of tissues which are less resistant than normal to the action of the tubercle bacillus.

Hemorrhagic diathesis is the synonym of hæmophilia and indicates a peculiar constitutional condition in which the patient is prone to hemorrhages.

The part played by heredity in its relation to disease, though greatly limited by the advances of our knowledge in recent years, must not be underestimated. There exists a close relationship between diathesis, used in the sense of predisposition or tendency, and heredity.

It would seem wise and in keeping with the spirit of the age to eliminate as much as possible from our vocabulary the words diathesis and dyscrasia, and substitute for them words which will never become obsolete, viz., predisposition and cachexia. *James R. Arneill.*

**DIAZO REACTION OF EHRLICH.** See *Typhoid Fever* and *Tuberculosis.*

**DIETETICS OF THE SICK.**—The proper adjustment of food for the individual in health yields results, in the form of work and physical well-being, that will fully reward the dietetic care exercised. Man has at his disposal a greater variety of foods than any other animal. The methods pursued in the preparation of the food will greatly modify its taste and digestibility.

A *food* is any substance which can be utilized in the living organism for structural or functional purposes.

A *complete food* must contain all of the substances necessary to construct and maintain the activities of the tissues of the body. Thus, while meat furnishes us food in concentrated form, it is a simple and not a complete food. Milk is composed of the elements necessary to construct and maintain the human economy. Such a food must contain water, mineral matter, nitrogenous matter, carbohydrates, and fats. It is not enough that a substance possess these elements in order to be regarded as a complete food, but it must possess them in assimilable form and of such a character that sufficient for nutritive purposes may be ingested. The food required for twenty-four hours by a healthy individual weighing one hundred and fifty-four pounds, and doing moderate work, should contain the following elements:

| | Pounds. | Ounces. | Grains. |
|---|---|---|---|
| Water | 5 | 8 | 320 |
| Albuminoids | 0 | 4 | 110 |
| Starch, sugar, etc | 0 | 11 | 178 |
| Fat | 0 | 3 | 337 |
| Common salt | 0 | 0 | 325 |
| Phosphates, potash, salts, etc | 0 | 0 | 170 |

The individual in health gives little heed to proper combinations of food elements and the intake of nourishment sufficient to secure a condition of nutritional equilibrium. It is only when the viscera concerned with the elaboration and utilization of food have been disordered by the ingestion of an excess, or of unsuitable food, that dietetic measures are considered.

The problem of adjusting the food to the requirements of the individual in health is most complex: the adaptation of the dietary to diseased organs is yet more complicated.

In disease there is an increased need for food, and a lessened ability to digest it. The demand for nourishment will be influenced by the character of the morbid process. Thus there is a wide range of variation in combustion of nutritive material between the individual who is confined to bed with an acute local inflammation, and one who is subject to an acute infectious disease or a chronic suppurative process. The perverted secretions and functional inactivity associated with certain diseases render it impossible to secure the ingestion and metabolism of sufficient nourishment for the production of the heat incident to the disease. The circulating albumin, the fat, the muscular tissue, and finally, the viscera themselves are drawn upon to furnish the needed food elements for the morbidly active combustive process. One has only to look on the feeble, emaciated convalescent from an acute febrile disease, and to contrast his condition with the previously muscular, rounded form, to realize the extent to which the body consumes its own tissues when it is unable to elaborate and annex other forms of food in the necessary quantities. The intake of food is intermittent, while the necessity for nutriment to maintain the increased activity of this vital process is constant. This condition would indicate the desirability of administering nourishment, in assimilable form, in small quantities and at frequent intervals, since it is not what we eat but what we digest and assimilate that determines the sufficiency of any dietetic procedure.

The appetite and digestion will usually furnish a sufficiently reliable guide to regulate the character and quantity of food to be taken in health. In disease, with a perversion of the various secretions, it is not prudent to rely upon the patient's desire or disinclination for food.

The administration of food in disease will be determined by our estimate of the ability of the digestive organs to dispose of it. A temporary withholding of food in certain instances of acute disease will be the best dietetic treatment. The administration of what would ordinarily be an excessive quantity of food is advisable in certain chronic suppurative processes attended with fever. Since the digestive juices are influenced by the absence of fever, it is advisable to administer foods requiring the greatest digestive power at that time of the day when the fever is least active.

It is possible still further to adjust the proper administration of food with reference to existing morbid conditions by observing the rule to select the food with regard to the affected part. Thus, in disease which particularly involves the stomach, it would be best to give food whose digestion is accomplished in the intestines, *i.e.*, carbohydrates. The converse is equally true. When the intestines are the seat of the morbid process, a food requiring gastric digestion would prove most acceptable. This differentiation is not absolute, and yet it is reasonable and serviceable.

The dietetic treatment of disease may be planned with skill and care, and yet prove inefficacious because of a disregard of two essential factors in the successful administration of food. Dainty service may be given first place. All that can be pictured as implied by the expression will prove helpful in stimulating and aiding digestion. The glass of milk placed beside the spit-cup of the consumptive patient is not novel, neither is it appetizing. The cereal carelessly smeared over the sides and edges of the container, and served in a quantity sufficient for a laborer, is seen more often than it should be. The food sent by a cleanly neighbor is appetizing because it is served with the best china and linen, and the question of its selection has not been discussed with the patient.

Equally important is the preparation of the food. Egg albumen if slightly cooked is digested with the greatest facility. If well beaten it offers the digestive juices least resistance in their solvent action. The hard-boiled white of egg is an example of a food difficult of digestion. Roasted beef having a delicious aroma is far more digestible than the same meat when it is hashed and twice cooked. The chop quickly broiled, so that it retains its juices and is turgid, is more nutritive than the shrivelled and dried, slowly fried or broiled chop from the same cut of the lamb. The method of preparation of vegetables will determine their digestibility and nutritive worth quite as certainly as it does in the case of animal foods. Cereals with the starch cells unruptured by the application of heat or—equally difficult of digestion—cooked in hot fat after the starch granules have been exposed to the action of the over-heated fat, are not of much nutritive value. By the application of the proper amount of heat the cellulose element of certain vegetable foods can be made tender and digestible, and their nutritive worth may be secured instead of being lost between the meshes of the cellular fibres.





The ordering of diet will be simplified by keeping in mind the chemical composition of the various foods.

If animal food is to be made a part of the diet, it becomes necessary to select the form deemed suitable to the digestive power and condition of a given case.

If a vegetable food is to be used, it will be necessary to consider the proportion of nitrogenous or albuminous elements contained in it. We should select vegetables belonging to the class of legumes if a large percentage of nitrogenous material is desired.

In certain instances vegetable nitrogenous material properly prepared will be found better adapted to impaired digestive power than the animal form. If, on the other hand, food rich in carbohydrates and poor in albuminoids is desired, we should order vegetables containing the purer forms of starch, such as potatoes, rice, corn starch, and arrowroot. The green vegetables, being poor in starch and nitrogen, and rich in woody fibre and antiscorbutic elements, are selected with reference to the need and ability of the patient to digest this form of food.

Condiments should be used extensively and judiciously, being more important in sickness than in health. Tea, coffee, cocoa, and chocolate are valuable agents, combining as they do food and therapeutic worth.

The method of preparation of the various foods exercises a determining influence upon their utility. It is not enough to select the foods that may be used in a given instance, but detailed directions, with reference to the method of preparation, must be supplied. A great variety of foods at one meal may prove unsuitable to certain cases, while a meal composed of a sufficient variety of food principles to constitute a complete food, may be found to be easily digested. A meal made up of several kinds of meat and one or more legumes is likely to contain an excess of nitrogenous food. It will probably serve best the purpose in view to consider at this time the chief alimentary substances, and some of the ways of administering them, and in this way avoid the necessity for repeating certain statements when directing the employment of these food agents in the dietetic treatment of disease.

### Milk.

This food is the chief article of diet in feeding the sick, and by reason of its availability and the likelihood of its being moderately pure, it is relied upon to supply the nutriment required in almost all forms of disease. When we consider how nearly it is *the ideal complete food* for the invalid, it is in order to give thought to all the means at our command to make it acceptable to the patient. There are those who persist in the idea that they are unable to take milk as a food. They point to the vomited curd as an evidence of their inability to digest it. These people must be taught the fact that the milk taken into the stomach always forms a curd as a necessary part of the process of digestion. Then they must be told that we can so modify the milk that the curd formed will be small and easily digested. Other patients will object to the taste and odor of the milk. These objections must be overcome by a knowledge of *the ways in which milk can be made acceptable* to a patient.

Let us consider the chemical composition of milk and see what constituents may disagree with the patient. Cow's milk has the following composition:

| | Per cent. |
|---|---|
| Casein | 4 |
| Fat | 4 |
| Sugar | 4.50 |
| Bacteria | |
| Salts | 0.8 |
| Water | 86.7 |

It is the casein that most frequently taxes the digestion by reason of the size and density of the curd formed. Therefore the question of successfully administering milk in most instances is one of modifying the curd, so that it may be digested with greater facility.

The fat constituent of milk, represented in the cream, is less frequently a disturbing element in the use of milk as an exclusive diet. The indications for reducing the proportion of fat in the milk would be presented by disease or perverted function of the organs concerned in digesting and assimilating fat, that is, in disease of the liver, as jaundice, and in certain cases of intestinal indigestion.

The presence of bacteria in milk greatly influences its acceptability in cases of sickness. One difference between cow's milk and human milk is found in the number and character of the contained bacteria. The method pursued in handling milk from the time it leaves the cow, if not before that time, will determine the number and character of the bacteria present. There is hardly any doubt that the objections to milk are chiefly due to the presence of bacteria and their products. When we remember that the number of bacteria in a given milk is proportionate to the skill and care with which it is handled, it is at once manifest that we are justified in demanding that the milk supplied should conform to certain reasonable tests. I cannot do better than submit the standard of purity exacted by the Philadelphia Pediatric Society of those who would derive the advantages of the certificate of the Society for the product of their dairy. The tests are the result of much study on the part of the Society's committee, and while it fixes a high standard, it has proved to be a working standard, and one that can be obtained only by the most painstaking care with every detail of the processes of feeding, milking, and bottling.

ARTICLES OF AGREEMENT entered into the.....day of.....190.... between the Milk Commission of the Philadelphia Pediatric Society of the first part and.....of the second part.

It is agreed by the said parties that these articles of agreement shall continue for a period of eight months from date.

The party of the second part agrees that the party of the first part shall procure a bacteriologist, a chemist, and a veterinary inspector; the bacteriologist to procure a specimen of the milk either from the dairy or delivery wagon of said party of the second part, whenever the said party of the first part sees fit, at intervals of approximately one month, the time of procuring said milk to be without notice to the said party of the second part; which bacteriologist shall test said milk for the number and nature of bacteria present to the extent which the needs of safe milk demand, and to make a microscopic examination for pus cells and injurious germs. It is also agreed by the parties hereto that the required standard of purity shall be milk free from pus or injurious germs and having not more than ten thousand germs of any kind or kinds to the cubic centimetre.

It is agreed by the said party of the second part that the chemist of the party of the first part shall examine said milk for the percentages of proteids, fat, sugar, mineral matter, and water present; shall test its chemical reaction and specific gravity; and shall examine it for the presence of foreign coloring or other matters or chemicals added as preservatives. It is agreed by both parties that the required standard shall range from 1.029 to 1.034 specific gravity, be neutral or very faintly acid in reaction, contain not less than from 3.5 per cent. to 4.5 per cent. proteid, from 4 per cent. to 5 per cent. sugar, and not less than 3.5 per cent. to 4.5 per cent. fat (a higher percentage in fat to be so specified on each bottle), and shall be free from all contaminating foreign matter and from all additions of chemical substances or coloring matters; that richness of cream in fat shall be specified and shall vary not more than 1 per cent. above or below the figure named, and that neither milk nor cream shall have been subjected to heat before the examination nor shall be at any time unless so announced to the consumer.

It is agreed by both parties that the veterinary inspector shall at intervals equal to those of the bacteriologist and chemist, and without previous warning to the party of the second part or his agents, inspect the cleanliness of the dairy in general, the care and cleanliness observed in milking, the care of the various utensils employed, the nature and quality of the food used, and all other matters of a hygienic nature bearing upon the health of the cows and the cleanliness of the milk, including as far as possible the inquiry into the health of the employees on and about the dairies; and that he shall see that the cows are free from tuberculosis or other diseases.

It is also agreed by both parties that charges shall be made by each of the experts not to exceed ten dollars for each examination, which amount is to be paid by the party of the second part at the time of examination and without reference to whether the report is favorable or otherwise.

It is agreed that all examinations by the experts shall be made only upon instruction by party of the first part.

It is agreed by both parties that if examinations as aforesaid find the milk up to the aforesaid required standards, the said party of the first part shall give a certificate to said party of the second part as follows:

MILK COMMISSION OF THE PHILADELPHIA PEDIATRIC SOCIETY.

Date.....

The Veterinary Inspector of this Commission has examined the dairy of....., and reports it to be well kept and clean and the cows to be in a healthy condition.

The Bacteriologist reports the milk free from germs within the limits of the standards of the Commission.

The Chemist reports that the milk is of standard richness and that he has discovered no impurities, coloring matters, chemical preservatives or harmful substances.

The Commission certifies to these statements of the Examiners, it being understood, however, that this certificate is good for only one month from date.

.....

It is further agreed by both parties hereto that in case an examination shows the milk not to be up to the required standard that said party of the second part may have another examination made within a short time at the direction of the Commission.

It is agreed by the party of the second part that the milk furnished by him to dealers shall be in glass jars hermetically sealed in a manner satisfactory to the party of the first part, and as a guaranty to the consumer that the examination has been regularly conducted, he shall paste over the mouth of each jar or give to the consumer with every jar a label similar to the following:

MILK COMMISSION OF THE PHILADELPHIA PEDIATRIC SOCIETY.

Date.....

Milk from the dairy of..... ..... has been recently examined by the Inspectors of this Commission and found of the required standard.

This certificate is good for only one month.

*Milk Commission of the Philadelphia Pediatric Society.*

It is further agreed by the said party of the second part that this agreement is entered into by the parties hereto solely at the request of said party of the second part; that no liability shall accrue to said party of the first part except or beyond that expressly stated in these articles of agreement; and that he the said party of the second part will assume all risk and be liable for any complaint alleged to be traceable to the examinations, issuance of certificate, and labels aforesaid.

In testimony whereof the parties hereto have hereunto set their hands and seals the date aforesaid.

[SEAL] MILK COMMISSION PHILADELPHIA PEDIATRIC SOCIETY.

Milk secured under these conditions will keep for a longer period than that collected in the usual way.

It is interesting to note that fermentation changes in milk proceed from the surface toward the bottom of the container. So markedly is this the case that it is frequently possible to pass a tube through an upper layer of thick, sour milk and draw off sweet milk until only the layer of thick milk remains. This condition implies that the milk was practically sterile when bottled, and that the souring has been due to a later entrance of bacteria.

Pasteurization of milk is accomplished by subjecting it, by means of a water bath, to a temperature of 167° F. for a period of thirty minutes.

Sterilization of milk is accomplished by the same method followed in Pasteurizing, except that the temperature to which the milk is subjected is 212° F.

Both methods have for their object the destruction of harmful bacteria. The consensus of opinion would seem to justify the statement that Pasteurization will accomplish all that can be attained by sterilization, and that it has the advantage of impairing the digestibility and the nutritive worth of the milk less than does the higher temperature. Infants fed upon sterilized milk are more likely to develop rickets and scorbutus than are those raised upon Pasteurized milk.

There are numerous outfits in the market for the sterilization and Pasteurization of milk, and with each of them will be found directions for use. If the patient is unable to procure one of the more pretentious devices for this purpose, he can accomplish the object by placing the milk in bottles of suitable size, plugging them loosely with sterile cotton, standing the bottles in a kettle on a plate, piece of thin wood, or folded paper, and filling the kettle with cold water to a point on a level with the milk in the bottles. The water is then heated until it reaches the boiling point, and if the kettle is then removed to the back part of the stove, or the gas flame is lowered so that a temperature slightly below the boiling point is maintained, the milk will be Pasteurized in thirty minutes. If it is desired to sterilize the milk, the water should be kept at the boiling point for the time specified. The milk should be cooled rapidly and kept in a cool place. The keeping quality of the milk will be proportionate to the number and character of the contained bacteria.

*Foreign Bodies in Milk.*—An interesting object lesson in the *origin of the "cow odor" of milk* can be obtained by a visit to a creamery where milk, gathered indiscriminately from farms, is centrifuged. Here there can be seen thrown out from the milk a layer of excrementitious material that has gained entrance into the milk from the soiled teats of the cow, the dirty hands of the operator, and the dust of the shed or pasture. Milk that has been properly handled should have no odor.

The question of administering whole milk may present one of two problems: First, how to change the taste in order to make it acceptable to the patient; second, how to modify the curd so that the enfeebled digestive power may not be overtaxed by the size of the curd formed.

To change the taste it may be administered cold, hot, sterilized, boiled, or skimmed, or with the addition of coffee, tea, chocolate, malt, liquor, or a spiced water, the latter to be prepared by adding boiling water to cloves, ginger, nutmeg, allspice, cinnamon, or a few bay leaves, and allowing it to cool, then adding sufficient of this to the milk to change in a slight degree the flavor. These flavors can be changed at each feeding, or combinations of them may be used.

A satisfactory way to overcome the dislike of the taste of milk is to have it taken through a tube or a straw.

To modify the curd, have the patient *eat* the milk, that is, sip it slowly. If it is gulped down the curd formed will be large, especially if there is excessive acidity of the stomach contents. For this reason the use of a straw in taking milk is of advantage. The addition of an alkali to neutralize the excessive gastric acidity will lessen the size of the curd. For this purpose one may also use lime water or bicarbonate of soda. Simple dilution of the milk will make the curd smaller, and this may be accomplished by the addition of barley, rice, oatmeal, egg, or carbonated water.

When there is a deficiency of acid secretion, it will be of advantage to add dilute hydrochloric acid drop by drop to the milk and give it with the flocculent curd suspended.

With adults, just as with infants, it is the casein of the milk which most frequently taxes digestion. If we are unable to secure the retention of the milk by any of the methods considered, it will be in order to change the casein into a more digestible compound by peptonizing it to a point where its further digestion can be accomplished by the enfeebled gastric secretion.

*Peptonizing Milk.*—This is accomplished by mixing a powder composed of five grains of extract of pancreatin and fifteen grains of bicarbonate of soda, or the contents of a peptonizing tube, with two tablespoonfuls of cold water, and adding it to a pint of milk. The milk is then placed in a vessel containing water at a temperature of 115° F. (or so warm that the hand may be immersed in it without positive discomfort) for five, ten, or fifteen minutes, according to the degree of digestion desired. There is developed, in the course of the process, a bitter taste proportionate to the time the milk is subjected to the action of the ferment. After the milk has been peptonized to the desired degree, it should be placed upon ice or quickly brought to the boiling point to check further digestive action by the ferment. It will be found satisfactory in many instances to mix the milk and the contents of a peptonizing tube, and allow the peptonizing to occur in the stomach. For this purpose put two tablespoonfuls of cold water in a goblet or glass; dissolve in this the powder contained in one peptonizing tube, then add fresh cold milk to fill the glass; stir this mixture thoroughly and drink immediately, sipping slowly.* Warm

* Acknowledgment is due to Fairchild Brothers & Foster for the formula.





milk may be used instead of cold if the physician so directs.

*The Administration of Milk.*—There is no more important direction to be given to a patient than that milk should be taken slowly. If it is eaten, and not gulped, it will certainly be digested with greater facility. In many cases of persistent vomiting milk will be retained if it is fed by the teaspoonful at short intervals. If it is desired to nourish the patient on an exclusive milk diet, it is well gradually to lessen the variety and quantity of mixed food, and at the same time increase the quantity of milk. It might be a source of discouragement to the patient to announce the quantity of milk you desire to have him take to the exclusion of all other foods; therefore let the transition be gradual and make it a matter of pride with the individual to take the six or nine pints of milk that it is desired he should consume in twenty-four hours as his only form of nourishment.

As the condition changes and demands a less strict milk diet, the transition to a mixed dietary should be gradual. There will be manifest likelihood of harm being done to the circulation in any sudden withdrawal of so much liquid from the food.

*The Quantity of Milk Required.*—An adult in bed with an acute illness, such as typhoid fever, should take about three pints in twenty-four hours. This has always seemed a disproportionately small allowance for the adult, when it is remembered that the healthy child of one year of age is given two and a half pints. Emphasis is given to this disparity when it is remembered that the nutritive needs are proportionate to the amount of fever present.

"We do not appreciate how much a continued high temperature alone exhausts a patient. Were the body composed of water alone, to raise the temperature of a person weighing 150 pounds from 98.5° to 103.5° F., *i.e.*, 5°, to say nothing of the expenditure of force needful to keep it there, requires an expenditure of force equal to raising 285 tons one foot (150 × 5 × 772 foot pounds). A girl of 100 pounds weight, simply lying still in bed suffering from such a fever, does daily the work of two or three men." * On the other hand, the vast experience of many writers has demonstrated the sufficiency of three pints of milk daily for a fever patient.

*The frequency of administration* will be determined by the condition of the patient. If eight ounces are given every three hours from 7 A.M. to 7 P.M., and twice during the night, he will receive three pints. If he is given six ounces every two hours, and is fed twice during the night, he will likewise receive three pints. It is good practice to have the milk intended for the patient kept separate from that for household use, so that it may serve as a control record of the quantity administered in the twenty-four hours.

*Fortified milk* is prepared by the addition of nutritive substances, such as egg albumen, either fresh or dried, or whipped cream.

Milk may be introduced into the dietary in innumerable forms, and with but little change in its character. Served under another name, and slightly different in taste, it is readily accepted by those who decline plain milk. One of the nicest preparations of this class is *plum porridge*, made as follows:

Raisins, minced, twelve; starch (potato or corn), one teaspoonful; milk, one pint. Heat the raisins and milk in a double boiler to the boiling point. Mix the starch with cold water and form a smooth paste; add it to the milk, keep it at the boiling point for five minutes, strain and serve. This preparation has a fruity taste, and is often accepted by an irritable stomach. It is of service in diarrhœa.

Milk may also be administered in the form of pap, junket, whey, koumys, zoolak, matzoon, bonny clabber, curds and whey, cottage cheese, custards, and a great variety of prepared dishes which have milk as their chief constituent.

*Koumys* is prepared by taking one quart of milk, heated to about 100° F., a tablespoonful of sugar dissolved in a cup of hot water, and a fifth of a yeast cake dissolved in a tablespoonful of cold water. Mix and put in strong bottles—beer or citrate of magnesia bottles are sufficiently strong. Let the bottles stand in a warm place, above the range, for twenty-four hours; then place on their sides in a cool place, *e.g.*, the cellar in summer, or some place where the temperature will be about 60°, for six days. The koumys is then ready for use, and should be drawn off with a champagne tap, because of the likelihood of losing a large portion of it if the cork is removed. The acidity and taste of the preparation will be influenced by the length of time fermentation has continued, and the temperature at which it has occurred. A koumys having a flavor and digestibility suited to the patient may usually be secured by attention to these details.

*Milk Jelly.*—Heat one quart of milk; then add and stir until dissolved one pound of granulated sugar; allow to boil for ten minutes; then let cool, and when cold add, with constant stirring, one ounce of gelatin dissolved in four ounces of water; when well mixed add the juice of three lemons mixed with a half cupful of sherry wine or good whiskey. Pour into cups, and keep in a cool place. Serve warm or cold.

*Junket.*—Milk, half a pint; warm to blood heat. Sweeten and flavor to taste. Add the half of a rennet tablet, dissolved in a dessertspoonful of water. Stir. When thickened, place at once upon ice.

*Bonny Clabber.*—Skimmed milk, preferably in a glass dish, is allowed to thicken spontaneously. This may be fortified by the addition of whipped cream and egg albumen.

*Pap.*—Flour, one tablespoonful; milk, one pint. Cook ten minutes. The white of an egg may be added.

### Meat.

The use of meat in the dietetic treatment of acute disease is generally confined to the administration of beef, mutton, or chicken, in the form of a fluid representing the soluble constituents of the meat albumen, extractives, salts, etc.

The method pursued in the preparation of these foods will determine their nutritive worth. Thus, beef tea will be a stimulant if the albumen of the preparation is strained from it after it has been coagulated by the application of heat. Beef tea, subjected to a temperature of 212° F., retains in solution only the salts and extractives of the meat, and to these constituents it owes its stimulating property. On the other hand, beef tea is a food if it is prepared in a way to secure the retention of the albuminoid in the finished product.

In selecting the form of beef for a patient, we must be influenced by his digestive capacity. Thus we may give a dilute extract of beef having mildly stimulating properties, or we may select preparations having progressively increasing proportions of nutritive worth, even ordering the entire beef, in which case we should have to consider only the method of cooking it.

The digestibility of the various meats is determined by so many modifying influences, such as the age and condition of the animal supplying the meat, the time that has elapsed since it was killed, the method of preparation, and the digestive power of the individual, that it is not possible to do more than to state approximately the relative digestibility of the various forms of meat.

The order of facility of digestion, other things being equal, is as follows: Oysters, eggs, sweetbread, tripe, calves' brains, white fish, white meat of chicken, beef, mutton, squab, fish, dark meat, game, veal, pork.

The color of meat is influenced by the distribution of the contained fat. The marbling of red meat is due to the fat. The white meat of fowls is very deficient in

* W. W. Keen: "Surgical Complications and Sequels of Typhoid Fever," p. 56.

fat; in this case it is collected in layers and distributed about the white meat. The dark meat is richer in fat, and requires greater digestive power. This fact will influence the selection of fish, fowls, and beef. The fat of mutton has a higher melting point than that of beef and fowls, and for this reason it sometimes occasions indigestion. Cold mutton, in which the fat can be readily separated, will frequently be found acceptable when the recently cooked mutton cannot be digested.

Taking up first the mildest preparation of beef which we are able to offer the patient, we may consider:

*Stimulating Beef Tea.*—The choice of the cut of beef in making various foods for the patient is of little importance, aside from the question of cost. The meat from the neck will give a preparation quite as nutritious as that made from meat taken from the round steak. Take one pound of beef from the neck, put it twice through the chopper, and place it in a porcelain-lined kettle; add one point of cold water. Allow it to macerate in a cool place for three hours, occasionally stirring with a wooden spoon. Heat the preparation to the boiling point, and allow it to simmer for one hour. Season it to taste. Strain through a double layer of cheese-cloth, cool rapidly, remove the fat, keep securely covered. If it is desired to have a preparation that is perfectly clear, the well-beaten white of an egg may be added, and the tea heated to the boiling point and then strained. This preparation is mildly stimulating and may induce wakefulness in those cases in which a stimulant would produce such an effect, and it is not to be relied upon as a food. Most of the beef tea made from the solid extracts of beef furnishes a product of small nutritive worth.

*Beef Extract by the Cold Process.*—Minced beef, five ounces; cold water, a pint; hydrochloric acid, five drops; common salt about twenty grains. Macerate in a cool place for three hours, strain through a sieve, and wash the residue with sufficient water to make the finished product measure a pint. Remove the fat, and serve warm or cold.

*Nutritive Beef Tea.*—Take one pound of beef from the neck, remove the excess of fat, and put it twice through the chopper. Add one pint of cold water, and place in a quart jar. Macerate in a cool place for three hours, with occasional stirring. Make a water-bath, and have the water of the bath extend to the level of the beef and water in the jar. Stand the jar in the water-bath, and heat slowly until the water in the water-bath reaches the boiling point. Lessen the heat and continue its application, not allowing it to reach the boiling point, for a period of three hours. Strain through a sieve, and wash the residue with enough water to make the finished product measure a pint. Season to taste, cool rapidly, and remove the fat. Keep the tea as nearly sterile as possible. Should the patient tire of the flavor of this preparation the taste may be modified by the addition of various aromatics, such as bay leaves, mace, cloves, some minced celery, or aromatic herbs. This preparation if not subjected to too much heat should have a reddish-gray color, and possess nutritive worth.

*Bouillon* is a dilute form of stimulating beef tea. A shin bone is usually used in its preparation.

*Consommé* is bouillon flavored with herbs and colored with caramel. The advantages of these two last-named preparations are that we are able to secure them from the hotels and restaurants, and in ordering them for a patient we apparently make a concession to the taste of the individual.

If a stronger beef preparation is desired, we may give beef juice made by taking meat from the neck, cutting it in slices about an inch thick, broiling it slightly in order to start the juices, then cutting the meat into cubes and subjecting it to pressure in a meat press designed for the purpose. The press should be heated before use by pouring boiling water over it, so as not to chill the meat; a warm cup should receive the meat juice, and the meat should be fed into the press in small quantities. In giving the preparation to diphtheria cases salt should not be added, unless it is found necessary to do so, because that contained in the beef is quite sufficient, and any addition of salt would cause smarting of the inflamed mucous membrane. The neck or tender side of the round steak will yield about six ounces of juice to the pound of steak. If beef juice is to be prepared for any length of time, it is more economical to buy a meat press rather than yield to the temptation to temporize with a potato-masher. This is a concentrated form of nourishment, and one well adapted for administration to typhoid-fever patients with perforation or hemorrhage. The residue leaves little to irritate the ulcerated area.

*Scraped beef cakes* constitute a more concentrated as well as a more digestible form of nourishment than whole beef. They are prepared by taking a steak from the tender side of the round, and, with a knife that is not too sharp, scraping it in the direction of the fibre until the pulp of the meat is removed, leaving the connective tissue. The pulp is then gently pressed into a cake of uniform thickness and is broiled over the coals or in a dry pan. Seasoning and butter should then be added, and the cake put into the oven so that the seasoning may become uniformly blended with the meat pulp. The flavor of this preparation may be changed by adding minced celery, almonds, or pine nuts, and its nutritive worth may be increased by the addition of various nuts, butter, or egg albumen.

*Raw Beef Soup* may be made by taking the pulp of beef, prepared as above stated, and mixing it with water sufficient to give it the consistence of a cream soup. Salt, pepper, or celery salt may be added, and the preparation may be slightly warmed, if more acceptable to the patient in that condition. This preparation has a field of usefulness in dysentery and certain forms of summer complaint.

*Minced Meat Cakes* may be prepared by putting a choice cut of beef twice through the chopper and making it into cakes as was directed in the preparation of scraped beef cakes.

If we would give beef in its entirety, it would be best to select the tender side of a sirloin, which will be more tender than any other part, even if it is less juicy. The convalescent is disinclined to make much effort in masticating food, and this necessitates the selection of tender meats, or the preparation of them in a way that will require a minimum amount of effort.

*Mutton Broth* is prepared by the same method, and the meat is used in the same proportion as directed in the preparation of beef tea. The fat of mutton is less digestible than that of the beef, and care must be exercised to remove every particle of it. An additional reason for getting rid of the small globules of fat is found in the tendency of these particles to float on the surface of the tea and attach themselves to the lips of the patient, leaving a disagreeable after-taste.

*Chicken Jelly.*—In making chicken broth it is best to select an old fowl. Crack the bones, cover the meat with water, and heat to the boiling point, and continue the application of heat a little below the boiling point for three hours, adding water from time to time to replace that lost by evaporation. Strain through a colander, wash the residue with hot water sufficient to make a pint of fluid for each pound of chicken used, season to the taste, and pour into suitable small moulds. When cool remove the fat with a spoon and damp cloth. Serve cold in the form of cubes, or allow it to retain the shape of the moulds; or it may be warmed and administered as a broth.

*Chicken Panada.*—Chicken (white meat, raw), one-fourth pound—chop and rub fine; fresh bread crumbs, four ounces; milk, four ounces; whites of two eggs, well beaten. Season and poach in small cups.

*Veal Broth.*—Veal, chopped fine, one-half pound; cold water, one pint. Macerate for three hours. Water-bath for three hours. Strain, season, cool, and remove fat.





### Eggs.

The chemical composition of eggs is as follows:

| | White. | Yolk. |
|---|---|---|
| Water | 84.8 | 51.5 |
| Albuminates | 12.0 | 15.0 |
| Fats | 2.0 | 30.0 |
| Mineral matter | 1.2 | 1.4 |
| Pigment extractives | .... | 2.1 |

The albumen of the white is very easily digested if given raw or so slightly cooked as not to interfere with its digestibility. If well beaten or but slightly cooked, or if it is added to water, it will be found more digestible in some instances than milk.

The large percentage of oil contained in the yolk would indicate its value in those patients who need oil and are able to digest it. It should be slightly cooked. If it is to be given hard boiled, it should be heated until it is mealy and then grated or passed through a sieve.

Eggs may be prepared in many ways. If fresh they are easily digested, and furnish a concentrated form of nourishment.

Eggs should not be subjected to a high temperature in their preparation. A satisfactory method for preparing a soft-boiled egg is to place one egg in a cup containing one-half pint of water heated to the boiling point and allowing it to remain for ten minutes. The cup should not stand on marble or metal, since the cooling of the water would be too rapid for the purpose in view.

A poached egg should be prepared by dropping an egg into water near the boiling point to fix the albumen. It should then be basted with water of a lower temperature, about 170°, until there is a veil over the yolk, and the white of the egg is jellified. An egg prepared in this manner may be given when one poached in the usual way would not be tolerated.

*Albumin Water.*—The white of one egg well beaten; water, one-half pint. Mix and strain. It may be flavored with sherry or lemon.

*Egg Custard.*—One egg, beaten; milk, four ounces; sugar, one tablespoonful. Mix and put in cups and bake.

*Chocolate Custard* is made by adding sufficient chocolate to flavor and color the egg custard.

*Caramel Custard* is made by adding sufficient browned sugar to impart a caramel flavor to the egg custard.

*Brandy-and-Egg Mixture.*—Yolks of two eggs; sugar, one heaping tablespoonful; brandy, two ounces; cinnamon water, four ounces. Mix. Administer in tablespoonful doses.

*Egg Lemonade.*—White of one egg, well beaten; juice of one lemon; sugar sufficient; water, one-half pint. Shake thoroughly. Strain.

*Egg Flip.*—Milk, hot, one-half pint; yolk of one egg, well beaten; whiskey one ounce. Mix.

*Egg Nog.*—Put the yolk of one egg with a tablespoonful of whiskey or brandy, a tablespoonful of Jamaica rum, and a tablespoonful of granulated sugar, with a half pint of whole milk into a pint jar, and shake thoroughly until the sugar is dissolved. Beat the white and add most of it to the mixture, and shake again. Put the remainder of the beaten white on the top of the drink, and have the patient take it through a tube or straw.

*Bartholow's Food.*—Sago, one ounce; milk, one-half pint. Soak for ten minutes, then place in water-bath until clear. To this add: Stimulating beef-tea, one-half pint; yolk of one egg, beaten; celery salt, sufficient. Mix. This is a complete food.

### Fish.

The digestibility of fish is influenced by the kind, quantity, and distribution of the oil contained in the meat; and by the season, the freshness, and the method of preparation of the fish.

The blue, dark, and red meats of fishes are due to the presence of oil or fat. In white fish the fat is collected in local parts, and for this reason white fish may be given to those who cannot digest the oil contained in the dark meat.

For the sick, fish should be broiled, and the amount of fat desired should be supplied in the form of melted butter used as a dressing.

If the fish is prepared by being plunged into boiling salted water, and the process of cooking is continued with the water at a slightly lower temperature, it will retain almost all of its nutritive worth.

### Oysters.

Oysters contain a small proportion of nourishment, and are easily digested if the "eye" is rejected. The juice, prepared by mincing a dozen fat oysters with a silver knife and putting them into a fruit jar and standing the jar in hot water for a half-hour, is often accepted by an irritable stomach that refuses almost all other forms of nourishment.

*Oyster Soup* should be prepared by taking some flour and butter and mixing them, with the cold milk, gradually added, and then adding the liquor drained from the oysters. This mixture should be boiled for five minutes, and the oysters and seasoning then added; the soup should be served at once. Prepared in this manner the oysters should be plump rather than shrivelled, and the soft parts may be eaten by the patient who is able to digest solid food.

*Oyster Broth.*—Oysters, twelve; water, two ounces. Mince the oysters. Place over water-bath for a half-hour. Season. Strain.

### Clams.

Clams have a place in the dietary of the sick chiefly for the juice, which is very acceptable in a great variety of cases.

To prepare clam juice take six large clams, in the shell, scrub the shells, put them into a kettle, add a cup of water, heat until the shells open, pick out the shells and clams with a fork, strain the liquor through a double layer of cheese-cloth, cool rapidly, keep well corked and cool, and dilute with hot or cold water to suit the taste of the patient. Some persons will accept the juice if it is diluted until it has only a suggestion of the clam flavor, who would be unable to take it if it were stronger.

A cream of clams may be made by adding milk and enough flour to give the density desired.

### Vegetables.

A simple though somewhat inaccurate classification of vegetables is that which divides them into *those growing above ground*, and *those growing below ground*.

Above-Ground Vegetables.—*The green vegetables* possess low nutritive worth. They are difficult to digest because of the large percentage of contained woody fibre, and many are not available for food purposes until they have been cooked. They are valuable for the volatile oils and the large proportion of water they contain.

*The cereals* approach in character a complete food by reason of the contained gluten, starch, and fat. The proportion of nitrogen is not sufficient, however, for bodily needs without a supplemental supply in other forms of food. The distinguishing advantage possessed by them is that they can be made into bread. Much of the nitrogenous worth of the bread prepared from wheat is sacrificed to the desire for whiteness. The gluten layer of the wheat grain is located directly under the outer bran coat of the grain, and if this were allowed to remain it would give a darker color to the flour and the bread prepared from it. *Whole-wheat bread* contains the gluten and the phosphates of the grain, and for this reason is darker and more nutritious, and because of a small proportion of bran associated with the flour is helpful in overcoming constipation.

*Legumes* contain nitrogen in the form of proteid, in addition to starch and fat, and are represented by peas,