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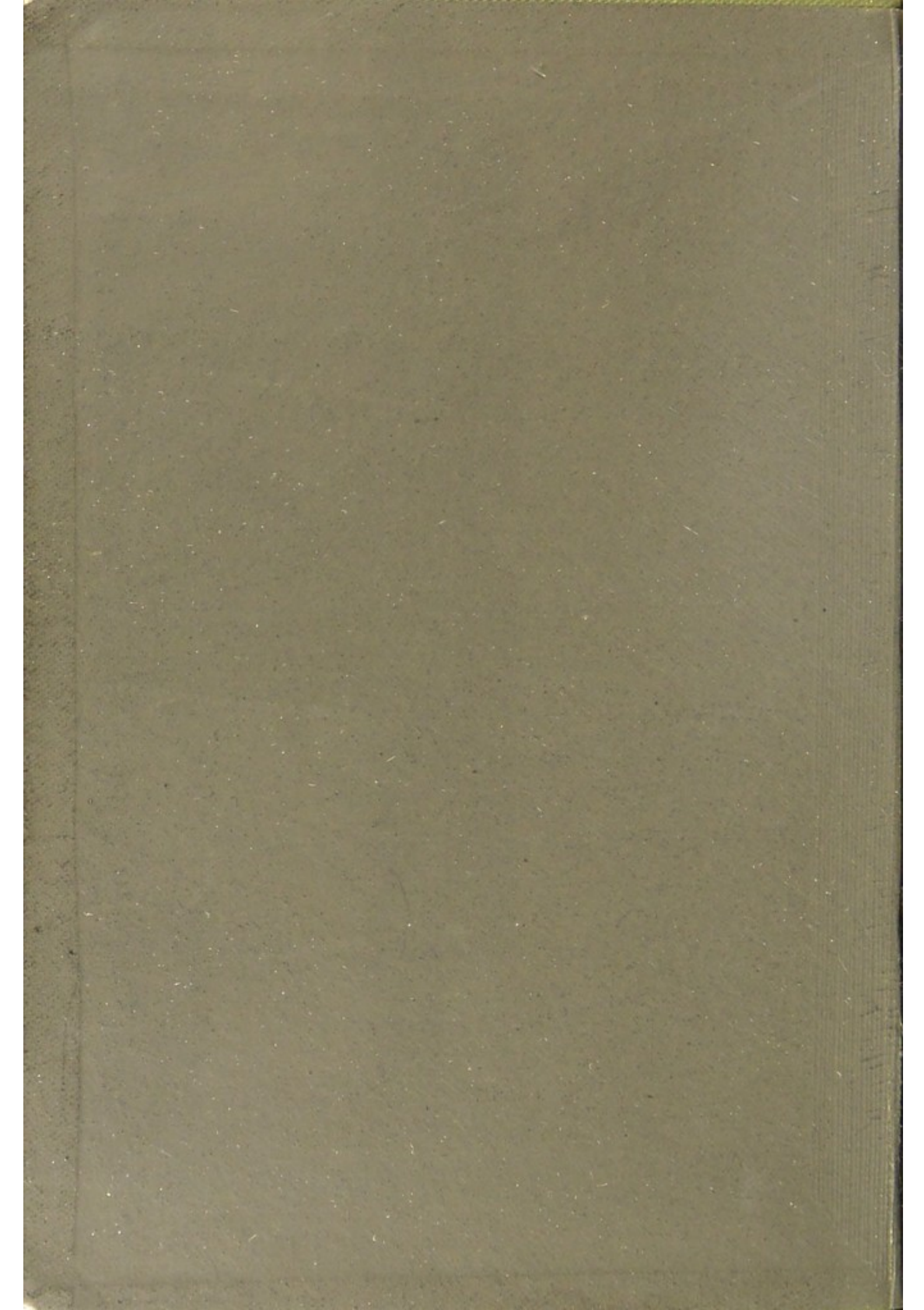


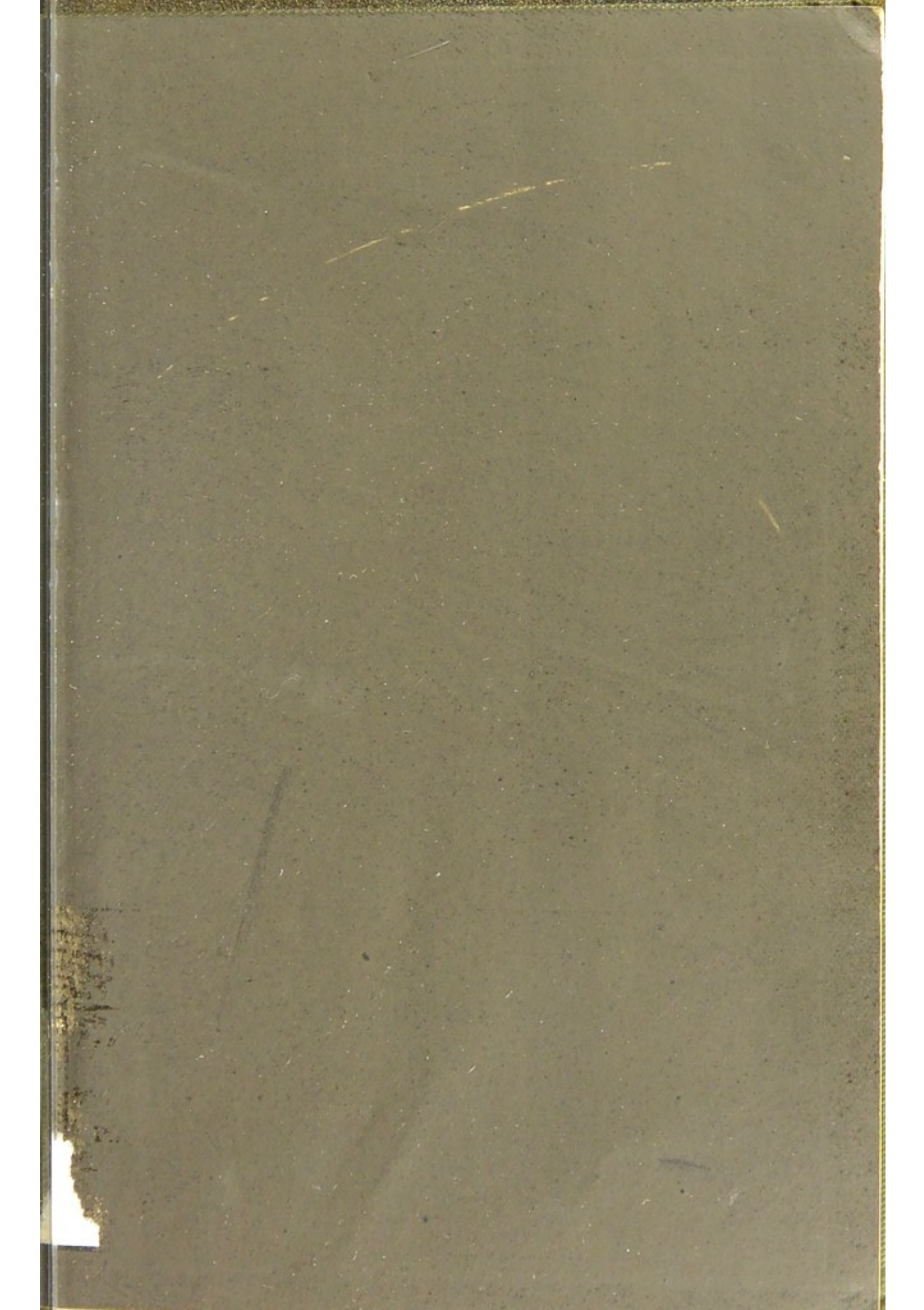
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PRACTICAL
LESSONS
IN
NURSING

OUTLINES
FOR THE
MANAGEMENT OF DIET

By EDWARD TUNIS BRUEN





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PRACTICAL LESSONS IN NURSING.

OUTLINES

FOR THE

MANAGEMENT OF DIET;

OR, THE

REGULATION OF FOOD TO THE REQUIREMENTS
OF HEALTH AND THE TREATMENT
OF DISEASE.

BY

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EDINBURGH:

YOUNG J. PENTLAND.

1887.



PREFACE.

It has been said that the three best doctors in the world are Dr. Diet, Dr. Quiet, and Dr. Merryman. A proper proportionment of physical exercise and rest, with suitable hygienic surroundings, are of great assistance in securing cheerfulness and good digestion, but *Diet* holds essentially a first place.

The substance of this little volume was delivered in the form of Lectures to the Nurses of the Training Schools of the Philadelphia, University of Pennsylvania, and Woman's Hospitals. The scientific aspect of the subject has been subordinated to the presentation of some practical suggestions to guide in the selection of suitable food in different conditions.

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OUTLINES FOR THE MANAGEMENT OF DIET;

OR,

THE REGULATION OF FOOD TO THE REQUIREMENTS
OF HEALTH AND THE TREATMENT OF DISEASE.

CHAPTER I.

POINTS ON THE PHYSIOLOGY OF DIGESTION.

THE celebrated surgeon Ambroise Paré, living in 1575, wrote that he knew of three parts of physic,—“chirurgie, which by the use of the hand; diet, which by the convenient manner of feeding and ordering the body; and pharmacy, which by medicines; attempt to expel diseases and to preserve health;” and adds, that “no one ought to be accounted a chirurgion who has no knowledge of diet and regimen.”

And truly it may be said in this day that one of the most important factors in the successful management of disease is a thorough knowledge of the principles of dietetics, and a suitable diet

formula cannot be framed without considering the processes of physiological digestion.

The digestive process is begun in the mouth by the action of the saliva upon the starchy elements of the food, and is continued in the stomach by the peptic ferments which are elaborated when the mucous membrane is stimulated by the presence of food or by the action of certain drugs. The essential part of the gastric fluid is known as pepsin; and the albuminoids are converted by it into peptones. The stomachic digestion is essentially an acid digestion, and is facilitated by the presence of an acid. The property possessed by the gastric cells of producing a secretion which changes the character of albuminoid substances brought in contact with it, is scientifically known as metabolic force.

Metabolism, or digestion, is continued and carried on chiefly in the upper portion of the small intestine through the action of fluids elaborated by the pancreas and the liver, and of the succus entericus, a secretion of the glands situated in the mucous membrane of the large and small intestines. The pancreatic fluid is the most important of these agents, since it contains a ferment which continues the metabolism of the albuminoid foods, producing peptones.

Pancreatic digestion differs from the gastric in that it is essentially an alkaline digestion. The activity of the alkaline juice is arrested by acidification and hindered by neutralization. The pancreatic juice exercises a solvent action on albuminoids, and acts with great energy on cane sugar and starch, whether raw or boiled, converting them into grape sugar, the only form under which these substances can become suitable for nutrition. The pancreatic juice has a further office: it emulsifies the fats. Thus, if hog's lard or olive oil be exposed to the action of the pancreatic juice, such a minute division of the oil into small globules occurs that a creamy emulsion, lasting an almost indefinite time, is formed. Thus the pancreatic juice possesses the power of acting on all food-stuffs,—the proteids, the starches, and the fats. The succus entericus probably to a minor degree participates in the metabolism of the same substances as are acted upon by the pancreatic fluid, and hence one may use the term intestinal digestion as properly as stomachic digestion. The biliary secretion would appear to be less important, possessing on albuminoids only an indirect effect, but upon fats its action is emulsifying and slightly solvent. It also forms soaps with free, fatty acids, which soaps are

very soluble in bile. Since oil passes more readily through filter-paper kept wet with a solution of bile salts as compared with one kept wet with distilled water, it has been thought that the bile facilitates the absorption of fat by its action upon the mucous membranes. The function of the liver is by no means limited to the formation of bile. In the liver many metabolic changes take place in the albuminoids, and a substance known as glycogen or hepatic sugar is also produced. Any cause, therefore, which prevents the hepatic function may engender serious evils upon the economy.

The definite changes which occur in the contents of the large intestine are unknown, but the chief characteristic of the work done is absorption. By the abstraction of the soluble constituents, and especially by the withdrawal of water, the liquid contents of the intestine become converted as they approach the rectum into firm, semi-solid fæces. The color changes from the bright orange, which characterizes the contents of the small intestines after admixture with bile, into a darker, dirtier brown. The importance of the thorough action of the digestive secretions is illustrated by the fact that even the poison of the rattlesnake is innocuous when swallowed, while

the peptones, if injected directly into the blood, are capable of causing marked poisonous effects.

Anatomically considered, the twenty feet of small intestine and the five feet of larger bowel attest the importance of the metabolism accomplished in these portions of the alimentary tract. Further, the importance of intestinal digestion is indicated by the consideration that the entire venous blood-vessel supply of the intestines is tributary to the portal vein, from which, after passing through the liver, the blood is carried into the ascending vena cava, and thence to the right heart.

The intestinal veins receive all the elements resulting from intestinal digestion, except that portion taken up by the intestinal lymphatics, which must traverse the lymphatic system before reaching the blood.

The route of the circulation of the blood from this point should be borne in mind, because in many diseases reference must be made to it. The heart is divided into four chambers,—the right and left auricles, and the right and left ventricles. The right auricle receives the venous blood from the great trunk vein, the vena cava ascendens. This in turn receives the blood from the lower portion of the body and the kidneys,

as well as the blood from the intestinal canal, which has traversed the liver. There is a descending trunk vein, the vena cava descendens, which carries to the right auricle the venous blood from the arms and head. The right auricle transmits its blood to the right ventricle, the remaining chamber of the right heart. From the right heart the venous blood is transmitted to the lungs, in which organs it is aerated or oxygenated. It is then known as arterial blood, which is collected by special vessels and carried to the left auricle; from thence the blood is transmitted to the left ventricle, the remaining portion of the left heart. The left ventricle discharges the arterial blood into the blood-vessels, which carry it throughout the system.

The arterial vessels are elastic, and when distended by the blood which is discharged from the left ventricle they recoil, and the contraction aids in forcing the blood throughout the arterial system, creates the pulse, and maintains a certain pressure within the arteries, which is known as the arterial tension. Various agencies cause this tension to vary. Temporary nervous excitement can exercise a reflex influence on the blood-vessels, and by causing them to contract will increase the pressure upon the

contained blood and raise the arterial tension. Excited action of the heart will also increase the force with which the blood is projected into the arteries, and therefore increases the blood-pressure within the vessels.

This subject has been mentioned chiefly because, when the elimination of nitrogenous elements of diet has been imperfect, they cause by reflex action on the nervous system general arterial contraction, and the intra-arterial blood-pressure, or tension, is thus increased. This effects many serious changes in the heart and blood-vessels; it is sufficient to indicate the fact and urge that elimination by the four great sources shall be unimpeded. These sources are the kidneys, the skin, the lungs, and the bowels; for in the bowels not only are the waste elements from the diet removed, but by keeping the bowels open the useless and possibly harmful elements contained in the venous blood can be in part removed. The difference between venous and arterial blood may be briefly summarized in the statement that arterial blood carries with it to the tissues of the body the oxygen, without which the tissues cannot give up those waste elements which are continually accumulating in them. The muscular system

becomes the storehouse for much of this waste material, and discharges all into the veins. Venous blood, therefore, is the non-oxygenated blood,—the blood after it has yielded its oxygen and has received many elements more or less completely deoxidized. There is a peculiarity in the circulation of venous blood which is worthy of notice. A portion of the force which propels it towards the heart is gained by the contraction of the muscles through which the veins pass, as well as the impetus from the left ventricle. The obvious lesson is that proper exercise is demanded to fulfil all the requirements of the circulation. Upon perfect circulation depends the aeration of the blood and the elimination of waste elements by means of the lungs, kidneys, skin, and intestinal canal.

CHAPTER II.

REGULATION OF FOOD TO THE REQUIREMENTS OF HEALTH IN DIFFERENT PERIODS OF LIFE.

LIFE during the period of youth is formative, and, as between the age when infancy ceases and manhood or womanhood begins new tissues are being developed, diet and hygiene should be carefully studied. The proper apportionment of the elements of food and its selection to fulfil different indications has been considered elsewhere; but, in general, it may be said that, when renewal of the tissues is demanded, the food must consist largely of albuminoids, which supply the elements of which the muscular, nervous, and bony tissues are formed. In children under two years of age, and even up to the completion of the first dentition, deficiency of lime-salts in the food, combined with the influence of foul air, damp, cold rooms, want of sunlight, and lack of cleanliness and of exercise, seem to be the predisposing influences leading to the development of that well-marked disease known as rachitis, with its attendant deformities.

In this disease fresh, pure, bracing air will, in a

measure, counteract the effects of an improper dietary; for it has been noticed that injudicious feeding is less hurtful in country places where the air is dry than in large towns. Doubtless a vigorous digestion is fostered by an out-of-door life, which enables the child to derive nourishment from food which under other circumstances would be innutritious.

The more the strength of a child is reduced before the actual exciting causes of disease come into play, the more quickly does the patient fall a victim to their effects. Therefore all influences which impair the general strength, such as weakness in the parents or in the child itself, or previous acute disease, render the predisposition to this disorder more marked. Although rachitis is a disease of young childhood, yet in its management by diet useful hints can be drawn for conditions of debility or impaired nervous and muscular power in the young.

The direct addition to the food of lime in the form of phosphate, hypophosphite, or lactophosphate; of iron; and especially of cod-liver oil, forms part of the usual treatment. These remedies act the part of foods. Milk should form a prominent article in the dietary, and should, if necessary, be mixed with various ingredients to

adapt it to the digestive powers. The diet proper may require the limitation of starchy or farinaceous foods. The use of meat-broths or eggs in the case of those too young to use meat is often a helpful measure. In the treatment of growing persons and patients in whom nutrition has been reduced, we should apply the same principles.

In order that we may have some guide to the value of foods, Pavy has divided their constituents into inorganic and organic principles.

The inorganic principles consist of water and the various saline matters required by the system. They are as much needed for the support of life as the organic portions of food.

The organic principles are subdivisible into nitrogenous and non-nitrogenous; and the non-nitrogenous are again subdivisible into hydrocarbons and carbohydrates.

The nitrogenous principles contribute to the growth and nutrition of the various bodily textures, and furnish the active agents of the secretions. They also undergo resolution in the system into urea, which is excreted, and a complementary hydrocarbonaceous portion, which is susceptible of application to force-production. They are thus capable of administering to all the purposes fulfilled by the organic portion of an aliment.

The hydrocarbons, or fats, are applied to the production of heat and other forms of force. They seem also to be essential to tissue-development generally, besides yielding the basis of the adipose tissue.

The carbohydrates (starch, sugar, gum, etc.) contribute to the formation of fat, and are also applied indirectly, if not directly, to force-production.

Milk may be regarded as a typical representation of an alimentary article which includes elements belonging to all the groups of classified foods.

TABLE OF DIGESTIBILITY OF ALIMENTARY SUBSTANCES.

EASY OF DIGESTION.	MODERATELY DIGESTIBLE.	HARD TO DIGEST.
Mutton,	Beef,	Pork,
Venison,	Lamb,	Veal,
Sweetbread,	Rabbit,	Goose,
Turkey,	Young pigeon,	Liver,
Chicken,	Duck,	Salt Meat,
Partridge,	Woodcock,	Sausage,
Pheasant,	Snipe,	Hashes,
Grouse,	Soups,	Mackerel,
Beef-tea,	Eggs,	Salmon,
Mutton-broth,	Butter,	Herring,
Milk,	Turtle,	Halibut,
Haddock,	Cod,	Salt fish,
Flounder,	Trout,	Lobster,

EASY OF DIGESTION.	MODERATELY DIGESTIBLE.	HARD TO DIGEST.
Fresh fish,	Raw or stewed oysters,	Crabs,
Roast oysters,	Potatoes,	Shrimps,
Stale bread,	Beets,	Oil,
Rice,	Turnips,	Melted butter,
Tapioca,	Cabbage,	Cheese,
Sago,	Spinach,	Fresh bread,
Arrowroot,	Lettuce,	Muffins,
Asparagus,	Celery,	Buttered toast,
Beans,	Apples,	Pastry,
Cauliflower,	Apricots,	Cakes,
Baked apples,	Currants,	Custards,
Oranges,	Raspberries,	Nuts,
Grapes,	Bread,	Pineapples,
Strawberries,	Farinaceous puddings,	Onions,
Peaches,	Jelly,	Carrots,
Toast-water,	Rhubarb,	Peas,
Black tea.	Cooked fruits.	Mushrooms.

Furnished with these principles, the formation of a reparative diet can be readily framed for those near the plane of average health, but milk or some of its adaptations as a sole diet will accomplish more in the manufacture of fat and blood, and consequently strength, than any other food.

During childhood or youth, and in states of debility, sleep is of equal value with diet. From ten to twelve hours of continuous sleep must be secured daily under six years of age, and under four years of age an additional nap

should be taken in the daytime of one or two hours; even until the fifteenth or sixteenth year as long a period of unbroken rest as possible should be the rule. Indeed, after adolescence in those brought again to childish weakness by the arduous pursuits of life, rest and sleep become the principal restoratives and the best handmaids to diet.

As beverages in health or disease, alcoholic stimulants have no place, and should only be prescribed by the physician as medicines. But in relation to sleep, it cannot be too often reiterated that tea or coffee promote excitement of the nervous system, must be classed as stimulants, and should be avoided by those under sixteen years of age, and by all persons who suffer from wakefulness. As a substitute-drink a preparation made by boiling cracked cocoa and milk forms a harmless and suitable beverage. It may be prepared according to the following receipt:

Allow one tablespoonful of cocoa to each pint of milk. Mix the cocoa with two tablespoonfuls of cold water, put on the fire and let it just come to the boil. Then add the pint of milk and let the mixture just come to the boiling-point again. Then stand it on the back

part of the fire and let it slowly simmer for an hour. It should then be strained through muslin and sweetened to the taste.

The porcelain-lined pot in which the cocoa is prepared should be new and kept exclusively for this purpose. Do not cover the pot while cooking.

Nursing mothers should use a liberal dietary of nitrogenous food, and a plentiful supply of milk should be consumed, since the nutrition of two organisms is laid upon a single digestive system. Some women, even if the reverse of robust in appearance, possess excellent mammary glands and vigorous digestive processes, and therefore are enabled to furnish a large supply of nutritious, typical milk. The practice of imbibing beer and tea as stimulants to lactation should never be resorted to without medical advice.

In old age, which some have compared to second childhood, the same principles in the main should govern the diet, with, however, modifications to meet idiosyncrasies and the state of the digestive powers. It has been said that every person, when he advances in years, should go over his whole method of life and personal habits with some wise counsellor, and

adapt his mode of life to the peculiarities of his individual case.

Provision should be made for thorough mastication of the food by providing artificial teeth when the natural teeth are deficient, since the chewing of food is even more necessary in the old than in the young. The food should not contain an excess of nitrogen, which is liable to be injurious, since the liver and kidneys may not be intact. Meats and rich foods should, therefore, be used sparingly. Milk and milk products, or preparations of bread-stuffs cooked with milk, should form a very large proportion of the food of the ordinary aged person. The injurious consequences of over-feeding manifest themselves, because old persons cannot take sufficient exercise to use up the surplus food in the manufacture of heat, and as all growth has ceased, food is not ordinarily required for the replacement of tissue. In chronic or acute diseases, in which repair of the tissues is needed, the administration of food should be as carefully regulated as in the early periods of life. These circumstances render an attack of indigestion more injurious in the aged, because less easily overcome. The period of old age seems to be the only epoch

in life in which during ordinary health stimulants can be given as foods with good results, as they quicken the circulation, and, in consequence, warmth and nutrition are promoted. This restorative effect upon the nervous system indirectly favors the more thorough performance of digestion. The stimulants used should be taken just before or with the meals, and should preferably be brandy, whiskey, or gin. With some, a glass of hot whiskey and water at bedtime will allay nervous irritation and secure the night's rest. As sleeplessness is the great bane of individuals as they advance in life, the use of tea and coffee should be avoided by those troubled with wakefulness at night, and since most persons crave a warm beverage, at some meals cracked cocoa prepared as elsewhere indicated should be substituted.

No stimulating drinks of any kind should be used by the young or growing persons. Milk or water or dilute cocoa should be the only beverages. Coffee and tea may thus be reserved for later periods of life, when their stimulative properties may support the nervous system; whereas, if the patient has been overstimulated while formative forces are at work, it is often impossible to prevent the develop-

ment of an irritated and unbalanced state of the nervous system, which many persons notice in young children without understanding the cause or how easily the trouble might be obviated.

Finally, neither the old nor the young should neglect suitable exercise of all the muscles. With persons of advanced life, riding or walking will probably be sufficient.

In massage we have a form of exercise for the muscles of persons too weak for other forms of exercise. In young children living in the country the out-of-door employments of life may afford a sufficient physical development, but in schools and colleges provision should always be made for physical culture.

CHAPTER III.

LIQUIDS USED AS BEVERAGES.

Tea—Coffee—Cocoa—Alcoholic Beverages—Water.

ASIDE from the classification of food-constituents into organic and inorganic elements, all articles of diet may be conveniently grouped as the fluids and the solids. Among the fluids we find the beverages, such as tea, coffee, cocoa, and the alcoholic stimulants.

Tea.—The advantage of tea as a stimulant may sometimes be secured without detriment if it is taken either without food or with such articles of diet as require but little activity in the digestive ferments; and individuals possessing ordinary digestive powers may safely enjoy its unquestionably stimulative and restorative effects.

Tea and coffee are often objectionable on account of their direct influence upon the digestive tract, and also by their indirect effect upon the nervous system. Tea contains a large proportion of tannin. This principle diminishes the salivary secretion and also retards the peptic digestion. Sir William Roberts is quoted by

Yeo ("Lectures on Digestion," 1882) as stating that in weak infusions of tea there is two per cent. of tannin, and in strong tea from four per cent. to seven per cent.

In the ordinary domestic decoction of coffee seven per cent. of tannin exists, and as much as fifteen per cent. in the French infusion. It is suggested by the writer that if tea be mixed with bicarbonate of soda in the proportion of two grains to the ounce, one can neutralize the tannin and obviate its effect upon the salivary and peptic secretions.

Coffee is generally used in smaller quantities than tea; thus, a small cup of coffee mixed with a large meal has an almost imperceptible effect upon digestion, but a large amount of coffee is even more injurious than a corresponding quantity of tea, because the infusion is usually stronger.

The use of coffee is objectionable in many cases of diarrhœa, apparently increasing the trouble. Tea and coffee also contain a principle which has an unquestionable and direct effect upon the cardiac innervation, even when they do not produce indigestion with its usual reflex action on the heart. Tea and coffee are powerful cerebral stimulants, and many injuri-

ous consequences may follow their excessive use, among which sleeplessness is conspicuous.

Cocoa is for most persons an excellent beverage, and there can be obtained from its use the salutary effects of a warm, agreeable drink. It does not contain tannin, and has no injurious effect on the nervous system, but in some cases it is found to be indigestible.

A dilute mixture of gin, whiskey, or brandy, say twenty per cent., is capable of promoting the salivary and stomachic secretions, but a larger amount is very prejudicial. A fifty per cent. mixture of either will so paralyze the functional activity of the stomach that the digestive ferments will no longer be secreted. Both brandy and whiskey, especially the former, may be objectionable on account of the oils, ethers, and coloring matters which they contain. Gin is less apt to be adulterated than either, but is scarcely as acceptable to the stomach.

The food-value of alcohol is a controverted point; and certainly in health, or in chronic diseases, its use is for the most part undesirable as a food, since its favorable influence upon the assimilation can generally be as thoroughly and much more safely secured by other means.

Medicinally, the chief importance of alcohol is as a cardiac and arterial stimulant. It is of infinite value in certain acute diseases attended with cardiac failure, and in nearly all instances of cardiac weakness. In advancing life, under special circumstances, it can be guardedly used, but it should always be regarded as an agent capable of harm as well as benefit.

It may be conceded that alcohol, in the forms already mentioned, is in the best shape for ordinary medicinal use; but questions of taste or idiosyncrasy may determine the selection of one of the various wines. The sparkling varieties can be used as diffusible stimulants, and are often very acceptable to the stomach from the amount of carbonic acid which they contain. The dry varieties are preferable. They can be tolerated by some in the pure state, but usually they can be advantageously diluted with Apollinaris, Seltzer, or other sparkling mineral waters.

Sherry, the white wines, hock, claret, and port are all, as a rule, unfavorable in their action upon the digestive system; many of them are objectionable on account of the acid they contain, and their use is frequently attended by acid fermentation in the digestive tract.

Sherry is probably the most prejudicial, if

taken in a large amount. The objection to the use of acid wines may be overcome by neutralizing the acids by the addition of some alkaline water. The very moderate use of wines prescribed by a medical attendant may be advantageous.

The use of beer is discountenanced by most authorities for those who suffer from slow digestion, and it is considered to be a depressant both to stomachic and intestinal digestion. Medicinal malt preparations may be divided into the thin and thick varieties. The former are well represented by Hoff's or Genois malts, the latter by Trommer's malt, or Reed & Carnrick's Maltine. The thin malts mostly contain a percentage of alcohol and hops, and should be regarded as possessing sedative and tonic properties, and they are useful when these general effects are required. They also contain diastase, which possesses the power of facilitating the digestion of starchy elements of food. Starchy solutions mixed with various proportions of malt respond readily to the ordinary tests for grape sugar, showing the absence of starch from the solution. The thick malt extracts, however, are doubtless more rapid and complete in their action upon starch, since starchy solutions di-

gested with a preparation like Reed & Carnrick's Maltine are rapidly altered and do not respond to the ordinary iodine tests for starch. Their employment is indicated when the action of malt upon starchy food is required in cases of indigestion, or in slow digestion. The thick malts can either be mixed with the starchy elements of diet, or a mixture of equal parts of malt extract with warm water can be beaten up so that a syrupy fluid is made, and suitable proportions administered in plain water, or with the addition of seltzer or aerated water.

By using some of this draught one or two hours after those meals into which starchy foods have largely entered, the fermentation and indigestion which often follow their use can be sometimes prevented. The syrupy or thick malts have this advantage,—a bottle of the preparation can be kept open for a longer period, because fermentation is less apt to occur.

Vinegar should be avoided by most dyspeptic persons, as it has been found that even in the proportion of one to five thousand it will sensibly retard the digestive process.

Various opinions are entertained with reference to the use of pure water as a beverage at meals. In reasonable amounts the use of water

dilutes the intestinal contents and promotes its appropriation by the vessels of the intestinal canal. Between meals fluids should be freely used; at least three to four pints of water or other fluid may be assumed to be required daily.

That the water used should be pure is an aphorism. Its contamination by organic matter is a most serious evil. Inorganic substances in drinking-water, unless they carry with them sewage matter, are unpleasant rather than harmful.

Organic material may be derived from the animal or vegetable kingdoms, and may be undecomposed (or in the same form as it exists in the organism), or changed into some other more or less complex organic substance. If the matter be decomposed, it may contain any of the products of decomposition down to the purely inorganic (like carbon dioxide, or nitric acid, or ammonia); and these may be recognized, while the organic matters escape detection. If the organic matter is of animal origin, the nitrogen compounds will ordinarily be more abundant than in other cases. These nitrogen compounds are supposed to exert a very great influence in causing the water to be unwholesome.

Water may appear perfectly pure to taste, smell, and chemical tests, and yet contain micro-organisms capable of carrying disease. In one of the reports of the State Board of Health a simple plan for testing for organic impurities has been suggested. A solution is made of chemically pure permanganate of potassium, eight grains to the ounce of distilled water. Into half a pint of impure or suspected water in a goblet or tumbler put one drop of the red solution of permanganate of potassium; if the red tint disappears from the glassful in half an hour, add more of the solution. For every drop that loses its color in the half-pint there will be found to be from one and a half to two grains of putrid organic matter in the gallon of water.

The general tests to determine the purity of water can only be applied by the skilled sanitarian chemist; but every one should be interested in learning how to disinfect impure drinking-water.

Recently calcined charcoal, well pulverized, is probably the only depurative substance which can be safely and yet effectively mingled with water without communicating taste or hurtful properties. It is usually placed in layers be-

tween clean gravel or broken quartz, through which the water is filtered.

The charcoal should be frequently renewed, for its efficacy depends chiefly on its absorbent power; and when it is saturated this property fails, after which it can only act as a mechanical sieve.

One of the best methods of securing perfectly pure water, free from odor or organic matter or infectious germs, is to boil it. The water after boiling should be exposed for a time to the air, so that it may absorb again a portion of oxygen and carbonic acid.

Some germs resist the action of high degrees of heat; yet the boiling of potable waters is one of the best methods of purifying them at present known. Melted ice is sometimes used as drinking-water, but freezing does not secure the same immunity from contamination as heat, although when the ice is obtained from water known to be pure, one may secure very valuable drinking-water by this method.

CHAPTER IV.

SPECIAL PLANS OF DIET.

Infants' Foods—Beef-tea and Broths.

SPECIAL plans of diet should be prescribed for those who can take and digest little or no solid food, but who must be fed on various liquid forms of nourishment, and for others who might digest solid food, but whose dietary must receive attention for special reasons.

In selecting a diet formula the personal idiosyncrasies of individuals must be considered, for no proverb is more true than what is one man's meat is another man's poison.

The infant digestion during the two first years of life offers a suitable model for the administration of liquid foods, since the various stages of development are often paralleled by the types of enfeebled digestion met with in adult life.

It is not the intention in this chapter to more than outline the subject of infant-feeding. No food is so suitable for infants under the age of twelve months as that which nature

provides, yet many mothers are unable, from ill health, organic disease, recurrent pregnancies, overwork, or poor appetite, to afford their infants a suitable supply of breast-milk. When these circumstances deprive the infant of the supply of maternal breast-milk, the choice of a wet-nurse or artificial feeding must be considered. Wet-nurses can only be employed by well-to-do families, on account of the expense involved. It is always difficult to exclude, in choosing a wet-nurse, the scrofulous, the tubercular, or even the syphilitic, and when this obstacle has been overcome, the habit of the intemperate use of alcoholic stimulants by wet-nurses often remains, and also the danger of a sudden abandonment of the infant on account of some freak of temper, which may have a most disastrous effect upon her charge.

Numerous conventions composed of physicians who have had a large experience, have decided that with infants who must be artificially nourished cow's milk is certainly the best of all foods. But cow's milk differs from human milk in three important particulars: it contains more casein, has an acid instead of an alkaline reaction, and is sweeter. Cow's milk when received into the stomach exhibits a ten-

dency to coagulate in large, tough masses; human milk, on the contrary, under the same circumstances forms a friable, flocculent, or flaky coagulum.

It is a popular fallacy that better milk can be provided for infants by obtaining it from one cow; but the casein, as well as other ingredients of cow's milk, fluctuates between wide limits, according to variations in the health, feeding, and exercise of the animal: moreover, the best milk is brought from a distance, and it is manifest that but little reliance can be placed on the statements of the last handlers of the milk, so that a mixed milk of the dairy furnishes a better and more uniform average than is likely to be obtained by the constant use of the milk of one cow. In cities, when milk is delivered in the morning, it is generally the product of the two milkings of the previous day. In hot weather the milk should therefore be placed on ice to prevent fermentation, and if this is impossible it should be boiled. This method of treating the milk will also obviate any probability of the transmission of poisonous microbes into the system.

In feeding children under one year of age, one should approximate the cow's milk to the

standard of human milk. This is done by diluting it with an alkaline menstruum, but it is observable that the proportion of sugar and fat is also lessened. It is, therefore, desirable to add these ingredients. Meigs has suggested that for the first month the formula should be,—

One ounce of cream;

One-half ounce of milk;

Two ounces of lime-water;

One-half ounce of sugar of milk.

At the end of the first month these proportions should be doubled, and then not changed until eight or ten months have passed, because one finds that human milk after the first month remains unchanged during the first year.

The solution of sugar of milk can be made by dissolving seventeen and three-fourths drachms of sugar of milk in a pint of water, but as the solution is apt to become sour it is best to prepare only a small amount at a time. Lime-water, an expensive article when purchased at the chemist's, can be readily made by taking a piece of lime as large as a walnut, adding two quarts of filtered water, and allowing it to settle for twenty-four hours. The clear water on the top is then ready for use, and is sufficiently impregnated with the alkali.

Louis Smith, of New York, offers the following schedule :

Infants from birth until the close of the third week require one part milk and three parts of water.

From the third week to the sixth week, one part milk to two parts of water.

From the sixth week to the third month, two parts milk to three parts of water.

At the third month, half milk and half water.

At four and a half months, three parts milk and two parts of water.

At six months, three parts of milk, one part of water.

After the age of six months one-quarter part of water may be added.

To correct the acid reaction of cow's milk the addition of two to three teaspoonfuls of lime-water to the milk required at a feeding is recommended, and a little salt added may promote digestion. The true rule must be made upon the basis of each child's growth, development, and digestion. The passages should be free from partially-digested milk, semi-solid, and bright yellow in color. A child should be fed with as strong a solution of milk as it can digest.

Probably the next best article for young babies

is condensed milk. This preparation contains fifty per cent. of sugar, nine to ten per cent. of casein, and ten per cent. of fat; the water being reduced from eight hundred parts in the one thousand to twenty-seven. This large proportion of sugar is found necessary to preserve the preparation.

Condensed milk is commonly given to infants diluted in the following proportion: one teaspoonful to four or six ounces of water. After the first month one to two ounces of cream added to the above mixture will supply the needed fat, while the amount of condensed milk used can in many instances be doubled at this time. A stronger solution—for example, condensed milk diluted with four times its quantity of water—will cause it to resemble ordinary milk in consistency, but will contain a surplus of sugar. When, therefore, an infant seems to require a stronger food than it receives under the first-named dilution of condensed milk, this article of food should, if possible, be abandoned and another substituted.

There are also certain objections to condensed milk which should be remembered.

One cannot be certain that reliable milk has been used in its preparation, and also, as already mentioned, the large amount of sugar is objectionable. This latter fact usually interdicts its use

after the infant is six or eight months of age, because so much condensed milk must be used to secure a preparation of suitable strength, that the mixture becomes too sweet, and this excessive sweetness is often followed by fermentation with indigestion. The sugar is also liable to form too great an increase of adipose tissue, and the material for the elaboration of the important bony and muscular tissues is not supplied in its due proportion.

It is often necessary to use a food devoid of casein to remedy temporary indigestion. For this purpose, for young infants, one part of cream may be added to five or six of hot water. For older children the proportion of water can be decreased, and in adult life the cream may be diluted with ice-water.

As soon as the digestive equilibrium is restored, the permanent plan of diet can be resumed.

Indeed, it may be desirable during an attack of indigestion to withdraw all forms of milk diet for days or even weeks, and instead to use chicken-, veal-, mutton-, or beef-broths. These broths can be prepared in strength proportionate to the age of the child, and may be thickened with barley-water for children over eight months of age. The entire disuse, for the time being, of the food

which probably developed the indigestion is an important element in its cure. Barley-water may accomplish the same result as the diluted cream, and even in young infants the saliva excited by the act of sucking will aid the intestinal secretions in the digestion of the small amount of starch contained in a thin barley-water.

The tendency of cow's milk to the coagulation of the casein into a tenacious curd can be counteracted by the addition to the milk of certain ferments equivalent to those which are active in natural digestion. Among the variety of preparations of this character none is more valuable than the peptogenic powder prepared by Fairchild Bros. & Foster. This is an extremely convenient preparation, and by warming the milk with the powder for from five to twenty minutes, the milk can be predigested to a varying degree. In this manner the formation of a friable, flaky coagulation of the casein is promoted, and as the milk should be diluted before being subjected to the action of the powder, the specific gravity of the preparation is made to resemble the standard already discussed. Cream should be added to supply the fats. Milk, more or less fully predigested, is a most excellent food to bridge over some period of debility or acute illness. Its

permanent employment is objectionable, because the digestive ferments are evoked by the presence of food requiring digestion. If the digestive tract is normal, it is best not to furnish predigested food, since the secretion of the digestive juices is lessened by disuse, just as the muscles of the body become reduced if deficient exercise is taken.

The effect of boiling upon milk is a controversial point, some asserting that the digestibility of the article is promoted, others as stoutly maintaining the reverse. It is certainly worth a trial when unboiled milk proves indigestible. Boiling of the milk prevents fermentation, and is a suitable precaution in hot weather, and boiled milk is undoubtedly beneficial in diarrhœa.

A great many of the prepared foods for infants are largely composed of starchy elements. By taking as samples a certain number of these preparations, the principles which should govern their selection may be developed. It will be found that the percentage of starch in Blair's Food is .64, Imperial Granum .78, Ridge's Food .77, and Robinson's Barley .77. .

All contain from one to four parts cane-sugar, and from two to three parts grape-sugar. In "Farina" the starch is derived from corn instead

of wheat. There has been much effort expended to predigest this element of starch. Baron Liebig first endeavored to reduce the starch by heat into grape-sugar, because it is in this form that it is digested.

There are four leading foods in the market which are based on this principle,—Mellin's, Horlick's, Hawley's, and Keasby & Mattison's foods.

In addition to these, in the domestic flour-ball the starch is similarly changed. This is prepared by taking three or four pounds of flour, tying it tightly in a bag, and boiling for twenty-four hours. The outer rind is then removed, and the inside, when grated, will be found to respond to the test showing grape-sugar. A teaspoonful to a tablespoonful may be used mixed in cold water, and then boiled ten minutes in half a pint to a pint of water with constant stirring. When it becomes a thick paste it can be then diluted with milk, as already described.

Any one of the above-mentioned foods can be added in small amounts to milk designed for infants under six months for the purpose of mechanically breaking up the coagulated casein. Again, the various preparations of malt are intended to secure the reduction of the starch to

grape-sugar. The thick liquid extracts of malt, such as Reed & Carnrick's or Trommer's, should be employed. If one-half to one-third of a teaspoonful of the malt be added to the previously-mentioned flour-paste after it is cold, it should become so thin as to easily pass through the tip of a nursing-bottle. The starch is changed into a more soluble form and is probably more easily digested, even if it has not reached the stage of conversion into grape-sugar. This gruel can be mixed with milk in any desired proportion. Very few malts can produce entire digestion of the starch, and it is a question whether this absolute conversion is desirable, since large amounts of glucose are sometimes indigestible, and may have a laxative effect which is objectionable in the summer months. The starchy foods should not be used as aliments for children under the age of six to eight months. Although young infants by the aid of the saliva and the intestinal secretions can deal with small amounts of starch, yet the ability to digest starch increases with the age of the child.

The digestion of an infant should never be forced; the true index may be found by studying the actions of the bowels. No method of feeding should be tolerated until the passages show that the food is being digested and appro-

priated. The question of when pure milk should be used can be settled upon the same plan. With some children one can begin at six months to give pure milk, but probably for the majority this course is not desirable until after the first year. A great deal depends upon the richness of the milk. The Alderney milk should not be used until the second year is passed.

Nestle's food and the Anglo-Swiss food may represent the patented foods, and are objectionable chiefly because we cannot be quite sure of the mode of preparation; a criticism which cannot be urged against the use of milk modified at home on the principles we have already laid down. Nestle's food contains four per cent. of water, one per cent. of fat, six per cent. of grape-sugar, thirty-two per cent. of cane-sugar, forty per cent. of starch, and the balance is made up of unimportant ingredients. The Anglo-Swiss food contains wheat-flour, yolk of egg, and condensed milk.

In many instances a preparation of barley-water made sufficiently thin to be readily poured from one vessel to another is a very useful diluent to break up the casein of cow's milk, in preference to lime-water. Barley-water may be made in two ways. A teaspoonful of pearl-barley may be

added to a pint of cold water and boiled to two-thirds of this quantity and strained, the result being a thin, jelly-like fluid; or a teaspoonful of Robinson's barley may be added to two ounces of water and allowed to boil. The consistency of the preparation can be lessened at pleasure by dilution with water. Barley-water has some food value for infants, and it can be rendered agreeable by flavoring with such a substance as cinnamon. Its usefulness is greatest after the sixth month when undiluted milk is often used, and the casein has a tendency to coagulate in such masses as to be indigestible. The malts may be used with barley-water when digestion is imperfect or constipation exists.

It is necessary to be as particular in children as in adults with the administration of the foods. "Little and often" must be the rule for young infants, but this must not be construed to mean constant or irregular feeding. Infants nourished with breast-milk should be suckled on the average every two hours in the daytime after the age of six weeks, and hourly if under this age. The practice of allowing infants to nurse constantly is most injurious. Bottle-fed infants require a longer time to digest food, and they should not, as a rule, be fed oftener than every two and a half hours if under the age of three months, or every three

hours if above this age. Some infants, like some adults, require more food than others, but an infant under the age of six weeks should receive only about one and a half fluidounces at each feeding, more than two ounces producing distension and uneasiness. At three months the quantity should be about three ounces, and up to the tenth month the infant may receive four to five ounces of fluid having the consistency and nutritive properties equal to that of human milk. Feeding from a bottle encourages the secretion of saliva and mixes the food with this and other secretions of the mouth. The bottles should be kept scrupulously clean, and in the intervals of feeding the bottle and its tip should be immersed in water rendered alkaline by bicarbonate of sodium.

When children commence to use a mixed diet and lessen the use of milk, it is important that their aliment should still consist largely of milk, vegetables, and cereals, reserving meat for a later period.

Bread and milk, oatmeal or hominy, wheaten grits with milk and sugar, are good breakfast foods.

Dinner: Bread and milk, potatoes,—thoroughly cooked,—eggs, spinach, tomatoes, peas, beans, with sago-, rice-, tapioca-, or bread-puddings.

Supper: Corn-starch, corn-meal mush, hominy, or bread and milk. Stewed prunes, apples, or peaches.

In spring and summer the fresh vegetables afford a greater variety, and strawberries, raspberries, peaches, and pears in moderation are wholesome.

The full meat diet should be reserved until the milk-teeth are shed and the second dentition has begun. Disorders of the nervous system or disturbances of the digestive organs are then much less frequent than in infancy, and the physique seems better fitted to resist the inroads of unavoidable diseases. Until the eighth year meat once a day, three or four times a week, is sufficient. While this general rule is advisable for the average child in health, deviations must be made in cases of special debility, or when sickness with fever has induced a large consumption of the albuminoid and fatty elements of the tissue.

Any dietary calculated to promote nutrition is one-sided unless appropriate physical hygiene be provided.

The pivotal measures are the apportionment of appropriate and systematic exercise with the suitable excitation of the function of the skin,

and the proper supply of fresh air introduced throughout the day into the living-rooms of those necessarily housed, with due attention to cleanliness. Infants who cannot exercise their own muscles should be sheltered from severe cold or windy weather, but by bathing the desired exercise can be secured and the function of the skin promoted, and no prejudice should exclude the daily bath, summer and winter, from the management of any infant. The liability to take cold will be reduced by the diminished susceptibility of the skin, and the exercise afforded the infant is alone worth the trouble.

Children when over the age of five should be taught and encouraged to bathe daily by sponging the whole surface of the body with water, the ablution to be followed by brisk towelling.

The family physician should decide the appropriate amount of muscular exercise in case the child is sedentary by habit or presents unequal muscular development. Usually children secure abundant exercise naturally in play, especially those living in the country.

Sleep forms the final measure demanded for suitable growth, development, and reproduction of the tissues.

BEEF-TEA AND BROTHS.

Yeo, a celebrated English writer, observes that there is a widespread misapprehension among the public in regard to the nutritive value of beef-tea. The notion prevails that the nourishing qualities of the meat pass into the decoction, and that the dry, hard remnant of meat fibre which remains undissolved is exhausted of its nutritive properties, and this latter is often thrown away as useless. A deplorable amount of waste arises from the prevalence of this erroneous notion. The proteid matter of meat is quite insoluble in boiling water or in water heated above 100° F. The ingredients that pass into solution are simply the extractives and salines of the meat and nothing more, except some trifling amount of albumen.

The fibre remnant, on the other hand, contains the real nutritive element of the meat, and if this is beaten into a paste with a spoon or pounded in a mortar and duly flavored with salt and other condiments, it constitutes not only a highly nourishing and agreeable but also a very digestible form of food. Beef-tea must, therefore, be regarded as a stimulant and restorative rather than as a food. The deductions of the laboratory

cannot always be applied literally, and broths may sometimes be used in conjunction with other forms of food if only for the sake of variety. In preparing veal- or chicken-broth or beef-tea for children, one-half a pound of meat to the pint of water is sufficient; for adults a full pound should be used. A good form of beef-tea can be made by allowing the meat to soak in tepid water for four hours. The infusion can then be placed over a hot fire and removed just before it reaches the boiling point. Boiling causes coagulation of the albumen, and the food value of the preparation is lost.

Beef or chicken can be advantageously used when prepared as above, but without the final application of heat. When maceration is finished, the meat can be passed through a press and flavored with cinnamon or cloves. A nourishing raw-meat soup may be prepared as follows:

One pound of finely-chopped beef should be macerated in one pint of water containing ten drops of hydrochloric acid, and afterwards strained through a cheese-cloth and seasoned.

Beef-tea is nearly always laxative, and its use should be avoided when the intestinal canal is believed to be in an inflamed or ulcerated condition.

If slightly-broiled beef is cut in pieces and pressed, the juice which contains a large proportion of the albumen of the beef will be obtained. Half a pound of beef should yield about three teaspoonfuls of juice. Broths are very useful combined with cereals. A gruel can be made of almost any form of meat to which one-eighth its weight of ground malt has been added, and this may afterwards be mixed with the broths in the proportion of one to five, forming a very nutritious liquid food. The malt by acting on the starch of the flour converts it into a more soluble and digestible substance. The liquid extracts of malt mentioned in the earlier part of this chapter can be used instead of the malt flour.

These nitrogenous forms of food are never to be administered to healthy infants under a year. After the age of fifteen months they are gradually added to the diet list. If infants are debilitated by disease, malnutrition, or imperfect hygiene, two or three teaspoonfuls of the freshly-expressed juice of the beef may be given twice daily, especially to infants over five or six months old. Meat and potatoes should never be used prior to the eighteenth month, and only then in case the proper complement of teeth

have been cut. Milk should form the chief article of diet for at least the first two years, but it may be combined, after eighteen months, with cereals such as rice, grits, oatmeal, or gluten flour.

If potatoes are used they must be thoroughly cooked and never given partially boiled. The best form in which this staple can be used is baked, roasted, or mashed. The practice of giving to young infants six to twelve months of age mixtures of crushed soda-crackers, stale bread, or zweibach prepared with milk is very injudicious, excepting under special circumstances.

CHAPTER V.

AMOUNT OF FOOD REQUIRED BY THE SYSTEM.

Foods which are Readily Digested : Soups—Meats—Eggs—Oysters and Fish—Nutritive Enemata—Vegetables.

WHEN an adult is the subject of disease, the digestive powers may be so much reduced that foods should be selected upon the same basis as that on which infants and young children are nourished.

The type foods already described and designated as "liquid forms of diet" may be administered. In considering other forms of food, they may be broadly placed in two groups,—those solids which produce the fatty structures of the body, and those which contribute to the repair of the muscular and nervous tissue. The essential principles of those foods which are available for this latter purpose are called albuminoids or proteids. It is claimed by Pavy and others that the fatty foods also have a share in this renewal of tissue. At the same time, when persons are required to do hard work causing considerable waste of tissue, or in fevers, the renewal of the tissues must be effected

by food conveying nitrogenous elements. An appreciation of these facts will enable one to make a suitable apportionment of food. The following table of Moleschott's indicates the proper amount of food for a person of average stature, doing a moderate amount of work in the temperate zone:

Albuminoid matters	4.587	} Solids, 46 ounces. Water, 58 ounces.
Fat . . .	2.964	
Carbo-hydrates .	14.250	
Salts . . .	1.058	

This furnishes a supply of about twenty-three ounces of dry, solid matter, one-fifth of which is nitrogenous. If we reckon that ordinary food contains about fifty per cent. of water, then twenty-three ounces will correspond to forty-six ounces of solid food in the condition in which it is consumed. To complete the alimentary ingestion a further quantity of from fifty to eighty ounces of water may be assumed to be required to be taken daily in some form or other.

In Guy's Hospital thirty ounces of solid food per diem and the equivalent of seventeen ounces of water-free material are allowed each patient, and this amount suffices to satisfy and sustain (Pavy). A hard-working man may take two pounds of bread and three-quarters of a pound

of meat; that is, forty-four ounces of solid food per day, one-quarter of which is animal matter. If we assume that fifty per cent. of a mixed diet is water, somewhere in the neighborhood of forty-six ounces of solid food will represent the amount of food required to maintain the system on the normal plane. If people live sedentary lives, thirty ounces of solid food will suffice. The human organism is best adapted to receive a mixed diet. From four to five per cent. of the food should consist of albuminoid matters, the rest of a mixed diet of grains, vegetables, and starchy foods. It has also been found by experiment that a man of medium stature, doing a moderate amount of work, requires some three hundred grains of nitrogen and forty-eight hundred grains of carbon daily to compensate for the waste of the tissues. This supply is yielded by two pounds of bread and three-quarters of a pound of meat. If the diet consisted of meat alone, more than six pounds would be required to furnish the necessary amount of carbon. Under such circumstances there would be an excess of nitrogen over what is needed by the system. The liver and kidneys would be called upon to remove this excess of nitrogen, and if their work is greatly increased it predisposes to diseases of these organs. If

bread alone were taken, over four pounds would be required to furnish the requisite quantity of nitrogen. In this way too much carbon is taken. This is not so injurious as an excess of nitrogen, for it tends simply to increase the deposit of fat.

The nutritive value of certain substances may indicate the basis on which foods should be selected.

SOUPS.

The use of a first course of soup at dinner is really, even if unintentionally, based upon a physiological principle. The action of a warm liquid tends to encourage secretion of the gastric ferment, and if sufficient time is allowed to elapse before the second course is taken, the action of the gastric juice is secured, and the digestive system is thereupon in a much better state of preparation for its duty.

A very nourishing soup can be made by the subjoined receipt:

One pound of bacon or ham;

Two calves' feet;

Three onions;

One pound of beef; with

whole peppers, cloves, parsley, marjoram, and thyme.

The quantities given should yield from two to

three pints for each edition, besides a foundation for about four pints of excellent soup. The cost will not exceed one dollar.

First edition. Slice three onions and completely cover the bottom of an earthen pipkin with them. Over this place a layer of fat bacon in slices a quarter of an inch thick. Slice three carrots and place them over the bacon. Over all place the following condiments judiciously proportioned: salt, whole pepper, cloves, parsley, sweet-marjoram, and thyme. Upon this should be placed two calves' feet, chopped fine, and one pound of lean beef finely minced. Cover the pipkin and place on a moderate fire so that there is no fire on the side, but all on the bottom, and allow it to remain undisturbed for one hour. Then uncover the pipkin and pour in sufficient boiling water to cover the contents and no more. Then replace the cover and place back on the fire to simmer for one hour. At the end of this time the liquor should be poured off without disturbing the other contents and strained through a towel, and the little fat which floats on the surface when cold must be removed. The soup is then ready for use. A teaspoonful of sherry and a small quantity of sugar may be advantageously added to each cupful of broth. When cold this prepa-

ration will become a firm jelly, which may be administered in the solid form.

Second edition. After the first liquor has been poured off, more boiling water, with a few spices and herbs, may be added, after which a couple of hours' boiling will produce a soup nearly, if not quite, as good as the first. When cold this also will set in a firm jelly.

Third edition. What is left in the pipkin furnishes an excellent foundation for a good soup. All the odds and ends of meats, bones, poultry, etc., which may be at hand are put into a saucepan with the above residuum. More spices, herbs, pepper, salt, and vegetables are added, and the whole is set to simmer for five or six hours. The liquor is then strained, and cleared with white of egg, and a capital soup is obtained.

Another excellent receipt for soup is as follows:

Take four pounds of fresh lean beef,—the less bone the better,—and put it in a soup-kettle with three quarts of cold water and salt and pepper. Place over a hot fire. In the course of half an hour a certain amount of fat will rise on the top and the water will commence to boil. When the water has boiled a few minutes, draw the kettle aside and add half a glass of cold water, removing the scum thoroughly. It is then ready for

the addition of the vegetables. Have prepared two carrots, scraped and cut into small pieces, one small turnip, a bunch of parsley, two small onions, two or three cloves. The vegetables should be cut into small pieces and placed in the kettle, and the whole allowed to simmer for five hours or more. It should then be strained. If it is kept over night, put in a cold place. To make perfectly clear put in the whites of two eggs with a little cold water, mix through the soup, boil gently for ten minutes, and strain through a coarse cloth. This quantity is sufficient to give a dozen persons more than a cupful. It is extremely nourishing, and free from the objections which pertain to beef-tea.

MEATS.

It may be assumed that red meats, such as mutton and beef, or white meats, such as poultry, are valuable albuminoid foods. A diet exclusively based on these substances may be ordered when the indication to repair tissue-waste is prominent, and when milk or milk foods are indigestible or obnoxious to the palate. Meats may be advantageously prepared for cases in which the digestion is seriously impaired, by using a chopper, preferably the American No. 1;

and for cases in which the digestive powers are more vigorous, the Enterprise, size No. 10. The pulp of the meat thus separated from the fibre can be made into the form of a steak, broiled and seasoned. Thus prepared it forms an article of diet which is very acceptable to the stomach. When an exclusive meat diet is deemed desirable, it can be varied by using eggs, oysters, sweetbreads, or bouillon soups; but all vegetables containing starch, and all fats, are incompatible with the plan. The most digestible meats, when the chopper is not used, are the steaks or joints of beef. They should be as free from fibre as possible, not stringy nor fat. Meats should be cooked and eaten rare and thoroughly masticated. Mutton, if tender, may occasionally be employed for the sake of variety. Lamb is apt to contain too much fat. Sweetbreads can be prepared so as to be an extremely digestible form of food. As a guide to their preparation the following receipt may be followed:

Boil a pair of sweetbreads in salt water for twenty minutes; take them out and put them in cold water for ten minutes; remove the outer coating and break them in small pieces; stew them in cream for twenty minutes with a little pepper and salt, adding a piece of butter the

size of a walnut rubbed in a small quantity of flour; add a little chopped parsley.

Veal and pork are objectionable animal foods, the last, especially, on account of the fat combined with it.

Eggs and oysters possess a high nutritive value, and are among the most desirable articles of diet that can be administered. The white and the yolk of the egg are both useful, but the white can often be received by the stomach when the yolk cannot. For example, the white can be mixed with either orange-flower water or plain ice-water, or the entire egg can be shaken with ice-water and sherry, the latter as a condiment. Some persons cannot digest raw eggs; in such instances they are acceptable if prepared by adding half a cup of hot water and half a cup of hot milk to an egg which has been beaten for fifteen or twenty minutes. The entire egg may be used, or the yolk only. Another formula in preparing eggs may be found in the *menu* given for consumptives. Eggs may also be given lightly boiled, poached, or scrambled; when fried, or made into an omelet, they are less digestible.

The oyster should be preferably raw; next best, steamed or roasted. To prepare in the latter way

the oyster-shells should be washed in clean, cold water, then laid on the hot coals until they open. Remove the oysters from the shells; season with salt, pepper, and butter. Serve by putting from four to six oysters on a small slice of buttered toast. If stewed, the less cooking the better. The sauce should be simply the oyster-juice made richer with milk; and it is most objectionable to soak crackers or bread in oyster-juice, as an accumulation of gas in the stomach is nearly always the result. The hard portion of the oyster should always be rejected.

Fish foods vary in digestibility; those like the shad, the sole, or fresh fish generally, are for the most part readily digested, and may be used when an ordinary mixed diet is resumed after a meat or milk diet has been followed for some time. With many persons, however, idiosyncrasy renders them unable to use fish at all. Codfish, pike, trout, mackerel, eels, salmon, herring, halibut, salt fish, lobster, crabs, and shrimps are more or less indigestible, and yet many persons can digest well-boiled, tender lobster even when it is prepared as a salad.

Nutritive enemata are sometimes suggested as a means of feeding those who can receive no food by the stomach. The rectum has little or no digestive

function, therefore anything introduced by this passage must be predigested, or ready to be absorbed. Peptonized milk or beef, or egg-albumen, diluted, are among the best of nutritive enemata. Enemata should not be given oftener than every four hours, since the rectum soon becomes irritable, and in consequence this mode of administration cannot be continued for a long period.

The fat-forming foods comprise the starches, the sugars, and the oils, or oil-carrying edibles, such as butter. These substances require perfect intestinal function, and should be withdrawn when evidences of indigestion occur in proportion to the urgency of the case, and should be cautiously used if the digestion is feeble, or when an exclusive milk or meat diet has been adopted. They should be withdrawn when evidences of indigestion occur.

It is well to commence a mixed diet with the use of green vegetables,—spinach or celery; only one of the starchy vegetables should be used at each meal. The vegetables should be thoroughly cooked, and the potatoes pressed through a cullender. Rice or other grains ought to be so thoroughly cooked as to be readily broken down with the fork. Corn (maize) should never be eaten by persons of feeble digestive power. A certain amount of fatty food is desirable when it can be

digested, but the amount to be taken varies in accordance with the climatic conditions under which we live. In the summer one should partake of fatty and albuminoid articles of diet with moderation, since the tissue-changes are slow, and these foods are not urgently required if but little exercise is taken. Instead we should use freely the carbo-hydrates,—starches, green vegetables, and fruits. The body temperature is lessened by this course, since the activity of the digestive forces is not so great in hot weather as in cold. But in winter the use of albuminoids and fatty articles is essential, as at that season much more exercise is usually taken, entailing rapid tissue-changes, therefore an additional food-supply is requisite to secure suitable tissue-replacement.

CHAPTER VI.

HOW TO REDUCE FLESH—HOW TO INCREASE FLESH.

THE fat-forming foods comprise the starches, the sugars, and the oils, or oil-carrying edibles, such as butter. To these must be added the fluid consumed, chiefly water. When it is deemed desirable to decrease the weight due to excessive deposit of fat, it is obviously necessary to reduce the frequency of the meals and the gross amount consumed. But in addition the fat-forming substances must be limited or possibly abandoned. As a guide, it may be stated that the corpulent should avoid the fat of meat, butter, cream, sugar, or sweets, pastry, puddings, farinaceous articles (such as rice, sago, tapioca, and potatoes), carrots, parsnips, beets, sweet ales, porter, and all sweet wines. Wheaten bread should only be partaken of moderately; brown bread is better than white. The gluten biscuits which are prepared for the diabetic may, on account of their comparative freedom from starch, be advantageously used by the obese as a substitute for bread. The articles

which may be taken to the extent of satisfying a natural appetite are lean meat, poultry, game, eggs, green vegetables, succulent fruits, light wines, dry sherry, and spirits. Milk should be used sparingly.

The general principles portrayed by the foregoing dietetic rules have attained prominence through the letters of the late William Banting. Besides altering the character of the food and withholding all fat-forming foods, the Banting system includes a limitation of the quantity consumed, not more than twenty-two to twenty-six ounces of solid food (corresponding to eleven to thirteen ounces of water-free material) being consumed in the twenty-four hours. This amount is less than that allowed during a life of inactivity, as illustrated by the diet supplied patients in Guy's Hospital, London, and which suffices to satisfy and properly sustain them, viz., thirty ounces solid food, equivalent to about seventeen ounces water-free material. This limitation of the quantity of food must have contributed an important share towards producing the effect observed in Mr. Banting's case. The following bill of fare is similar to that under the use of which a weight of two hundred pounds was reduced in a year to about one hundred and fifty pounds.

BILL OF FARE.

For Breakfast: Four or five ounces of beef, mutton, kidneys, broiled fish, bacon, or cold meat of any kind except pork and veal, which are not easily digested; a large cup of tea (without milk or sugar); a little biscuit or one ounce of dry toast, brown bread, or ordinary bread crust; an egg if not hard boiled.

For Dinner: Five or six ounces of any fish except salmon, herring, and eels (owing to their oily nature); any meat except pork and veal; green vegetables, and any vegetable except potatoes, parsnips, turnips, beets, and carrots; one ounce of dry toast; fruit out of a pudding, any kind of poultry or game, and two or three glasses of good claret, sherry, or Madeira; champagne, port, and beer being forbidden.

For Tea: Two or three ounces of fruit, a rusk or two, and a cup of tea without milk or sugar; a little coffee may be permitted.

For Supper: Three or four ounces of meat or fish similar to dinner, with a glass or two of claret.

For night-cap, if required, a tumbler of grog (gin, whiskey, or brandy, without sugar) or a glass or two of claret or sherry.

The latter portion of the bill of fare will doubtless be omitted in the majority of instances; but the principles which underlie the *menu* are, however, correct, and may be used as a suitable model in cases of corpulency.

In reducing the weight the question of suitable exercise should receive especial attention. Walking a stated distance at a stated pace should be a daily duty. The loitering gait called walking should not be tolerated, nor should any ordinary exercise in the house supersede suitable gymnastic exercise. Great harm may result from an attempt to reduce the adipose elements without corresponding attention to the up-building of the muscular and nervous structures.

HOW TO INCREASE IN FLESH.

Some persons are constitutionally spare and cannot be fattened. The true view is simply to regard fat-forming foods as possible factors in the repair of the fatty elements of the tissues, subject to the standard of constitutional predisposition. Increase in flesh is more or less rapidly effected in proportion to the amount of rest secured. Quite considerable increase in flesh may be rapidly attained by combining with a specified mode of feeding absolute rest in bed;

but much of this fat is apt to be lost when the usual habits of life, which require greater consumption of tissue, are resumed, and the nutrition returns to the ordinary plane.

It is best for the majority of persons to pursue a well-considered plan of physical exercise, in order that the muscular tissues may be developed, and by the exercise the circulation can be more thoroughly performed and the waste of the tissues eliminated.

The power of appropriating an increased supply of food is acquired, and the muscular, nervous, and fatty tissues built up together. Massage accomplishes this muscular exercise for those individuals who must rest in bed or who cannot take suitable active exercise.

The principle of physical exercise is, therefore, a cardinal consideration for those who desire to gain in weight and to build up their tissues, and must be settled before the question of foods can be considered.

The following foods facilitate the increase of the fatty tissues: the fat meats, butter, cream, milk, cocoa, chocolate, bread, potatoes, farinaceous and flour puddings, oatmeal porridge, sugar and sweets, sweet wines, porter, stouts, and ales.

Probably the addition of three pints to two

quarts of milk to the daily menu will be all that is necessary if the diet embraces foods selected on the principles already laid down. The milk should be preferably the Alderney milk if it can be assimilated; if ordinary cow's milk is used, a pint of cream can be taken daily in addition,—part on rising in the morning, and the remainder with the breakfast porridge. The programme for the day for persons who desire to increase their general health, strength, and flesh should be as follows:

A glass of milk or cream while at the toilet, which should include bathing in cold or tepid water, followed by a brisk general towelling. Before dressing, such gymnastic exercise should be performed as may be prescribed by the medical adviser. If possible, five or ten minutes should be spent in the open air at suitable seasons of the year.

Breakfast an hour after rising. When this meal has been concluded, devote half an hour to resting; then a brisk walk of a mile should be taken. For lunch a portion of milk with a biscuit. Dinner; and the remainder of the day may be disposed of by recreation, reading, riding, or driving. The bathing and exercise on rising should be practised at all events by

those who may not have leisure nor the necessity to consider further details in daily life. When the appetite is feeble the quantity of food administered at a time should stand in relation to the power of digesting it, and to properly compensate for a diminished capacity for taking a quantity of food there should be an increased frequency of administration. "Little and often" is the maxim to be followed by many persons who cannot sustain the ordinary intervals between meals, or who may desire to increase the amount of food appropriated without overtaxing the digestive powers.

CHAPTER VII.

DIET IN SPECIAL DISEASES.

Dyspepsia—Headache—Gastritis—Rheumatism—Gout.

It would be impossible to take note minutely of the questions that may arise concerning diet in special diseases unless each disease were taken up separately, and much tedious repetition would be necessary. By selecting a few typical instances of special conditions, applications may be made indefinitely.

Disorders of the digestive functions are frequently associated with organic disease, but instances of indigestion also occur from excess of food, improper food, or articles rendered unwholesome by bad cooking. Most vegetables and cereals in the raw or partially-cooked state are unsuitable for food.

Improper foods, by the irritation they occasion, may create more or less griping pain, and often lead to diarrhœa; and if edibles are enveloped in greasy sauces they may resist the action of the gastric juice and pass unreduced into the intestines, setting up irritation until discharged.

Some articles of food—such, for instance, as mushrooms and shell-fish—are unwholesome only to certain persons. Instances are recorded of serious and even fatal poisoning from their ingestion. A very common coincidence caused by indigestion is urticaria (nettle-rash), with or without swelling and irritation of the eyes or throat.

Imperfections in the chemical processes of digestion may arise from a deficient quantity or improper quality of the secretions, and one may objectively group the consequences under the “acid” and “flatulent” forms of dyspepsia.

Persons suffering from acid dyspepsia complain of eructations of bitter material shortly after eating, or during the digestive process. This can often be remedied by attention to the diet alone.

The flatulent form may occur from the ingestion of improper food, but also when the gastric or intestinal juices are insufficient; or special elements of the secretions may be wanting, such as hydrochloric acid and bicarbonate of potash; or the ferments, pepsin and pancreatine, may exist in too small quantity.

It is a physiological fact that alkalies given before eating will produce an increased secretion

of gastric juice, just as bitter roots when chewed will stimulate the secretion of saliva.

The simple bitters of gentian and quassia given with an alkali before meals will provoke a secretion of gastric juice. It is, therefore, evident that when persons suffer from the flatulent form of indigestion medical treatment must be especially necessary.

In the dietetic regimen, food liable to undergo the process of fermentation should be restricted or abandoned.

Frequently half a pint of hot water drunk just before meals may be serviceable. It operates as a stimulant to the central nervous system, and by the process known as reflex action the secretion of gastric juice is increased. This action is similar to the familiar operation of checking hemorrhage with hot water.

Hot water also increases peristaltic action,—*i.e.*, the vermicular contraction of the intestinal canal by which the food is carried first around the stomach for a couple of hours and then is passed through the intestinal tract.

The dietary of the dyspeptic should be varied from day to day, although the range should never be wide at any one time.

The patient's weight should be noted, and as

the digestive power increases, the diet list should be enlarged. Animal food is very valuable in many severe cases of dyspepsia as a sole form of diet. Each meal may be preceded by the use of half a pint of hot water. The meat may be given broiled, or prepared with one of the choppers already mentioned. In other cases meat may be used at breakfast three times a week; the other days, egg, toasts, or gluten flour in porridge, or as biscuit and bread when it is desirable to absolutely exclude starch. Fish is very obnoxious to some dyspeptics; others can use it as a breakfast dish with impunity. In mild cases it may be practicable to use the ordinary cereals, with the exception of oatmeal; corn-meal mush being a specially serviceable article. In most cases four to five hours should intervene between each meal.

If digestion is fairly good, the mid-day meal may include half a pint of one of the meat infusions, and thin slices of stale bread with oysters or fish. In others, broiled meats or fowl, with stewed fruits, will be found very acceptable. In grave cases the lunch may be confined to half a pint of hot water, followed by scraped beef, raw or boiled, with stale bread and butter. Milk can be tentatively tried.

For dinner, a light soup, or in its place half a pint of hot water, any form of meat (broiled or roast), fowl, and one vegetable, say, cauliflower, spinach, asparagus, peas, or tomatoes. The use of bottled vegetables makes this dietary possible throughout the year. Potatoes, hominy, and starchy articles in general are the most objectionable forms of food, but well-boiled rice and macaroni without cheese are better borne than the first-named articles. Certain fruits may be used as dessert. As a class, those which are juicy are best; peaches are more digestible than apples, raspberries than strawberries. Blackberries and bananas are very indigestible.

In some forms of dyspepsia the use of a milk and stale-bread diet for a long period is essential, and by degrees a mixed diet may be resumed. Four or five pints of milk must be taken in every twenty-four hours, and when necessary should be predigested, or mixed with flour and malt, as recommended for children.

It is especially essential that no more food should be taken at one time than can be easily digested in three hours. Food should never be taken when the patient is suffering from bodily fatigue, mental anxiety, or nervous excitement. A twenty or thirty minutes' rest in a recumbent

posture, or a short nap, should, if possible, be taken before eating.

In severe cases each meal should consist of a single article, and never, when care is necessary, should more than two or three varieties of food be chosen for a single meal.

Indigestion frequently accompanies or complicates general diseases. For example, affections of the throat, nervous disorders of the heart or respiratory system, as asthma, may be sometimes mitigated or removed by attention to the digestive system in connection with other measures. Headache is another example of a disorder which is more or less amenable to dietetic treatment. Headache is a symptom of many conditions more or less serious and opposed to each other, such as cerebral disease in the forms of inflammation or tumor; abnormal conditions of vision, almost all the general diseases, as well as a reflex symptom, indicating gastric disorder.

In cases of headache arising from dyspepsia the diet must be modified by avoiding the sort of food which invoked the indigestion.

In addition to these foregoing forms of headache, there is a variety known as nervous or recurrent headache, in which careful attention to diet will secure positive benefit. In many instances

the abandonment or reduction of the meat foods used, and their substitution by a diet largely composed of green vegetables with cereals and milk, pure or modified as prepared for young persons, will afford relief. In some instances the adoption of a strict milk diet for a lengthened period will prove most salutary.

Gastritis, or inflammation of the stomach, is commonly due to the ingestion of poisons, but is frequently caused by chronic alcoholism. In these cases the condition is often associated with changes in the liver and the mucous membrane of the small intestine. Indiscretions in diet of any sort may provoke inflammation of the stomach, but sometimes without any assignable cause this organ may become irritable, and it may be almost impossible for the sufferer to retain any food. When the stomach is irritable, the diet should be similar to that appropriate to the infant digestion, and the management of all cases of indigestion associated with vomiting may be conducted on a similar plan.

Wine whey,¹ ice cold, in small quantities at

¹ Wine whey is prepared by taking a pint of fresh milk. While boiling, pour in a small tumblerful of sherry wine (four ounces); bring it to the boil a second time, being careful not to stir it. As soon as it boils, set it aside until the curd settles, and pour off the clear whey.

intervals of an hour or two, may be used, or curds and whey can often be retained by the stomach when other foods are rejected. It may be remembered that we have in barley-water an excellent temporary form of nutrient, and also a medium through which the tendency of milk to disagree may be modified. The employment of malt mixed with the barley-water may promote its digestibility; indeed, with any starchy foods this addition may be profitably supplied. Among other foods peptonized milk is peculiarly appropriate.

Gum-arabic water will be tolerated sometimes, until more nourishing food can be retained. Cream and ice-water, one to three, is very serviceable, as is also the white of an egg stirred up in orange-flower water. The egg may be beaten up with wine (sherry) and ice-water or with shaved ice. Sometimes the yolk alone is used in this manner and the white beaten up separately and placed on top. A tablespoonful of one of these articles every hour may be all that can be retained, but in the aggregate a good deal of nourishment is thus supplied.

RHEUMATISM.

In the blood of rheumatic patients there is always a surplus of albuminoid matters in various forms,

which cannot be appropriated by the tissues as in ordinary systemic conditions. Therefore it is desirable to restrict the albuminoid form of nourishment. Any form of starchy food may be used with milk, or one may use gluten flour from which the starchy element has been removed. Cerealina and Hard's Food are palatable and digestible substances. When rheumatism is accompanied by high fever, a milk diet, or the same modified as in the preparations advised for young children, should be given. In some cases it is necessary to depart from the foregoing plan. When the fever is high and prolonged, the muscular and nervous systems especially suffer,—the former because in them the retrograde changes of the tissues chiefly occur, and after prolonged fever the muscular elements of the body are always sensibly reduced.

Again, if the general strength is depreciated by the tedious and painful character of the malady, or if the long-continued employment of the usual plans of treatment has induced debility, albuminoid food may be demanded because the muscular and nervous systems are chiefly recruited by these elements of diet. In chronic rheumatism the dietary laid down for the gouty subject is exceedingly appropriate.

GOUT.

There is a popular division of gout into the rich man's gout and the poor man's gout. Many persons who have been treated for this disease by means of purgatives, diuretics, and low diet are cured when placed under a more liberal regimen. Moderation in the quantity of food, and regularity in the times at which it is taken, are the first points to be attended to in the treatment of the gouty diathesis, and the adage of rising from the table hungry may be formulated under the rule that at no time should the stomach be uncomfortably filled. An essential part of the dietetic treatment consists in diminishing the amount of meat consumed; and by a continual study of the excretions, notably the urine, one can discover just how much nitrogenized food can be digested and eliminated.

In this manner the proper nutrition and strength of the body can be maintained, and yet no surplus added in excess of what is required or can be dealt with by the economy. Gouty subjects may use chicken or other fowl, mutton, and beef. The green vegetables may be used freely, but those containing much starch or woody fibre should be avoided, or used with greatest caution. A study should, therefore, be made either to select

such forms of starchy foods as can be appropriated without causing flatulence, or a reliable extract of malt may be used with them to assist in their digestion. Sugar or saccharine articles of diet are very objectionable. The juice of oranges or lemons is by many considered desirable; but the action of fruits upon the digestive system must be carefully watched, lest evil consequences ensue. In acute or chronic rheumatism stimulants should not be prescribed, and the same may be said of gout; but if, in the latter disease, habit renders them necessary, they should be such as are rapidly eliminated. For example, the pure spirits, gin or whiskey, well diluted, may sometimes be permitted, but only at meals. A small quantity of dry sherry may suit the palates of some and be reasonably well borne, but the wines and malt liquors are injurious. Tea and coffee should be used with great moderation. The abundant use of pure water between meals is very desirable, hence the popularity of the waters from the various mineral springs, such as Poland, Waukesha, or Buffalo Lithia.

CHAPTER VIII.

DIET IN SPECIAL DISEASES (*Continued*).

Constipation—Diarrhœa—Fever Diet.

CONSTIPATION.

ONE of the most prominent English physicians, Sir Andrew Clark, has recently presented in a most striking manner the practical details which must be observed in order to correct this unfortunate habit. His views are so excellent that frequent quotations have been made in the pages devoted to the management of constipation.

The disagreeable consequences of simple constipation lead many persons to adopt means to avert it. Medicinal remedies when frequently resorted to may create irritation of the bowels, which often paves the way for serious processes of an inflammatory nature, or may even promote the development of stricture or morbid growths.

The action of a cathartic often produces abundant mucoid and liquid discharges, yet the violation of Nature's laws is frequently so extreme

that the bowels, robbed of their normal conditions of action, refuse to operate at all except under the spur of strong aperients frequently repeated. The laws of healthful activity of the bowels demand that there shall be a plentiful supply of solid and liquid digestible foods which shall contain a large proportion of material which is not suitable for nutrition. This material is useful by mechanically mixing with the intestinal contents and by distending the walls of the bowels, especially the colon. This distention naturally stimulates peristalsis. The patient solicitation of the action of the bowels should be practised daily at an appointed hour; and should this season pass without result on a single day, a repeated solicitation should not be attempted until the next day at the same time. By this means a thorough distention of the colon and rectum may be secured, in consequence of which reflex action is more readily excited and an increased intimation of the need of relief is secured.

It is obvious that if the promptings of nature are disregarded the sensibilities of the parts concerned become blunted, and in the same way irregular attention to the intimations of nature will lead to the same result. Sufficient relief

from the bowels may be obtained by quite a moderate daily discharge; for instance, for a person of average weight, consuming a reasonable amount of food, the discharge in the twenty-four hours should be about five ounces. This should be formed, sufficiently aerated to float, slippery, and according as the cylinder is moist or dry will measure from four to six inches in length.

Constipation is usually amenable to dietetic and hygienic management. Fluids when freely used tend to promote solubility of the bowels. It is also true that fluids taken at special times are peculiarly efficacious. A glass of cold or hot water slowly sipped on rising in the morning and on going to bed at night will often secure a favorable result. In various mineral waters saline substances are mingled which possess purgative properties, but these belong to the class of medicines. A tablespoonful of unbolted flour mixed with the water taken in the morning on rising will often be sufficient to secure a movement of the bowels, yet at times coarse, irritating foods which cannot be digested may provoke catarrhal irritation of the bowels and induce diarrhœa. These substances must, therefore, be used with intelligent caution, and if their use causes pain they must be discontinued.

A juicy fruit eaten in the morning may be preferred, and as much bicarbonate of potash as can be placed on a nickel may be taken in addition. If this latter substance is employed, the teeth should be brushed with prepared chalk to avoid injurious consequences. A tablespoonful or more of the best olive oil added to suitable green vegetables or potatoes taken twice daily may be effective in certain cases. The free use of strong tea favors a constipated habit, and so does a pure milk diet, or one composed largely of meat or bread. The meals should include bran bread, the liberal use of Indian or oatmeal porridge, or porridge made from the coarser grains, of which there are a large variety. The green vegetables and fruits contain a large proportion of material which is not suitable for nutrition, yet may be mechanically useful.

On the contrary, articles of diet, such as meat and bread, which are highly nutritious, afford but little residuum, and are, therefore, constipating. Constipation, however, may still persist, in spite of the suggested change of diet, if peristaltic action of the muscular coats of the bowel is deficient. This can be remedied in part by kneading the abdomen along the course of the colon from right to left, as is done in massage.

General exercise is also a handmaid to diet, and joined with local massage may be wonderfully effective. On rising, a cold or tepid sponge-bath, followed by a brisk general rubbing, is beneficial. The clothing should not be worn so tight that the abdomen is constricted. Sedentary habits favor constipation, and walking at least half an hour twice daily is essential. Sitting or working for long periods in such a position as will compress or constrict the bowels should be avoided.

The use of cold water enemata tends to cleanse the rectum and to restore muscular power to this portion of the digestive tract. Again, an enema of olive oil and water may promote the solution of hardened fæces in the rectum. The enema should be received in the recumbent posture, with hips raised; the anus and lower portion of the rectum should be anointed with vaseline or oil. It is an error to fancy that by diet alone one can always control the habit of constipation, but it is equally wrong to imagine that physic, without attention to diet, should be employed. Moreover, unless physic is prescribed upon the principle that the muscular power of the intestinal tract should be stimulated, it can only result unfavorably.

The management of constipation in children under fifteen months is often difficult. Infants

are prone to constipation because they live on foods which offer but little residuum. Peptonized milk, condensed milk, or any milk given with large amounts of sugar, favors the habit. Those articles which can be mixed with the milk, such as gruels, tend, by affording a suitable bulk to the food, to obviate the evil. The addition of a reliable malt to the food in various proportions is one of the most available means of removing the habit.

As early as possible children should be taught to solicit the action of the bowels at stated times. They should not be encouraged to play while soliciting, and very soon the influence of habit is invoked, just as the control of the bladder may be learned. A sluggish action of the muscles of the rectum is often the cause of infantile constipation. The fæcal matter may become hard and packed within the bowel, so that it must be softened by the use of some lubricant. A suppository of non-irritating soap should be prepared, and after partial introduction it may be held in position until relief is obtained. A molasses-candy suppository is also useful on the same grounds. These may be made at home by boiling down a dark molasses, and when sufficiently hard it may be formed into the proper shape. Use oil while introducing into the rectum. Gluten suppositories can be advan-

tageously used in certain cases, or enemata of tepid water and sweet oil. In giving an enema to a young infant, care must be taken to throw in the water slowly and gently, and not to distend the bowel uncomfortably. The syringe must be first well oiled.

By some of these methods purely medicinal measures may be averted, although certain remedial agents properly classifiable under this head may be mentioned. Small amounts of flake manna dissolved in the milk, or pure cod-liver oil in amounts from five drops to a teaspoonful, may be given to correct the evil. Ipecac is another useful substance to secure the same end, as it possesses the power of increasing the intestinal secretions. Daily bathing and gentle towelling, with frictions over the abdomen, as already described, will often prove valuable adjunct measures.

DIARRHŒA.

Diarrhœa often arises from ingestion of unsuitable food. A speedy restoration to health may follow entire abstinence from solid food for twenty-four hours, and if undigested food remain in the stomach an emetic is required. This is easily obtained by swallowing two or three teacupfuls

of warm water with a teaspoonful of wine of ipecac or five to fifteen grains of the powder.

In a child half a teaspoonful of the wine or syrup of ipecac may be given every fifteen minutes. Occasionally a laxative may be required in addition.

Diarrhœa may occur as indicating relaxation of the bowels. This may be associated with any form of wasting disease, and it notably occurs in consumption. Diarrhœa may also be due to ulceration following catarrhal inflammation of the bowels, or the specific ulceration of typhoid fever.

In young persons, when diarrhœa is developed without apparent cause, especially if attended with debility or possibly slight chilliness, and rise of temperature, typhoid fever may be suspected.

In consumption the bowel is prone to tubercular ulceration as well as catarrh.

The small intestine occupies the central portion of the abdominal space, while the large bowel commences near the right flank, passes upwards, crosses below the epigastrium, and descends on the left side to end in the rectum. If tenderness on pressure exist, together with diarrhœa which is difficult to control, catarrhal

irritation, or even ulceration, may be suspected. The latter condition can be distinguished by the recognition of pus in the dejections. The treatment of these conditions is partly medicinal and partly dietetic; neither can be successful without the other. In connection with the dietetic treatment, it should be remembered that the slightest impression of cold upon the abdomen or feet will favor a motion of the bowels. It is well for sufferers from chronic diarrhœa to wear a flannel band around the abdomen and loins. The application of a spice plaster, or powdered tansy moistened with warm alcohol, thus forming a warm, light poultice, may be recommended. Woollen stockings and shoes with thick soles should be worn, and when walking about the rooms care should be observed to protect the feet by the use of warm slippers.

In diarrhœa due to ulceration more care should be used than when diarrhœa is simply attributable to relaxation. Those articles of food which are digested in the stomach rather than those digested in the bowels should be given. The articles especially appropriated in the small intestine are starches and fats; these should, therefore, be excluded as far as possible, and in bad cases even bread is not desirable. Bread

may be used in the form of toast, as by the action of the heat the starch has been in part converted into a form of grape-sugar. Milk, especially in peptonized form, or barley-water is very useful. Equal parts of milk and thin barley-water are peculiarly satisfactory forms of diet.

Boiled milk strained may in some cases be the best of the forms under which milk can be administered.

Arrow-root prepared with water or milk may operate either as an emollient and sedative, or it may prevent the formation of a hard curd from the casein. Malt mixed with arrow-root or barley-water favors their digestion by aiding the transformation of the starch into grape-sugar. Again, malt may be mixed with the milk and barley in the proportion of a teaspoonful to half a pint of milk. Mellin's or Horlick's food may be used upon the same principle. It is of the first importance to thoroughly break up the curd in the milk, since by forming a source of irritation excessive peristalsis may be caused, which may produce diarrhœa.

In typhoid fever diarrhœa is often increased in this manner, so that it becomes important in this disease to secure an action from the bowels once a day in order to rid the intestine of

hardened collections within its calibre, and at the same time lime-water or barley-water may be used if a tendency to coagulation of casein be noticed. The serious complication of hemorrhage may in many cases be avoided if this course is followed.

The various forms of beef-tea are objectionable in irritable states of the bowel, since they are likely to occasion diarrhœa; but in catarrh of the bowel, or when there is ulceration, a meat diet may be the most suitable in these circumstances. The use of meat should be preceded by half a pint of hot water, and the food may be taken three or four times daily. The hot water tends to produce normal secretions, and, although peristaltic action may be increased, the transmission from the bowels of partly-digested elements of diet and superabundant mucus is facilitated. The beef should be scraped raw beef or beef prepared by the choppers and afterwards broiled. Beef-tea, if used, should be thickened with twenty per cent. of flour and malt. Horlick's or Mellin's foods may be mixed with beef-tea and used once or twice a day. Valentine's and Liebig's beef preparations are open to the disadvantages of ordinary beef-tea. Bread made from gluten flour is serviceable because it con-

tains no starch. Eggs are unobjectionable. In catarrhal diarrhœa in which there is little or no ulceration the following diet in use at the Children's Hospital, Philadelphia, is a suitable model. For a child of seven years :

Breakfast, 7.30 A.M.: Milk, with lime-water; four tablespoonfuls of lime-water to each tumblerful of milk. The lightly-boiled yolk of an egg; a thin slice of well-toasted bread or stale bread.

Dinner, 12 M.: A mutton-chop, without fat, broiled, or a slice of roast beef or mutton; occasionally a bowl of meat-broth. Stale bread or toast.

Supper, 7 P.M.: Milk and lime-water; stale bread or toast. For drink, filtered water. Starchy food to be avoided as much as possible.

The amount of milk suitable for the nourishment of an adult may frequently be best supplied by repeated administration. In the management of the diarrhœa of young infants, the principles of feeding already described as appropriate for conditions of indigestion must be followed. With young infants under the twelfth month recourse to a wet-nurse may be indispensable. The food used at the time the attack originated must be discarded. Peptonized milk is very

appropriate, or the milk may be diluted with lime-water or barley-water below the strength used when the infant is in health. Milk must sometimes be abandoned temporarily and the child nourished by barley- or rice-water, with or without the addition of malt. Veal-, mutton-, or chicken-broth may be useful, but their use must be watched, since they may increase the diarrhœa. Dilute admixtures of cream and water may afford a resource of much value. Boiled milk is especially serviceable in cases of intestinal irritation or diarrhœa.

FEVER DIET.

In all fevers there is an excessive consumption of the proteids of the tissues and blood,—that is, of elements formed from albuminoid articles of diet. Consequently the muscular tissues waste away, and with them the fats, so that prolonged fever implies a wasting process which may involve death by inanition. When the fever is of a temporary character, the diet should be of the most simple nature, usually nutritious liquids. If the fever is likely to be long-continued, a diet adapted to repair the waste of the tissues is necessary, especially if the fever is an infectious one, for in these cases the progress of the

disease is attended with great tissue-waste and also much prostration of nervous force.

It is a good principle to give nourishing food in fevers as far as the condition of the digestive organs permits. When the febrile excitement is inconsiderable, the digestion is better preserved; in cases of very high fever, on the contrary, the diet must be adapted to the condition of greater impairment or actual loss of this function. Solid food should be always excluded from diet in febrile conditions when the digestive juices are scanty, for it may remain partially digested and undergo decomposition, thus becoming a source of irritation. This irritation aggravates the fever and still further impairs the digestive powers, and is liable to cause distressing retching and vomiting. Liquid nourishment is far less disposed to act as an irritant to the stomach and bowels. Milk is a pre-eminently suitable food in febrile conditions, but it must be modified so as to prevent the formation of casein curds. In case this precaution is not adopted, milk will often produce a feeling of oppression and fulness over the stomach, and its use will be followed by a coated tongue and a disagreeable taste in the mouth, or even diarrhœa. But milk can be readily prepared so that this difficulty may be obviated; and it should be the staple

food, since it takes the place of those albuminoid or meat foods which cannot be assimilated, and supplies all that they could afford. Nutritive enemata may be the means of tiding the system over a period during which the stomach may be unable to receive food, but they should not be given oftener than every four or six hours, as the rectum may become irritable and non-retentive. It is obvious that they can only prove a resource of a temporary character.

Broths may be given for the sake of variety, which may please the palate, but must be avoided if there is a tendency to diarrhœa. A liquid diet of three to five pints, largely milk, will afford sufficient nourishment to support the system through a febrile attack. Eggs, beaten up with milk, may be given three or four times a week, but are usually too rich for daily administration. Eggs, lightly boiled or dropped, may be used if the febrile movement is not marked. The carbo-hydrates—*i.e.*, starchy foods in the form of farina or well-boiled rice-pudding, or even custards, taken in small quantities—may prove serviceable if the fever is not high, and in periods of early convalescence. The easy oxidation of these substances checks the tissue-waste by limiting the destruction of albumen. The malt extracts play

an important part in predigesting the starchy foods, converting them into saccharine carbohydrates, which are the final products of the physiological digestion of amylaceous substances.

Water is of all articles the most indispensable for a febrile patient. It may be given cool, but not ice-cold, and should be offered frequently to those patients who, from excessive fever, no longer possess consciousness enough to call for drink. The water acts as a diuretic, increasing the activity of the kidneys and ridding the system of much of the waste elements which accumulate in the blood of febrile patients. In addition to plain water, the effervescent waters, such as Seltzer water or Apollinaris water, may be given in moderation; and, with the same injunction, apple-water, tamarind-water, red or black currant-jelly-water. Thin rice-water or lemonade, sweetened with Mellin's food, the whey of milk, may also be used to quench the thirst. Gum-arabic-water, flavored with lemon, may also be acceptable. The febrile state may complicate inflammatory processes in any of the organs. Independently of these conditions, fevers are classified as ephemeral, or temporary, and continued fevers. Continued fevers include typhus, typhoid, scarlet fever, and diphtheria. It is espe-

cially in these cases that the food question should receive special attention. Concentrated food in small quantities, frequently repeated, is the rule. With most persons food must be given every one, two, or three hours in proportion to the amount taken each time and the ability to digest the same. When but little is taken, the intervals between giving the food must be shortened. Whenever it is practicable, it is well to omit the use of all food for a period of four or five hours once in the twenty-four, so that the digestive system shall have time to recuperate.

It is in these continued fevers with great prostration that nearly all authorities sanction the use of alcoholic stimulants, and agree that they rather diminish than increase the temperature. Their administration should, however, be reserved to combat the evidences of prostration sure to appear in fever of long duration, notably in typhoid fever, and in fevers attended with blood-poisoning. The pure form of alcohol obtained in whiskey is the most reliable, although champagne, as a rapidly-acting diffusible stimulant, may occasionally be useful.

A marked exception to all rules of diet must be made in the case of typhoid fever, in which disease there is, as a necessary part of the process, ulcera-

tion of the mucous membrane of the small intestine. This lesion practically prohibits the use of any solid food from the time the true nature of the disease manifests itself until some time after the temperature has become normal. The length of time is greater in cases in which there has been extensive intestinal lesion, and solid food should only be resumed, in this disease, after consultation with a physician. A perforation of the bowel, a serious and usually fatal accident, may follow neglect of this precaution.

CHAPTER IX.

DIET IN SPECIAL DISEASES (*Continued*).

Bright's Disease—Diabetes Mellitus—Scurvy.

BRIGHT'S DISEASE.

This morbid process presents two aspects, under both of which the questions of diet and hygiene are of prime importance.

In one form the patient is swollen and dropsical, the pleural and abdominal cavities often containing large amounts of fluid. This condition of dropsy means that the venous system is surcharged with blood which has not been oxygenated. The diminished circulation of blood through the kidneys and its consequent deficient depuration is followed by venous repletion, the first manifestation of which is recognized in the deficient secretion of urine. Then its effects are felt in the pulmonary system by the surcharge of the radicles of the pulmonary artery. This vessel carries blood to the lungs, in which the blood is supplied with oxygen; and unless so aerated it cannot circulate freely through the pulmonary system. The

deficient oxygenation of the blood is the cause of manifold evils. From it often springs a cough, dependent upon catarrhal inflammation of the bronchial mucous membrane, to which condition it is predisposed by the deficient circulation. Then, following the route of the circulation, the liver, and from this organ the portal vein, become repleted, and thence the entire venous circulation of the digestive tract. This implies indigestion, or at least the inability on the part of the digestive system to manufacture suitable blood-forming elements, and, consequently, the tissues, which are renewed by a normal blood-supply, become deteriorated. The tissues are also unable to give up the elements of retrograde changes to the imperfectly-elaborated blood, which is already more or less surcharged with these waste elements. Among these the most important to be eliminated, and the most dangerous to the system if retained, are the nitrogenous elements.

In this dropsical form of Bright's disease the natural constitution or crasis of the blood is also reduced by the constant leakage of albumen from the blood. There are, then, three indications to meet by diet and hygiene: to diminish the albuminoids in the diet, and increase the elimination of the surplus of partly-reduced nitrogenous ele-

ments in the blood; to diminish the loss of albumen from the blood through the urine; and to remove the dropsy and thereby reduce the deterioration of the tissues, which is concomitant with the dropsy.

The second form of Bright's disease is one in which there is little or no dropsy, yet the destruction of the renal organ may be equally extensive as in the first group of cases. In this form of chronic Bright's disease there is always an increase in the blood-pressure, and an augmented propulsive power from the heart. The circulation is, on this account, adequately performed, and for a long time the subject of this disease may wear the appearance of reasonable health; or even if the complexion be pale and sallow, still digestion may be fairly good and no special disease suspected. At the same time the kidneys eliminate the nitrogenized waste less thoroughly, and a constant drain of albumen may be going on. It is only in the last stages of this form of the complaint that the dropsy is discovered. Among many serious symptoms it becomes difficult to particularize, yet one of the most critical of either of these renal conditions is headache, which may be frequent and severe, signifying a dangerous accumulation of imperfectly-depurated blood in the nervous centres; in a word, a form of

blood-poisoning. If nausea and vomiting be added to headache, the condition becomes more threatening.

In the non-dropsical form of Bright's disease, or when the dropsy is slight, the indications for treatment by diet and hygiene are to lessen the amount of albuminoids furnished to the system, to increase the elimination of previously-formed albuminoid substances, and also to diminish the discharge of albumen in the urine.

The dietetic and hygienic measures which are suitable to apply to the management of these serious diseased conditions are based upon a recognition of the physiological fact that the skin and the intestinal mucous membranes are the surfaces from which vicarious elimination can be attained. The clothing must be woollen or flannel next the skin, from head to foot, summer and winter, to prevent the liability to sudden chilling of the surface. Owing to such chilling, the kidneys are suddenly overworked by the increased repletion of the internal blood-vessels. Cold suppresses and warmth encourages the action of the skin, and every one has noticed under sudden changes of temperature the increased desire to pass urine from the bladder. The feet must be equally protected from dampness by woollen socks or stock-

ings, or by shoes with thick soles. On account of the possibly feeble circulation and the lack of proper cutaneous reaction, methodical repeated dry frictions to the skin by the use of the flesh-brush and the bathing of the trunk daily, with brisk towelling afterwards, is valuable. First the upper section of the body should undergo ablution while the lower part is protected by clothing, then the lower part should receive similar attention. An occasional Turkish bath or sweat produced by hot vapor bath, with special precautions against taking cold by friction afterwards, will encourage the action of the skin.

Massage is also useful, since it promotes the elimination of effete matters which are apt to be stored up in the muscles, and in this way the tired feeling which often accompanies chronic Bright's disease may be removed. By the frictions the sensitiveness of the skin to external impressions is lessened and the liability to take cold reduced.

As sea-bathing is capable of inducing albuminuria in perfectly healthy individuals, still more mischievous must be the effect of sea-bathing on those individuals possessing diseased kidneys. It is manifest that, when practicable, exposure to cold or damp should be avoided, since the consequences of taking cold may be more serious

in Bright's disease than in almost any other complaint, and occupations should be chosen with this end in view. The living rooms should be dry, warm, and well ventilated,—familiar maxims applicable to invalids in all conditions, but especially to sufferers from Bright's disease, because the vicarious activity of the skin is promoted and the burden of elimination naturally resting on the kidneys is thereby lessened. Indeed, it is said that in the extreme north and south kidney-diseases are almost unknown, and although precise statistics are wanting, yet it is readily understood that in hot climates the function of the kidneys is largely replaced by the secretions of the skin, while in damp countries with variable temperature, like England and many parts of the United States, kidney diseases abound. Unpleasant symptoms in persons with established renal disease may be avoided by residence in those southern latitudes which possess a warm, equable, and reasonably dry climate; but persons who must reside in a variable climate should avoid the open air in unfavorable weather.

Muscular exercise in moderation may be taken at home in a room which has a temperature of 65° to 68° F. Violent muscular exercise is injurious to persons with kidney-disease.

The bowels should receive diligent attention, and constipation should never be permitted. The natural aperient waters, Hunyadi, Friedrichshalle, Rakoczy, Carlsbad, or Congress, are especially useful.

Dyspepsia should be speedily relieved, because one of the prime indications for treatment is to lessen the supply of albuminoid food as a means of reducing the quantity of albuminoid substances in the blood. The system can often deal better with its own waste if fresh supplies of partially-digested forms of food are not forced upon the alimentary tract.

The diet during the long period in which the disease is curable or manageable should be as follows: an exclusively milk diet, which acts as a typical food and not as a diuretic. From four to eight pints may be taken in the twenty-four hours. Every precaution already indicated may be used to secure a perfect digestion of the milk. Nutritive broths may be used if the appetite craves a greater variety. Ordinary nitrogenous food, and especially that very rich in nitrogen, ought to be forbidden in most instances. The use of meat or eggs should be limited to those cases in which they may be given under medical directions.

Lean meats have a greater tendency to produce urates than other forms of albuminoids, and the urates cannot readily be discharged through the diseased kidneys. Fatty substances are easily oxidized and may retard the consumption of albumen. Butter should be freely used at the meals, and occasionally fat meats, bacon and pork.

Fish and fish-roe or herring may be used as sapid foods to stimulate a flagging appetite.

Indigestion or the appearance of headache will be the warning signal to abstain from meat. In cases in which nitrogenous food can be tolerated it may be ordered as follows:

Breakfast, 7.30-9 o'clock: Small cup of coffee, oatmeal or other cereal. Eggs, fish, or bacon. One and a half pints of milk.

11 or 12 o'clock: Pint of milk, with crackers.

Dinner, 2.30 o'clock: White meat of fowls. Roast beef or mutton. No veal. Two vegetables. If there is indigestion, avoid potatoes, hominy, and lima beans. Rice and green vegetables are permissible.

Supper, 6 o'clock: Pint of milk, milk-toast, stewed fruit. A little herring, broiled ham, or salt fish.

At bedtime half a pint of milk. The meat is to be withdrawn at any time if headache occurs.

The regulation of the elimination of albuminoid waste is within the province of the physician, and can be accomplished by the increased action of the bowels or by the administration of certain drugs having a diuretic tendency; yet these measures would be useless without a strict *menu*.

There is a feature in the management of Bright's disease, especially in its chronic form, which should always be considered. It is the avoidance of sudden excitement, which, by altering the vascular tension, may suddenly lessen renal activity and produce a condition of uræmia (blood-poisoning caused by the retention of greatly-reduced albuminoids), even when the diet has been managed with the greatest care. The effect of a milk diet is to secure an increased amount of urine, but the relief of dropsy and the reduction of the elimination of albumen belong more directly to the province of the physician. Rest in bed will often do much towards relieving these symptoms. It is a question, however, whether the advantages of rest are not counterbalanced by the disadvantage to the patient of confinement and want of fresh air and out-of-door life. These considerations must be weighed and that course adopted which best suits the individual case.

In Bright's disease strong alcoholic drinks

should be avoided. The light wines, especially the red varieties; the malt liquors, such as beer and porter, may be used by some, but in more cases they exercise an unfavorable influence on the liver. The perfect activity of this gland is so peculiarly necessary to subjects of Bright's disease that abstinence from all liquors is by far the best rule.

DIABETES MELLITUS.

Diabetes mellitus is a condition in which there is an over-production and diminished consumption of sugar by the economy.

Much can be accomplished in this disease by regulating the diet, and by cutting off from it those substances which assist in the formation of sugar. Saccharine materials, or the vegetables containing starch, must be ostracized. No vegetable which contains chlorophyl, or is colored green, will be found to contain much starch, as, for example, the green part of asparagus, or lettuce, or cabbage. The vegetables to be especially avoided are white and sweet potatoes, rice, beets, carrots, turnips, parsnips, peas, and beans. Meat, oysters, the green vegetables, milk, and eggs form the staples of the diet. Bread must be made from gluten flour, which may also be used in the form of cakes or as a porridge, the latter being made by

stirring the gluten into boiling water until thick enough, and then keeping up the boiling process for fifteen minutes.¹ A little salt and butter should be added to improve the flavor, and the porridge may be eaten with cream or milk. Bran flour deprived of its starch by washing is stated by Parkes, the authority on hygiene, to possess considerable nutritive value. It is useful in that it contributes a desirable bulk to the food of which it forms a part, and thus aids in maintaining the action of the bowels. Bakers' bran bread is made of unbolted flour, and contains starch along with gluten and bran; but the starch is in a much smaller proportion than in the bolted flour. The use of skim milk as an exclusive diet has been recommended in this disease by certain physicians who maintain the view that sugar of milk is a material assimilable in diabetes, and does not in the slightest degree contribute to the formation of sugar. The strictest diet may be unendurable, and must be relaxed from time to time, but only under medical advice. In selecting beverages for the diabetic, coffee, tea, cracked cocoa, with milk or cream, are suitable, but must be used without

¹ Gluten flour is prepared by the Health Food Company, 74 Fourth Avenue, New York, with directions for its use.

sugar. Carbonated water, and all the ordinary table mineral waters, may be freely employed.

Acid wines, including claret, Rhine wines, and the still Moselle, are not objectionable unless they cause indigestion. Very dry sherry, unsweetened brandy, whiskey, or gin, may be permissible if habit requires alcoholic stimulants. No malt liquors should be used except those ales and beers which have been long bottled, and in which the sugar has all been converted into carbonic acid and alcohol.

It is necessary in this disease to devote particular attention to maintaining the general health, in order to preserve the comfort of the patient and secure proper assimilation. A dry, harsh skin is nearly always a symptom in diabetes, due to the absence of perspiration, and we find sometimes itching of the skin, especially near the genitals. The Germans have designated the means to be employed to obviate these symptoms *Haut-Culture* (skin-culture). It can be attained by grooming the skin as directed in Bright's disease. Morning ablutions with cold water over chest and body, with suitable after-frictions, will tend to secure a favorable reaction of the cutaneous nerves. A tablespoonful of sodium carbonate added to an ordinary bath is

a suitable addition, softening the skin and facilitating its action. Massage is an especially useful measure, as is also muscular exercise, both by walking and gymnastics. The sense of muscular weariness common in this disease is ascribed by some to an accumulation of sugar in the muscles. If this be true, it forms another reason for attention to various modes of exercise. Periodic regular exercise at short intervals, two or three times daily, will gradually increase the strength, so that long walks of four or five miles can be taken without fatigue. Fatigue should be especially guarded against, as, until the muscles have regained their normal tone, sudden death may occur from over-exertion. Any exhaustive effort or practice should be abjured. From eight to ten hours' sleep should be obtained, and, as already observed, tea and coffee so frequently prevent natural sleep, that, as a beverage, cracked cocoa, prepared with milk or cream, should be used in preference.

Physiologists have found that asphyxiated lower animals are apt to have sugar in the urine, and the same condition may be a symptom when the respiration is embarrassed in diseases like whooping-cough or croup. Analogy would, therefore, indicate that perfect respiration should be accom-

plished, as a portion of the sugar can be eliminated by oxidation; accordingly, especial attention should be given to the development of the auxiliary muscles of respiration, viz., those of the chest, back, and arms.

It is also desirable that persons suffering from diabetes should devote attention to the ventilation of their living and sleeping rooms. Finally, attention to the secretion of the bowels is of the greatest importance to the diabetic. The waters of the various mineral springs can be highly recommended in this disease as laxatives.

From impressions formed at the European springs, the writer believes that much of the advantage resulting therefrom is ascribable to favorable hygienic influences, such as diet, rest, fresh air, and exercise. When the importance of the waters themselves is considered, the sulphate of sodium and the chlorides seem to be the most useful of the ingredients in the natural mineral waters. The Carlsbad Spring, which contains a large amount of the sulphate of sodium with the chlorides, stands first on the list.

The Vichy, which is a more alkaline but less purgative water, has also a reputation, but it contains less than half as great a proportion of chlo-

rides, and only a small amount of sodium sulphate. The American waters which approach the foreign in chlorides and sulphates are those of Sowder's Crab Orchard Springs, in Kentucky; the Estill and Harrodsburg Springs, of the same State, and Bedford Springs, in Pennsylvania. The Saratoga Spring waters contain the chlorides in very large proportion, reaching seventy grains to the pint; in the Geyser Springs and in the Empire and Hathorn, sixty-three grains to the pint. They contain no sulphates, but the carbonates are in considerable proportion, though less than in the Vichy waters.

Mineral waters containing the foregoing ingredients may not only be useful as laxatives, but they also tend to affect the circulation and the functions of the liver, and may modify the formation as well as assist the elimination of sugar.

Scurvy is a condition in which the alkaline salts of the blood contain too great an equivalent of acid. While this disease is well known to develop on shipboard among those deprived of fresh vegetables, and who have been living on salted provisions, yet a condition very closely allied or identical may be provoked in hospitals, or among the poor, when fresh meats or vegetables are unwonted luxuries.

Fresh vegetables in any form, or the succulent fruits, supply the salts required for the formation of a healthy blood-tissue. As the subjects of this disease are usually much prostrated, a liberal diet is necessary; yet the fresh vegetables and fruits are absolutely essential.

CHAPTER X.

DIET IN SPECIAL DISEASES (*Continued*).

Consumption—Heart-Disease—Neurasthenia.

CONSUMPTION.

PULMONARY consumption is the cause of over one hundred thousand deaths in the United States annually. One of the essential features of this dread disease is the wasting of all the tissues. Moreover, two classes of persons are especially liable to consumption: first, the scrofulous, who inherit a peculiar organization, and in whom the manifestations of consumption are particularly accompanied with debility and malnutrition; and, second, those who are reduced in strength by artificial, unhygienic habits of life, prolonged exhaustive effort, as in nursing the sick or by protracted business care.

It is unlikely that the causes of the disease will operate if the general health is maintained, and the catarrhal inflammation of the bronchial tubes which so often is associated with the process is not so likely to be progressively developed. While it must be understood that the dietetic treatment

of pulmonary consumption is only one of the means which may be employed to combat this wasting disease, yet alimentation almost to the extent of super-feeding is of prime importance, and every means calculated to enable one to take food should be fostered. Physical exercise, especially if it can be taken in the open air, tends to increase the ability to assimilate food, hence the resort, in many cases, to those climates which permit out-of-door life during the maximum number of hours in the day, and days in the year. There are, of course, other considerations in climate which should be weighed, and special forms of exercise which are most desirable, but the opportunity to lead an out-door life is of cardinal importance. In no disease is physical culture more serviceable than in consumption. Attention to diet should be supplemented by thorough bathing, rubbing of the skin with a flesh-brush, and such gymnastic exercises as shall tend to develop the respiratory muscles in particular, although the general physical development should be fostered.

Suitable inhalations of compressed or super-oxygenated air not only tend to effect changes in the lungs, but, by furthering the circulation, increase the appetite. Certain inhalations have at times the power of diminishing suppuration, and

thus, by reducing the temperature, enable the system to assimilate food, so that the subject of diet is necessarily intertwined with medical supervision.

Woollen underclothing should be worn by any one subject to catarrh. Merino which is largely cotton should not be substituted. The feet should also be thoroughly protected against the action of damp or cold.

A diet *menu* must be formed which will supply the most nourishing and concentrated foods. One of three plans may be followed.

Three ounces of cream may be drunk, on rising, with a teaspoonful of brandy. The three ordinary meals should be taken, including, at breakfast, oatmeal or hominy grits porridge, rare steak or chops; cream potatoes, with one pint of milk. This may be varied on certain days by substituting whitefish, broiled or stewed chicken; eggs, soft boiled or dropped. A small cup of warm beverage may be permitted if habit demands. At 11 o'clock three-quarters of a pint of milk, with biscuit or a slice of toast; and on days when eggs have not been used at breakfast an eggnog is suitable. The following formula may be followed in its preparation.

Candiel or Spanish eggnog: Take the yolks

of two eggs and beat them up; the lighter they are beaten, the better. Put a full half pint of milk on to boil with a few pieces of cinnamon bark and lemon peel. When the milk is boiled, pour through a strainer slowly on the eggs, stirring at the same time. Sweeten slightly, and add from half an ounce to an ounce and a half of whiskey. Grate some nutmeg on the top, and drink while hot.

At 2 o'clock, lunch, which may consist of oysters, or a meat soup, boiled rice, milk toast, one glass of milk. With this meal a wine-glass of malt is very serviceable. In the afternoon, if it can be digested, another eggnog or a glass of milk may be taken.

At 6 o'clock, dinner: Soup first; if desired, fish; meat, with a choice of the following vegetables: cauliflower, peas, tomatoes, celery, beets, beans, asparagus, macaroni without cheese. The starchy substances, such as potatoes and hominy, should be avoided. The dessert may consist of fruit, stewed if desired. At bedtime another glass of milk may be taken. Pickles, spices, salted provisions, pies, pastry, cheese, preserves, and nuts should be avoided; also hot liquids with the meals.

Under this plan, at least a quart of milk can be taken daily with a large proportion of other

food; and all the resources of therapeutics, whether medicinal, hygienic, or climatic, should look towards rendering such an ample *menu* possible.

The second plan is a more strict milk diet. From four to seven quarts of milk should be taken in divided amounts during sixteen hours out of the twenty-four, with, if possible, two eggs and two ounces of malt, given twice daily. If the stomach will tolerate it, one-half an ounce of cod-liver oil may be used as a food twice daily. If this diet prove constipating, the oil will aid in modifying this objection, or some substances such as Indian meal, porridge, or oatmeal, or malt extract, may be introduced.

Lastly, the above plan may be alternated with a largely nitrogeneous diet of meat and bread on three days of the week, or on alternate weeks. In pursuing this plan, nitrogeneous food, with stale bread and butter, must be taken six times in the sixteen working hours; meat or chicken soups or oysters may be tolerated, but no starches and no milk. Cod-liver oil to the extent, if possible, of three ounces should have a place under this plan. Vegetable, bouillon, sago, vermicelli, or cream soup may be preceded by oysters as a first course, then fish for the third, and, finally, the

meat. The advantage of having a meal served neatly and in courses cannot be over-estimated, since more food can thus be taken and digestion can be more thoroughly accomplished.

To promote assimilation, the general strength must be stimulated by systematic exercise or by massage. Eight hours of consecutive sleep should be secured, and two hours of additional rest in the twenty-four. The habits of life should be thoroughly regular and uniform. The patient should be warned that food must never be taken when he is fatigued.

HEART-DISEASE.

The various affections of the heart all demand careful dietetic treatment, and yet the questions involved are so complex that medical supervision of the habits of life is peculiarly necessary. The same is true of the various dropsies, or collections of serum in the chest, abdomen, or cellular tissues. Physicians commonly feel that it is unnecessary to inform a patient that he is the subject of organic heart-disease until its consequences manifest themselves in his personal inconvenience. Usually the defective circulation manifests itself earliest by the various symptoms of indigestion.

The failing circulation should be a warning that those forms of exercise which increase the demand upon the central organ of the circulation should be reduced. Indeed, it is desirable to forestall the demand by modifying the habits of exercise before nature imperatively requires it. In valvular heart-disease, in some of its forms, very great danger will result from excessive exercise; in other forms exertion can be tolerated and become beneficial if wisely directed.

Walking or riding are always less objectionable than running, rowing, or violent exercise of the arms. The nutrition of the heart suffers from changes in the blood-vessels, which occur independent of the changes in the general tissues, and are incident upon the mechanical operation of the circulation, and can only be partially influenced by habits of exercise or rest; but at the same time the maintenance of the general health will contribute to the integrity of the heart, even when the vessels are diseased. Persons suffering from weak or fatty heart, or who are subject to shortness of breath or other evidences of cardiac failure, are often advantageously affected by the reduction of the body weight, the circulation being radically relieved. This is especially true of persons who have

long indulged freely in the pleasures of the table and become obese. If larger amounts of nourishment have been consumed than are required to balance equally repair with waste, and especially if great quantities of fluids like beer have been used habitually, fat has in many cases been abundantly though gradually deposited between or even in the bundles of the muscular fibres of the heart. The blood, meanwhile, has also been slowly increasing in volume. Consequently, greater demands are being made on the heart than in its weakened condition it is able to meet. The least exertion is fatiguing and induces shortness of breath; slight dropsy may appear, the quantity of the urine is reduced, and indigestion becomes a frequent symptom. When indigestion commences in consequence of failing circulation, the elaboration of the stomachic and intestinal juices becomes imperfect and consequently constipation often ensues. It is especially objectionable to allow this habit to continue, since perfect elimination of effete materials is very important to a perfect circulation.

Fatty degeneration of the heart differs from the fatty infiltration already described because in fatty degeneration the muscular tissue of the heart is disintegrated, while in the foregoing process the

muscular fibre only is infiltrated with fat. The same symptoms may follow fatty degeneration; but in the latter condition the symptoms are of more serious importance, and the hygienic and dietetic treatment should only be conducted under an especially careful medical supervision. The principle of reducing the body weight by the measures elsewhere indicated, and especially by restricting the amount of fluids consumed in the incipient stages of weak and fatty hearts, was advocated by physicians more than fifty years ago. Thirty years ago, Stokes, a celebrated Irish physician, wrote apropos of this subject: "The symptoms of debility of the heart are often removed by a regulated course of gymnastics, or by pedestrian exercise, even in mountainous countries, such as Switzerland, or the Highlands of Scotland or Ireland."

At the present time, and especially by German physicians, these principles are given serious attention. The body weight must be reduced by careful regulation of food, and particularly by the limitation of the amount of fluid used. In this way the blood-mass is reduced, and the pressure upon the pumping-force, or heart, lessened. Systematic exercise, preferably on foot, in the open air, in a hilly region, and under careful management, may

prove highly beneficial. The German authorities referred to, especially Oertel, also claim that the functions of the skin should be specially stimulated. Vapor baths, when carefully conducted, will accomplish this, but exercise diminishes the blood-mass by favoring perspiration and the discharge of water through the lungs. The muscles are rid of effete elements, oxidation and nutrition generally promoted, and the heart-muscles improve *pari passu* with other organs and tissues. When the body weight has been reduced, individuals who at first were only able to walk on a level for a very short distance without great shortness of breath, can take long walks and even climb hills without detriment. Intelligent care will generally enable a physician and patient to form a happy mean between too much rest and over-exercise.

Persons often suffer from unpleasant sensations in the heart, such as pain, palpitation, and irregularity, without any disease in the heart itself, but simply in consequence of indigestion. These symptoms are dependent upon the intimate relation of the cardiac and the stomachic nerve-supply. Again, unpleasant sensations frequently accompany the use of some substances such as coffee, tea, or tobacco. Palpitation, cardiac pain, and irregularity are occasionally induced by sexual

excesses. Overwork may bring on a susceptibility of this portion of the nervous system, and we often find the same susceptibility of the heart when convalescence has begun after severe illness.

In instances of cardiac disorder, such as pain, palpitation, or irregularity, the possible influence of these causes must be considered. Indigestion must be removed by a careful selection of diet. Foods likely to cause fermentation should be discarded, such as the starchy foods, and oil or fats. The *menu* should include the proteids or milk diet until unpleasant symptoms disappear. Tea, coffee, or tobacco should be restricted or abandoned, at least temporarily, and the sexual functions should be controlled and overwork avoided.

When there is much dropsy, especially if fluid accumulates in the chest or abdominal cavities, liquid forms of diet should be limited, and the nutrition maintained, as far as possible, by meats or other albuminoid foods, in addition to such starchy foods as may be acceptable to the digestive organs. By the suitable employment of medicines calculated to secure increased activity of the kidneys, combined with diet as free from liquid elements as possible, absorption may be effectually promoted. In cases of extreme cardiac dropsy, when dry forms of diet cannot be digested, the

diuretic properties of milk render it a valuable remedy as well as a food.

The same dietetic treatment is suitable for those subject to accumulation of fluid in the thorax after an attack of pleurisy, which may be followed in some cases by large effusions of water within the thorax into the pleural spaces.

NEURASTHENIA.

By this term the public and medical profession alike designate a condition protean in its possible forms, and manifesting itself, it may be, by disturbances in the functions of any, or even all, of the organs. Indigestion, neuralgic pains, constipation, debility, indisposition to perform any physical or mental task, emotional disturbances, all characterize, or may characterize, this condition.

There are sickly or moulting periods in every human life; the first of these, says Waterhouse, was noticed to "befall males chiefly at thirty-six years of age, when the lean person becomes fatter and the fat kind leaner. The second period happens at some time between forty-three and fifty, and lasts a year, or perhaps two. During it the complexion fades, the appetite fails, the tongue becomes furred at the smallest over-exertion of mind or body; the muscles are flabby and the

joints are weak, sleep is unrefreshing, and the spirits droop. At this time a man first experiences a reluctance to stoop, prefers a carriage to riding on horseback, and perceives each change of the weather affect him. Between sixty-one and sixty-two a similar deterioration of health takes place, but with aggravated symptoms."

In females the liability to neurasthenia may begin shortly after the appearance of menstruation and during early girlhood. The period of the menopause is another time of special susceptibility to nervous disorders. The prime of life for both sexes is between twenty and thirty, at least for the performance of short, severe labor. Severe strains on health are supported at this time with greatest impunity; yet it is a time when, if the laws of health are seriously and persistently contravened, nervous prostration may be developed. Men reach their full weight at forty, women sometimes not until fifty, and the period of thirty-five to fifty-five, with few exceptions, includes the years of diminished vulnerability to nervous disorder.

The dietetic management of neurasthenia is closely associated with personal hygienic measures. Hypochondriasis and hysteria are the special visitants of those living in ease and affluence. Gymnastic exercises should occupy

the attention of every subject of this disease. A room suitably provided with machines for physical exercise is as important for those who can afford the expense as a bath-room, and suitable exercise, either before breakfast or during the day, is earnestly recommended. Riding and walking must be systematically practised before the mid-day meal, and again between mid-day and evening. Rowing and tennis are also to be considered as desirable forms of exercise. A proper variety of exercise develops the muscles uniformly. Care must be taken not to exercise too soon after eating, as the digestive process is less perfect. Sleep must be secured. If six to eight hours be considered sufficient for health, with three or four additional hours once a week, sleep for twelve hours and upwards may be needed by the subject with exhausted nervous force. Indeed, in some cases rest for eighteen hours in the twenty-four may be demanded, and at times rest in bed altogether may be necessary. For these latter cases exercise by massage of the muscles must be provided. John Wesley advised, as a test for the amount of sleep required by any one to repair his nervous system, rising half an hour earlier every morning until one finds that he no longer lies awake at all on going to rest in bed, or wakes up

until it is time for him to get up. While rest is, unquestionably, the measure most needed by many persons, yet for some neurasthenics it is well to recollect that mental over-fatigue may be repaired not only by sleep, but by exercise in the open air, since exercise directs the blood-flow to the muscles and renews the appetite. Patients should avoid excessive or unusual sexual excitement. Bathing, with frictions to the skin, should be followed upon the plans elsewhere advised. Since there may be liability to cold, woollen garments, and the suitable protection of feet or abdominal organs, should be especially considered.

The diet list should include those aliments capable of yielding most to tissue repairs. Milk, representing as it does elements contained in the primary foods,—albuminoids, carbo-hydrates, and hydro-carbons,—is the most important of all articles of diet, and should be a chief constituent of all plans of alimentation.

Albuminoid substances, chiefly meats and eggs, rest upon the same plane of value. Either milk or pure albuminoid food may be selected in consonance with the requirements of the digestive apparatus. When digestion will permit, the starches, the sugars, and the fats should be introduced into the bill of fare in small proportions,

and gradually increased as the digestive power improves. Peas and lima beans are especially valuable vegetables. Alcoholic stimulants should be avoided, but the thin or the thick malts may be used,—the latter when its digestive action on starch is required; the former when the sedative and tonic properties of the hops which it contains may be demanded. Tea and coffee should be forbidden; cocoa nibs, milk, or water should be the only liquids used.

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