a direct westerly aspect, for from the west we get most of our gales and keen searching winds. It is then the sunny south or south-east that we prefer for most things, and especially for our apples and pears. A very high situation, too, is inexpedient, as liable to exposure to rough weather; one perhaps fairly low, but certainly not damp, is the best. It is also a mistake to have too many large fruit-trees in a kitchen or vegetable garden; mutual destruction is the result of this too frequent experiment, for under these circumstances neither trees nor vegetables attain their full perfection, as the constant shadow of and drip from the trees injure the vegetable crops, while in