THE SECRETS OF HEALTH

OR

HOW NOT TO BE SICK

AND

HOW TO GET WELL FROM SICKNESS

BY

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PREFACE

A NEW book with no good purpose is an impertinence. A new book with a good purpose, but with only thread-bare modes of expression, has no place. A new book with a right purpose and somewhat unfamiliar thoughts, is always a need of the times.

This book comes burdened with three themes, all more or less common, yet two of the three so unlike anything heretofore published for the people that if the purpose to enlighten them upon these subjects be right, the need for it is beyond question.

Diet, Hygiene, and Home Prevention and Treatment of Disease! The spirit of invention and discovery has put so much into our modern life, and crowds men so rapidly through life, that these are the only safeguards against wreckage by overloading, or collapse in mid-ocean by over-pressure upon the boilers.

Hygiene is in a general way somewhat understood, but of diet, lest the assertion might be deemed unduly disparaging, let Sir William Roberts, among the foremost of the medical profession of Europe, be our spokesman. In his words, "Our notions on dietetics are little better than a farrago of whims and fancies." And let Dr. William H. Porter, of like authority in America, repeat his humiliating confession: "The vast majority of medical men have no definite knowledge with which to answer the simple, practical question of their first patient, 'Doctor, what shall I eat?'" Yet R. H. Crittenden, Ph. D., of Yale University, declares, "We need as definite knowledge of the properties of the foods we employ as of the medical virtues of the drugs we make use of."

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PART I.

HOW TO LIVE.—HYGIENE.

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Since to live we must, he is wisest who learns to live the best; that is, in nearest accordance with all the laws of his being. Hygiene is only a single department of those laws. It is simply the right method of preserving health. Its laws are clear, definite, and unchangeable. They have relation to air, water, sewerage, exercise, rest, sleep, baths, clothing, habits, contagion and infection.

1. THE AIR.

The First Requisite of health is pure air, four-fifths nitrogen, one-fifth oxygen (the life-sustaining principle), a mere trace of ammonia and nitric acid, not more than 1.4 per cent. of aqueous vapor and from three and one-half to seven parts in 10,000 of carbonic acid (carbon dioxide, the gas of charcoal, with which so many Frenchmen suicide).

In each respiration about a pint of air is inhaled, which gives its oxygen to the blood and takes out in expiration from 4.6 to 5.2 per cent. (the amount varies), of carbonic acid. This expired gas, being more than seventy-one times the largest proportion admissible in inspiration, would soon surround every one with an atmospheric shroud of death were it not for the law of diffusion of gases, by which this excess of carbonic acid is scattered instantly through a large area of adjacent air. Hence, in confined spaces, the air often becomes fearfully impure.

A school room 20x30 and 10 feet high contains 6,000 cubic feet of air. Fifty children are sometimes confined for hours in such a room, which has just air enough to last them four minutes. School rooms have been found that contained from 2 to 4 per cent. of carbon dioxide—which, of course, was made from the oxygen of the rooms—thus reducing that supply, and rendered doubly deleterious by being mixed with the organic effluvia from the lungs and skin of many persons in a confined place. It is then known as "crowd-poison," and is the cause of typhus, jail and ship fevers. Public rooms have sometimes been found to contain from 29 to 72 parts in ten thousand of carbonic acid.

Ventilation Required.—In order to show the relation of this point to common life, suppose there are four rooms each containing four persons and each representing a different class of people.

Room Number One is in the home of a respectable city family, and is 16x14 feet and 10 feet high, containing 2,240 cubic feet of air. It is warmed by a coal stove and lighted by two six-foot gas jets. The only ventilation is by the cracks of windows and doors. Assuming that the stove and gas consume all the fresh supply of oxygen through the crevices of doors and windows, the people must depend upon the original supply in the room for respiration. (Of course the diffusion of gases would render this impossible literally, yet for the purpose of the illustration it is *practically* correct.) Another element must now come into the calculation. Angus Smith and Hartley affirm that a gas burner of six-candle power throws off every hour more than three cubic feet of carbonic acid, a man from six to seven-tenths of a foot, an oil lamp one-half a foot, and a tallow candle three-tenths of a foot.

This room contains 132,160 pints, or breaths, and the people alone would render the air irrespirable in fifteen and one-fourth minutes. The gas burners alone would render it unfit to breathe in about seven minutes. Yet how often does a family remain two hours, or more, in just such circumstances!

Room Number Two is 12x14x9, containing 1,512 cubic feet of air, or 90,208 breaths, and is lighted by a one and one-half inch kerosene lamp, and warmed by a coal stove. The people alone would spoil the air for further respiration in ten minutes, and the lamp alone would do it in thirty-five minutes.

Room Number Three is 12x12x8, containing 1,152 cubic feet, or 67,968 breaths, and lighted by a one-inch kerosene lamp. The people alone would render the air irrespirable in eight minutes, the lamp alone in about forty-one.

Room Number Four is 10x12x7, having 840 cubic feet, or 49,560 breaths, lighted by a tallow candle, and with a four-inch double wick kerosene stove (which yields four cubic feet carbonic acid gas per hour). The people alone would render this air irrespirable in five and one-half minutes; the candle alone in forty-eight minutes; the stove in about four minutes.

When the carbonic acid in a room rises from the highest permissible health point—namely, to ten parts in ten thousand—it begins to smell, and when it reaches one hundred parts in ten thousand, it is almost unendurable (Pettenkoffer). This is why persons entering such a room as we have described, from the free air, are almost suffocated, and the occupants would feel it as keenly were it not for the stupefying effect of gas upon the mind and its narcotic effect upon the nerves of sensation. Is it any wonder that nervous irritability, unrefreshing sleep, headache, paleness and lassitude follow such sitting-room comforts?

Open Fireplace Ventilation.—Jenkins affirms that "a good ordinary fire" (open, he evidently means), "will take from six thousand to ten thousand cubic feet of air out of a room every hour. Hence, the desirability of open fires for assured ventilation. The expense objection can be greatly modified by having a furnace flue or close stove in another part of the room to furnish requisite heat, while the open fire is a good investment for cheer and health. Were this the

general practice, it would very sensibly reduce the sickness and the mortality rates of the country.

An ordinary two-wick four-inch gas stove throws off about as much carbonic acid gas as two gas jets. Hence, the necessity is imperative to provide both special ventilation for the escape of this gas from lights and oil stoves, and to supply them with fresh air in addition to the requirements of the people.

Carbonic Oxide is the gas that puffs from the stove before the coal becomes completely ignited, and burns with a pale blue flame. It is often found in rooms, attacks the red-blood corpuscles and paralyzes them. Dampers in pipes to shut off draft tend to generate this gas and diffuse it in the rooms, especially from hot-air furnaces.

Sulphuretted Hydrogen and Sewer-Gas frequently impregnate the air, and to the latter is ascribed the production of typhoid and scarlet fever, diphtheria, dysentery and cholera.

It is these noxious ingredients, so often existing in the closely-constructed houses of civilized countries, that partly account for the physical degeneracy of enlightened peoples, as contrasted with the stalwart health of nomadic tribes.

In France, in those localities that had seven per cent. of badly-constructed dwellings, one person out of every seventy-two died, while in those that had thirty-eight per cent. of such homes, every forty-fifth person died.

Even Pure Air soon becomes deleterious, if not frequently changed. Stagnation becomes foulness, and foulness breeds disease. Unventilated rooms, and nooks and corners not swept by winds, are always pest-breeders.

The Necessity for Ventilation.—What is ventilation? It has been written about for generations, but what is it as practically of use in ordinary life?

London, with eight persons to each house, lost twenty-four out of every 1,000 of her population. Vienna, with fifty-five to each house, lost forty-seven to every one thousand population. These facts indicate a difference in ventilation.

Of ten thousand cholera patients, living one person in a

a room, three hundred and twenty-seven died. A difference still in ventilation.

A healthy adult takes from the air every twenty-four hours sixteen cubic feet of oxygen, and gives to the air fourteen cubic feet of carbon dioxide, and an indefinite quantity of organic matter, still more poisonous, from his lungs and skin. The combustion of fires and lights adds still more. Morin gives these figures as the amount of fresh air required per head each hour:

Ordinary hospitals and workshops	2,362	cubic inches
Surgical wards and unhealthy shops	3,936	" "
Primary schools	590	" "
Higher schools	1,181	" "
Assembly rooms, theaters, etc.	1,771	" "

The Size of the Ventilating Orifices and the velocity of the air current determine the quantity obtainable. Morin advises fourteen square inches of ventilating space for each one hundred cubic feet of space in the room. This is about 12x16½ inches for a room 11x13x10, and is probably about right for average spring and autumn weather in rigorous climates, but is four to six times too little for summer, and is as much too great for winter when the communication is directly with the open air.

Every living room should have an open ventilator proportioned to its size and the number of its occupants, which should connect, preferably, with a thoroughly-ventilated and well-warmed hall; or by a pipe of sufficient caliber to carry all that the inlet ventilator admits, leading from the outside to a funnel-shaped end covered with wire gauze, or pierced with small holes, so as to sprinkle the cold air directly upon the stove, or within a casing partly surrounding the stove.

The exit-ventilator should be in the baseboard of the side most distant from the stove, should connect with the chimney, and be in size proportioned to the number of occupants. For one person, 6x6 inches; two, 8x8; four, 8x12; six, 12x12; or two, each 8x9; eight, two, each 8x12; twelve, two, each 12x12. This will force a constant circulation of pure, warm air all

through the room, carrying off the layer of cold air that keeps the feet cold while modifying the upper layer of hot air that keeps the head hot, and thus induces headaches, colds, and disease.

The Objection that "so much more fuel would be necessary," has no weight, because the heat-producing capacity

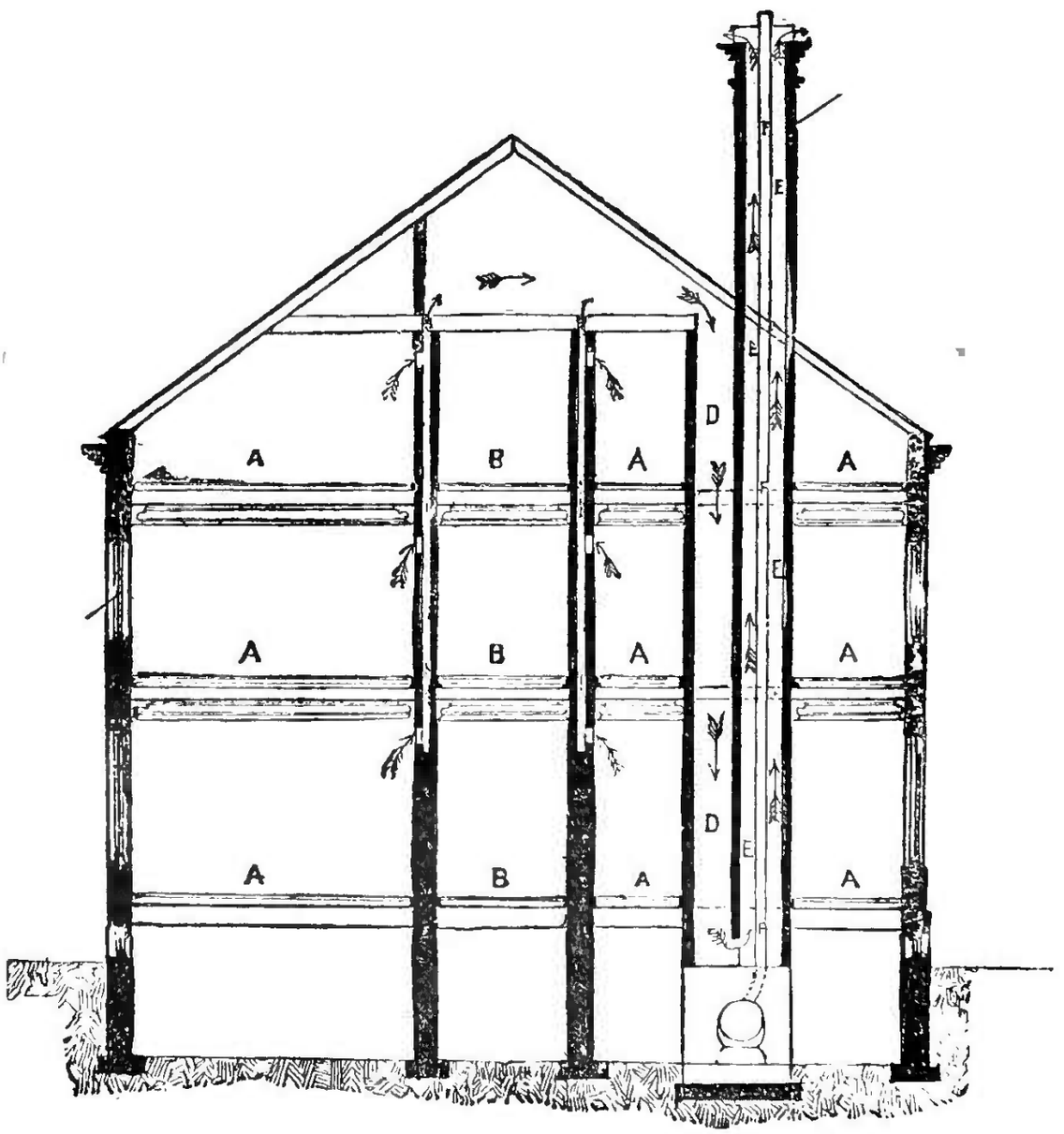


FIG. 1. WOOD'S IDEA FOR VENTILATING, SO AS TO PRESERVE AN EQUABLE TEMPERATURE.

of the occupants would be so largely increased that a much lower temperature could be safely maintained, with a corresponding less liability to shocks from the alternations between indoor and outdoor air at the extremes. As it is now, people

rush many times a day from a tropical heat, within, to a mid-winter temperature, without, and the reverse, and the mucous membrane is unable to stand the strain, and catarrh, fever and pneumonia result.

To Equalize the Temperature, and at the same time secure proper ventilation, the plan shown in Fig. 1 is recommended by Dr. Castle in that admirable work, "Wood's Household Practice of Medicine." *A*, are the chambers; *B*, halls; *D*, downward current to furnace; *E*, upward current to outer air; *F*, smoke pipe passing through center of ventilator shaft.

The Best Available Method of ventilation for constructed buildings is probably that suggested by Dr. Keene: Tack a piece of cloth across the lower ten inches of the window frame and raise or lower the sash according to the weather; or that of mismatching the window sashes by having a strip

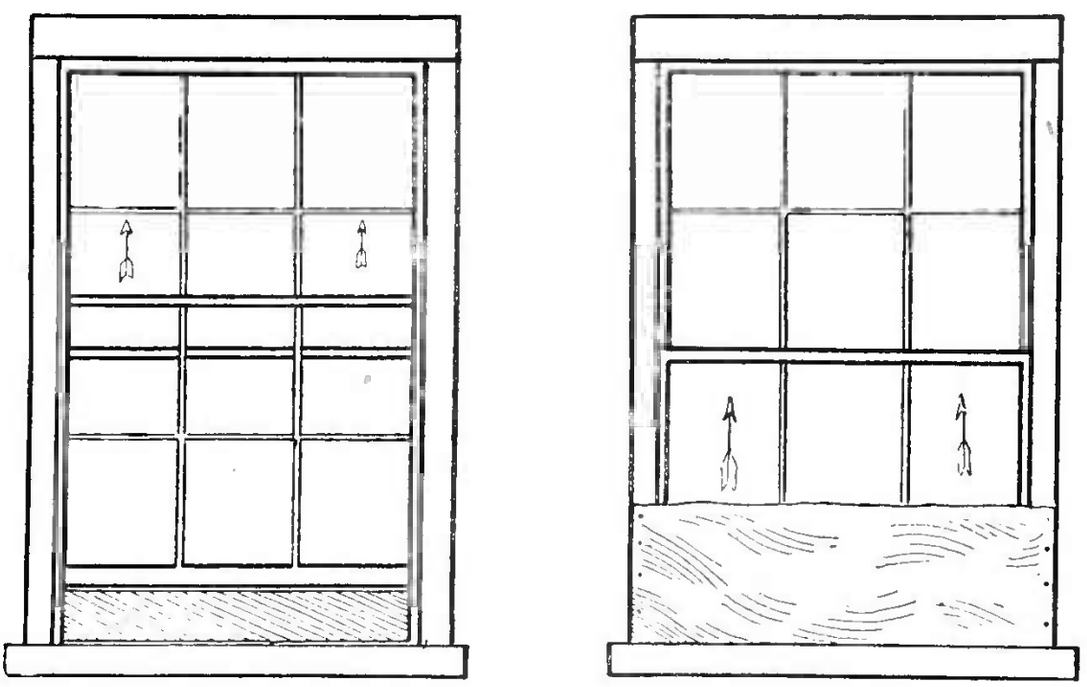


FIG. 2. WINDOW VENTILATORS.

of wood three inches wide fitted under the lower sash, thus giving an upward current between the sashes into the room. But as outlets are as important as inlets, on another side of the room an escape flue should be in open communication.

The practical end to aim at is to give constantly to every person a room ten feet square to eight feet high, with uninter-

rupted free communication with the outer air. If the room be smaller, or more than one person occupy it, the avenue of communication must be correspondingly increased.

In the light of these facts, ventilation, as ordinarily understood and practiced, is greatly deficient. In the War of the Rebellion tent hospitals gave much better results than the best of hospital buildings, because the ventilation was so much greater.

Every room should have a window on two sides reaching nearly from floor to ceiling.

2. SUNLIGHT.

Sunlight is closely connected, as a health agent, with ventilation.

A House should never be so shaded that the sun cannot shine upon every part of it. New Orleans, in an epidemic of yellow fever, had six times as many cases on the shady as on the sunny side of the same streets. Buffalo, in the cholera of 1849, had a similar expreience. Many other facts are recorded in medical literature showing that these are not isolated incidents, but illustrations of a law of nature.

"Where light is not permitted to enter, the physician will have to go," says the Italian proverb, and it is equally applicable to the direct sun-rays upon the dwelling.

Shade is very desirable for comfort in hot weather, but the trees should stand far enough from the house to prevent the dampness that always accumulates in a shaded house.

Streets should be twice as wide as the height of the houses bordering them.

Sun Baths.—The nervous system of man is organized to respond to the vitalizing influence of the sunbeam, like a fruitful soil. Therefore, the skin should be freely exposed to the direct rays of the sun. When, by reason of occupation or fashion, this does not occur, a sun bath should be taken from one to three times a week, when the whole person is exposed naked for fifteen to thirty minutes. An invalid can lie upon

the carpet, or mattress, and turn from side to side. Should there be rush of blood to the head, it should be shielded.

As a nerve tonic, few things are better than a sun bath. A man of eminence, finding his nerves giving way, fenced in a portion of his garden with boards twelve feet high and well jointed. Then he locked himself within every sunny day, and stripping naked worked from thirty to sixty minutes, and by the time his crop had ripened, his nerves were sound.

The Growth Period of childhood and youth especially needs the vitalizing power of the sun's actinic ray. It is that ray (not the light, or heat ray) that the photographer employs in his art, and that ripens the seeds and fruits of the summer and autumn. The potato vine that sprouts in the cellar grows, but never matures unless removed to the open air. So children may grow, but the vigor and maturing power of normal youth can never be theirs unless they, too, find the open,—bask in its sunshine, drink in its inspiring oxygen, and by instinctive activity gambol every muscle into vigorous development.

3. TEMPERATURE AND HUMIDITY.

Air Feels Damp, not by the moisture that it actually contains, but by what its temperature fits it to contain.

The same air that feels very damp outside at 32° will feel uncomfortably dry in a room at 72°, because at that temperature it can hold 8.54 grains of vapor per cubic foot, while at 32° its capacity is only 2.13 grains. Hence, as air is heated, it should be fed with moisture.

No heating arrangement should ever be heated red hot if the air that comes in contact with the red surfaces is to be breathed, because it is thereby greatly vitiated. Furnaces are usually heated to 100° or 500° while air that is to be breathed should not touch a surface heated beyond 150°.

The Best Way to Warm is to circulate pure warm air, instead of keeping the air stagnant and trusting to radiated heat.

Temperature and "relative humidity" are closely related. Call the air saturated with moisture 100; it may have lost all the way down to 12°. That loss is relative humidity, which sinks as temperature rises. From 67 to 69 humidity is best for comfort and health.

The proper sitting-room temperature is 70°. Should you feel chilly in this temperature, do not increase it, but by exercise raise the heat of your physiological furnace within.

The heating appliances of the day are paralyzing the heat-making functions of our bodies; hence, the colds, etc., from which we suffer so frequently, and which would be largely prevented by the adoption of the open fireplace, and of the heating arrangement as recommended on Page 3.

Radiated heat diminishes in proportion to the square of the distance, so that the child on the floor ten feet from the open fire receives one hundred times less heat than the cat lying one foot from it; hence, the necessity for the heating stove, or furnace, also.

Cooling can be accomplished on a small scale where one has a well into which a pail may be lowered, but it is far better, and the expense is so slight, if one cannot afford an ice house, to have an ice mound, which costs only a little straw and the labor. Simply raise a platform of earth above the level of the surrounding soil and slope it slightly from the center down to the edges. A layer of sticks and then of straw, or sawdust, ice closely packed on that, covered with straw, or sawdust, more sticks, then bank over with earth and sow with grass seed, or cover with hay, or straw, and you have a reservoir of cooling blessing for all the hot summer.

Digging into a hillside saves some of the labor, but care must be exercised to provide for drainage. More elaborate ice houses with cold storage attachments are within the means of most farmers.

4. WATER.

A Wonderful Blessing. The uses of water as a health preserver and restorer, are not known by one person in a

hundred. If this book teaches the masses to enjoy the countless blessings of the proper and manifold uses of water, and to avoid abusing this great agent, it will confer untold benefits upon mankind. Intelligently used, but not abused, water will render many a family comparatively independent of doctor or druggist, saving much money, pain, sickness and sorrow.

The Purity of Water is of the utmost importance. To test it take two clean four-ounce bottles of water, one from the well, the other perfectly clean rain water. Drop in each a piece of alum as large as a kernel of corn, and let them stand over night. The sediment in the morning will show the degree of impurity.

Exeter, England, in 1832, had one thousand deaths from cholera, but when it reappeared in 1849 there were but forty-four cases. The water supply had been changed in the interval.

In London's cholera season of 1848-9, two companies supplied the water. Of those who drank the Lambeth water 125 in each 10,000 of the population died. Of those who drank the Southwark, 118 in each 10,000 died, the loss being nearly equal. The Lambeth company then changed and drew their supply from a point, higher up the river, where the water was much more pure. In 1854, the Southwark deaths were 130, and the Lambeth thirty-seven.

In Millbrank prison, England, the prisoners drank the Thames water, with frequent epidemics of fever and dysentery. The water was filtered, but no relief. An artesian well was sunk, and at once the diseases disappeared.

One grain per gallon is all the organic matter that first-class drinking water can contain; yet some has ten grains without detriment to health, but it must be purely of vegetable origin.

From five to twenty grains of mineral salts are deemed necessary, while thirty-five grains should never be exceeded, and animal matter must be entirely excluded.

The Average Need for Water is half an ounce daily for every pound of weight. And the average used for all purposes is from fifteen to thirty gallons a day, while the minimum supply is one gallon a day on board of war vessels.

Water is Hard when it has an excess of carbonate of lime, or of calcium sulphate. The latter is not removable. To correct the former, boil it, or add washing soda, or quicklime.

Soft Water is preferable for domestic purposes, but care should be exercised not to allow contact with lead or with copper when hot, for rain or soft well water will absorb enough of the metal to poison it.

Lead Pipes.—Only one-tenth of a grain of lead in a gallon of water will injure some people. However, if lead pipes must be used, it is said that one pound of sulphide of

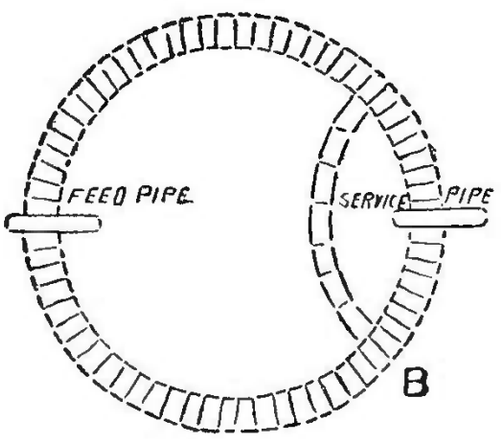


FIG. 3. CISTERN FILTER.

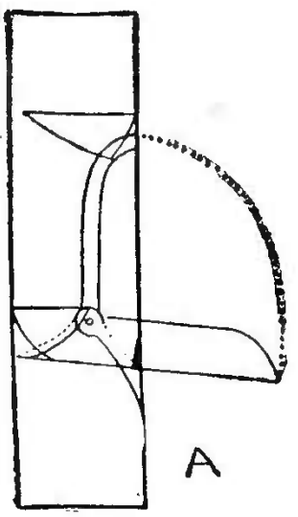


FIG. 4. SHUT-OFF FOR FEED PIPE.

potassium in two gallons of water kept in the pipe until the inside is thoroughly blackened, will aid in rendering it harmless.

Filters.—If the purity of the water be doubtful, it should be filtered by running it through charcoal and sand, and the filter should be cleansed frequently, else it will increase the difficulty. If this is inconvenient, boil the water.

Dr. Parker suggests a good home filter: A common earthen flowerpot with a bit of zinc gauze, or clean flannel, over the whole, three inches of coarse gravel, three of white fine sand well washed, four of charcoal (animal preferred), and on the top a well-cleansed sponge, to be thoroughly cleansed once a week.

To purify water that is not well filtered, dissolve a lump of alum as large as a small butternut, in a quart, and stir slowly into a barrel of water.

Cisterns, properly constructed and cared for, are the preferable source in populous districts. A house 40x20 feet, with an annual rainfall of forty-two to forty-five inches, will give sixty gallons a day throughout the year. The rainfall of the United States, except the mountain region south of Colorado, averages from forty-five to sixty-five inches. Ninety thousand cubic miles of water constantly float in the air to supply the rainfall.

Cisterns should be cleansed every three to four months, and should be built with a shut-off to turn aside the first wash-

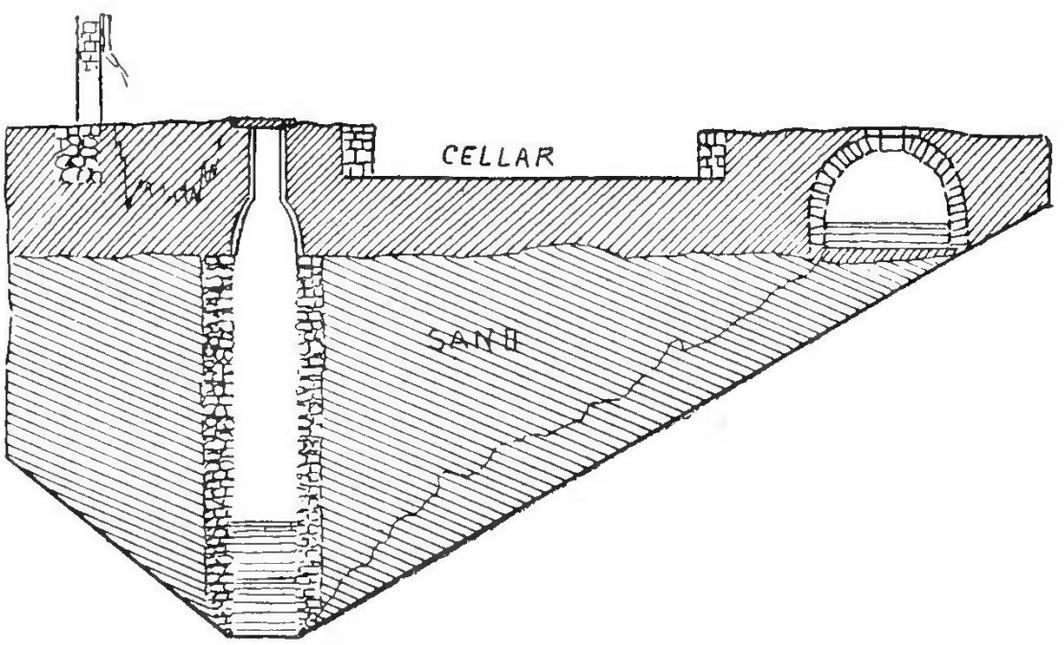


FIG. 5. WELL POLLUTED FROM A CESSPOOL.

ings of the roofs, as they contain dust, excreta of birds, and microbes of disease. Cisterns should always have a brick partition, as a filter, laid in cement, but not covered with it, separating the body of the water from the service pipes, as shown in Fig. 3. Of course, the usual automatic shut-off to prevent over-flow of the cistern should be provided, on the principle illustrated in Fig. 4. Families occupying rented houses without cisterns, can secure a good supply of clean

water by hanging up a clean sheet or canvas by its four corners, putting a clean stone in the middle and placing under the stone a vessel to catch the water as it filters through.

Wells constitute the main source of water supply for country and village people. But the well is often substantially but a drain-pipe for the soil. A drain-pipe under the soil four feet will drain a strip of surface ten feet wide over its whole length on level ground. But if there be an incline, it will drain to an indefinite extent on the upper side. Hence, wells should never be within sixty feet of any collection of obnoxious (particularly animal) matter, such as privies, pig styes, barnyards, cesspools, etc., and if the incline is directly toward the well, at least 200 feet should intervene.

Cut 5 illustrates how wells are often fouled by drainage. The water was unpleasant, and though the walls were relaid in cement, there was no improvement. The cesspool was on the opposite side of the house, fifty feet away, but the rock dipped toward the well. Then the cesspool was removed and the well was cured.

The Supply of shallow wells is the underlying stratum of water beneath the soil, known as *ground water*, from the soaking down of rain and surface water and the filtering in from adjacent localities in a percolating flow toward a natural receptacle, such as a river, lake, or sea. Of course the purity of this supply is dependent upon the character of the soil, the amount and kind of surface waste, etc.

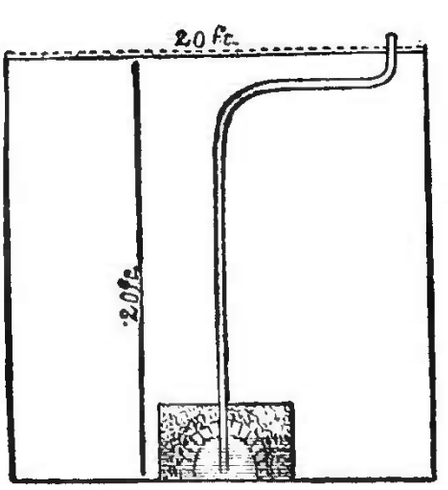


FIG. 6. A MODEL WELL.

Deep Wells may reach a geological stratum which contains a flow from mountain heights, and of remarkable purity.

Open Wells soon accumulate decaying vegetable matter, and living and dead reptiles, until the bottom becomes an oozy slime, sickening alike to sight and smell if but slightly

stirred, and contaminating all, though the water above it may be of crystal clearness.

The Model Well is to make the excavation and wall it up in the usual manner a few feet, arch it over with a service pipe in position, and cover the arch with several layers of stone, each of a smaller size than those below, to prevent the earth working through, and fill in above and pack down. Such a well is recommended by Wood and is illustrated in Fig. 6.

If a well, or vault, is to be entered, first lower in a cat, or small dog. If it dies, then purify the air by throwing in heated stones, hot iron, or pails of hot water to cause the vapor to ascend.

Driven Wells.—The best source of supply is a driven well, provided it reaches a stratum of uncontaminated water.

7. SEWERAGE.

Should be Perfect, not allowing leakage to soak into the soil near the house. Should be separated by water traps from every avenue of access to the house. Sewers should be flushed often, and should be disinfected with chemicals in all contagious diseases. Water closets should be in an annex entirely separated from all living and sleeping rooms.

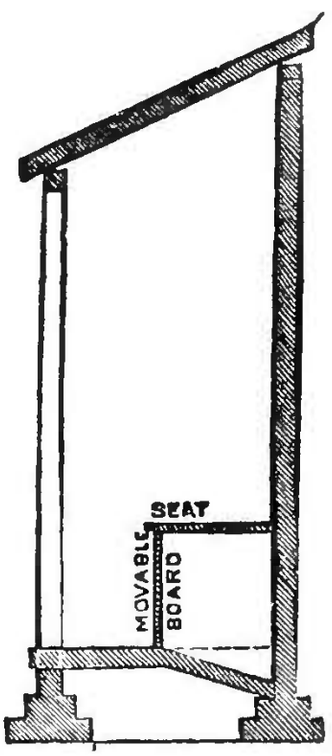


FIG. 7. EARTH CLOSET.

The Earth Closet.—Where no system of sewers exists, as in country places, the privy vault should be abolished and good earth closets substituted, for these reasons:

1. The stench is a nuisance to those obliged to occupy them.

2. They constantly menace the health of the family because sure to contaminate the ground water for a considerable distance around.

3. They are so uncomfortable because of odor, or temperature, or exposure, that habits of constipation are formed by hasty and imperfect evacuations.

4. A valuable fertilizer is needlessly lost.

All these objections are completely obviated by the dry earth closets, one form of which is given in Cut 7, as used in England; the sloping bottom is easy to clean. Better, still, is the Rochdale pail closet, the pail being half a kerosene barrel, which is removed weekly and disinfected; the week's contents weigh forty to fifty pounds. The construction of a pail closet is similar to any other, the pail taking the place of a vault.

An Outdoor Privy, if used, should never be built with a vault, but always with a sliding box to receive the deposits and be emptied frequently. By this arrangement the privy may be so near the house as greatly to lessen the risk to delicate persons in reaching or using it. Construct it to avoid the four great objections to privies mentioned above and on the preceding page. The conditions of most privies in the country is a disgrace to civilization and a constant menace to the health of the people.

Absorbents in an earth closet, or privy, will keep the deposit dry and odorless, provided, of course, that no slops, or other liquids, are poured upon it. Dry soil from the garden, or field, is the best absorbent. Sifted coal ashes is good. Ground gypsum, or what the farmers call land plaster (sulphate of lime), is a very valuable absorbent, and also adds to the value of the manure. Absorbed in this way, the night soil is comparatively unobjectionable for use like other manures, and when broadcasted and plowed, or spaded, under the soil, produces large crops.

Never use wood ashes, quicklime, slaked lime, or Mason's lime, for this purpose. They do not absorb, but instead rot the mass and set free the odor which land has little power to absorb.

The Cesspool should be lined with a cement of asphalt and sand, should be ventilated, and if within one hundred feet

of the house, the ventilating pipe should be not less than thirty feet high. Traps (to prevent the foul gases reaching the house through the pipes) of the best construction should protect every place of access to the house. On this subject see Parke's Practical Hygiene. It should be remembered that the deadly sewer gas cannot be detected by smell. Probably the water-seal, if properly constructed, is the best trap in general use. Even the drying of the wet napkins of the baby by the fire, or in the sun in a room, without previous washing, is extremely deleterious.

The Sink Spout, in many a farmhouse, is a source of death. If troughs can be arranged to carry the sink-slops off on to the grass, or garden, it is the best plan. The free use of absorbents and frequent cleaning out of a cemented basin into which the pipe empties in lieu of a cesspool, is the least that should be done.

6. HINTS ON HOUSE BUILDING.

That New House should be so carefully planned that no change will be made in construction. It should be contracted so definitely that no room should be left for misunderstanding in any detail. Set upon good, solid ground, or, if on "filled in," or "made" ground, not less than three years after the filling in, as it takes that time for the deleterious gases to escape; so sheltered that it shall not be exposed to special drafts of air like the entrance to a ravine, yet so exposed that ordinary winds shall sweep all over it; not itself shaded, yet with yard so protected and grassed as to cool the ground; with firm foundation resting upon concrete.

The Cellar.—If the soil is damp, the cellar walls should be over an outer wall and air space, and drain to protect from dampness. The cellar floor may be of six inches of concrete covered with cement, the cellar walls, inside, from the foundation to one foot above the cellar floor lined with asphalt, brick, or cement, and the drain pipe never connected with the cesspool, or sewer pipes. The cellar should be well lighted

with windows on at least three sides, to permit of perfect ventilation. Whitewash once a year, at least. A damp, or foul, or close cellar is a disease breeder. Fruits, vegetables, etc., stored in it, should be frequently inspected, and all rotten stuff removed. Any water or gas pipes should run overhead, not under the cellar floor.

House Warming.—If heated by steam, the system of air flues heated from steam pipes is best. If heated from a furnace, the air should come direct from outdoors to the furnace, never from the cellar. Some modern houses are so constructed that the warm air from the furnace permeates the space between floors and ceilings, and is let into the rooms by registers. A water tank should be inserted in the hot-air chamber of the furnace, so that its escaping moisture will permeate the hot air. If stoves, or steam radiators are used for heating, an open vessel of water should be kept on each, as its evaporation adds to the supply of oxygen in the air of the room, besides avoiding that dry heat so trying to the mucous membranes.

The Rooms should not be less than ten feet high, and large enough to give 9,246 gallons of air to each adult occupant, and 6,600 for each child under ten years, per hour. If there be two of each, 31,692 gallons, or 253,536 breaths, will be needed, for they will breathe 4,320 times an hour, and every exhalation will spoil 120 other breaths besides itself, thus requiring every hour 518,400 breaths of air to provide for themselves and the waste by excess of carbonic acid. See "Air," and "Ventilation."

As twenty-five per cent. of heat is usually lost by condensation on the window glass, all rooms with large windows should be supplied with double glazing, or double sashes.

If possible, every room should have the direct rays of the sun during some portion of the day.

The walls should be hard-finished, or painted, — never papered, as paper is a favorite camping ground of disease germs. Paper is no longer fashionable.

The Floors should be hard wood, waxed, or scoured, and with rugs that can be easily aired, where necessary for comfort. Carpets are physiological abominations, holding disease germs by myriads and yielding them with a seemingly infernal maliciousness on any sweeping.

An Annex, with reservoir at the top, where there is no pressure supply, set wash bowls, water closets and bath room to suit, a separate ventilating flue from bottom to top, and connected only by a single door with the hall of each story, should not be omitted upon any ordinary consideration of expense.

As a "farmer's boy," the author believes that these ideas can, and should, be carried out in an adapted way even in the construction of farmhouses, and that they would be found a good investment, with rich returns of health.

Beds should consist of cotton or linen sheets, woolen blankets (the feeble can use blankets for sheets), mattress and pillows of straw, husk, or hair. The bed should be aired daily all day, and sunned three times a week in health, and every day in sickness, if practicable.

Every bedroom should have a little closet for a chamber-vessel with a separate ventilating flue; a little recess, with a piece of baseboard hinged for a door, is sufficient.

7. BATHS.

The Principal Objects of Bathing are cleanliness, some change in the functions of the skin, some change in the determination of the blood, change in the temperature of the body, or part, and change of functional activity. Baths are named from the degree of temperature employed:—Cold, 33° to 55°; cool, 55° to 65°; lukewarm, 65° to 70°; tepid, 70° to 85°; warm, 85° to 95°; hot, 95° to 100°

Cold Baths, suddenly and powerfully contract the capillaries of the surface and force the blood inward, thus stimulating the heart and large arteries to a vigorous effort to drive it back, which, if successful, is the reaction which glows

and invigorates. But, if the vital organs be weak, and the capillaries sluggish, congestions, dangerous to health, and even to life, are apt to result. Cold baths should be taken in a very few minutes.

Cold whole baths remove *solids* from the system by increasing respiration.

Cold local baths, that is, applied to one part only, in reaction draw the blood to the part in order to replace the heat lost in the bath. Taylor says that a sitting bath, the water of which has been raised two degrees, has caused the absorption by the blood of the oxygen of four or five cubic feet of air, "enough to raise a half pint of water from the freezing to the boiling point, and eliminated from the system more than a half ounce of its solid material."

Sea Bathing is the most stimulative form of cold bathing, the invigorating effects of the simple cold bath being heightened by the saline constituents of the water, and the revulsive effect of the waves against the skin; aided, also, by the bracing air of the shore, temporary change in food and habits, etc. A good substitute for a sea bath is the following mixture of salts dissolved in about thirty-eight gallons of water for one bath: Ten pounds of chloride of sodium (common salt), five pounds of sulphate of sodium (Glauber's salt), seven and one-half pounds of chloride of magnesia, and two and one-half pounds of chloride of calcium.

Summer Surf Temperatures.

Nantucket	75° to 76°
Cape May	70° to 80°
Norfolk, Va	81° to 82°
Charleston, S. C	86° to 87°
Florida coast	87° to 88°

Cool Baths, in a person of ordinary health, slightly relax the skin, impart vigor, soothe the extremities of the nerves, and abate internal blood pressure. But in prostrate conditions, the effects are the same as from cold baths.

Tepid Baths are mild yet efficient relaxants to the skin and extremities of the nerves, relieving internal engorge-

ments and soothing the entire system. Yet they are not suitable to strong, local, or general congestion, flaccidity of structures, cool surface, colliquative perspiration, threatening gangrene, or chronic weakness of vital energy (Cook). They should take ten to fifteen minutes only.

Warm Baths are stimulating and relaxing to the surface, and soothing to nervous excitability. If continued long, they excite perspiration, and may cause oppression, languor, and giddiness, because the internal process of heat production is retarded, elimination of solids is checked, and respiration diminished. Time, thirty to sixty minutes.

Hot Baths, rarely over 100° strongly arouse the capillary circulation, by the effort of the body to return the surplus heat given to it, relieve local rheumatism and neuralgia, accompanied by partial congestion, when applied locally in the form of fomentations. They are not advisable when the skin is cold and clammy, except when impregnated with the strongest stimulants. With perspiration, excessive and warm, they are of great service. Hot baths are useful to restore warmth to the body in cases of profound shock, or after exposure to severe cold, but in the latter case the circulation must first be gradually restored. They should be avoided if the patient expects to be exposed to cold within a few hours.

Hot baths should not be taken except as a remedy for disease, baths of lower temperature accomplishing all that is needed for ordinary purposes.

Pack Baths consist in wrapping the entire body in a sheet wrung out of water, with blankets so enveloping him as to maintain a tepid warmth in every part, thus producing the same effects as the tepid bath, but to a far greater degree, even to the extent of promoting the absorption of internal effusions. Sleep ensues as a consequence of the general relaxation, and care must be used, or, if the pack be continued too long, the over-relaxation may produce, in serious cases, inability to tone up afterward.

Compresses are simply cold local packs; fomentations hot. For the latter wet from two to four thicknesses of cotton,

or linen, in the water or decoction selected, heated according to the case, and cover with three to six thicknesses of dry flannel, projecting on all sides three inches beyond the wet, and bind firmly in place. If continuous heat is required, change the wet cloth frequently without removing the dry, by lifting the dry and slipping the wet under it as hot as can be borne. In congestions the moisture is absorbed through the capillary walls detaching the adhering corpuscles and unclogging the blood vessels.

Vapor Baths.—110° to 140°. The famous Russian bath is vapor. The early Thomsonian method was to seat the patient, naked, in a chair set on slats across the top of a tub of hot water, into which hot bricks, or stones, were put. Blankets enveloped the patient.

Another method is to generate the heat by putting an alcohol lamp under a chair, suspending a basin of hot water over the lamp, and have the patient sit on the chair with blankets tent-like about both. This is the *hydro-alcoholic* bath.

Another way is for the patient to sit in a box, or cabinet, and have the vapor conducted in from outside.

Still another is for the patient to lie in bed with the clothes raised by supporting half hoops and have the vapor conducted under the bed clothes, or a vessel of steaming hot water put in.

Another is to surround the patient in bed with several hot bricks wrapped in cloths and pour vinegar or alcohol on them.

However they may be taken, vapor baths should not be continued many minutes after the face perspires freely. They are far more penetrating and powerful than sponge baths, securing a full outward flow of blood, breaking up internal congestions, and stimulating the entire surface.

In scarlatina, measles, smallpox, erysipelas, hydrophobia, chronic skin affections, colds, rheumatism, ague, flooding, acute dysentery, lockjaw, dropsy, chronic abscesses, etc., they are invaluable. The bowels should be first emptied by a full injection of hot water, or the contents may be absorbed and carried through the system toward the surface.

The vapor bath should not be risked in conditions of decided prostration, in heart troubles or diseases of the large blood vessels, or in internal mortification. Persons of very delicate nervous organization are liable to faint in it because of the sudden flow of blood from the brain to the surface, and they may feel prostrated for days by it.

The Turkish is a hot-air bath, followed by sundry washings and manipulations, which render it sometimes of great value, but the custom of treating all patients alike causes frequent injurious results.

The Franklin Bath consists in exposure of the whole body naked to the air. It should be attended with general hand-friction of the skin, not long enough to produce general chilliness, and repeated with sufficient frequency to have the system welcome it as a luxury.

General Rules for Bathing.— Those suffering from heart disease, faint spells, or congestion of the brain, should never bathe in the surf.

Full baths of any kind should not be taken within one hour before a meal; within two hours after a meal; when much fatigued, or otherwise exhausted; when the body is cooling after perspiration; when cold from previous exposure (except the warm bath).

The ears should be protected with light cotton plugs, in surf-bathing.

Should lassitude result from surf-bathing, or persistent chilliness, or numbness, discontinue it and rest, also take a strong cup of coffee, but do not try to "walk it off," as that will exhaust still more. Contrary to general opinion, the *feet* should be first wet.

In all baths, heavy shocks should be avoided. The bath should be adapted to the person. If a cold bath is recommended for a certain condition, and the patient is used to warm baths only, begin with a tepid, gradually reduce to cool, then to cold. The abuse of water by enthusiastic believers in its virtues, is as much to be guarded against as its proper use is to be encouraged.

Women should take only such baths during the last two months of pregnancy, or while menstruating, as are appropriate to their condition.

The rule not to bathe within two hours after a meal, is of the utmost importance, as many cases of fatal "cramp" are due to the plunge into cold water when the stomach contains much food.

A patient suffering from dry asthma with cold perspiration during the paroxysm, would be injured by a tepid bath.

In excessive urination with a dry skin, a tepid sponge, or vapor, bath, will diminish the flow. On the other hand, a cool bath, when the skin is moist, especially with an astringent added, will increase the discharge from the kidneys when that is deficient (Cook).

Persons who have reached the decline of life, whether at fifty or seventy years of age, should avoid chills from whatever baths they allow.

8. CLOTHING.

The Use of Clothes.—The natural demand for clothing is for sanitary reasons. Moral reasons exist, but they grow largely from custom.

As all bodies radiate, or absorb, heat according as they are surrounded by a medium of lower or higher temperature than themselves, therefore, in a variable climate, clothing becomes a matter of grave importance. In summer, clothing that will rapidly conduct the heat away; and in winter, that which will retain it best, seems most desirable. But moisture from the surface of the skin plays an important part in the conductive capacity of different articles of clothing. Thus cotton and linen are rapid conductors of heat, and are made much more so when moist or wet. Flannel, on the other hand, is a poor conductor either moist or dry. Therefore, flannel is the preferable clothing for winter use. Experience shows, also, that in the greatest heats of summer it is superior to either cotton or linen for those who are exposed to the direct rays of

the sun, because its poor conductivity protects its wearer from the intensity of the sun-heat.

The expensiveness of wool is often a serious objection against its use, but this can be obviated to a considerable extent by keeping layers of warm air between the skin and the outer cold. Wear the thinnest kind of all-wool garment fitting very loosely next the skin, and over that one of coarse cheaper wool, also fitting loosely. There will thus be, first a layer of air next the skin, another between the under-wool, and the upper-wool undergarments, and still others between that and the outer articles of apparel.

The Color of outside clothing is also of great importance, light absorbing less heat from the sun's rays than dark. For instance, white cotton shirting absorbs 100 heat-units, light sulphur yellow 102, dark yellow 140, light green 155, turkey red 165, dark green 168, light blue 198, black takes in 208.

As Disease Germs are much more readily absorbed by woolen clothing than by cotton and linen, doctors, nurses, and others who come in contact with infectious diseases, should wear linen and cotton clothing in preference to woolen, as far as other considerations will allow. But *silk* would be preferable to either for their undergarments.

The Fit.—While clothing should be made to fit properly, any article that restrains muscular movements, obstructs the circulation, or compresses the organs, should be condemned.

Dyed Clothing should be worn with caution, as the materials used for coloring purposes are often poisonous.

Clothing can easily be made *non-inflammable* by soaking in a solution (of three ounces) of four parts borax and three parts Epsom salts dissolved in ten to twelve ounces of water. (Wood.)

Garments for outdoor wear should be warmed before wearing unless kept in a warm room.

9. SLEEP.

The Brain, the fountain head of all nervous energy by which we think, and do, and live, never recuperates except

in sleep. Hence it is that so much time is allotted by Nature to this function of our organism. Other functions, such as eating, walking, and speaking, are subject to very great and long continued modifications, but sleep, with comparatively slight variations, is imperative, because of the necessity for brain-recuperation.

Time for Sleeping.—Ten hours until puberty is established, nine hours from that period until physical growth is complete, and eight hours sleep for mature life, are the average demands of nature. He who ignores this law, does it at his peril.

Nature never forgets. She may seem to disregard for a time, but every habitual violation is written in her book, and will, as certainly, be visited with penalty, as life furnishes the opportunity.

To Secure Good Sleep, the following conditions must be observed:

The bed should be not so hard as to "make the bones ache," nor so soft as to unduly heat the body.

The bedclothes should be light and warm, and always in cool and cold weather comprise an extra to be laid across the feet and drawn up in the night when the natural sinking of the body-heat calls for an extra covering.

All persons should sleep alone, if practicable. Invalids and healthy people should never sleep in the same bed, nor invalids and children, nor aged people and children.

Hearty meals should not be eaten just before retiring, but it is better to eat a little bread, or even drink a cup of weak black tea, than to feel the gnawings of hunger in bed.

The brain should not be worked hard within one or two hours in health, and two to five hours in illness with brain pressure, before retiring.

Sleep that is disturbed by uneasy tossings may become tranquil by giving the covering a hearty shake, lifting the night clothes to the armpits and giving the body a hasty hand-rub in the cool air, and lying down in a different position from the last.

Never retire with cold feet, but, instead of resorting to the debilitating hot brick, or water bottle, plunge the feet for an instant into cold water and jump into bed without drying them, and they will soon glow. But if the person is too feeble for reaction to take place thus, then give the cold plunge and dry with a flesh brush, or coarse towel, and, if necessary, rub or whip them into warmth.

The night clothes should hang entirely free from the shoulder and be some inches longer than the limbs, so as to envelop the feet.

Ventilation should be perfect. But should it be possible to provide adequate ventilation only by exposing the bed to a current of air, protect the bed by a screen, or curtain, between that and the ventilator.

The more the nerve force is drained, the more sleep is required. Hence, brain work needs more than manual labor. Those who use alcoholic stimulants require more than abstainers. Large eaters need more than small eaters. Pregnant and nursing women should have more than others. Rapidly-growing children can scarcely get too much sleep.

10. REST AND RECREATION.

Why Needed.—The great American nation has become nervous, dyspeptic, sexually weak, and physically degenerated, largely by the untamed spirit of drive and conquest, which is the product of its environment and history.

Three more generations of retrogression, and, as a people, we shall be the scorn of the civilized world. It is time to halt; and the first reformation should be on the high ground of rest. Greed must check his speed, ambition must take time to breathe, competition must ease up for a holiday.

Commodore Vanderbilt, with all his immense financial interests, set an example in this respect worth following. He would never allow work, however pressing, to keep him busy after 2 P.M.; then rest and recreation the rest of the day. "But with his means he could well afford to rest," objects the

worker. No, with his means he could not afford to do otherwise! And he was wise enough to see it.

The Incessant Grind of the busy brain needs a let-up; and it will have it, or the impinging fibers will grind each other away. This is the very point that we are deploring. The damage to the brain-fiber is reporting itself in the nerves, stomach, manhood power, and physical stature and strength of the younger generation. More holidays, and half-holidays, a sacred rest-hour in the hum of the day, business locked into the mill, bank, counting-room, office, store, or shop, when it is closed for the day, instead of being welcomed at the home fireside and transformed into a hideous nightmare in the sleep-hours!

Rest, rest, rest, is what we need.

Vacations all through the year. Let up, hold up. *Stop!* is the imperative of an imperiled race, or neurasthenia with all its untold horrors will be the distinguishing characteristic of our land.

Reform in Schools.—But the mandate will never be heeded until the example is set in our public schools. Stuff, cram, force, is the very spirit of school boards and teachers' institutes, until the young brain takes on its habitual type of high pressure, which will be maintained later on in the business of life until the machine crashes and the untimely end is reached.

None the less imperative is Nature's call for rest.

The Habit of Semi-Sleep rest should be cultivated. Sit easily in an easy chair, hands folded on lap, chin fallen upon chest, eyes closed, and breathe slowly way down to the pelvis bone, minute after minute, and soon (thinking only of the deep breathing) the whole organism will sleep, consciousness only being half dreamily alert. This rest-faculty ought to be cultivated, especially by all nervous people and brain workers.

Rest One Day in Seven, is a law of Nature, as well as the commandment of God. The observation of Sir Robert

Peel, that no man can work seven days in the week without prematurely breaking down, has been abundantly demonstrated in many ways.

11. EXERCISE.

The Muscles and their Uses.—There are nearly 500 muscles in the body, and the life of every one is dependent upon exercise. One hundred and forty-seven are used in every deep inspiration with forcible expulsion of the air.

In ill health muscles always loss their power to a greater, or less, extent. In most cases, *to restore the museular vigor is to cure the disease.* But to do this, appropriate exercise must be had. To continue to exercise parts already overworked but increases the general evil.

Yet, after twenty-five years of age, prescribed special exercises seem drudgery, unless they have a strong pleasure element, or are intimately linked with the common utilities of life.

General Principles.—Before describing exercises upon which we shall rely as a special treatment for disease, some general principles should be strongly insisted upon, the violation of any one of which will throw the responsibility of failure, if it should occur, upon the patient. (These exercises are, in part, selected from Taylor, Emerson, Nissan, Blakie, Foster and Checkley).

1. Take them very slowly, unless otherwise directed.
2. Rest as long before repeating any movement as the movement consumed.
3. Graduate the force of the movement to the existing strength of the patient.
4. Always with free ventilation ; better in the open air.
5. Always in light, loose clothing, or none at all.
6. Always with the help of abundant sleep.
7. Always with clean skin and open bowels.
8. Always with an extra quantity of pure, soft water, drank cold or hot.
9. Always in as cheerful frame of mind as possible.

10. Always with the help of one to three sun-baths a week.

11. Always with some purpose sufficiently commanding to secure persistence. "It is the continuance that gives value."

12. Always with the utmost power of the exercise put forth in the middle of it.

13. Always with sufficient regularity to institute a physiological habit.

14. Always with a due regard not only to what should, but also to what should not be done.

15. Seldom, or never, immediately after a full meal.

16. Never when too much hurried to be mentally restful in the use of that particular period of time.

17. Never when greatly fatigued.

18. Never with the use of narcotics, if it can be avoided.

19. Never to the extent of inducing fatigue that cannot be relieved by an hour's rest.

20. Never with jerks and rapid movements, unless the last are directed. "Jerks are a sign of weakness."

1. CORRECT STANDING.—Feet firmly planted, toes turned out, body erect so that a perpendicular line from the toes would touch chest, chin and lips, arms hanging loosely.
2. NECK EXERCISE.—Erect. Throw head back so as to see as far over back as possible, then slowly rotate the head so as to see as far back as possible in all directions; body must not turn. Twice and reverse four to six times.
3. PROPER BREATHING.—Correct standing position, slowly draw in the breath so as to produce the utmost expansion of the short ribs, and protrusion of the upper abdomen.
4. HAND EXERCISE.—Squeeze a rubber or yarn ball slowly and forcibly five to twelve times with each hand, then four to eight times with both hands.
5. WRIST EXERCISE.—Elbows close to sides, forearms held horizontally in front, palms up; then bend the wrist so as to bring the ends of the fingers as near the arm as possible. Then bend the hand as far backward as possible. Each movement ten to twenty times with each hand.
6. FOREARM EXERCISE.—Lift a weight suspended from a stick held in the hand; or, put the further end of the stick under a bed, sofa, or shelf, and lift against it. Repeat ten to twenty times.

7. UPPER ARM EXERCISE.—(*Biceps.*) Standing correctly, lungs fully inflated, attempt to lift the left hand to the shoulder while the right rests on it and resists. Repeat ten to twenty times. Reverse and repeat.

(*Triceps*). Stand facing a wall, two feet from it. Now place hands on a level with the ears, three feet apart, against the wall. Hold back the head and slowly drop the body in until the chest nearly touches the wall. Then push it back by the arms. Three to fifteen times once a day.

8. SHOULDER EXERCISE. — *a.* Stand correctly, hold weight in one hand, arms extended horizontally, and elbows not bent; slowly carry weight to front of the opposite shoulder, then around back of the working shoulder and return. Slowly drop to the side, and take weight in other hand and do likewise. Repeat two to ten times, according to size of weight. After a time both arms can be used together, with a weight in both hands.

b. Stand. Lungs inflated and breath held; revolve the arm like the spoke of a wheel, the shoulder being the hub, carrying it backward as far as possible. Two revolutions. Exhale. Other arm same. Then both arms together, same. Then reverse the direction of the revolutions, and proceed as before.

c. Stand erect, closed fists at shoulders. Strike forward as far as possible, with one hand, then with the other. Five to ten times each. When strong, strike with both together, straight from shoulder.

9. CHEST EXERCISE.—*Depth.* Nail a hand-slat across the end of a ten- or twelve-foot board, the slat projecting a foot each side. Lay the board across a pole so that the further end of the board on the ground, the hand end will stand a foot above the head. Weight the ground end. Now stand a foot or eighteen inches from the handles, grasp them with both hands, fill chest to utmost, and hold it in while forcing the handles down to the waist, the legs kept straight. Repeat the "teter" motion ten to seventy times.

Breadth.—(*a.*) Stand correctly, thick of hands on sides, fingers pointing forward. Contract ribs so as to bring hands as close together as possible. Now send them as far apart as possible by muscular effort. Repeat six to fifteen times.

b. Stand correctly, extend arms and lock thumbs down in front. Inhale. Raise arms, holding breath, as high as can be done without bending; slowly return the arms and exhale together.

c. Stand correctly. Inhale and hold. Lift elbows to a level with shoulders, hands on same level in front of chest, elbows bent, then strike out with both hands, until they are in line with the

shoulders, and return. Exhale, drop. Repeat eight to twelve times.

c. Stand the length of the arm and hand from and facing a corner; extend the arms sideways on a level with the shoulder and press against each wall. Now slowly fall forward (feet not moving) until the nose touches the corner. Inhale and press back to the upright position by the unmoved hands. Repeat three times.

Apex-fulness.—Stand with head four to six inches back, face upward, lungs inflated, arms wing-way; carry weight from one shoulder around to the other and back, then from the horizontal up and down to eighteen inches. Each arm six times.

10. BACK EXERCISE.—(*a.*) Standing, heels nearly touching, toes out nearly at a right angle, *stretch* upward arms extended, then sweep down in a curve, bending every joint but the knees in the effort to touch the floor. Rise slowly. Then, finger tips on chest, carry head backward and down until the front neck is *stretched*, then bend the knees and allow the body to go down as far as possible without bending the back, then slowly rise. Repeat three times.

b. Between two chairs rest one elbow on each, and heels on floor, body rigid, face up, hold there a minute. Repeat three times.

11. SIDE EXERCISE.—*a.* Sit upright, left hand against left side, right hand upright against the head. Carry head and arm as far over toward the left hand as possible without raising right hip from seat. Return slowly. Repeat three to five times with each hand. If stronger exercise is desired, carry weight in upright hand.

b. Hop straight ahead first on one foot, then on the other. Begin moderately, and go a little further each day.

c. Standing, right arm bent gracefully over the head, the left hanging loosely. Throw weight upon the foot under the raised arm, carrying the other foot out sideways as you bend far in the direction of the free foot, holding the head up toward the raised arm. Repeat one to three times each side. Return slowly.

12. LOIN EXERCISE.—*a.* Stand. Stoop forward, and with both hands pull steadily for one minute on something fixed to the floor. Rest. Now pull with one hand while the object is oblique from your front, then rest and pull with the other hand in similar position. Once or twice a day, three to six pulls with each hand.

b. Sitting, feet spread far apart, arms upright nearly against head, fall slowly over, the body upon one knee. Rise slowly and fall on the other knee. Repeat five or six times each way. The sitting position must be held. Weights can be used in the hands.

13. ABDOMEN EXERCISE.—(*a.*) Sitting, legs extended, hands on head, bend forward far as possible and return slowly. Repeat five to eight times.

b. Lying with legs projecting from the couch and falling to the floor, hands over head, slowly raise the legs to a perpendicular, hold one or two minutes, and slowly return them. Repeat four to six times.

c. Lying. Arms crossed under chin. Raise trunk on elbows and toes and hold a minute or more; return.

d. Same as c, only instead of holding on elbows and toes, horizontally, the hips rise as far as possible, and there hold, making an arch.

e. Sit on bed, legs off, body and thighs at right angles, fingers grasping loins. Now fall backward, bringing thighs up, hip joints rigid; as soon as your back touches the bed, spring up from the shoulders to first position, and so rock back and forth twenty to sixty times, A mother can hold her babe as a weight against her chest.

f. Stand two or more feet from a wall, place hands against it as high as shoulders, throw chest forward as far as possible.

g. Lying on floor, heels against thighs, hands clasped on top head. slowly raise hips as high as possible, resting on feet and shoulders, and hold a few seconds. Down slowly; rest; repeat two to six times. Breathe five times deeply in each time of rest.

h. Draw abdomen in and out without breathing.

14. THIGH EXERCISE.—*Front.*—Stand feet six inches apart, head and chest high. Now drop by bending the knees, then slowly rise. Repeat five to ten times. The severity of the exercise will be graded by the distance dropped.

Back.—(*a.*) Stand against the wall and press the heel backward hard against the baseboard many times.

b. Stand erect, and without motion at the hip, kick up backward, bending the knee only. Twenty to fifty times for each leg.

c. Kneel on cushion, feet under a sofa, hands on hips and pitch slowly forward until the head has moved fifteen to twenty inches. Repeat three to six times.

15. CALF EXERCISE.—(*a.*) Stand three feet from and facing a wall one foot resting against it, heel close up and with ankle sharply bent, and hands on loins. Now spring that knee forward and hold it with calf strained a moment. Ease off slowly. Repeat five to ten times for each foot.

b. Stand and rise and fall on the toes of each foot, alternately, ten to twenty times or run on tiptoe. Breathe long, deep and steady; lips closed.

16. SHIN EXERCISE.—(*a.*) Walk on the heels with the toes held high, one to four times around the room.

b. Lay any weight on the foot and lift it from the floor five to ten times for each foot.

c. Stand and stoop as far forward as possible three to seven times without lifting the heels.

17. ANKLE EXERCISE.—(*a.*) Walk on tiptoe.

b. Stand with upper part of one foot resting upon a chair placed back of you. Now press down with the hand on that heel firmly, and when the ankle is well bent, ease up and let it return against some pressure. Repeat each foot six or eight times.

c. Sit with legs across an extra chair, and feet together. Turn the feet to one side slowly as far as possible. Hold a moment and slowly reverse. Repeat ten or twelve times.

18. FOOT EXERCISE.—(*a.*) Stand on a stool on one leg with one hand against a wall, the other on the loins. Now swing the free leg as far forward and backward as possible fifteen to twenty times. Then the other.

b. Sit with one ankle across the other knee, with a thin-soled slipper on the raised foot. Now take a stick fifteen inches long and one-half of an inch thick, and strike thirty or forty light blows on the sole. Then treat the other foot.

19. VISCERAL EXERCISE.—(*a.*) Creep several times around a good-sized room before dressing in the morning, and after undressing at night, on all fours.

b. Standing, thick of hands on hips, thumbs forward and downwards, move hips a little forward and hold them there all through. Now bend the body (above the hips) forward, head falling, and slowly move head and body around to the right side, then back to front, left, back to front, then entirely around forming a circle.

c. Stand with head, shoulders and spine strong. Lift forearms to a horizontal position out in front, the upper arms hanging easily from the shoulders, and the hands from the wrists. Now swing the forearms rapidly up and down with great energy without moving the body. Then whirl them in a circle one way, and reverse. One to two minutes once a day.

20. POISE EXERCISE.—Stand correctly, hands resting lightly on the opposite shoulder. Now, chest leading, poise the body as far forward as possible, then backward, keeping the chest in the same leading position and return. Now take the weight on the ball of the right foot, heel gently touching the floor, and swing the left foot in a circle around the right and back, and finally holding it behind the right, poise the body around the same as on both feet at the beginning. Transfer weight to the other foot and repeat.

21. WALKING EXERCISE.—Correct standing position, tips of fingers resting lightly on shoulders, weight on one foot, slowly send its hip out at the side as far as possible, holding chest steady and

shoulders level. Now the head is below its normal height. Without rising glide the weight obliquely to the other foot by bending the knee of the weighted foot and straightening the free knee, at the same time sending its hips out sideways. Repeat and return.

22. WHOLE SYSTEM EXERCISES.—Take exereises No. 10 *a;* also 11, *a;* 12 *b:* 13 *e;* 14; front.

23. TRANQUILIZING.— Sitting, legs far apart, hands on head. Body twists as far as it eau with moderate rapidity one way, then the other. Repeat fifteen to twenty times.

24. FOR CAPILLARY CIRCULATION.—Stand, legs spread, hands reaching high, every musele from fingers to toes *stretched* upward one minute. Repeat four to ten times.

When to Use These Exercises.—It may sometimes be desirable to incorporate these movements into the ordinary duties of life. While this is not preferable, on account of liability to overdo, and lack of intervening rests, yet for necessary cases the following suggestions are made:

1. When holding a standing conversation, or waiting.

2 and 3. At any leisure moment, sitting or standing.

4. Whenever anything soft and squeezable is in the hand.

5. Playing with the baby, or waiting.

6. Whenever a suitable stick is found in the hand.

7. Whenever carrying light weights from place to place, one hand only in use (*Triceps*). Whenever passing empty-handed through a door. Use the casings as a wall.

8. *a.* In carrying weights; *b* and *c*, in going from place to place.

9. (*Depth*). Playing with children. A child as weight. (*Breadth*). *a.* In dressing and undressing; *b* and *c*, whenever resting a moment from sewing or writing; *d*, when looking for anything in a good corner.

10. *a.* To pick up a pin; *b*, when amusing children and young people.

11. *a.* When sitting anywhere; *b*, in going short distances.

12. *a.* When standing by the stove, or any heavy object; *b*, sitting waiting.

13. *b*. On getting out of bed; *c* and *d*, while lying in bed; *e*, getting up; *f*, wherever a wall, or tree, is found; *h*, anytime and anywhere.

14. (*Front*). When carrying the baby; (*Back*) *a*, when standing anywhere against a wall; *b*, amusing the children.

15. *a*. Anywhere, standing facing a wall. or large stone; *b*, standing talking, or going from place to place.

16. *a*. Walking a short distance; b, carry coal hod on toes; *c*, anywhere.

17. *a* and *b*. Going upstairs; *c*, reading newspapers and fiction.

18. *a*. When standing on a balcony; *b*, while dressing.

19. *a*. To amuse the children, or up and down stairs; *c*, when not knowing what else to do.

20. While standing.

21. Watching the cooking, waiting for carriage, etc.

23. When sitting anywhere.

24. After sitting.

Nearly all these exercises can be adapted to the feeble by the attendant becoming the point of support, or in cases of the very feeble, he can, on the same principles, give passive exercise, firmly and moderately forcing the desired muscular movements.

Bicycle Exercise.—Next to a systematic use of the foregoing exercises, bicycle riding is, perhaps, the most desirable within the reach of ordinary invalids. For them the pneumatic tire is specially desirable. The rider should sit naturally, chest out, head up, and be very careful that his saddle be so soft and springy, or his person so padded that irritation of the genital organs, does not result. Enough cannot be said in condemnation of the racing posture in riding. It contracts the chest, crooks the spine, irritates the prostate. and ages men years before their time. With these qualifications, the bicycle is commended especially for two reasons—(1) It concentrates the mind on what is being done, and (2) demands the exercise of thoughtful skill which diverts the

thoughts from self and all morbid channels, and thus induces mental recuperation.

12. HABITS.

By habits is meant any customary indulgence that depletes the vitality of the individual.

The Drink Habit.—The testimony of Hon. Chauncey Depew is important as a practical summary of the case from the standpoint of actual examples:

"Twenty-five years ago I knew every man, woman and child in Peekskill. And it has been a study with me to mark boys who started in every grade of life with myself, to see what has become of them. I was up last fall and began to count them over, and it was an instructive exhibit. Some of them became clerks, merchants, manufacturers, lawyers, and doctors. It is remarkable that every one of those that drank are dead; not one living of my age. Barring a few who were taken off by sickness, every one who proved a wreck and wrecked his family, did it from rum, and no other cause. Of those who were church-going people, who were steady, industrious, hard-working men, who were frugal and thrifty, every single one of them, without an exception, owns the house in which he lives, and has something laid by, the interest on which, with his house, would carry him through many a rainy day."

The following facts concerning both moderate and excessive drinking are conclusive. Dr. N. S. Davis, before the Chicago Medical Society, said:

"All excesses and irregularities in eating, or drinking, are injurious, as also are excessive and exhausting mental and physical work. And still more injurious is the use of any unnatural drinks, which, like those containing alcohol, directly interfere with the function of the hæmoglobin of the blood and diminish the activity of both the leucocytes and tissue cells, and thereby greatly impair the resisting power of the whole system. Abundant experience has shown that *an alley filled with decayed garbage does not more certainly invite cholera germs in the neighborhood than does the use of alcoholic drinks invite them to the tissues of the individuals who use such drinks.*"

Dr. G. Lowther truly wrote in *The Voice* (See Sept. 22, 1892):

The places where intoxicating liquors are sold have proved to be generators and conductors of cholera. Not only so, but the users of alcohol are the most ready victims of the disease. This is accounted for by the fact that, by its use, the digestion is deranged, the blood

vitiated, the nerves unstrung, and further, that the presence of alcohol in the system renders it more susceptible to infection. But, account for the facts as we may, here are the testimonies of physicians, and others, during the scourges of 1832 and 1866:

Dr. French, a medical health officer in Liverpool, says: "The outbreak of cholera in July, 1866, in that city, was in a house where a woman died of another disease. They kept the body for three days, during a drunken debauch, in a crowded room, filled with the fumes of tobacco and alcohol. This revel was called 'a wake.' One week from that time forty-eight persons had died from cholera within a radius of 150 yards from that place."

During the epidemic of 1832, Dr. Bronson said: "In Montreal, 1,000 persons have died of cholera, only two of whom were teetotalers." A Montreal paper said: "Not a drunkard who has been attacked has recovered from the disease, and almost all the victims have been at least moderate drinkers."

In Albany, N. Y., the same year, cholera carried off 366 persons above sixteen years of age, all but four of whom belonged to the drinking classes. Packer, Prentice & Co., large furriers in Albany, employed 400 persons, none of whom used ardent spirits, and there were only two cases of cholera among them. Mr. Delevan, a contractor, said: "I was engaged, at the time, in erecting a large block of buildings. The laborers were much alarmed, and were on the point of abandoning the work. They were advised to stay and give up strong drink. They all remained, and all quit the use of strong drink except one, and he fell a victim to the disease." He says also: "I had a gang of diggers in a clay bank, to whom the same proposition was made; they all agreed to it, and not one died. On the opposite side of the same clay bank were other diggers who continued their regular rations of whisky, and one-third of them died.'

In New York city there were 204 cases in the park, only six of whom were temperate, and these recovered, while 122 of the others died. In many parts of the city the saloon-keepers saw and acknowledged the terrible connection between their business and the spread of the disease, and, becoming alarmed for their own safety, shut up their saloons and fled, saying: "The way from the saloon to hell is too short." In Washington the board of health was so impressed with the terrible facts that they declared the grog shops nuisances, ordered them closed, and they remained closed for three months. A prominent physician of Glasgow reported: "Only 19 per cent. of the temperate perished, while 91 2-10 of the intemperate died." One extensive liquor dealer of Glasgow said: "Cholera has carried off half of my customers.' In Warsaw 90 per cent. of those who died from cholera were

wine drinkers. At Tifels, Prussia, a town of 20,000 inhabitants, every drunkard died of cholera.

Sir William Roberts states as the result of actual experiments that proof spirit, brandy, whiskey, or gin, in food produced these effects upon digestion: Thirty per cent. retards digestion eighty minutes beyond the natural time; 40 per cent. retards digestion 200 minutes beyond, and 50 per cent. permitted almost no digestion.

In harmony with the foregoing, is the *probability of life*, as based on statistics of beneficiary societies:

At 20	44.2	years,	if	temperate
At 30	36.5	"	"	"
At 40	28.8	"	"	"
At 50	21.25	"	"	"
At 60	14.28	"	"	"
At 20	15.6	years,	if	intemperate
At 30	13.8	"	"	"
At 40	11.6	"	"	"
At 50	10.8	"	"	"
At 60	8.9	"	"	"

The Opium and Chloral habits are universally and justly condemned.

The Tobacco Habit is of such general tolerance that its merits should be considered. In favor of it, it is claimed that inveterate tobacco users sometimes live to a great age, therefore, it cannot be harmful.

Mr. Samuel Jesoup died May 17, 1817, at Heckington, Eng., at the age of sixty-five years. Yet it is in legal evidence in the Lincoln *Assizes* that from 1794 to 1810, sixteen years, he swallowed 84,584 pills—fourteen and one-half every day — of the old-fashioned alopathic make; that from 1811 and in 1815 he took sixty-two pills a day, and in 1814, 141 each day. Besides these, he took "juleps and electuaries, and 40,009 bottles of mixtures set out in fifty-five closely-written columns of apothecaries bills." Yet he lived to be sixty-five.

As well claim that those carloads of drugs were not harmful to him. The reasonable inference is that a constitution that could resist all that so many years might have endured the assaults of time without that for at least a hundred years.

Medical authority and general indulgence are also urged

as justifying the use of tobacco. But these weigh nothing against the facts to which attention is now called. Eighteen years ago the author published a book, in which the following propositions were maintained:

1. By the operation of the chemical and physiological laws involved in the use of tobacco, its invariable tendency is to induce disease in a healthy organism.

2. That the tobacco habit tends directly to induce other habits of an injurious character.

3. The tobacco indulgence transmits to posterity diseased conditions and perverted tendencies.

4. It strengthens selfishness and demoralizes the mind.

Neither the facts nor logic of that treatise have ever been overthrown. The propositions stand impregnable. In confirmation, some more recent facts may be cited: From the records of the senior class of Yale students for eight years, it has been found that non-smokers were 20 per cent. taller, 25 per cent. heavier, and had 62 per cent. more lung capacity than smokers. In the Amherst graduating class of 1891, non-smokers were 37 per cent. taller, 24 per cent. heavier, 42 per cent. larger chest girth, and average lung capacity of 8.36 cubic inches (equal to more than one-fourth of an ordinary inspiration) than the smokers. (Dr. John Ellis).

Let common sense say whether an article that thus dwarfs the body can fail equally to affect the mind. Says Prof. Paul Paquin from the standpoint of science, purely:

"One marked result of its use is the *semi-intoxication* of the *nerve-cells*, thereby rendering the brain slow, the mind cloudy, and deranging the whole governing power of the organism to a degree incompatible with the regularity and accuracy which should characterize the respective duties of the various organs." The Supreme Passions of Man, p. 109, the very latest and highest authority, Rohé, says: "The depressing effects of tobacco, due principally to the nicotine upon the nervous and digestive systems, have long been recognized. Recently, however, it has been found that very serious symptoms are produced upon the sense of vision by the constant or excessive use of tobacco. A special form of amaurosis, termed *tobacco* amaurosis, has been frequently noticed."

The great Lord Wolseley said: "I did not smoke for a week before Tel-el-Kebir was won, and as I wanted every iota

of nerve before I went up to take Khartoum, I gave it up then." That which robs a man of "nerve," ought to be given up.

Much could be added on moral and hygienic grounds against this disgusting habit.

13. THE ABUSE OF DRUGS.

Drug Dosing may legitimately be classed among the unsanitary habits of civilized people. It is stated that the people of Great Britain swallow 5,500,000 pills daily, equal to 178 tons, which would fill thirty-six freight cars. The Boston *Globe* says that there are 5,000 patent medicines of American make on the market, of which one in eight is thought to have some real value. The sales exceed $22,000,000 a year in the United States; seven-eighths of this vast sum are a thousand times worse than thrown away, for any drug that is of no real value, is a positive detriment.

In France the sale of proprietory medicines is only allowed after the formulæ have been given to the Academy of Medicine. In Germany the sale is strictly prohibited, unless the formula is on the bottle. Even thus, in three years, sixty-one compounds were officially denounced. But in the United States any man can throw any compound upon the public, and the more astoundingly he can falsify, the more rapid will be his sales. Some proprietary articles are valuable, but they are few.

Cosmetics and Skin Ointments and Lotions are particularly dangerous, because of the poisons that they contain. Ranke found mercury in the liver, glands of the abdomen, brain, spinal cord, some of the nerve extremities, spleen, heart, and many of the muscles of the trunk, in a case where sublimate inunctions had been made several months before.

Physiologists affirm that there are 2,500 square inches of skin upon the body, each with 417 to 2,800 pores, and that through all the 2,500,000 pores in the skin, thirty ounces of what we eat and drink pass off every day. With like facility these pores carry into the blood matters lodged upon the skin; hence, mercury will salivate; potassium-tartrate of antimony

will vomit; arsenic and lead will poison; iodine will stimulate the glands; turpentine will appear in the urine, if but rubbed upon the skin. Mercurial and arsenical salts constitute the potency of most skin preparations.

Prof. Chandler's analyses of fifteen popular hair restorers showed an average of 5.25 grains of lead in every fluid ounce.

Physicians, Themselves, many among the most eminent, have become profoundly disgusted with drug-dosing.

Here is the honest declaration of old Dr. Rush, of Philadelphia: "I AM HERE INCESSANTLY led to make an apology for the instability of the theories and practice of physic; and those physicians generally become the most eminent who have the soonest emancipated themselves from the tyranny of the schools of physic. Dissections daily convince us of our ignorance of disease, and cause us to blush at our prescriptions. What mischief have we done under the belief of false facts and wrong theories? We have assisted in multiplying disease; we have done more, we have increased their mortality. I will not pause to beg pardon of the faculty for acknowledging, in this public manner, the weakness of our profession. I am pursuing truth, and am indifferent whither I am led, if she only is my leader."

Said the celebrated Dr. Abercrombie: "Since first cultivated as a science, medicine is fraught with the highest degree of uncertainty. We cannot properly be said to act upon experience, as we do in other branches of science."

Sir Ashley Cooper, the famous surgeon, in a lecture before the students of Guy's hospital, said: "The art of medicine is founded on conjectures, and improved by murder."

Dr. Hoffman, the celebrated physician of the last century, wrote: "As regards most medicines, the physician is deceived, as their true properties are quite unknown, and we know of no general law of Nature for their remedial employment in disease."

The world-famed Dr. Hufeland made this remarkable statement in his published works: "Man has two great enemies to fight—sickness and the doctor!"

Prof. John Hughes Bennett, of the Edinburg University, says: All those who have acquainted themselves with what is known of the structure and composition of the tissues, the laws of nutrition, and the pathological changes which occur in organs during disease, must feel astonished at the unfounded assumptions, want of evidence, and even unreasonableness, which characterize writings on the action of medicines."

Said Sir John Forbes, after fifty years' practiee of the current system of medicine: "Our estimate of this kind of treatment must be entirely of a damnatory eharaeter, the slight amount of good ever derived from it being eounterbalanced by a huge sum of evil."

It may be objected that these confessions were made in an age of less scientific knowledge. Granted. But has the advance in science materially changed the main fact confessed? Here follow some of our own day:

Dr. Bickat says on Page 114, of *Popular Seicnce Monthly* of November, 1883: "To what errors have not mankind been led in the employment of medieines? It is not a seience at all, it is a shapeless collcetion of inaccurate ideas."

Dr. Schrodt: The entire system of therapeuties is founded upon an erroneous conception of disease.

Dr. Magendie: I hesitate not to declare, no matter how sorely I shall wound our vanity, that so gross is our ignorance of the real nature of the physiological disorders called diseases, that it would, perhaps, be better to do nothing, and resign the eomplaint (we are ealled upon to treat) to the resources of nature, than to act, as we are so often eompelled to do, without knowing the why and the wherefore of our conduct, and at the obvious risk of hastening the end of the patient.

Dr. Jules Vires: Our system of therapeuties is so shaky, that the soundness of the basis itself must be suspected.

Dr. Boek: Twenty-five years' experience at the siek-bed and the dissecting table, in the nursery and on the battlefield, has convinced me that, with rare exceptions, the disorders of the human body, which have been treated after such an infinite variety of drug systems, can be as well cured without any drug at all.

Dr. Francis Cogswell: I wish not to detract from the exalted profession to which I have the honor to belong, and which includes many of my warmest and most valued friends; yet it cannot answer to my conscience to withhold the acknowledgment of my firm belief, that the medical profession (with its prevailing mode of practice) is productive of *vastly more evil than good;* and were it absolutely abolished, mankind would be *infinitely the gainer.*"

John Mason Good, M. D., author of "Study of Medicine," etc.: The science of medicine is a *barbarous jargon*, and the effects of our medicines on the human system is, in the highest degree, *uncertain*, except, indeed, that they have *destroyed more lives* than war, pestilence and famine combined.

The great Prof. Wunderlich wrote in 1852: "Instead of investigation, we find *empiricism;* instead of faets, we have *theories;* instead of

correct conclusions, *dogmatic rules;* instead of ascertaining causes, *useless talk.*"

Dr. Richter says in his work on "Medicine:" "No science is so full of erroneous conclusions, mistakes, dreams, and lies, as the so-called science of medicine! Many who would get well, if left alone, are killed by the art of the doctors. If one sees a physician take a pen to write a prescription, one feels like saying: 'Lord forgive him, for he knows *not what* he does.'"

If drugs are so potent for mischief in the hands of educated physicians, what folly it is for the people to dose themselves at haphazard!

14. CONTAGION AND INFECTION.

Wall Papers are often the abode of millions of disease germs, as well as sometimes deleterious by reason of the chemical poisons used in their colors.

Household Pets have many times carried diphtheria and scarlet fever to their human playmates. Dr. F. J. Leviseur has traced many cases of ringworm and fevers to the fondling of cats.

Kissing the Dead is a practice full of peril to the living.

Disinfect all Bowel Discharges from typhoid fever patients. In Lausanne, Switzerland, some were thrown into a small stream, which soon disappeared into the earth, but reappeared half a mile away in a clear mountain spring. Yet the use of that spring water caused 144 cases of typhoid fever.

Numerous cases have occurred by simply rinsing milk cans in infected water.

When the city of Munich was supplied from wells, the death rate from typhoid was 24.2 per cent. in 10,000 inhabitants. When sewered and furnished with a general supply, it sank to 1.4.

The Cause of Many Mysterious Fevers and bowel diseases in apparently healthy localities is owing to the fact that slops are poured on the ground close to the house. Ground-air, that is the air that fills the spaces between the particles of earth, not only contains more carbonic acid than the atmosphere, but it absorbs poisons from the decaying

organic particles in the slops, and sets in a constant current toward the cellar by reason of its heat, whence it rises through the house.

The disease generated thus spreads in the ratio of the density of the population. Thus Dr. Farr found that in England and Wales the death rate and density corresponded:

Deaths in 1,000 *Population Per Square Mile.*

Population	166	186	379	1,176	4,499	12,351	63,823
Deaths	17	19	22	25	28	32	39

Proximity in Square Yards.

Yards	147	139	97	46	28	17	7
Life duration	51	45	40	35	32	29	26 years.

Antiseptics and Disinfectants for Water-Closets, Vessels and Drain-Pipes:—Hot water, two and one-half gallons; copperas, four pounds; carbolic acid, four pounds. In cases of typhoid fever, dysentery, etc., keep this mixture in vessels and pour it down the water-closet freely. Or copperas, ten pounds, in a bucket of water. A teacupful for a bed-pan, or chamber vessel, each time it is used, or for the last, one fluid ounce of chlorinated soda, or ten grains of permanganate of potassia to a quart of water. Another, sulphate of zinc, eight ounces, carbolic acid, one ounce, water, three gallons.

For drains, ditches and sewers, disinfect with chloride of lime; one pound is sufficient for one thousand gallons of running sewage. For heaps of filth, cover with charcoal, two or three inches deep, or with dry earth.

For washing clothes, in cases of erysipelas, smallpox, etc.: Sulphate of zinc, two and one-half ounces; carbolic acid, one ounce; hot water, one gallon. Water acidulated with commercial sulphuric acid, is excellent.

Fumigation after Contagious Diseases, with sulphur, is the only practical method. To disinfect blankets, heavy clothing, etc., open them, close the room tight, stuff all cracks and paste paper over the keyholes. Put the sulphur in iron pans set on bricks in tubs containing a little water; use hot coals in igniting it, or pour alcohol over it and light with

a match. Hasten from the room and keep it closed for twenty-four hours, then open the windows wide and air it thoroughly. Use two pounds of sulphur for a room ten feet square, larger rooms in proportion. Or, dissolve one pound of sulphuric acid in three times its volume of water in a strong earthen vessel, add three pounds of chloride of lime, and shut into the room the same as sulphur. In both cases avoid inhaling the fumes.

For Air of Sick Room:—Permangante of potash and oxalic acid, each one ounce. Mix and moisten with twice the quantity (by bulk) of water; add a little more water in two hours' time. This will emit ozone freely enough for a large room; it is an active disinfectant.

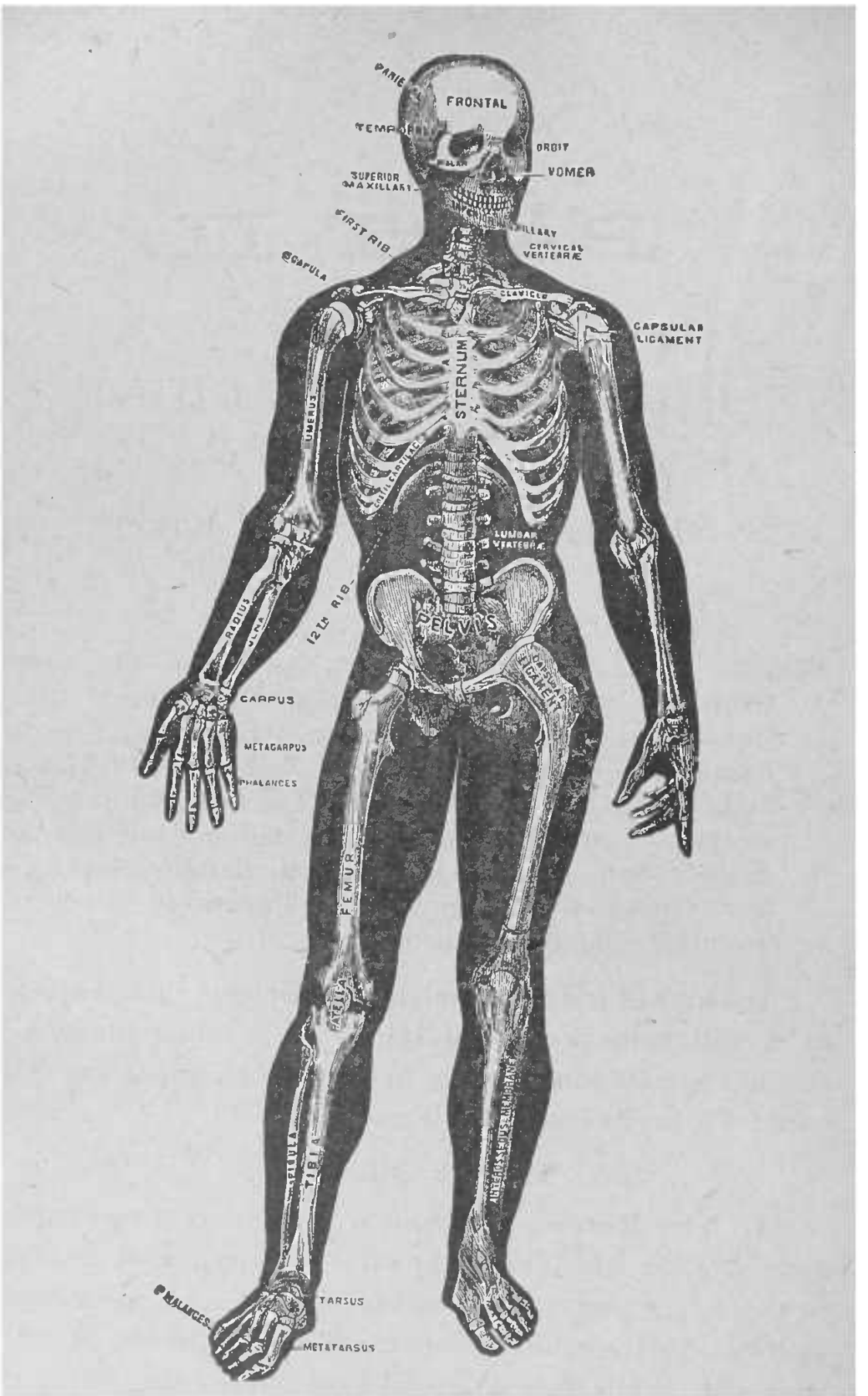


FIG. 8. THE SKELETON.

PART II.

I. OUR LIVING MACHINE.

ITS MECHANISM AND MOTIONS.

MOTION, Frame-work, Machinery, Covering — VEGETATION, Growth, Sleep, Rest, Recuperation—CIRCULATION, Blood, Respiration, Oxidation, Digestion, Absorption, Secretion, Excretion — SENSATION, Feeling, Taste, Smell, Hearing, Sight—INTELLECTION, Perception, Emotion, Volition, Origination — DEGENERATION, Sub-Oxidation, Sub-Nutrition, Ab-Secretion, Ab-Excretion, Ab-Circulation, Mal-Generation—GENERATION, Organs, Sex, Functions, Conception, Gestation, Maternity, Lactation.

The human body is a wonderful machine, that is operated by a still more wonderful spirit. It is important that we should know its construction, in order to be able to run it and care for it to our best advantage.

THE FRAME-WORK.

1. The Bones.—Its frame-work consists of two hundred and six bones, which serve the three-fold purpose of protection to the softer parts, preservation of form and possibility of motion. Their peculiar structure affords lightness, as well as strength. While their exterior is hard and resisting, the central portion consists of a cavity which contains an oily substance called marrow, interspersed by hollow tubes, about which layers of bone substance are arranged.

All the bones in their proper position constitute the skeleton, which consists of four principal divisions, namely, head, neck, trunk and limbs.

The Head, or skull, is made up of twenty-nine bones. Those behind and above (eight in number) form the brain-case, and are as follows: One occipital bone, at back of head; one frontal, the forehead; two parietal, on top and sides; two temporal, the temples; one sphenoid, the floor and sides of brain-box; one ethmoid, between top of nose and brain case. The front bones of the skull, fourteen in number, consist of one lower jaw bone; one vomar, between the nostrils; two upper jaw bones; two palate bones, supporting part of the roof of the mouth; two malar bones, supporting the cheek below and outside the eye; two lachrymal bones, between the nose and eye-socket; two nasal, on roof and sides of nose; two turbinate, inside the nose.

The other skull bones consist of three pairs of ear bones, the malleus, or hammer bone, the incus, or anvil, and the stapes, or stirrup; also the hyoid, to which the roof of the tongue is attached. The skull bones protect the senses of hearing, sight, smell and taste. With the exception of the lower jaw bone, which is attached to the skull by a joint, for the opening and closing of the mouth, nearly all the skull bones are dovetailed into one another by what are termed sutures.

The bones on the sides and top of the brain-case are made up of three layers, the outer one tough enough to bear a heavy blow, a central softer layer which deadens the jar of such a blow, and an inside layer of hard bony matter.

The Spinal Column is made up of a chain of twenty-six bones, called vertebræ. The upper seven in the neck are the cervical vertebræ, the next twelve at the back of the thorax, or chest cavity, the dorsal, and the next five the lumbar or loin vertebræ, behind the cavity of the pelvis. The two small bones at the end of the spinal column are known as sacrum and coccyx, the sacrum being the larger and the coccyx the

end bone. Projecting from the back of each vertebra is a bony bar called the spinal process. A canal, which contains the spinal cord, runs through the whole back-bone except the coccyx, and opens into the skull-chamber above. The vertebræ are separated from each other by thick layers of cartilage, which adds to the elasticity of the frame, and so cushions the spine as to prevent shocks to the brain by jumping and falling.

The Ribs are twenty-four slender curved bones, twelve on each side of the chest. Each of the first seven ribs is attached behind to a vertebra, and in front to the breast-bone. The next three are united in front by a connecting cartilage and attached to the seventh rib. The two lower ribs are free, or floating, at their front extremities.

The Limbs, with the bones which unite them to the trunk, consist of one hundred and twenty-six bones. The shoulder comprises on each side a collar-bone, or clavicle, in front, and a shoulder-blade, or scapula behind. Both these unite near the shoulder-joint. The bones of the arm and hand consist of the arm-bone, or humerus, which reaches from the shoulder to the elbow; two forearm bones lying side by side between the elbow and the wrist, that on the thumb side being the radius, and on the little finger side the ulna; and twenty-seven small hand bones, eight carpal lying close to the wrist joint, five metacarpal in the palm of the hand, and fourteen phalanges, three in each finger and two in the thumb.

The hip bones, one on each side, meet in front and form, with the sacrum, a bony ring inclosing the lower part of the cavity of the abdomen. This ring is known as the pelvis. The leg and foot bones are sixty in number. They consist of the thigh bone, or femur (the longest bone in the body), which reaches from the hip-joint to the knee; the tibia, or shin-bone, and the fibula, which run side by side from knee to ankle-joint; the knee-pan, or patella, in front of the knee-joint; and twenty-six foot bones, seven ankle and heel, or tarsal bones, five metatarsal and fourteen phalanges, these corresponding in position with the bones of the same name in the hand.

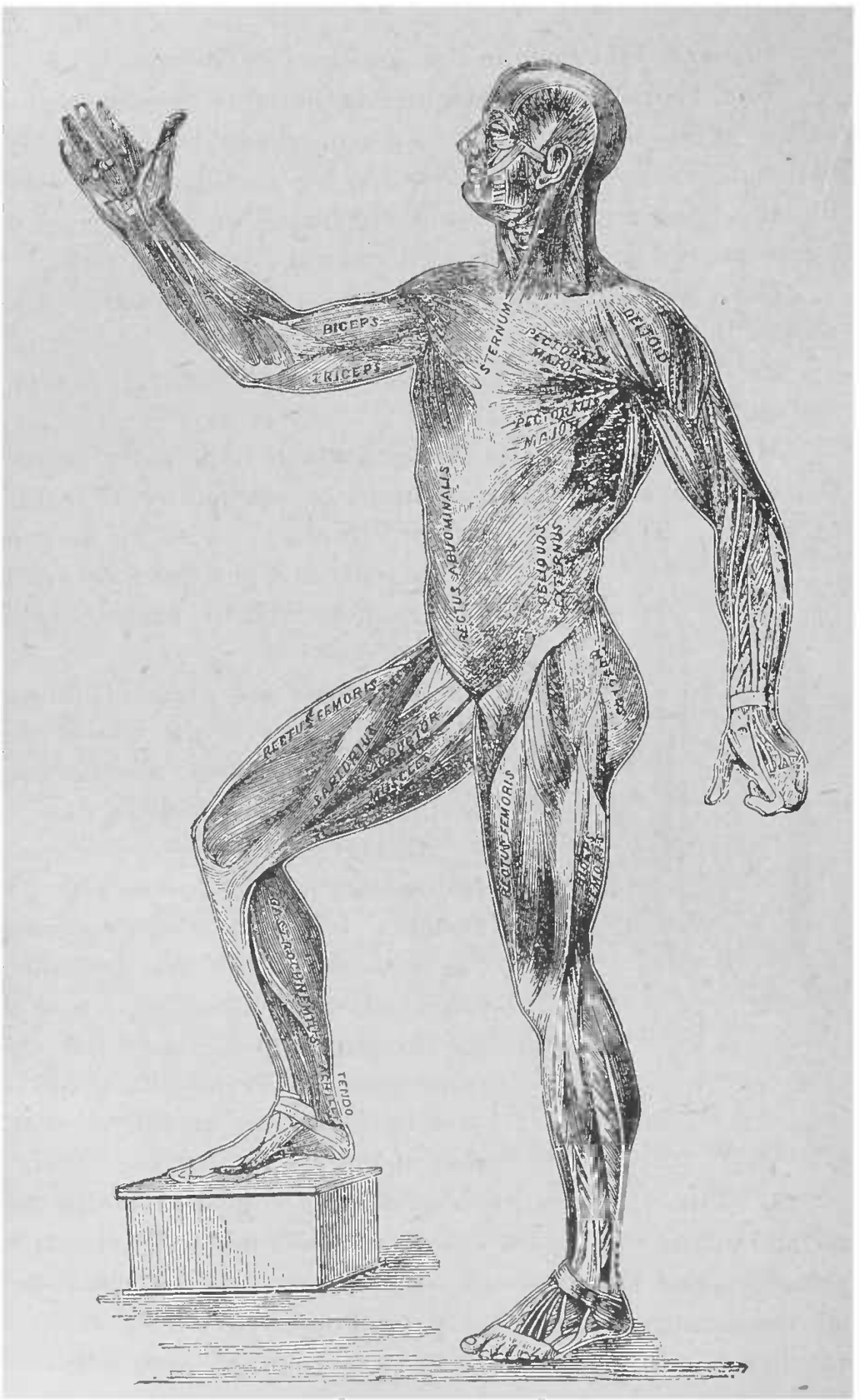


FIG. 9. ANTERIOR VIEW OF THE MUSCLES.

These are all shown in the skeleton frontispiece.

The Bones are Hinged to each other by contrivances called joints, or articulations, which are of two kinds; the ball and socket, as the shoulder and hip; and the hinge joint, like the knee, fingers, etc., and are bound in their places by ligaments. A joint is dislocated when it slips out of its bed.

But a jointed frame-work must have some mechanism of motion in order to move.

2. The Machinery is made up of muscles, tendons and cartilages.

Muscles are bundles of fibers which have the power to shorten themselves, upon appropriate nervous or electrical excitation. They are striped, or voluntary, under the control of the will; and unstriped, or involuntary, not under the control of the will.

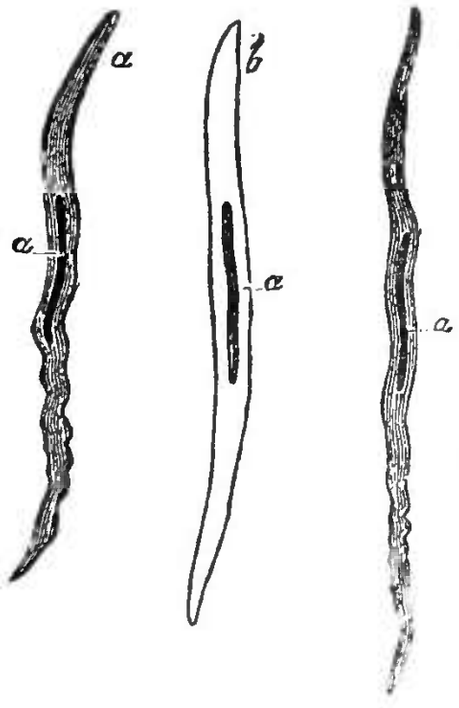


FIG. 10. MUSCULAR FIBERS.

Tendons are white glistening bands, which have few vessels and no nerves, and connect the muscles with the bones on which they act.

Cartilages form the original frame-work which ossifies into the skeleton, having portions covering the ends of bones, called *articular;* other portions constituting a part of the skeleton, called *costal;* and still other portions arranged in plates to preserve the shape, called *reticular*, that do not ossify.

3. The Covering.—*The Skin* is composed of the external horny covering, the cuticle or epidermis, without vessels or nerves, and the derma or true skin, which is an elastic tissue containing the sensitive papillæ, the seat of the sense of touch, the sweat glands, the sebaceous glands, fat cells and hair follicles.

A modification of the cuticle appears as the nails, and another modification forms hairs, which springs from the fol-

licles as a shaft, consisting of a central substance, a fibrous portion and an external covering of flat scales.

This power of motion, thus secured, is preserved by a certain

VEGETATIVE PROCESS,

Including growth, sleep, rest and recuperation.

4. Growth is the accretion resulting from the nutritive supply being normally in excess of the wastes of the system prior to maturity, and still existing in the form of repair-processes all through life. It is the special function of the medulla (the upper enlarged portion of the spinal cord), the

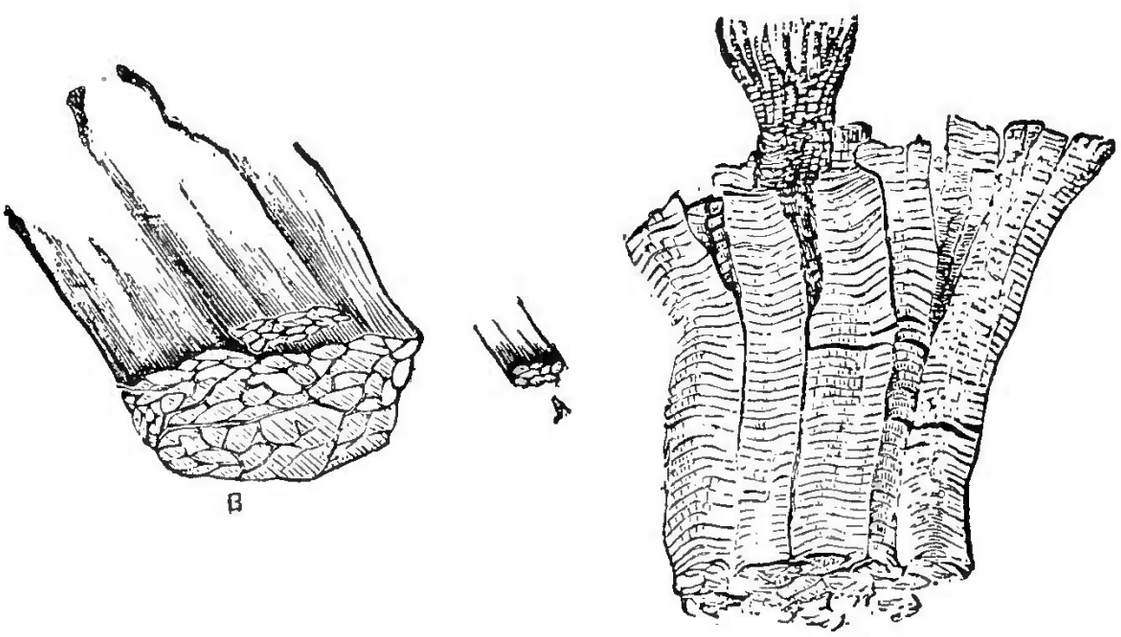


FIG. 11. MUSCLES.

cord and the viscera (the organs in the cavities of the cranium, thorax and abdomen), to preside over growth and repair. This is accomplished mainly by sleep, rest and recuperation.

5. During Sleep all the voluntary powers and consciousness are suspended, and the drain of active and conscious life saved, so that the nutritive functions can pour their tides of quickening energy into the channels of growth and repair.

6. Rest is the equivalent of sleep, as far as it goes, but, being more or less incomplete, it cannot take the place of sleep.

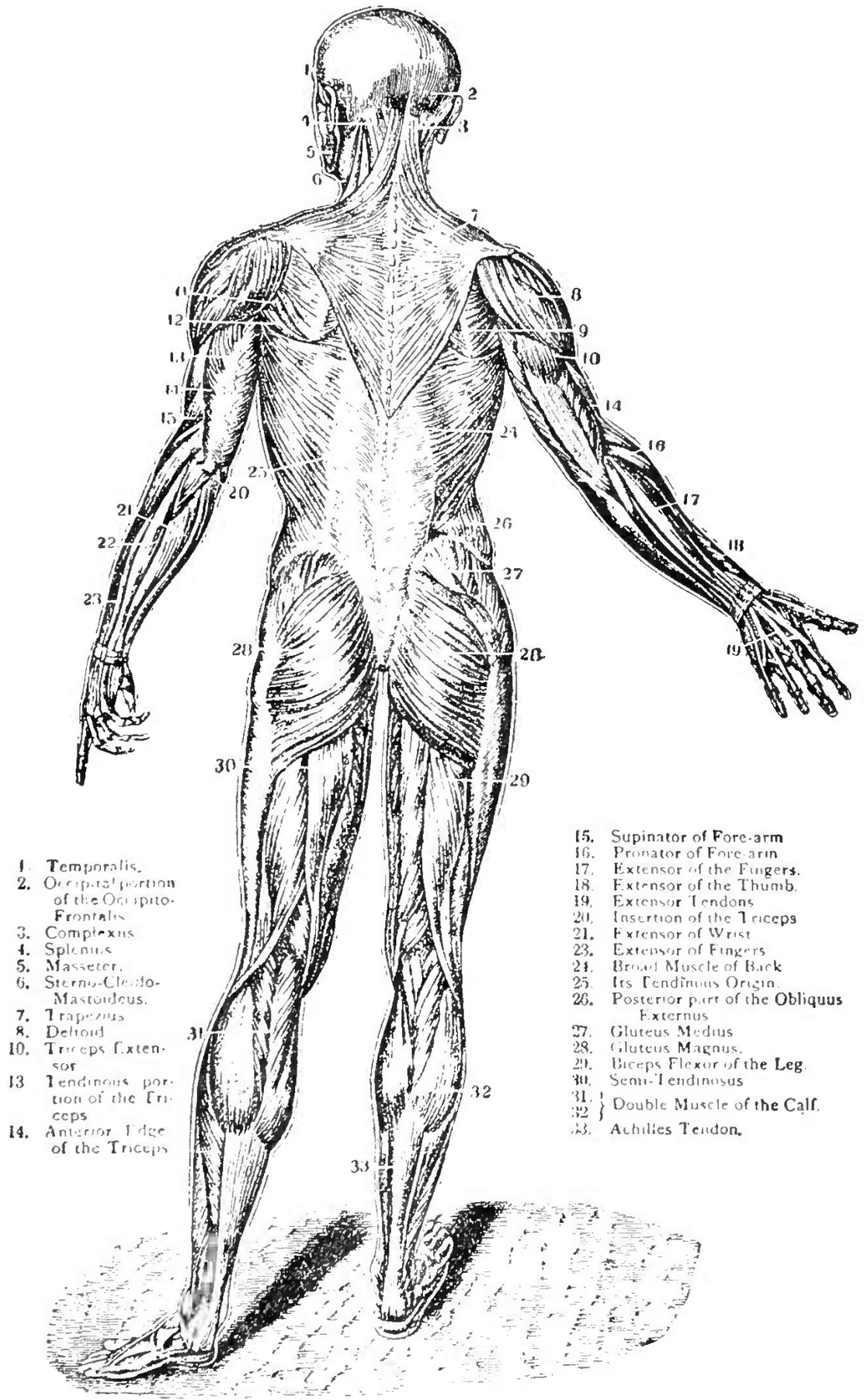


FIG. 12. POSTERIOR VIEW OF THE MUSCLES.

7. Recuperation is repair in function, as repair itself is reconstruction of the organism.

The brain never thoroughly recuperates except in sleep, because consciousness, which is inseparable from the waking state, is a vital process entailing exhaustion of vital force.

All this is accomplished by the medium of

THE CIRCULATION.

By this is meant the flow of the blood through the whole system, carrying to the tissues the elements of repair, and bringing from them the wastes that must be expelled.

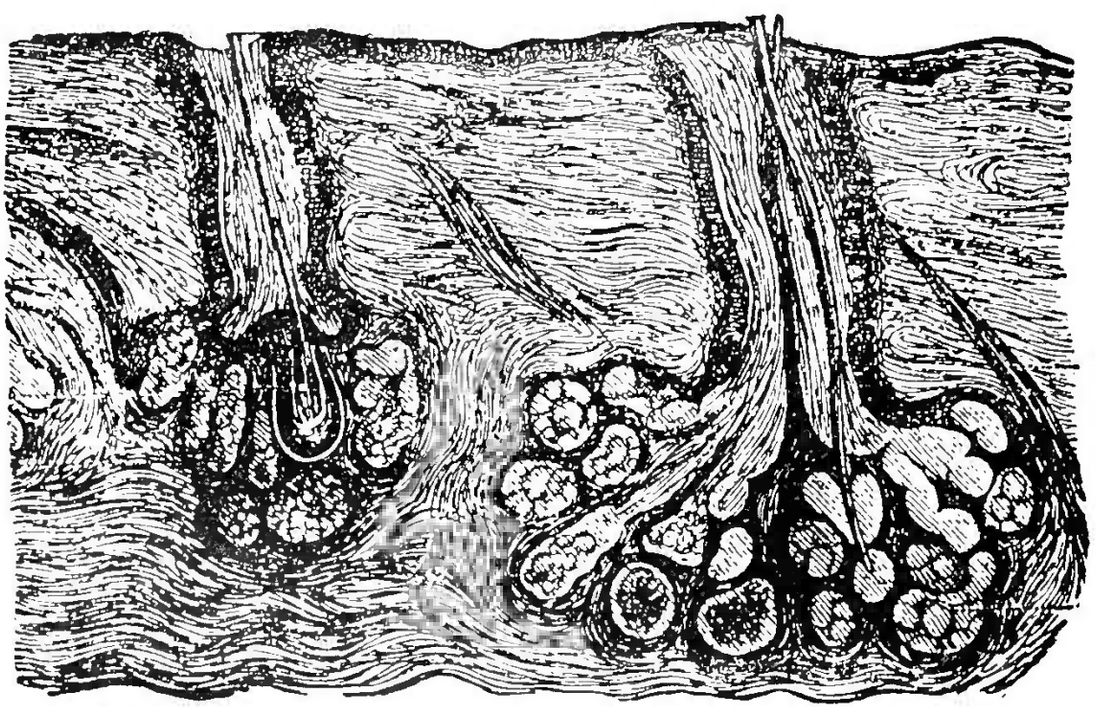


FIG. 13. SOFT HAIR PASSING THROUGH THE CANALS OF SEBACIOUS GLANDS.

8. The Blood is an alkaline, saline fluid, about one-eighth the weight of the body, consisting of two parts: 1, The liquor sanguinis, or plasma, a transparent colorless fluid, in which float, 2, the red and white blood corpuscles, consisting of forty per cent. of the blood. The red corpuscles average 1-3200 of an inch in diameter, and number about 125,000,000 in a cubic inch.

The most important constituent of these corpuscles is the hæmoglobin, an albuminous compound. About 17-1000 parts of the red corpuscles are capable of absorbing 7-10 of a cubic inch of oxygen to each 1-64 of a grain of hæmoglobin, when it is called oxy-hæmoglobin, which gives the bright scarlet color to arterial blood. The function of the corpuscles is to absorb oxygen in the lungs and carry it to the tissues.

The white corpuscles are about one to three hundred and fifty or four hundred of the red, and consist of a soft, colorless substance, each granule measuring about 1-2500 of an inch in diameter.

The Circulatory Apparatus consists of the heart, arteries, capillaries and veins.

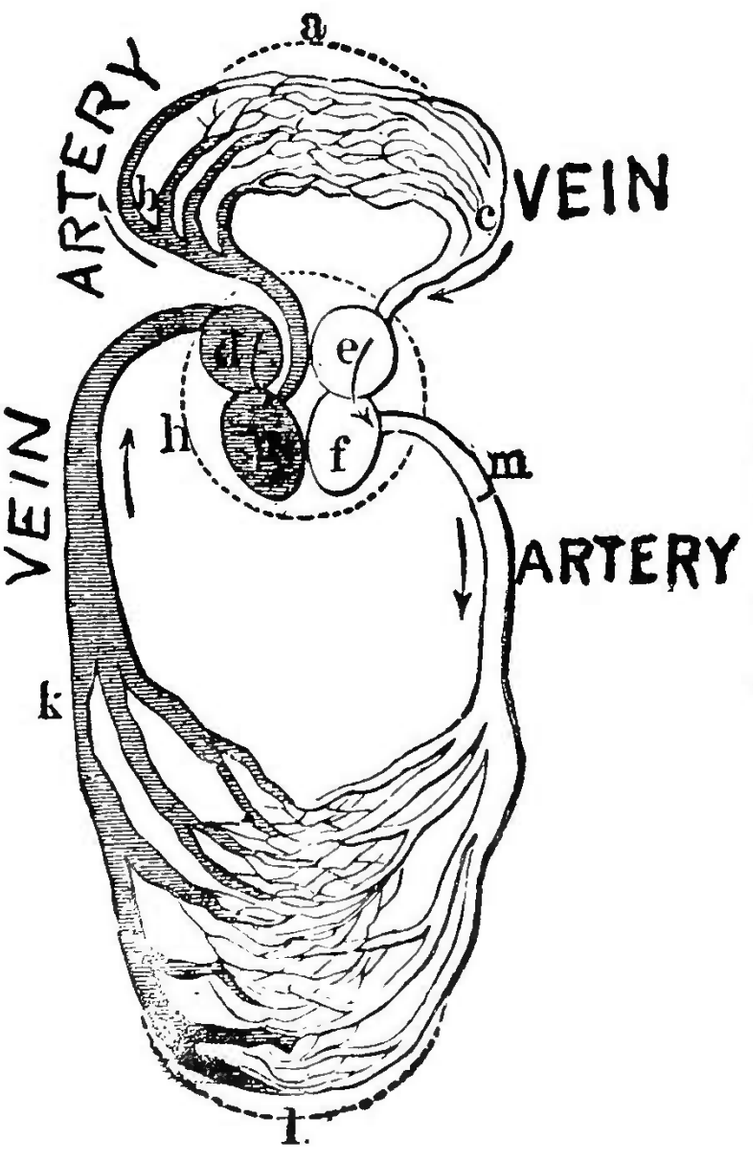
The heart is a hollow, muscular organ, pyramidal in shape, measuring five and one-half inches in length, and weighing from ten to twelve ounces in the male, and eight to ten ounces in the female. It consists of four cavities, a right auricle and ventricle, and a left auricle and ventricle, completely separated by a vertical partition.

The right is the venous side, receiving the blood from the vena cava, and propelling it through the pulmonary artery into the lungs. The left is the arterial side, receiving the arterial blood from the lungs by the pulmonary veins, and propelling it through the aorta to the system at large.

The heart function is to propel the blood to all portions of the vascular system. During the dilatation and repose of the heart, its chambers are filled with blood, which, by the muscular contraction, is forced into the blood vessels. These two conditions of the heart are termed respectively the diastole and systole.

Course of the Blood Through the Heart.—The venous blood returned to the heart (after having been used in the system and thus become enfeebled or weakened) by the superior and inferior venæ cavæ, is emptied, during the diastole, into the right auricle, on the contraction of which it is forced through the right auriculo-ventricular opening into the

right ventricle, and distends it. Upon contraction of the ventricle, the blood is propelled through the pulmonary artery into the lungs, where it undergoes aeration, and is changed in color, making it fresh and strong again. The arterial blood is now collected by the pulmonary veins and poured into the left auricle; thence it passes into the left ventricle, which becomes fully distended. Upon contraction of the ventricle, the blood



a. Capillaries of lungs.
b. Pulmonary artery.
c. Pulmonary veins.
d. Right auriele of heart.
e. Left auriele of heart.
f. Left ventricle.
g. Right ventriele.
h. Pericardium.
k. Veins bearing blood to right auriele from all parts of the body.
l. Capillaries of all organs exeept the lungs.
m. Aorta bearing blood to all parts of the body except the lungs.

FIG. 14. THE CIRCULATION.

is propelled into the aorta, and by it distributed to the system at large, to be again returned to the heart by the veins.

The conduits of the blood are:

ARTERIES, which are elastic pipes, carrying the blood from the heart to the body, and ending in the

CAPILLARIES. These are minute vessels connecting the terminating arteries with the commencing

VEINS, which are return pipes bringing the blood back from the body to the heart.

The Lesser, or Pulmonic Circulation, is the arteries leading from the heart to the lungs, and the return veins from the lungs to the heart.

The Greater, or Systemic Circulation, comprises the great distributing artery, the aorta, and its branches, and the returning veins from all parts of the frame except the lungs.

The circulation renders possible another intimately associated vital function—

9. Respiration, which has for its machinery the nose, trachea, bronchi, lungs, diaphragm and chest.

THE NOSE is the projection on the face formed by the two passages called the nasal fossae, or nostrils, separated by the septum narium, which is a cartilage supporting the roof of the cavities, and furnishing a passage for the air to reach the

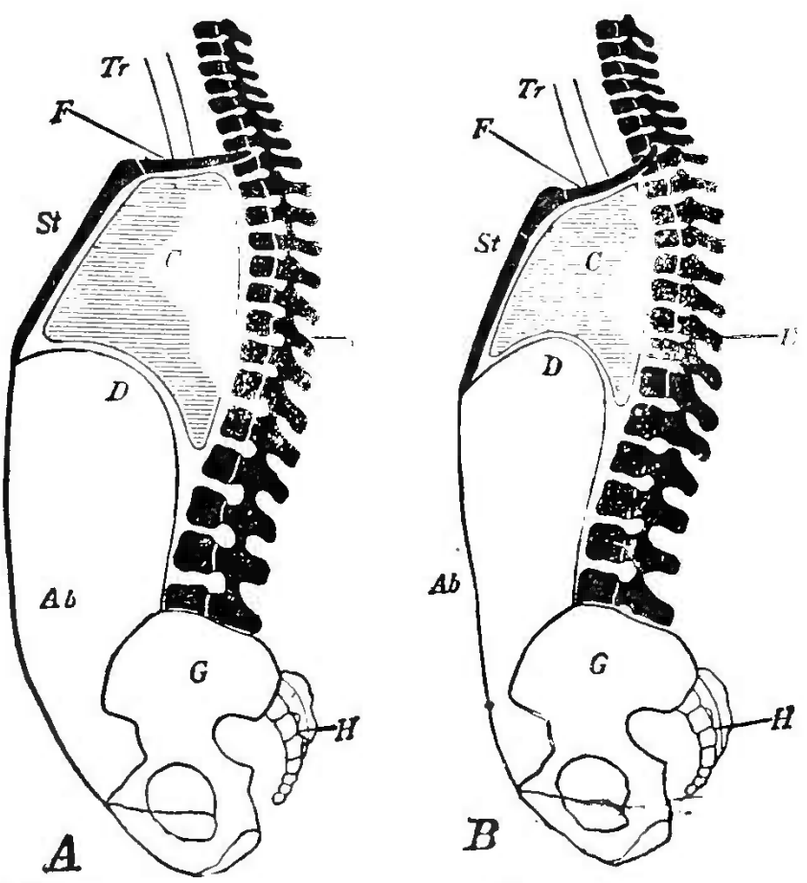
FIG. 15. LOBULE OF LUNG.

TRACHEA, which is a cylindrical tube of sixteen to twenty rings of cartilage, about four and one-half inches long, nearly one inch in diameter, beginning at the lower border of the larynx and forking into the two

BRONCHI, which are tubes similar in formation to the trachea, extending into the lungs, where they divide. Each is sub-divided into bronchial tubes. The right bronchus is about one inch long, and divides into two parts in the three lobes of that lung. The left bronchus is nearly two inches long, and divides into three parts in the two lobes of that lung.

THE LARYNX is a cartilaginous box, lying between the base of the tongue and the trachea, and containing the true and false vocal cords, with a cartilaginous lid called the epiglotis, for the passage of air to and from the lungs.

The Lungs are two; the right has three lobes, and weighs about twenty-two ounces. The left has two lobes, and weighs about twenty ounces. Each is composed of a multitude of alveoli, or air cells, that are from one two-hundredth



a. Inspiration.
b. Expiration.
c. Chest-cavity.
d. Diaphragm.
f. Collar-bone.

g. Hip-bone.
h. Coccyx.
st. Sternum.
ab. Abdomen.

FIG. 16. FORM OF CHEST AND ABDOMEN IN RESPIRATION.

to one-seventieth of an inch in diameter. These air cells are divided into compartments called *lobules*, around the ends of the bronchiole, or termination of the bronchial tube.

The Diaphragm is the great muscle of respiration, and constitutes the floor of the lungs.

The Chest, or thorax, is the cavity formed between the ribs, breast bone, spine, shoulder-blades, and the diaphragm. The ribs have been already described.

The Function of Respiration is the absorption of oxygen into the blood and the exhaling of carbonic acid from the blood. This is done by two movements:

1. Expansion of chest walls, depression of diaphragm, and inspiration of about one pint of air; one-fifth of the air is oxygen, a large part of which is absorbed into the blood.

2. At the same time, four and nine-tenths per cent. of carbonic acid is exhaled, with a contraction of the walls of the chest and rising of the diaphragm.

In inspiration the twenty to thirty cubic inches of air which passes in is called tidal, or breathing air. A forced inspiration adds about one hundred and ten cubic inches more, which is called complimental air. After ordinary expiration, about one hundred cubic inches remain, which can be expelled by forcible effort; this is called reserve air. It still leaves about one hundred cubic inches more which cannot be expelled at all, called residual air.

THE FOLLOWING TABLE SHOWS THE AIR CAPACITY OF THE LUNGS IN HEALTH AND CONSUMPTION.

Height.	Cubic Inches.	First Stage.	Second Stage.	Third Stage.
5 ft. 1 in.	174	117	99	82
5 " 2 "	182	122	102	86
5 " 3 "	190	127	108	89
5 " 4 "	198	133	113	93
5 " 5 "	206	138	117	97
5 " 6 "	214	143	122	100
5 " 7 "	222	149	127	104
5 " 8 "	230	154	131	108
5 " 9 "	238	159	136	112
5 " 10 "	246	165	140	116
5 " 11 "	254	170	145	119
6 "	262	176	149	126

According to Hutchinson, the average spirometer measure of females is 40 cubic inches less than that of males.

The capacity of the lungs materially affects another important vital process—

10. Oxidation, which is the absorption of the inspired oxygen by the hæmoglobin of the blood as carriers to the tissues, where the chemical changes involved in nutrition and elimination are wrought by the oxygen.

These changes are called metamorphosis of tissues, and consist in the disorganization of the used tissue-cells and the building up of the nutrient materials in the blood-plasma into new tissue-cells.

This leads to another vital process.

11. Digestion. The machinery of digestion consists of mouth, oesophagus, or gullet, stomach, duodenum, liver and intestines.

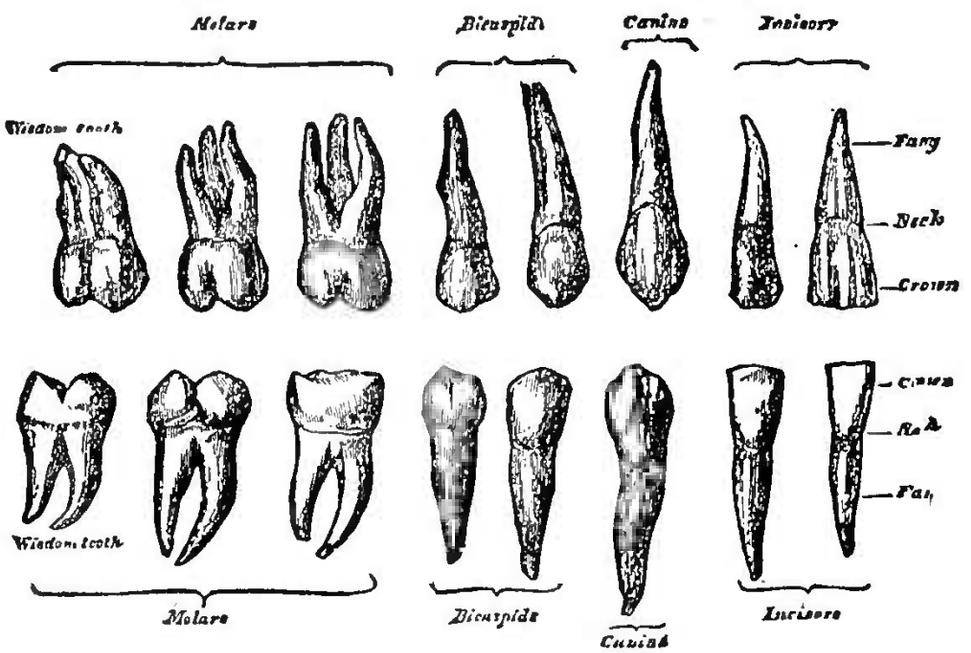


FIG. 17. UPPER AND LOWER TEETH.

The Mouth contains the tongue and thirty-two teeth, sixteen in each jaw, namely: four incisors, two canines, four bicuspids, six molars. Mastication is the process of disintegrating the food by the motion of the lower jaw and tongue, combined with the solvent properties of the saliva, of which about two and one-half pounds are secreted during twenty-four hours.

Deglutition is the forcing of the softened mass through the pharynx into the

Stomach, which is a bagpipe-shaped pouch about thirteen inches long and five inches deep, with a capacity of about five pints. It has three coats, serous, muscular and mucous.

By the muscular coat a churning motion is given to the organ. In the mucous coat are imbedded large numbers of mucous and gastric glands—the former at the pyloric, or liver end; the latter at the cardiac or heart end.

The peptic secretion is acid, and is under the control of the central nervous system, and is composed of 9.75 parts water, pepsine 15 parts, hydrochloric acid 4.78 parts, mineral salts 5.22 parts, and is further described under the head, The Process of Digestion.

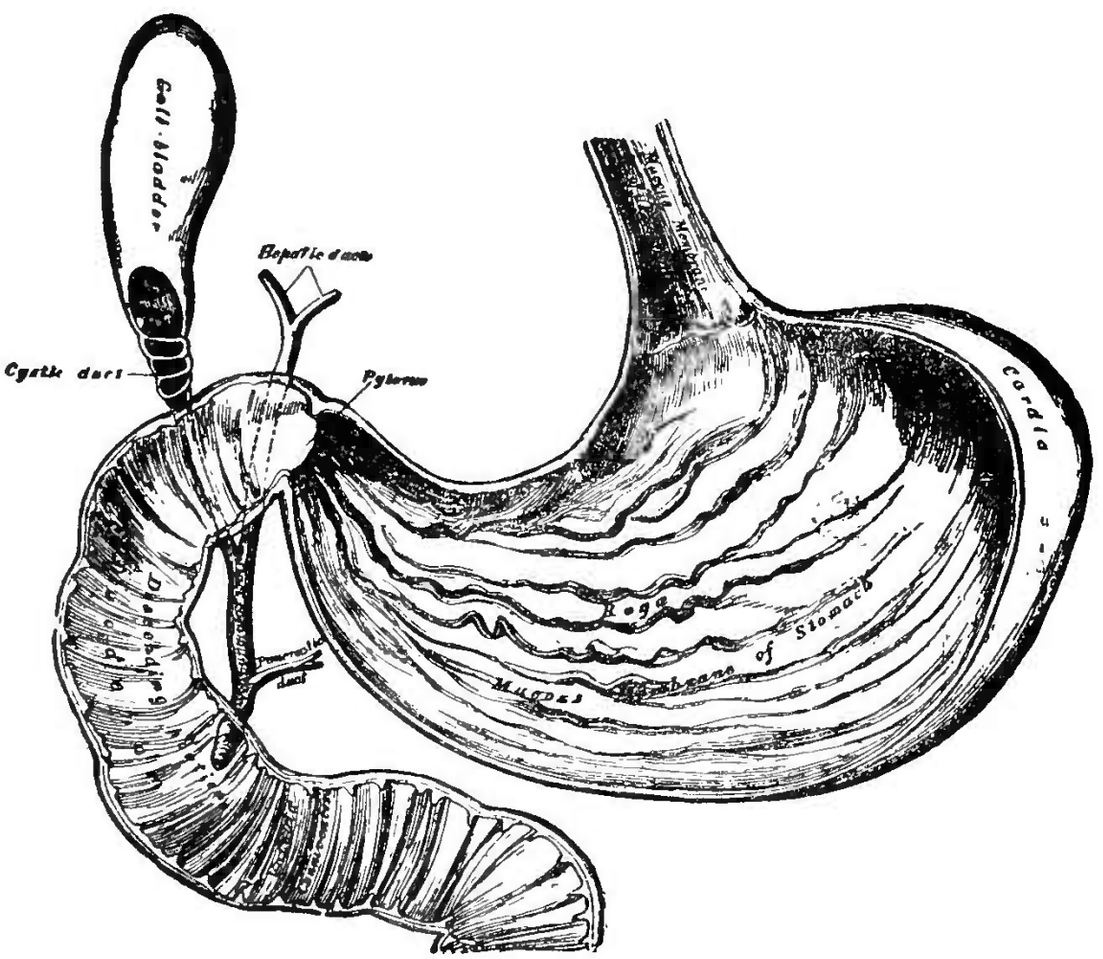


FIG. 18. THE STOMACH.

The Small Intestine, about twenty feet long and one and one-half inches in diameter, is divided into three parts; first, the duodenum, ten inches long, which ascends two and one-half inches, to the under surface of the liver, then descends three and one-half inches in front of right kidney, then passes four inches transversely to the left, and empties into the

Jejunum, which (about seven feet long) coils about in the umbilical (navel) region, and is usually found empty after death. This empties into the *Illeum*, which twists around below the navel, is about twelve feet long, and empties through the ileo-cæcal valve into the

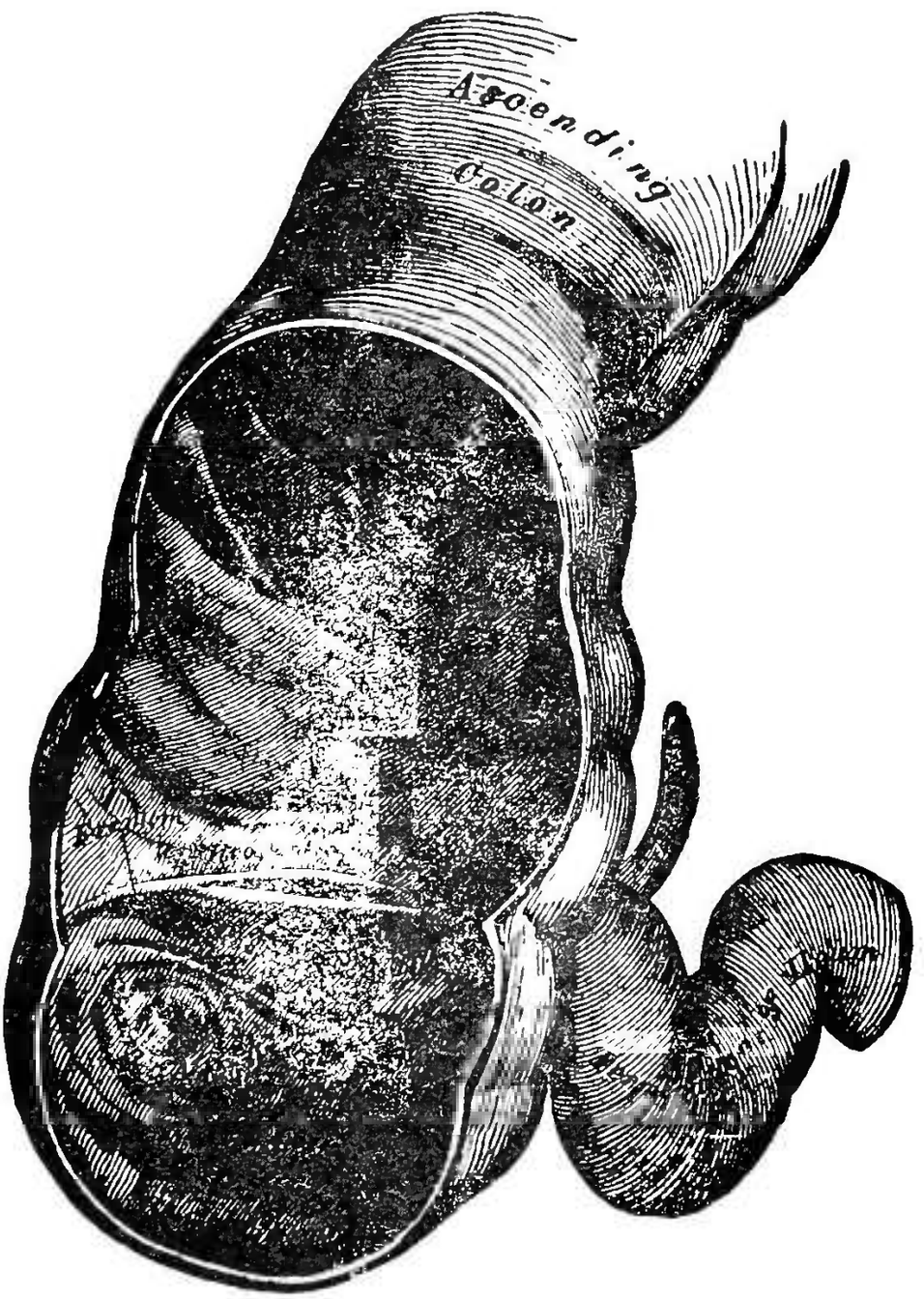


FIG. 19. PART OF LARGE INTESTINE.

Large Intestine, which is about five feet long, about two inches in diameter, extending upwards from the right groin to the under surface of the liver, called the ascending colon; then across just below the liver, gall-bladder and

spleen, to the left side, called the transverse colon; thence passing downward in front of the left kidney to the sigmoid

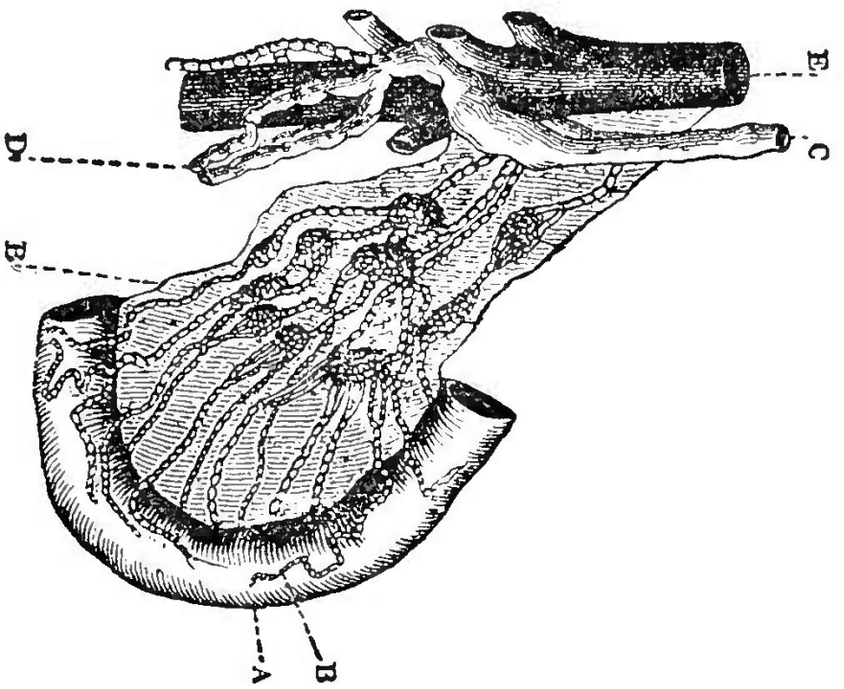


FIG. 20. THE LACTEALS.

flexure, called the descending colon; then through the flexure (curved like the letter *f*) to the rectum, which is six to eight

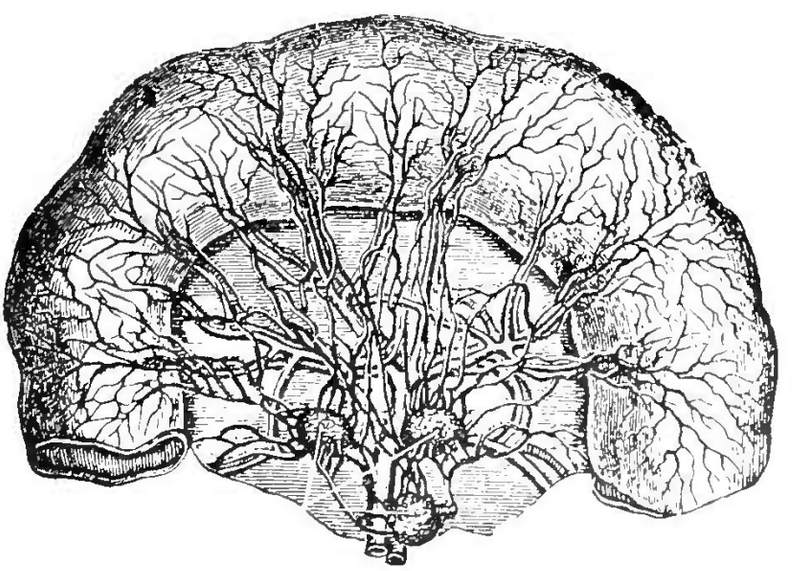


FIG. 21. LACTEALS AND LYMPHATICS.

inches long, and terminates at the anus. Thus the total length of the intestines is about twenty-four feet.

The Liver weighs from three to four pounds, situated in the right side, extending across into the left side. It is composed of numerous lobules 1-20 of an inch in diameter, clustering around the branches of the hepatic veins. Each lobule is composed of, (1) hepatic cells, about 1-1500 of an inch in diameter; (2) lobular veins, forming a net-work in each lobule; (3) an intralobular vein, and (4) plexuses of lymphatics, nerves and bile-ducts.

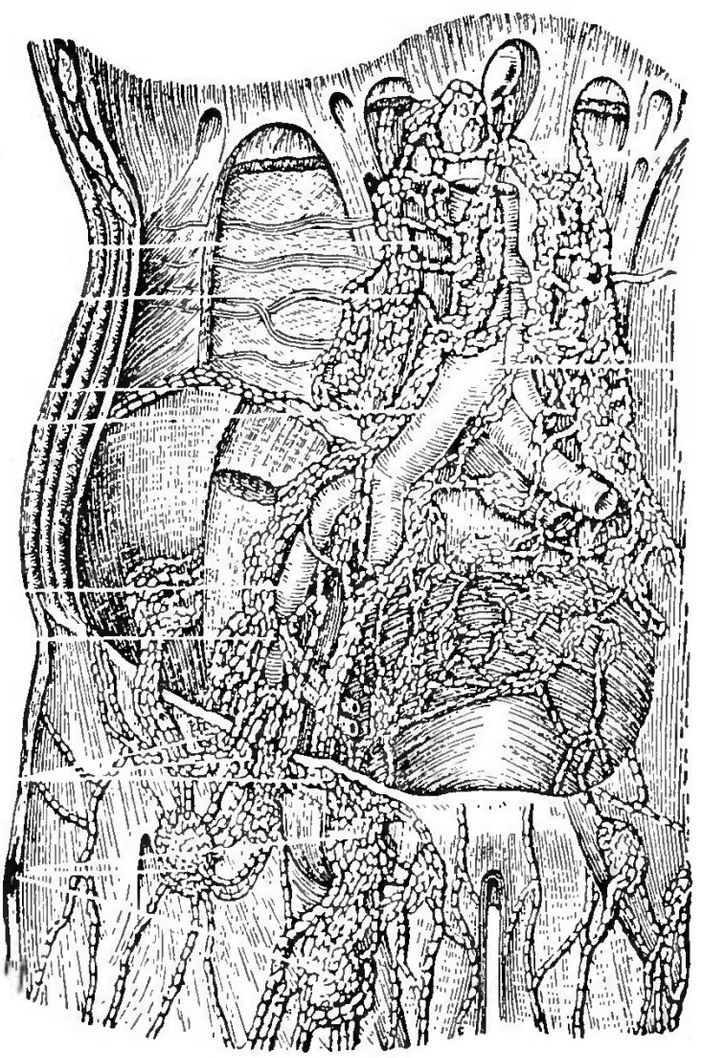


FIG. 22. LYMPHATIC VESSELS AND GLANDS.

The function of the liver is to secrete and excrete bile, which is a golden brown, viscid and alkaline fluid, constantly being formed, and discharged by the hepatic ducts into the gall-bladder, to the amount of about two and one-half pounds in twenty-four hours.

The Gall-Bladder is a pear-shaped bag, three to four inches long, holding from one to one and one-half ounces, the function of which is to store the bile for digestive purposes. The pancreas is a gland about seven inches long, lying behind and transversely across the stomach, opening into the duodenum, and secreting a transparent, colorless, strongly alkaline fluid, which, like the saliva, transforms starch into glucose, and is further explained in the process of digestion.

12. Absorption is by the agency of the veins and lymphatics. The food substances, having been mixed in the stomach in the form of chyme, as it passes through the alimentary canal the veins absorb from it water, albuminose, glucose and mineral salts, and carry them directly to the liver.

The fats are absorbed by the lymphatics, or lacteals. The lymphatics are a system of minute transparent vessels in nearly every part of the body, having valves but no nerves, and which convey lymph to the blood.

The lacteals are the lymphatics of the small intestine, designed to convey the chyle into the blood.

Lymph is blood plasma transuded from the capillary blood vessels. Chyle is the oily constituents of food made into an emulsion by the pancreatic juice and the bile.

Lymphatic glands are solid bodies in the course of the absorbent vessels, having valves but no nerves.

External Absorbents.—On the outside of the body there are two and a half millions of pores, little holes called medically, emunctories, out of which is constantly passing the effete matter of the body; that is, the used-up tissues. There are also millions of holes, called lymphatics, which absorb proper and improper applications. If you rub into your arm pus, or matter, after a time it will be taken into the system, and disease of some form is the sequence. Many other substances poison some skins in the same way.

The laws of absorption are very plain. All physicians know the immense benefit derived from the external use of mustard, poultices, plasters, etc. Apply a decoction of tobacco

under the arm; it will produce first, emesis; second, diarrhœa; and third, death. A teaspoonful of quicksilver in a tin plate, rubbed with the fingers until an amalgam is produced, in a few days will give a mercurial sore mouth. Croton oil rubbed over the abdomen will bring on a diarrhœal discharge. One thousandth part of a drop of vaccine virus absorbed into the

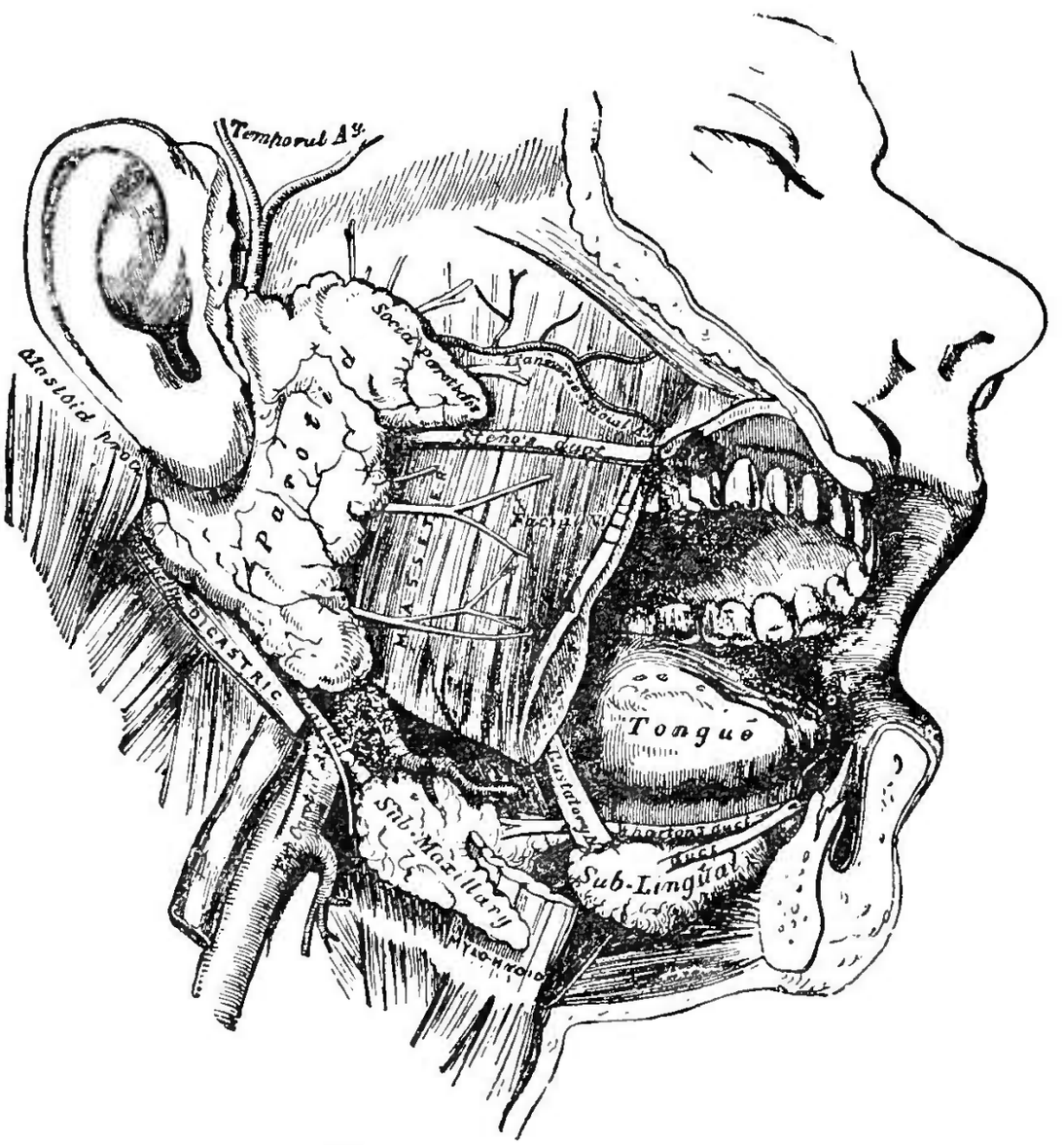


FIG. 23. THE SALIVARY GLANDS.

arm will produce cow-pox. It is by means of this power of absorption that inunctions of oil aid nutrition in wasting diseases.

13. Secretion.—The *Salivary* secretion is an alkaline fluid poured from the parotid, sub-maxillary and sub-lingual glands, and has the chemical property of converting starch nto grape sugar.

The *Gastric* secretion, which is pepsin (the organized, nitrogenized ferment of the gastric juice) in combination with hydrochloric acid as hydrochloro-peptic acid.

The *Biliary* secretion has already been described on Page 64

The *Intestinal* secretion is an alkaline, viscid fluid, which converts starch into glucose, and assists in the digestion of the albumens.

The *Mammary* secretion, consisting of two to three pints in twenty-four hours, of human milk, with composition, as shown in the table on another page.

The *Lachrymal* secretion, or tears, is a saltish fluid poured from the lachrymal gland situated over the upper eyelid, upon the surface of the eye-ball, for the purpose of lubrication.

The *Synovial* secretions are exudations from the synovial membrane of a viscid, glary fluid, for the purpose of lubrication.

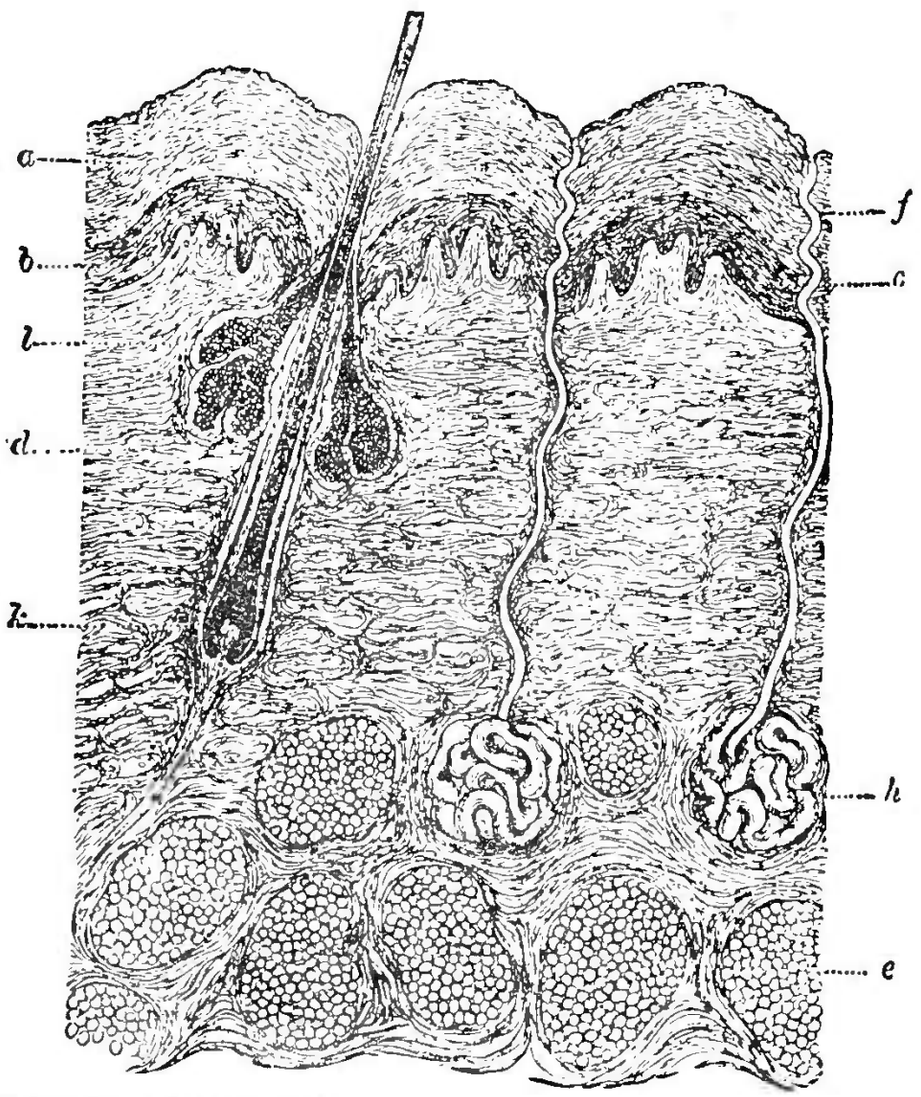
The *Mucous* secretions are exudations from the mucous membrane, varying in quality and consistency according to the condition of the membrane.

The *Lymph* secretion is a clear, transparent fluid, slightly alkaline, found in lymphatic vessels. It contains corpuscles called leucocytes, resembling the white corpuscles of the blood, each about 1-2500 of an inch in diameter. When exposed to the air, it coagulates the same as blood. The total quantity poured through the thoracic duct in twenty-four hours is three and one-half pounds.

The *Genital* secretions are explained in the parts treating of manhood and womanhood.

14. Excretion.—*Skin* excretions are: (*a*) Sebaceous, a peculiar oily matter secreted by the sebaceous glands to lubricate the skin and soften the hairs. (*b*) Perspiration, or sweat; a clear, colorless, slightly alkaline fluid, about two pounds of which are thrown off by the sudoriferous glands every twenty-four hours through the pores, which are estimated to be about 2,500,000 to the whole body. (*c*) Carbonic acid, about 1-200 as much as from the lungs, is thrown off in twenty-four hours.

Lung excretions are: (*a*) Carbonic acid loading every expiration to the extent of 5.9 per cent., or more than 1000 cubic inches an hour. (*b*) Water, depending in amount largely upon the dryness of the air breathed, is exhaled from the lungs

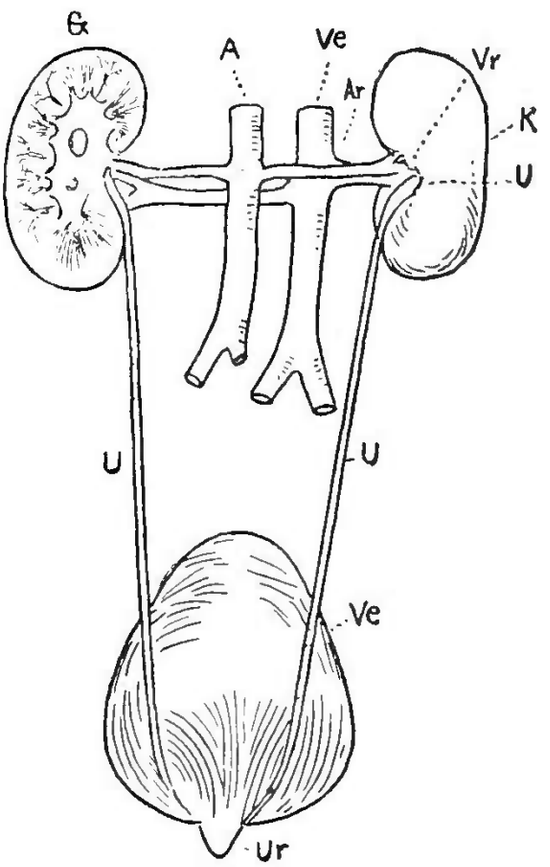


a. Horny layer of scarf-skin.
b. Mucus layer of scarf-skin.
c. Papillæ on surface of true skin.
d. The true skin.
e. Fat cells under true skin.
f. Canal of sweat gland.
h. Convoluted part of sweat gland below the true skin.
i. Shaft of fine hair.
k. Root of the hair.
l. Sebaceous gland emptying into a hair follicle.

FIG. 24. STRUCTURE OF THE SKIN.

with every expiration. (*c*) Organic matter, as explained under the process of digestion, on another Page, is constantly excreted in the process of expiration.

Kidney excretion, or urine—pale yellow, or amber, perfectly transparent, acid fluid with an aromatic odor and specific gravity of 1.020; forty to sixty ounces excreted in twenty-four hours, containing in that time water 52 fluid ounces, urea 512.4 grains, uric acid 8.5 grains, phosphoric acid 45 grains, sulphuric acid 31.11 grains, inorganic salts 323.25 grains, lime and magnesia 6.5 grains (*Braubaker*), which is carried through the ureters into the bladder.



A. Large artery of abdomen.
Ve. Large vein of abdomen.
Ar. Artery that feeds left kidney.
Vr. Left venal vein.
K. Kidney.
U. Ureter.
Ve. Bladder.
Ur. Beginning of urethra.

FIG. 25. THE KIDNEYS AND THEIR APPENDAGES.

Bowel excretion, fœcal matter or alvine discharges, consisting chiefly of indigested matters, excretin, stercorin and salts, from four to seven ounces in twenty-four hours.

THE NERVOUS SYSTEM.

SENSATION is the function of the nerves of sensation. The nervous system is divided into the cerebro-spinal, or nervous system of animal life, consisting of the brain, the spinal cord, the ganglia, and the cranial and spinal nerves, and the sympathetic, or nervous system of organic life.

The Sympathetic system consists of a chain of ganglia connected by nerve-filaments, and situated on each side of the spinal column, running downward. They are grouped as cranial 4, cervicle 3, thoracic 12, lumbar 5, sacral 5, coccygeal 1.

The Nerve Tissue is formed of (*a*) white fibrous matters, and (*b*) gray vesicular matter.

The *white matter* is composed of a number of tubes, like a sub-marine telegraph cable, consisting of a central axis cylin-

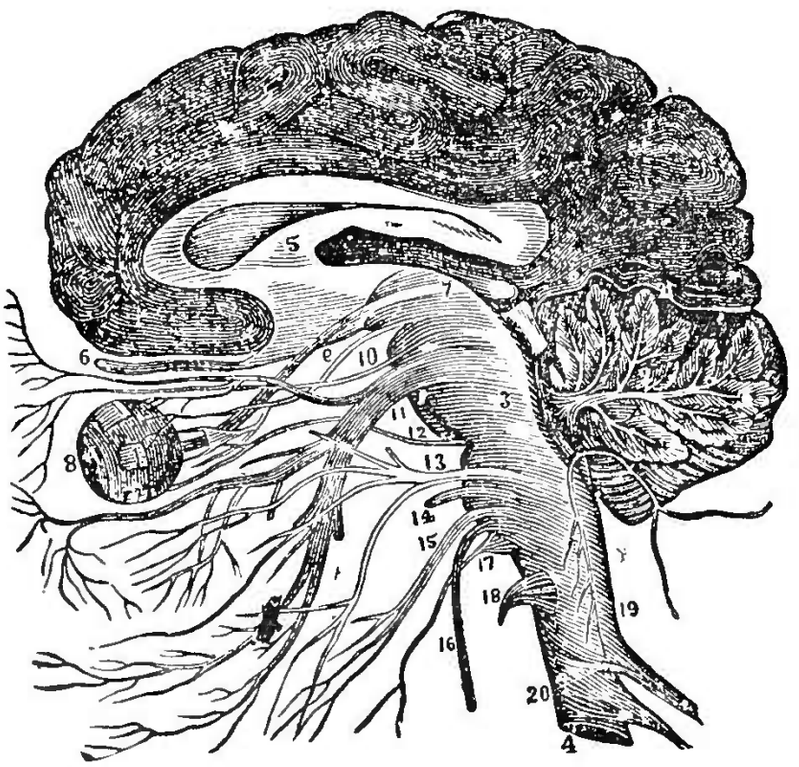


FIG. 26. THE BRAIN AND NERVES.

der, surrounded by the white substance, of Schwann, and enveloped in a tubular membrane, or nerve sheath; a bundle of such tubes, invested by a covering called the neurilemma, or perineurium, is a nerve.

The *gray matter* consists of a fine connective tissue, or stroma (that is, bed-formation), called neuroglia, in the meshes of which are embedded the gray cells or vesicles.

Classes of Nerves.—Nerves are divided into—

Afferent, or centripetal, which convey impressions inward toward the center, and may be either (*a*) Sensitive, when they carry impressions which give rise to sensation; or (*b*) Reflex,

or excitant, when they reflect impressions outward from the center and produce motion, secretion, etc.

Efferent, or centrifugal nerves, which transmit impulses generated in the center, outwardly. These are (*a*), motor, when they convey impulses to the muscles; (*b*) vasomotor, when they regulate the caliber of the small blood vessels; (*c*) secretory, when they influence secretion; (*d*) trophic, when they influence nutrition; (*e*) inhibitory, when they restrain or inhibit action.

Nerve Impulse travels in the sensory nerves about 190 feet per second, in motor nerves 100 to 200 feet a second; but in the spinal cord much less rapidly.

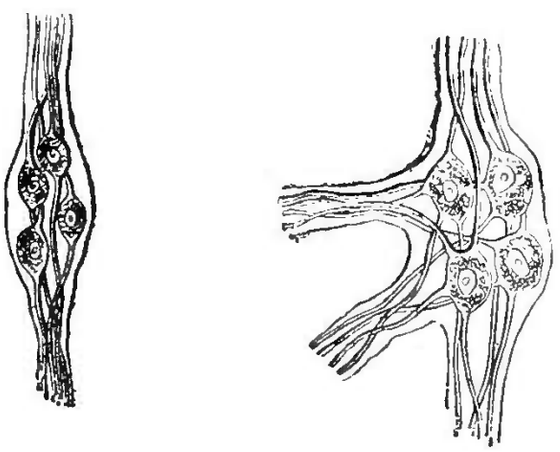


FIG. 27. NERVE TUBES AND CELLS.

Nerves of special sense are located in the skin.

Touch, or feeling, is general in all parts, but particularly active in the inner surface of the fingers.

Taste is located mainly in the mucous membrane of the upper part of the tongue, and is the function of the chordatympani, as its general sensibility is of the trifacial nerve.

Smell is located in the mucous membrane, lining the nasal cavity. It is a function of the olfactory nerve.

Sight is the function of the optic nerve expanded on the retina of the eye.

Hearing is the function of the auditory nerve, in the inner ear.

THE BRAIN.

Intellection, comprising perception, emotion, volition and origination, is a function of the brain, which is the central organ of life, situated within the skull; average weight, forty-nine and one-half ounces for males, and forty-four ounces for females. The brain is divided into four parts.

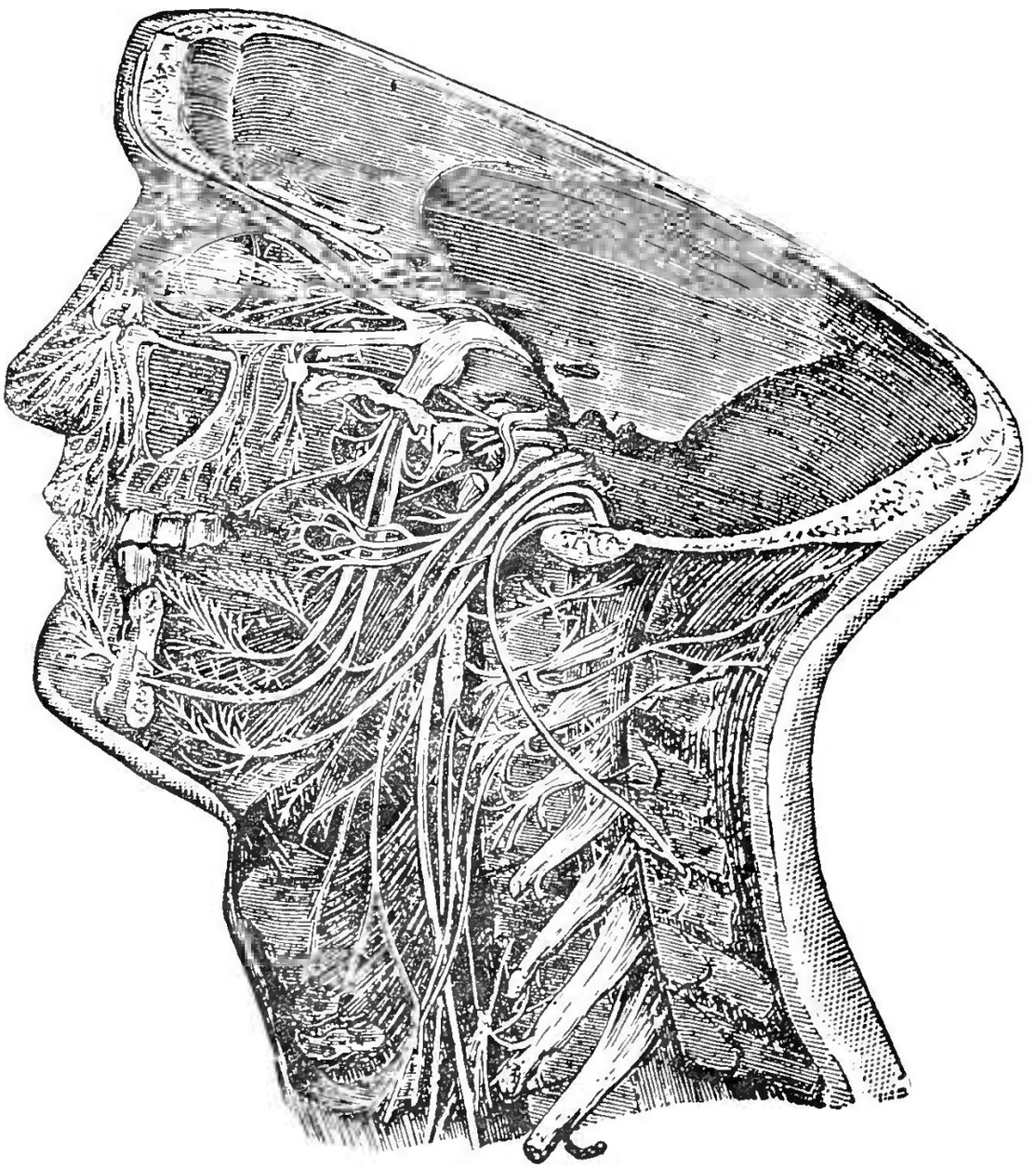


FIG. 28. CRANIAL NERVES.

A. Cord and sheath.
B. Spinal nerve.
C. Its motor root.
D. Its sensitive root.

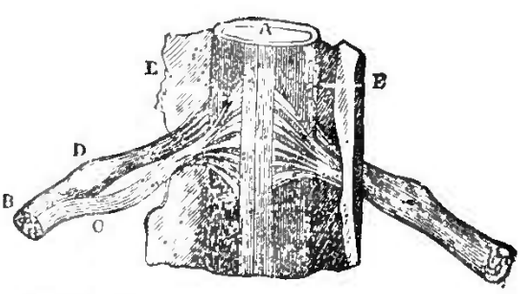


FIG. 29. SPINAL NERVES.

The Cerebrum, about seven-eighths of the whole, constituting the upper and front portion of the brain. This is the seat of reason, intelligence and will; it also contains the motor centers of the arms, legs, speech, trunk and head; and the sensory centers of sight, hearing, taste, smell and touch, in which sensations become conscious to us.

The Cerebellum, beneath the posterior lobe of the cerebrum, weighs about five ounces in the adult, and is composed of two hemispheres and an elongated lobe called the vermiform process. Its function is the coördination of movements.

The Pons-Varolii is a great transverse commissure, or connecting band, binding together the cerebrum above, and the cerebellum behind, and uniting both below to the medulla. Its functions are (*a*) to transmit motor impulses and sensory impressions from and to the cerebrum; (*b*) as centers which convert impressions into conscious sensations and originate motor impulses, independent of intellectual processes, as instinctive reflex acts, such as the coördination of the automatic movements of walking, etc.

The Medulla Oblongata is the upper and large part of spinal cord, one and one-half inches in length, three-fourths of an inch in breadth, and one-half inch in thickness. Its particular functions are:

1. As a conductor (*a*) of sensitive impressions upward from the cord to the cerebrum; (*b*) of voluntary impulses from the cerebrum to the cord and nerves; (*c*) of coördinating impulses from the cerebellum.

2. As an independent reflex center presiding over—*a*, mastication; *b*, the secretion of saliva; *c*, sucking and swallowing; *d*, vomiting; *e*, speech; *f*, facial expression; *g*, heart action; *h*, the contraction and dilation of the blood vessels; *i*, the disease diabetes; *j*, respiration and its modifications, laughing, sighing, sobbing, sneezing, etc.; *k*, convulsive movements; *l*, closing the eyelids, and dilation of the pupils; *m*, sweating.

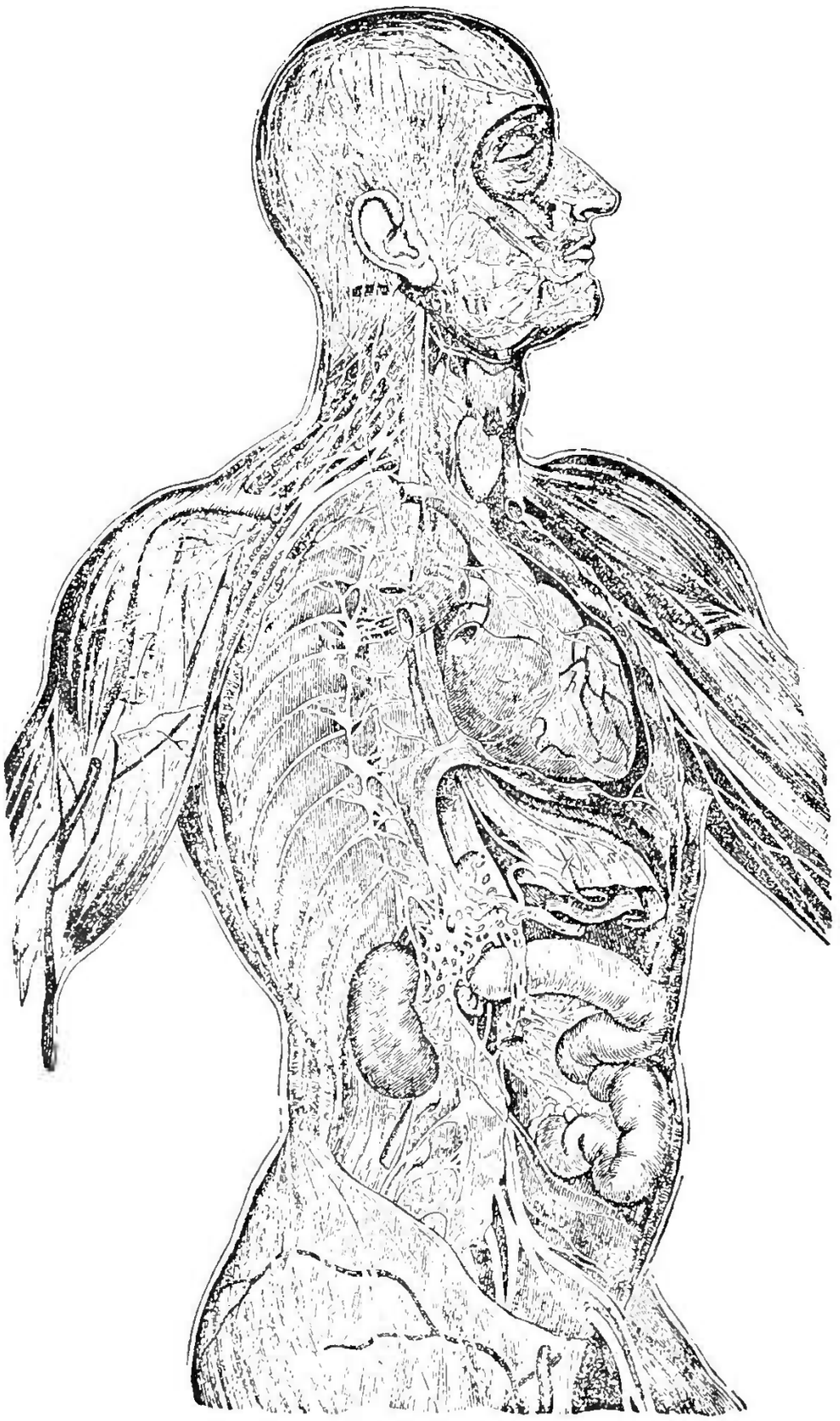


FIG. 30. NERVES OF THE BODY.

The Spinal Cord is from sixteen to eighteen inches in length, one-half inch in thickness, weighs one and one-half ounces, cylindrical in shape, divided into two lateral halves composed of white matter on the exterior and gray matter on

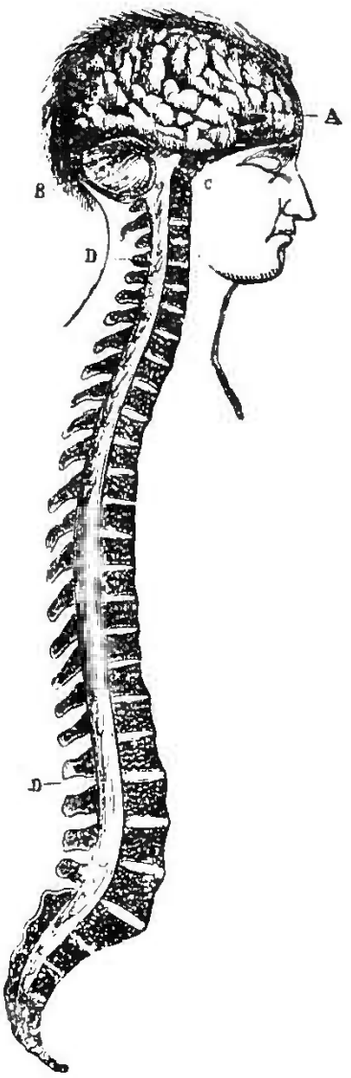


Fig. 31. *A.* Cerebrum.
B. Cerebellum.
D. Spinal cord.

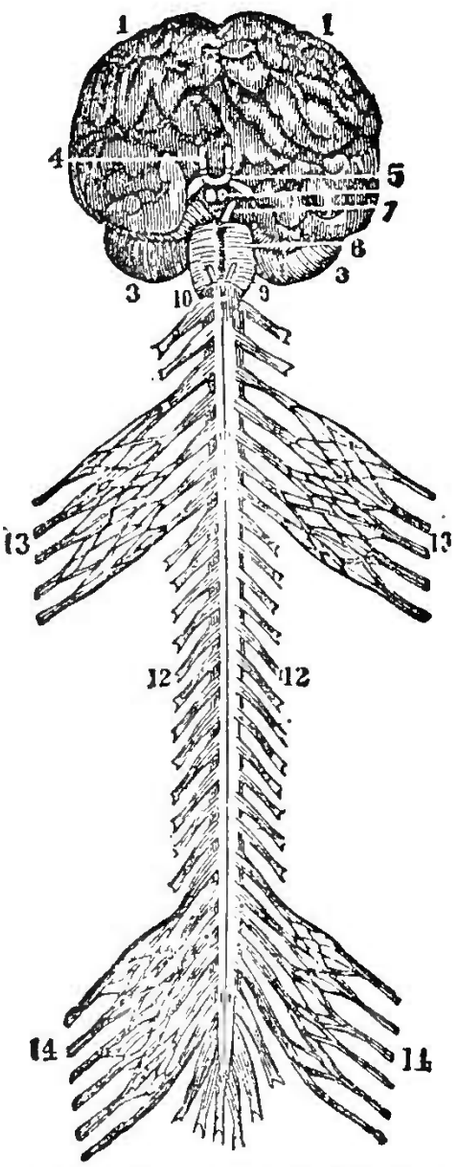


Fig. 32. 1. Hemispheres of cerebrum.
3. Cerebellum.
4. Olfactory nerve.
5. Optic nerve.
7. Third pair to muscles of eyes.
8. Pons varolii.
9. Fourth pair to oblique muscles of the eyes.
10. Medulla.
12. Spinal nerves.
13. Bronchial plexus to muscles of skin and arms.
14. Lumbar and sacral plexuses.

FIGS. 31 AND 32. SIDE AND REAR VIEW OF BACK BONE, BRAIN AND NERVES.

interior, and surrounded by three membranes—the Dura-mater, Arachnoid and the Pia Mater. The functions of the cord are, (*a*) to transmit impressions to, and volitions from, the brain; (*b*) to act as independent centers of reflex activity.

Reflex is a mode of action supposing a feeling surface, a sensory nerve, a nerve center, a motor nerve and a muscle. The sentient surface receives the impression which the sensory nerve transmits to the nerve center, from which the motor nerve communicates a command to the muscle. Reflex acts may be normal, such as deglutition, coughing, sneezing, walking, and the like; or diseased, such as lock-jaw, vomiting, epilepsy, etc. Another function of the cord is as a conductor of coördinating impulses from the brain; that is, the balancing power of different muscles, by which walking and other complex movements are carried on, and the results of perceptions, emotions, volitions and origination are achieved.

DEGENERATIONS.

The complex processes of organized life may take on retrograde movements, which are degenerations.

Sub-oxidation.—One of the most common and most fatal of these is sub-oxidation, which consists in the absorption by the blood in inhalation of a less amount of oxygen than the processes of nutrition and elimination require for normal accomplishment. This point will be elaborated under the head of diet.

Sub-nutrition is when the nutritive elements of the food are either deficient in quantity, or imperfectly assimilated through deficient absorption or by sub-oxidation. This point will also be further considered under diet.

Ab-secretion is when the secreting function is imperfectly performed or its product is abnormal, as in deficient pepsin in the gastric fluid, or an excess of hydrochloric acid in the same.

Ab-excretion is when the excretory organs throw off too little or too much, or the character of the excretion is changed, as in Bright's disease and diabetes, and in uric acid urine.

Ab-circulation is when an undue proportion of blood centers in one part, the excess vacating another part, as in the gorged brain and cold extremities of apoplectic seizures.

Mal-generations is when the nutrient materials in the blood, that are designed to build up new tissues, having too little vitality to accomplish that, generate instead, an inferior order of germ life; just as infertile soil grows weeds instead of grain.

GENERATION.

This implies sexes and respective organs of pro-creation, the functions of which are conception, gestation, maternity and lactation, all of which will be duly considered in the parts, Manhood and Womanhood.

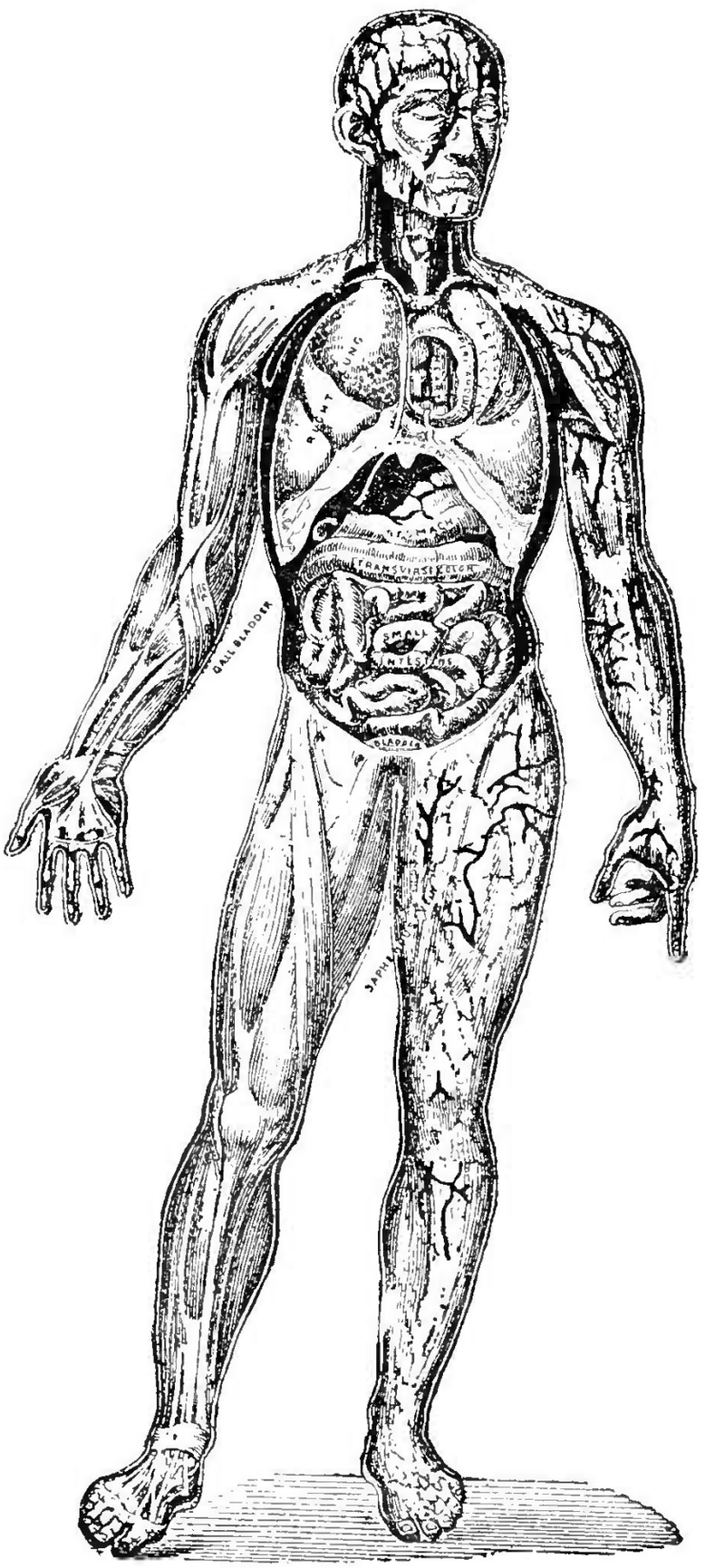


FIG. 32. THE VISCERA IN POSITION.

PART III.

THE DIGESTION.

ITS ORGANS AND PROCESSES.

Salivary Digestion; Gastric Digestion—Pepsin, Hydrochloric Acid; Starches, Sugars and Fats, Mineral Salts. Pancreatic Digestion, Trypsin; Fats and Grape Sugar Absorbed Through the Lacteals, etc.—Table of Digestive Ferments—Amount of the Secretions—The Process of Digestion Described—Chemistry of Digestion—Nutrition—The Process of Elimination, Its Products, Daily Quantity, Exciting Agents, What it Does, Character of Its Product Governed by its amount, Illustrative Table—Correct Dietary Scientifically ascertained.

Digestion supposes something to digest. The old questions, "What shall I eat? What shall I drink? and wherewithal shall I be clothed?" are just as pertinent and just as pressing now as when, nearly 1900 years ago, the Nazarene taught a religious trust that recoguized a Supreme Father's care, even in these common needs of common life. Yet the gist of the questions has changed, for it has reference now to

A Right Selection, rather than to procurement, of those universal necessaries. In that right selection is the essence of practical wisdom. The foods thus selected constitute the chosen diet.

Function of Digestion.—The proper consideration of diet necessarily presupposes some familiarity with the func-

tions of digestion. This may be defined as the chemical process which the food undergoes, under the control of vitality, in its transformation from its condition as a food into nutrient material, adapted to supply the growth and wastes of the animal body, and maintain its heat and energy. This process is conducted through several different stages, viz.:

1. Salivary Digestion, which consists in the change which starch almost instantly undergoes in its conversion in the mouth, while being mixed by mastication with the saliva,

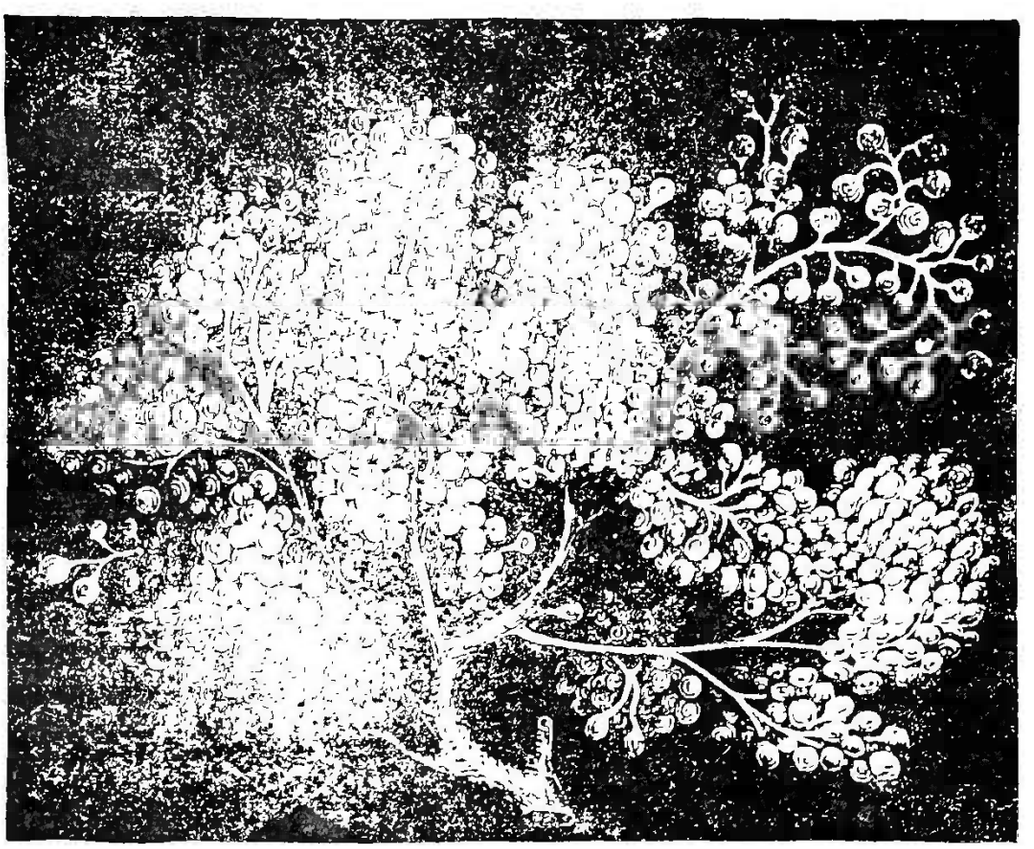


FIG. 33. STRUCTURE OF THE SALIVARY GLANDS.

The clusters of pouches and their ducts all emptying into the large duct or tube that discharges the fluid into the mouth.

into maltose and dextrine, by means of the salivary diastase or ptyalin, which is an alkaline substance possessing this special kind of energy.

The importance of this preliminary digestion may be seen from the fact that such a large proportion of starch enters into the composition of all the grains, leguminous seeds, the potato,

cassava, arrow root, tapioca, sago and the cellulose (the fundamental material of the structure of plants), which, together, constitute a large part of the food of mankind. About 1500 C. Cm's, or 48 ounces by weight, of saliva are secreted every twenty-four hours by each adult, to thus change the starch in his six pounds of food.

The saliva diastase, or ptyalin, is also called a ferment, by which is meant, "An albuminoid repository of cell-force, detached from the cells, which possesses the property of decomposing alimentary (food) compounds and reconstructing their elements into other chemical compounds, without giving any thing material to, or taking anything material from, the substances which they act upon."

Any saliva that passes into the stomach is neutralized by the acid of the gastric secretion.

2. Gastric Digestion, otherwise known as stomach, or peptonic digestion, is the change which albuminous and fatty substances undergo in the stomach by the agency of pepsin. These albumens are muscular flesh, casein of milk, and the white of the egg from the animal kingdom; and gluten, legumin and albumin from the vegetable kingdom.

The acid of the pepsin changes all nitrogenous albuminous substances into a uniform acid-albumin called syntonin; the pepsin slowly gelatinizes a small part of the syntonin into propeptone, then into albumoses, and finally into a liquid, diffusible peptone. One grain of pepsin converts 2,000 to 6,000 grains of albumin into peptones, and a discovery has just been made of a pepsin that will convert 30,000 grains of albumin to one of pepsin.

The most of the albumin passes unchanged into the alkaline juice of the intestine.

Pepsin is a ferment containing about 0.3 per cent. of hydrochloric (muriatic) acid (Richet says 0.17), in loose combination with leucin, a chemical product, the use of which in the animal economy is unknown.

The starches, sugars and fats are unaffected in the stomach except that the nitrogenous envelope of the starch granule, or

oil globule, may be digested away and the starch or oil set free. The stomach digestion of the fats probably consists only in a slight decomposition, with a liberation of a small quantity of free fatty acid.

Roberts holds that stomach digestion is aided by the salts that always exist in the food, such as acetates, malates, lac-

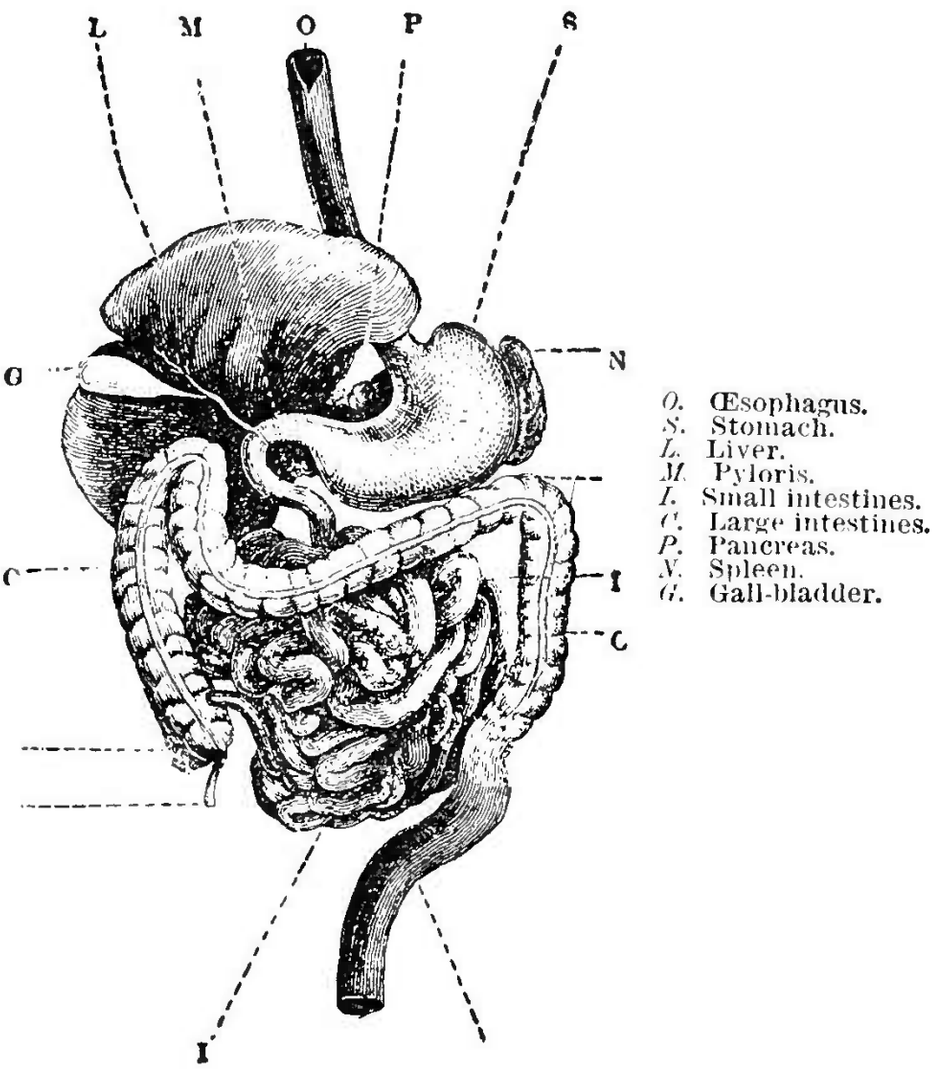


FIG. 34. THE ORGANS OF DIGESTION.

tates, butyrates, etc., leaving their own organic acids, and uniting with the hydrochloric acid, thus setting free in the mass of the food lactic, malic, acetic and butyric acids. The importance of this fact will appear further on.

Any pepsin that passes into the intestine in neutralized by the alkali of the intestinal juice.

THE DIGESTIVE FERMENTS AND THEIR ACTION.

(Compiled from Roberts and Porter.)

Digestive fluid or tissue,	The contained ferment.	Its action on food materials.
Saliva.	Ptyalin, or diastase.	Converts starch into maltose, dextrine and sugar.
Gastric juice.	*a*. Pepsin.	*a*. Changes proteids into peptones.
	b. Milk curdling, Rennin	*b*. Curdles caseine of milk.
	c. Lactic acid.	*c*. Splits milk sugar into lactic acid.
	d. Fat-splitting.	*d*. Splits fats into glycerine and fatty acid.
Secretion of Brunner's glands.		Liquefies proteids at 98.5° F. Converts maltose into glucose.
Pancreatic juice.	*a*. Amylopsin.	Changes starch into maltose
	b. Trypsin.	Converts proteids into peptones in alkaline and neutral media.
	c. Steapsin.	Splits fat into glycerine and fatty acid.
	d. Curdling ferment.	Curdles the casein of milk.
	e. Emulsive.	Emulsifies and partly saponifies fat (*i. e.* changes it to soap).
Bile and bile acids.		Emulsifies neutral fats Changes starch into sugar. Converts glycogen into sugar. Excites contractions of muscular coat. Stimulates the muscles of the hair-like prolongations of the membrane. Excites activity in the skin-like inner covering of the intestines. Moistens the intestinal walls. Lubricates the colon. Antiseptic,—prevents decomposition.
Liver.	*a*. Glycogenic.	Transforms glucose into glycogen.
	b. Bile secreting.	For use as above in digestion.
	c. Bile excreting.	To eliminate poisons and drugs from the blood.
	d. Peptone transforming	Changes peptones into serum-albumin and globulin.
	e. Germ and ptomaïne destroying.	Destroys germs and converts their poisonous ptomaïnes into inert ptomaïnes.
Intestinal juice.	*a*. Diastatic.	Converts maltose into glucose.
	b. Proteolytic.	Changes fibrin into peptone.
	c. Invertin.	Converts cane sugar into invert-sugar.
	d. Milk-curdling.	Curdles the casein of milk.
Blood.	*a*. Diastatic fibrin forming.	
	b. Fibrin forming ferments.	
Most tissue.	Diastatic ferment.	
Muscle.	Peptone-forming ferments.	

Along the curves of the stomach and in the duodenum are glands known as Brunner's, the function of which will be seen in the table on the preceding page.

3. Pancreatic Digestion also called intestinal, or tryptic digestion, is the change which the starch which may have eluded the salivary digestion, and the albumens that may not have been wholly transformed by peptonic digestion, and the fats (most of which have been but little changed by stomach digestion) undergo, by means of the alkaline ferment, trypsin, into peptones in the case of albumins; into dextrose in the case of starch; and into fat emulsion and soaps in the case of fats. The soaps are formed by the glycerine and fatty acids of the fats dissociating and the acids combining with the alkaline bases of the bile and pancreatic juice.

The fats and grape sugar are absorbed directly into the blood in an unaltered state through the little lacteals (mouths) that line the small intestines, and saponification takes place largely in the blood.

One grain of diastase converts 2,000 grains of starch into sugar, according to ordinary estimates, but Roberts, upon the authority of Horace Brown, and by his own experiments, states that pancreatic diastase can transform 40,000 times its own weight of starch into dextrine and sugar.

4. Systemic Digestion.—From this it appears that beyond intestinal digestion there is what may be called a systemic digestion; that is, a process of continued conversion of the food elements into final products throughout the whole physical structure.

According to Draper, more than twenty-one and one-half pounds of solvent secretions are poured daily into the abdomen to assist in the digestion, nutrition and elimination of two or three pounds of food (*i. e.*, pure nutrients), and the wastes of the system, as follows:

Saliva,	3.30 pounds	Pancreatic juice,	0.44 pounds
Gastric juice,	14.08 "	Intestinal juice,	0.44 "
Bile,	3.30 "		

The Processes Described.—By even this brief survey of the digestive process, it will be seen that it is no simple work.

To convert starch into maltose, the change runs successively through eight varieties of dextrine.

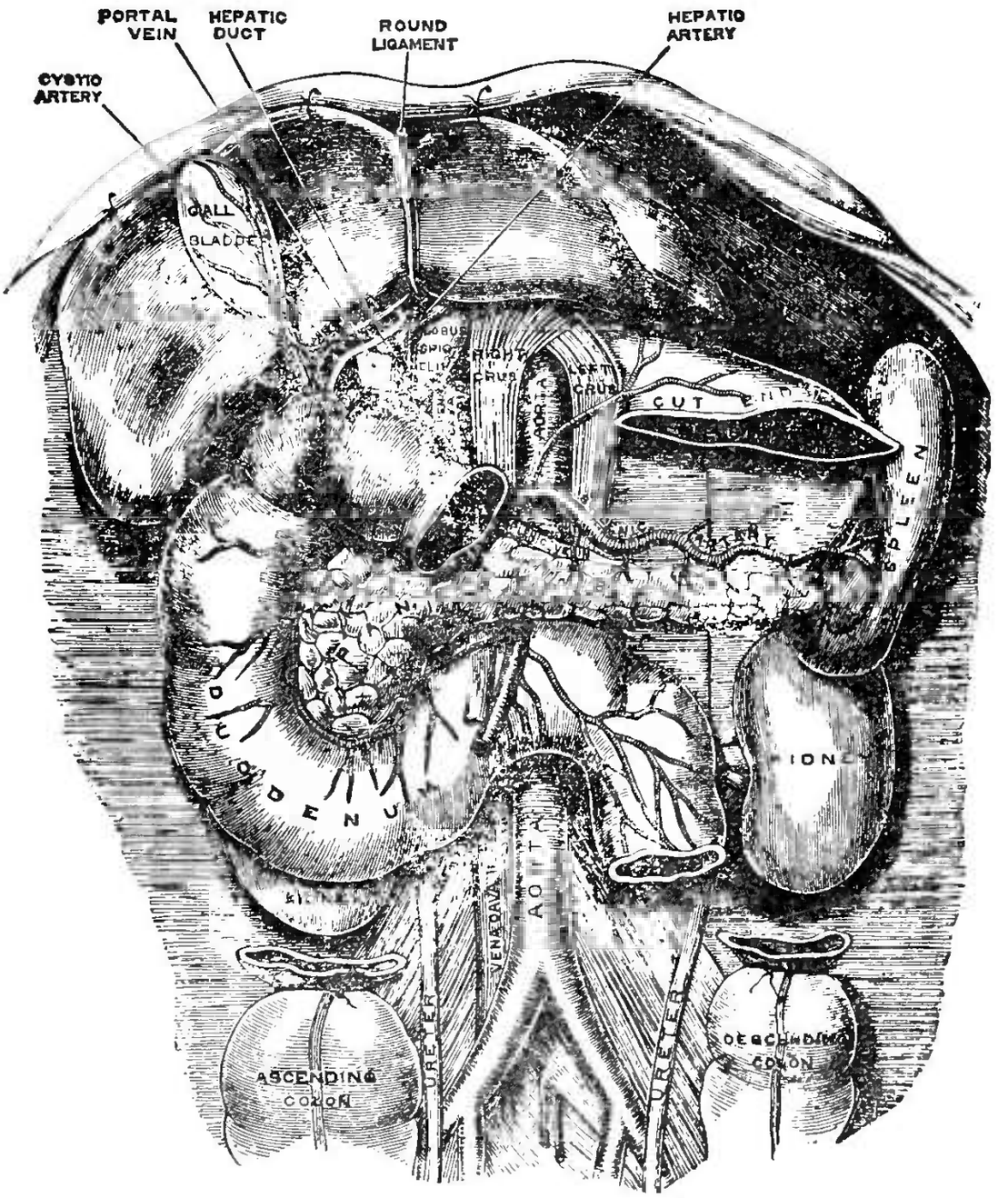


FIG. 35. ENLARGED VIEW OF PANCREAS.

And surrounding organs, with part of stomach cut away. This and Fig. 32, on Page 80, show all the internal organs in their relative positions.

To convert albumin into peptones, the acid pepsin must first be formed from the alkaline tissues. The pepsin contains 0.3 per cent. of the strongest mineral acid, that its antiseptic

effect may preserve the food from putrefaction. The acid is probably formed by the free carbonic acid that is always in the blood acting upon the chloride of sodium (common salt) which is also always in the blood, and setting free a small portion of its hydrochloric acid.

The pepsin acting upon the albumins, a series of intermediate change-products occur analagous to the dextrines in starch-digestion, before the end product, peptone, is formed; but these are but very imperfectly understood.

Then comes the mixture of the bile with whatever the stomach has passed on into the duodenum or small intestine. The bile is strongly alkaline, from the amount of carbonate of soda held in it, and also contains fats, soaps, and many organic and inorganic constituents. Its action is as an antiseptic in the upper part of the small intestine, while it aids the absorption of fats in the other portions.

The pancreatic secretion is also added to the duodenal mass of food passing on towards its last transformation, completing the starch changes that the saliva-diastase failed to carry through. Also attacking the fats, which are really compound ethers (*i. e.* combinations of alcohol and glycerine, with stearic, palmitic or oleic acid), and splitting them up into glycerine and the fatty acids, which (by the aid of the carbonate of soda contained both in the pancreatic secretion and in the intestinal juice) are completely emulsified, ready to be absorbed by the intestinal lacteals and carried into the blood.

The trypsin also seizes upon the albuminous substances which the stomach pepsin had failed to completely change into peptones, and by methods not understood, changes them into a number of different peptones.

With all this there are often lactic and butyric acid fermentations, with all the chemical changes that they involve.

Gas in the Bowels.—Partly as by-products of these processes, the intestines contain also—

Sulphuretted hydrogen gas,	H_2S.	
Carbonic acid gas,	CO_2.	
Nitrogen gas,	N.	
Hydrogen gas,	H.	
Marsh gas,	CH_4.	"fire damp."
Oxygen gas,	O.	

Chemistry of Digestion.—The digestive tract is thus proved to be a veritable chemist's laboratory, in which both analytic and synthetic processes of the most elaborate kind are continually going forward, under the direction of the mysterious master-genius, vitality, and elaborating therefrom the wonderful organisms of animal life.

That elaboration can only be wrought as diet becomes the handmaid of vitality, and furnishes the requisite materials.

Nutrition is the vital process by which the food, digested as already described, is taken up by the lacteals as chyle, and transferred to the blood, thence to the lungs to be vitalized by the absorption of the oxygen of respiration, thence to every minute tissue of the body to offer to it the pabulum which shall supply its wastes.

Elimination.—But continued organization would be but another name for mammoth aggregation, were there no disorganization.

Organized life consists in the balance of the two.

But even a balanced disorganization, without adequate elimination, would be but a vast accumulation of debris.

Hence *excretion*, which is physiological elimination, becomes an important factor in the construction of a dietary based upon physiological needs.

The Process of Elimination is the separation of the dead wastes and the useless or harmful substances in food, from the living tissues; and it is the function of the excreting organs to expel them from the system.

The perspiration from the skin, carbonic acid gas from the lungs and skin, urine from the kidneys, and fecal matter from the bowels are the gross forms of excretion.

In nutrition the oxygen of respiration unites with the carbon and hydrogen of the food and consumed tissues, and forms

carbonic acid and water, which escape through the lungs, skin and kindeys.

All *digested* substances leave the body, as urea, carbonic acid and water. The urea is formed by the union of the oxygen with the nitrogen, and a part of the carbon and hydrogen of the food and tissues, and escapes only by the kidneys.

ATWATER THUS TABULATES THE DAILY EXCRETIONS.

Through lungs and skin,	Carbonic acid	38.8 ozs.	or 1100 grams
	Water	12.7 "	or 361 "
Through the kidneys,	Urea, etc.	1.2 "	or 34 "
	Minerals	0.7 "	or 20 "
Through bowels and kidneys,	Water	71.4 "	or 2024 "
	Undigested matters	1.4 "	or 38 "
Totals,		126.2 ozs.	or 3577 grams

Deleterious and Poisonous Excretions.—Some of the excretions are intensely poisonous. They are formed in the body even in health, by the chemical changes which the nitrogen molecules undergo, commonly as the result of incomplete oxidation. Between the albumen of food and the excreted urea, twenty-eight nitrogenous compounds have been discovered, some of which are deadly poisons.

The Exciting Agent, Oxygen.—All the foregoing processes of digestion and excretion are the results of chemical changes in the food and its elements wrought by vital force. The chief factor, in each case, is a definite proportion of oxygen received through the blood from the lungs.

What Oxygen Does.—This oxygen produces a certain effect, governed by the amount taken into the system. For instance, take the albuminous group of foods represented by the white of egg or lean meat, which consist of carbon 72 parts, hydrogen 112 parts, nitrogen 18 parts, oxygen 22 parts and sulphur one part, illustrated by the chemical formula $C_{72}H_{112}N_{18}O_{22}S$. In a state of normal health, an adult who eats such food, for every 139 parts of oxygen he takes into his blood, will convert the elements of this albuminous food into urea four parts, uric acid one part, creatinine two parts, carbonic acid 55 parts, water 38 parts, sulphur one part, all of

which are excretive matters, and in a state of health are expelled from the system. This is the normal standard. It is secured by the inspiration of one pint of air 18 times every minute, which is about the average quantity inhaled by healthy adults.

The Character of Its Product, Governed by Its Amount.—Now as the quantity of oxygen absorbed varies from this standard, the result of its work will vary. Thus when the greatest possible amount of oxygen is taken into the system, 154 parts of it will convert one part of the albuminous food (composed as above) into urea nine parts, carbonic acid 63, water 37 and sulphur one part. This excess of urea indicates rapid waste of tissue, without disease products—the body burns instead of sickens.

On the other hand, the absorption of only 76 parts of oxygen converts the above elements into urea only two parts, uric acid two, creatinine two, glucose five, carbonic acid 22, water 10, sulphur one. This is the diabetic condition, kidneys overworked for lack of sufficient fresh air or oxygen to properly act upon the food.

Illustrative table, showing the excretory products resulting from the absorption into the system of varying quantities of oxygen:

Condition of the body or system.	Oxygen. Parts of used.	The proportion of oxygen named in the first column converts the albuminous foods above described into the following number of parts of excretory products. Urea.	Uric acid	Creatinin	Carbonic acid.	Water.	Sulphur.	Other substances. Those marked * are deleterious; those marked † are deadly poisonous, and their formation in the system is possible under certain conditions.
Normal,	154	4	1	2	55	38	1	
Gouty condition, or rheumatism,	136	2	2	2	52	40	1	
Calculi (stone), heart and nerve troubles,	129	2	2	2	38	33	1	*Oxalic acid, 7 parts
Atrophy of liver, rickets, etc.,	94	2	2	2	31	19	1	*Lactic acid, 7 parts
Diabetes,	76	2	2	2	22	10	1	*Glucose, 5 parts
Fever, diabetes, chorea, etc.,	67	2	2	2	21	24	1	*Hippuric acid, 4 parts
Sundry diseased conditions,	129	2	1	1	52	36	1	†Amphi-creat'n, 1 pt.
	122	3	1	1	49	32	1	†Leucin 1, santho-cre. 1
	116	1	1	1	46	33	1	†Cruso-creat'n, 2 parts

The System Poisons Itself.—Prof. Wood points out that, as the result of this process of under oxidation, a list of nearly two hundred other ptomaines and leucomaines might be added, among them some of the most virulent poisons known. These poisonous products, as well as some not poisonous, are called leucomaines, in distinction from somewhat similar products which are formed after death by putrefaction, called ptomaines.

There can be no doubt that much human disease originates in these abnormal chemical processes of digestion and elimination, hence further reference will be made to this page in other parts of the book.

From this survey how amazing is the process of digestion! What perils beset it at every step! And how little wonder that so many suffer from derangement of the function!

Foods May Be Defined as those substances which, when taken into the animal body, furnish, by the normal processes of nutrition, some element necessary to support life.

A perfect food is such a combination of food qualities in one substance as will furnish all the food elements necessary to support life in health and vigor.

A Correct Dietary.—The scientific method of ascertaining what is included in a correct dietary, is by analysis of the tissues to determine *what* constructive elements are necessary, and by analysis of the excretions, approximate the *amount* of each that is needful to replace the daily waste. Comparing these results with experience, as recorded by competent observers, deductions may be drawn that may be considered as practically accurate.

PART IV.

DIET.

WHAT, HOW MUCH, AND WHEN TO EAT.

Energy Expended —Amount of Oxygen Required—Units of Nutrition—The Kinds of Food Required—All Made up of Thirteen Elements—Average Composition of Foods —Proportions of Daily Supply —Foods as Usually Classified—Our Nomenclature—The Fiber-Foods—Fat-Foods — Force-Foods — Fixed-Foods — Oxygen-Food — Its Supreme Importance—Average Normal Demand per Day—How Far the People Fail—Two Reforms are Imperative—Subsidiary Foods—Tea—Coffee and Cocoa—Effects on Salivary Digestion—Effervescent Water, Vinegar, Wine and Brandy—Retardation of Digestion Beneficial—Mastication and Salivary Digestion—Food Value of Alcohol—Extractive Foods —The Amount of Food Materials Needed—Prof. Church's Dietary — Table of Food Elements Required in Different Circumstances—Similar Table—Conclusions Drawn From the Tables—American Waste—The Necessity for Dietaries —How to Make Dietaries—Rules to Work By— Nutrition not Goverened by Cost—Wrong Feeding and Disease.

WORKING TABLE FOR THE CONSTRUCTION OF DIETARIES.— Its Availability Illustrated—The Ideal Diet—Table of Defective Diets—National Examples of Diet—Condensed Rules for the Preparation of Home Dietaries—General Principles of Correct Diets—Facts of Importance to Aid Right Eating.

The animal body is a machine that is constantly expending energy in life-processes and in work. The steam engine can

only exhibit the force that is put into it in the fuel consumed. An engine with no fire has no power.

The animal engine works incessantly; for even in sleep the lungs must play and the heart must beat. That little beating heart does 4,320 pounds of pumping work in eight hours sleep. Those lungs lift the bony ribs over 8,000 times in those hours of rest. The digestive and assimilative organs have run a chemico-vital laboratory through every square inch of the entire organism, every moment of those hours. The excretory functions have been pulling out of every tissue and expelling the waste materials that have been rendered useless by the preceding day's activities, every instant of that restful time. There must be fuel to feed such use of power.

Hence, the practical questions are:

What amount of energy is expended in every twenty-four hours in the vital processes and the work of the animal machine?

What kind of materials is necessary to supply that energy?

What amount of those materials is required?

Inasmuch as the machine wastes with use, what kind of other materials is necessary to make good that loss?

What amount of those materials is required?

Are there still other materials requisite?

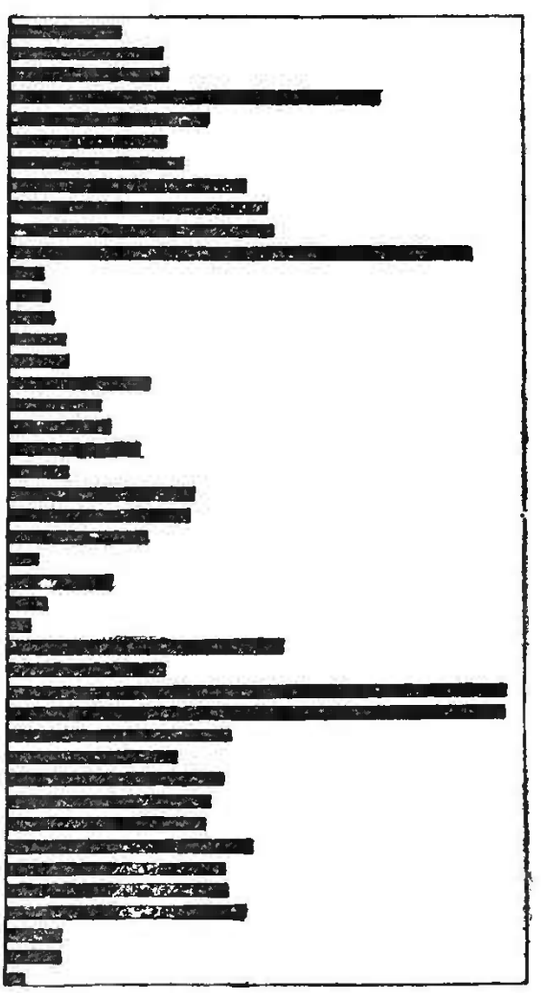
1. Energy Expended.—All molecules of food are burned or oxidized, by the action upon them of a definite number of oxygen atoms, into the ultimate forms in which all food escapes from the system, namely: Urea, uric acid, creatinine, carbon dioxide, water, or a sulphuric acid-forming compound. Different elements require for their reduction different proportions of oxygen. But the average of 750 grams (or 1,173 pints) of oxygen has been fixed upon as the daily number required by each adult person. (See Dr. Porter, Merck's Bulletin, Dec., '92, p. 732.) This process of reduction in the human machine, as in the engine, develops both heat and energy, or work.

Work Done.—In each twenty-four hours, Mr. Kendrick estimates the physical work done by the heart and circulation

THE POTENTIAL ENERGY OF FOOD.

CALORIES IN THE NUTRIENTS IN ONE POUND OF EACH FOOD-MATERIAL.

Beef, round, rather lean	807
Beef, neck	1108
Beef, sirloin, rather fat	1173
Beef, flank, very fat	2750
Beef, side, well fattened	1463
Mutton, leg	1142
Mutton, shoulder	1281
Mutton, loin (chops)	1755
Mutton, side, well fattened	1906
Smoked ham	1960
Pork, very fat	3452
Flounder	286
Cod	310
Haddock	331
Bluefish	404
Mackerel, rather lean	430
Mackerel, very fat	1026
Mackerel, average	696
Shad	750
Salmon	967
Salt cod	416
Salt mackerel	1364
Smoked herring	1343
Canned salmon	1036
Oysters	229
Hens' eggs	760
Cows' milk	308
Cows' milk, skimmed	176
Cheese, whole milk	2044
Cheese, skimmed milk	1166
Butter	3691
Oleomargarine	3679
Wheat flour	1655
Wheat bread	1278
Rye flour	1614
Beans	1519
Pease	1476
Oatmeal	1830
Corn (maize) meal	1616
Rice	1627
Sugar	1798
Potatoes	427
Sweet Potatoes	416
Turnips	139



The potential energy represents simply the fuel value of the food, and hence is only an incomplete measure of its whole nutritive value. Besides serving as fuel, our food has other uses, one of which is, if possible, still more important, namely, that of forming and repairing the tissues of the body, the parts of the machine.

W. O. Atwater. *Century Magazine.*

Reprinted by consent.

of the blood at 50,400 kilogrammeters; the work of respiration, 11,700; that of eight hours mechanical work, 125,000; total, 187,100.

Heat Produced.—He adds 620,000 more expended in heat production; that is, in keeping up the circulation. This makes a total of 807,000 kilogrammeters, or 5,800,000 foot pounds. In other words, the energy expended and work done in keeping up the animal body and heat is, in an adult, daily equal to the power required to lift 5,800,000 pounds weight one foot from the ground, if it could be directed to the production of mechanical power, as in the steam engine, and without waste. It will also be seen that the production of heat (called heat equivalence) employs five times as much energy as the entire mechanical work done in eight hours labor. Dr. Lees says that a very strong man generates every day a measure of heat sufficient to lift 13,500,000 foot pounds. Life implies heat, for heat is the great condition of change. Snow vanishes from the surface of vegetation before it does from the naked soil, because vegetation is alive.

The Units of Nutrition.—Prof. Atwater, following Frankland, Stahmann, Rechenberg, Danilewsk and Rubner has presented the matter in the form of "Units of Nutrition," thus: Four thousand calories of heat are expended every twenty-hours, in the human body. Therefore, the vital question is to select food that will yield that amount of heat.

The methods lead to the same practical result, so far as the necessary supply of heat-food is concerned, the difference being that the oxygen method is based upon the normal amount of oxygen, and measures the food by the oxygen required for its complete reduction, while the heat method is based upon the normal heat, and measures the food by its heat-producing power.

But the medical aspect of the diet question is most profoundly affected by the quantity of oxygen required. Therefore we shall use both systems.

Eleven hundred and seventy-three pints of oxygen, evolving 4,000 calories (6,120 foot tons), one calory making 1.53 foot

tons of heat from the food consumed every twenty-four hours, is the average demand of the human organism.

This immense physiological expenditure of force is best seen by noting the fact that three hundred foot tons is deemed a fair average of mechanical work for laboring men. Our non-laboring readers may best appreciate this day's work by the fact that in walking on a level a man does work equivalent to raising one-twentieth of his weight to a height equal to the distance walked; *e. g.*, a ten-mile level walk is about equal to raising 200 tons one foot. Therefore, the laborer's day's work is equal to a walk of 15 miles. If the 6,120 foot-tons of energy generated every day could all be expended in walking the dis tance traversed in 24 hours would be about 306 miles.

The Kind of Food required to yield that enormous amount of energy, is most important; yet if this were the only question, practical dietaries could be easily prepared. But our body-machine, like the engine, wastes in work, and the wastes must be re-supplied. As it will not do to replace an iron bolt in the engine with a wooden pin, so in the body, the wear and loss must be replaced by that of its own kind.

THE KINDS OF ELEMENTS IN A BODY WEIGHING 148 POUNDS.

Carbon,	31.3 pounds.
Oxygen,	92.4 "
Hydrogen,	14.6 "
Nitrogen,	4.6 "
Calcium,	2.8 "
Phosphorus,	1.4 "
Potassium,	0.34 "
Sulphur,	0.24 "
Chlorine,	0.12 "
Sodium,	0.12 "
Magnesium,	0.04 "
Iron,	0.02 "
Fluorine,	0.02 "
Thirteen Elements weighing	148. pounds.

These thirteen elements exist in the form of the five compounds:

Water,	90. pounds.
Protein,	26.6 "
Fats,	23.0 "
Carbohydrates,	0.1 "
Mineral salts,	8.3 "
	148.0 pounds.

These compounds are made up of the five gases, oxygen, hydrogen, nitrogen, chlorine and fluorine; and the eight solids,

of which iron, calcium, magnesium, potassium and sodium are metals, and carbon, phosphorus and sulphur are non-metalic. (There are also minute portions of silicon, manganese and copper, but these are not deemed essential constituents of the body.)

Hence, wherever any waste occurs in any one or any number of these elements, the food must re-supply it. Therefore,

Foods have been Classified by Bunge, as,

1. Those which supply energy and can replace exhausted constituents,—proteids and fats.

2. Those which supply energy only,—carbohydrates, gelatine and oxygen.

3. Those which repair waste only, and furnish no energy, —water and mineral salts.

Ordinarily, these classes are mixed in various proportions in different foods. But of these three classes of foods,

THE AVERAGE COMPOSITION IS:

Class of food.	Carbon.	Hydrogen.	Oxygen.	Nitrogen.
Protein,	53. per ct.	7. per ct.	24. per ct.	16. per ct.
Fats,	76.5 "	12. "	11.5 "	none.
Carbohydrates,	44. "	6. "	50. "	none.

The Average Body Contains, of protein, 18 per cent. (consisting of albuminoids 11 per cent., gelatinoids 6 per cent., and extractives 1 per cent.,) fats 16 per cent., and carbohydrates less than 1 per cent.

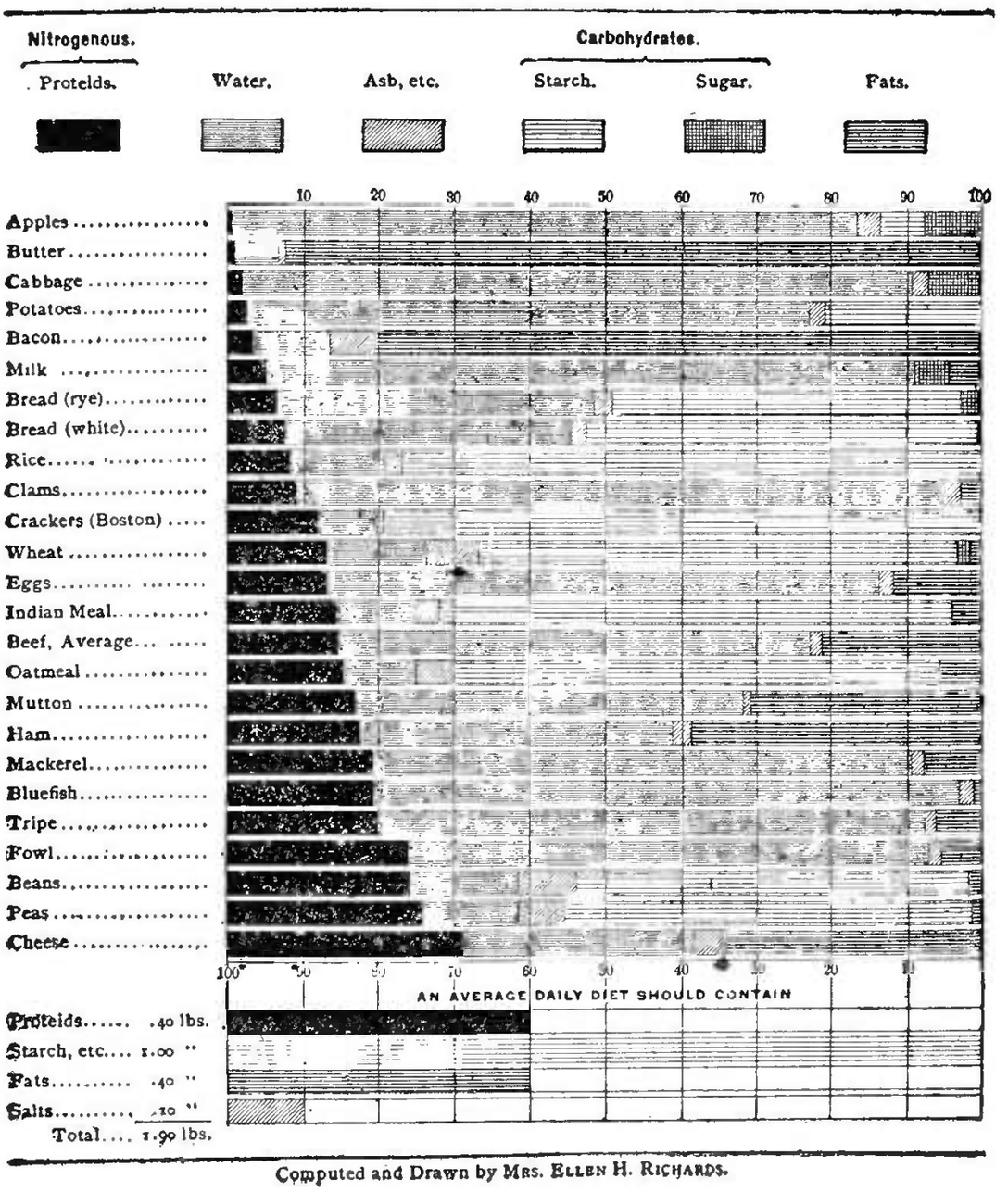
The Food Needed to sustain the wastes of the average body just mentioned, and the composition of this food, have been carefully computed by Prof. Atwater, who finds that the average daily diet for this purpose should consist of the following foods, or those furnishing a like amount of the various food compounds.

DAILY FOOD REQUIRED TO SUSTAIN THE WASTES OF THE SYSTEM.

Lean beefsteak (no bone),	8 ounces.
Bread,	20 "
Potatoes,	30 "
Butter,	1 "
Water,	37 "
Oxygen,	30 "

AVERAGE COMPOSITION OF COMMON FOODS.

Reprinted, by consent, from Edward Atkinson's "Science of Nutrition."



Computed and Drawn by MRS. ELLEN H. RICHARDS.

These seven and seven-eighths pounds of food contain:

Protein,	4.2 ounces,	or	118	grams.
Fats,	2.0 "	or	56	"
C. Hyd.,	17.6 "	or	500	"
Minerals,	0.8 "	or	24	"
Water,	71.4 "	or	2,024	"
Oxygen,	30.2 "	or	855	"
Totals,	126.2 ounces,	or	3,577	grams.

The metamorphosis of tissue that the doctors talk so much about as a necessary factor of health, is the process of wear and replacement.

When the engine wears to a certain point, it must be sent to the repair shop to have the worn bolts, etc., replaced.

The Repair Shop Within.—The human engine carries its repair shop within itself, and replaces as the wear occurs. It may be brass, iron or steel that is needed in the engine. It may be one, or another kind of food in the animal.

Foods as Usually Classified.—Proteids, fats and carbohydrates have been named. These are called by different writers:

1. Proteids, or albumens, albuminoids, nitrogenous, tissue-foods, C H O N S, repair foods, essential foods.

2. Fats, or hydrocarbons, and carbohydrates.

3. Carbohydrates, or C H O, non-nitrogenized, starch-foods force-foods.

4. Mechanical foods, water and mineral salts.

It is impossible to draw sharp lines of distinction between the carbohydrates, fats and proteids as they exist in foods, because they are so often combined in the same article. Yet some articles consist so largely of one kind that they may be somewhat loosely thus classed.

Our Nomenclature.—To prevent confusing our readers, we shall call the proteids fiber-foods, the fats fat-foods (although usually grouped under the carbohydrates), the carbohydrates force-foods, and the mechanical foods fixed foods.

The Fiber-foods have the following characteristics:

1. They consist of carbon, oxygen, hydrogen, nitrogen and sulphur.

2. They cannot be formed in the body by the union of the elements of other foods with free nitrogen.

3. They only can repair the wastes of tissues consisting of nitrogen, such as blood, muscles, sinews, skin and the vital organs. Muscle contains one twenty-seventh its weight of nitrogen.

4. When consumed, about 20 per cent. of them are not assimilated.

5. While they cannot be formed from other foods, they form the fats of the tissues, and yield both heat and force.

6. They are expelled from the system, as urea, uric acid, creatinin, carbon-dioxide, water, and a sulphuric acid-forming compound.

7. Carniverous animals require daily one-twentieth of their weight of them in the form of lean meat.

8. They only can support life through long periods.

9. They consist chiefly of the albumen, white of egg, casein of milk, myosin of lean meat and fish, ossein of bone, gluten of grains and legumen of peas, beans, etc.

10. They are the most expensive kind of food.

11. About 26.6 per cent. of the body is made from them.

12. They consume 3.15 grams of oxygen per 100 grams of proteid.

13. Of the animal fiber-foods, 96 per cent. are absorbed, while of the vegetable only 70 to 80 per cent., and sometimes only 60 per cent., are absorbed.

14. They are the plastic material out of which our living structures are reared, and are always present in the primitive cells and seeds of life.

The Fat-Foods have these characteristics:

1. They are first consumed in the process of digestion.
2. They yield heat, or force, interchangeably.
3. They are particularly necessary in low temperature.
4. They lubricate and cushion the bones, muscles, etc.
5. They are a store of heat and force.
6. They are expelled as carbon-dioxide and water.

7. They cannot sustain life without the fiber-foods.

8. The animal fats are absorbed, unchanged by digestion, and produce heat and energy within the blood current.

9. The fat contains one-tenth its weight of glycerine.

10. They may be formed from all three classes of food.

11. The vegetable fats are split up into a fatty acid and a glucose in the process of digestion. The acid then unites with the soda in the alimentary canal and forms hard soap, which is a natural laxative.

12. An excess of fat food increases the working forces. Killnor has proved that a horse fed with six and one-half ounces of linseed oil each day is able to do 646,000 pounds more work than without it.

13. They comprise about 16 per cent. of the weight of an average man.

14. They consist of carbon, oxygen and hydrogen.

15. They consume 2.8 grams of oxygen per 100 grams of fats.

16. They also assist in the digestion of the fiber and force foods.

17. They cannot be resorbed by the system beyond the quantity necessary to replace the carbon consumed by the oxygen of respiration.

The Force-Foods have the following characteristics:

1. In the body they constitute less than one per cent., and consist mainly of glycogen—liver-sugar, and inosite—muscle-sugar.

2. They consist of carbon, oxygen and hydrogen, the same as the fat-foods, but in different proportions.

3. They are found in the starches, sugars, dextrines, gums, etc.

4. They yield heat and force interchangeably.

5. They are particularly needed for force.

6. They cannot sustain life long without the fiber-foods. A dog will soon starve to death on bread from superfine flour, but will live comfortably on graham bread.

7. They consume less oxygen, molecule for molecule, than either of the other foods, but their affinity for it is greater, hence they are oxidized before the fiber-foods are. They require 1.07 grams of oxygen per 100 grams of force foods.

8. The system loses a large percentage of energy in preparing the digestive fluids by which they are fitted for absorption.

9. They are changed into fats, and consumed as fuel.

10. Seventeen parts by weight, of starch, are equal, as oxidizable food, to ten parts of fat.

Fixed Foods.—1. *Mineral Matters.*—As these comprise 6 per cent. of the whole weight of the body, 30 per cent. of the bones, and one per cent. of the flesh and blood, mineral salts to the extent of one ounce a day, are also required as food. The need is shown particularly by the fact that all animal and vegetable tissues, and in every cell two complex organic compounds are found which are very rich in phosphorus, namely, lecithin and nuclein; hence, these compounds must be considered as essential food substances, particularly since the first exists in milk. The nucleins contain from 3.2 to 9.6 per cent. of phosphorus.

As milk contains from seven to fourteen times less iron than other foods, and as the new born animal's liver contains from five to nine times as much iron as in the mature, it might hastily be assumed that iron is not a food element. But Bunge has shown, on the basis of Bischoff's and Schmidt's estimates, that the blood of a man weighing 154 pounds contains from 37 to 41 grains of iron. But as most vegetables contain from one-half to two per cent. of minerals, the need is ordinarily supplied without special care.

2. *Water.*—About 75 per cent. of the muscles, and from 61 to 70 per cent. of the entire body consists of water; hence, large quantities of this element are necessary.

The mineral salts and water are termed mechanical foods, because they enter and pass out of the body unchanged. We call them fixed foods for the same reason.

Oxygen Food.—Every molecule of food requires a certain number of oxygen atoms, to reduce it by chemical changes to the ultimate forms in which all food escapes from the system, namely, urea, uric acid, creatinine, carbon-dioxide, water and a sulphuric acid-forming compound. See table on Page 91.

The oxygen is just as important as the other food elements, because without it in due proportion, neither can the food be worked up into appropriate blood-plasma for the tissues, nor can the wastes be removed from the system.

Hence the question, "What shall I eat?" must be answered not only in a specified number of ounces per day of the fiber, fat, force and fixed foods, but also in a definite number of oxygen atoms, as well; for, if the oxygen be deficient, the force-foods will exhaust it, to a greater or less extent, thus leaving the fiber-foods to undergo deleterious changes, as will hereafter be shown.

The Diminished Use of Oxygen.—The tendency of civilized life is towards a diminished consumption of oxygen. As indoor and sedentary employments multiply, homes increase in "modern improvements," means of travel become more effeminate, outdoor life is relegated to the essentially outdoor occupations, and clothing becomes more luxurious, the oxygen absorbed by the average citizen approaches the minimum amount with which nature can run the human mechanism.

Hence it becomes specially necessary to adjust the diet quite as much to the oxygen supply received, as to the heat and tissue waste suffered.

Supreme Importance of Oxygen.—It is impossible to overestimate the importance of this phase of the subject; hence we give it special consideration, and particularly in view of the fact that it will prove the key to much of the medical and hygienic matter of this book.

The average normal demand per day for oxygen must be the basis for just comparisons and practical rules. Authorities have been cited, by writers upon the subject, whose estimates,

reduced to a common standard of pints of oxygen (0.54 grams to a pint), are as follows:

Pettinkofer and Voit calculate that from 7 to 11 cubic centigrams of oxygen are required to every gram of weight. Take 9 centigrams as the average, and 140 pounds as the weight; this would be 10,585 pints per day of oxygen required by an adult in a healthy state.

Menries—837 pounds of oxygen taken from the atmosphere each year. This gives 1,925 pints per day.

Preyer—One gram of hæmoglobin can only hold 1.27 cubic centigrams of oxygen in combination. Allowing 226 grams of hæmoglobin in the blood, that gives about 1.4 pints of saturation at any instant, which is being changed and renewed at the rate of one cubic inch 18 times a minute, or about 748 pints in 24 hours. But no allowance is made here for the tissue absorption of oxygen. It is absorbed through the walls of the blood vessels as it goes, and the hæmoglobin which is in muscles (as proved by Kühne and Ray Lankester), being an oxygen-carrier there, as well as in the blood (Bunge, Page 397), an indefinite quantity of oxygen may be thus transferred from the blood stream. It is known that oxygen diffuses in the tissues of the stomach, of the salivary glands and of the placenta; it therefore seems reasonable to conclude that oxygen is absorbed by other tissues also, to an unknown extent.

Hüfner, Marshall and Bunge—There are 2.6 grams of iron in the blood of a man weighing 140 pounds. About three parts of oxygen combine with one of iron. This is 14 pints of saturation at any instant, but constantly changing, as in Preyer's estimate, giving 762 pints in 24 hours, besides what may be absorbed directly through the blood vessels.

P. Quinquad—The blood can absorb normally 240 cubic centimeters of oxygen to every 1000 grams of blood. This gives 4.60 pints each third of a minute, and 19,872 pints per day, on the assumption that its whole supply is changed every round of the circulation.

Brubaker—One inch of oxygen remains in the lungs at each inspiration. Hence 25,920 cubic inches, or 748 pints, are needed in 24 hours.

No inquiry is made just here as to whether it is the oxygen from respiration alone, or including that contained in the food (of which there is an average of 572 pints per day consumed), respecting which the above estimates are made; for the discrepancies are so great that in this particular no reliance can be placed upon the authorities named. So let us try a different plan of getting at the amount of oxygen needed.

Chemical Analysis has shown, so it is affirmed, that the respired air has lost 20 per cent. of its oxygen while in contact with the lungs. Allowing 28.875 cubic inches, or one pint 18 times a minute, as the average inspiration of air, one-fifth of which is oxygen, of which oxygen one-fifth is absorbed, and 1036 pints of oxygen is the daily quantity consumed, which equals but 560 gramms.

Chemical analysis has also shown that the reduction of a normal quantity of food-stuffs to their excrementitious products requires an average of 802 grams of oxygen. This conclusion is reached by averaging the authorities, as represented by Dr. Porter and Prof. Atwater, the first a physician, the second a chemist.

Dr. Porter's statement is that the entire oxygenating capacity of man is less than 832 grams, and that 750 grams are normally inspired.

Prof. Atwater says 855 grams are the average inspired, closely following the average of Prof Ranke's experiments that showed 857 grams as the intake, with liberal food both at rest and at work.

Dr. Porter's possible increase is 82 grams. Giving Prof. Atwater a proportionate increase, or 93 grams, and averaging the two, gives 87 grams as the possible normal increase.

The Margin of Oxygen.—Hence we conclude that the adult body in health must have 802 grams (or 1,485 pints) of oxygen daily, and that 887 grams (or 1,642 pints) may be used. This margin of 87 grams (or 161 pints) of oxygen is therefore all that exists within the domain of health to meet the endlessly varied conditions of human life.

The Value of This Margin.—It becomes, therefore, a question of vital importance to determine the precise value of these 87 grams of reserve oxygen in quantitative respirations.

If the minimum 802 grams is obtained by 25,920 respirations, or 18 every minute, then each respiration must equal 1.3 pints, or 38.5 cubic inches of pure air. By the same ratio the 87 grams will require 2811 respirations.

Therefore, to reach the fullest oxygenating capacity of the system, we have only to increase the respirations 119 per hour, or about two respirations a minute.

Hence, any excess beyond 20 respirations a minute is fruitless panting after an unattainable good, unless there be deficiency of lung capacity that makes the more frequent breathing in a measure equivalent to the loss.

To Under-Oxygenate is Easier.—On the other hand, in order to under-oxygenate the system, all that is necessary is to drop out one respiration a minute; or, cut down each of the 25,920 respirations from one and one-third pints to one pint of pure air; or to breathe the usual number of respirations, but in bad air that lacks its proper allowance of oxygen; or to convey into the body an excess above the normal amount of food of, say three to four ounces in 24 hours, for a person weighing 140 pounds.

The Balanced Poles.—*In view of this, eating and breathing must be regarded as the balanced poles of a vibrating mechanism, which can work harmoniously only as that balance is maintained. It is all-important to ascertain precisely what that balance is.*

The Fundamental Point.—Practically, the fundamental point is that every 802 *grams of oxygen required for the reduction of the food consumed by every person, demands, upon peril of his health, the average inspiration of one and one-third pints of air* 18 *times every minute.*

Why is this so? Because the carbon which the food supplies, and which is the product of the vital changes, clogs and poisons the system. But, meeting the oxygen absorbed in respiration, the carbon combines with the oxygen to form carbonic acid gas, which is expelled at the next expiration. Thus the worn-out tissue is dissolved and removed. But if the oxygen be deficient, the eliminating process fails, and in the presence of the effete matter retained, the normal reduction of the food becomes an impossibility.

How Far the People Fail.—How does this fact correspond with the actual respirations of the people? Turning back to Page 103, we find that 25,920 respirations a day yielded but 560 grams, a deficiency of 242 grams, according to the

ordinarily accepted estimation. Here is a lack of nearly one-third, showing that under-oxidation is the common experience. Let us try another estimate.

How Far College Students Fail.—By the kindness of Miss M. Anna Wood, physical examiner for Wellesley Female College, Massachusetts, we have been furnished with tables of the examinations of 1,500 students of that college. From these, we extract the following averages: Age 19.10 years; weight, 119.4 pounds; height, 5 feet, three inches; girth of chest, 28.8 inches; girth of chest when full, 31.4 inches; chest expansion, 2.2 inches; depth of chest, 6.9 inches; lung capacity, 150.3 cubic inches.

Taking the graduating class of 1891, numbering 104, as fully average, we find these results: Average hours of daily outdoor exercise before entering college, one and three-fourths hours. Almost one-third of the number had poor or indifferent health. Nearly half of them were nervous before entering, and 60 per cent. were nervous before graduation. Less than four per cent were sleepless before entering; 27 per cent. were sleepless before graduation. These may fairly be assumed to represent the large army of female teachers, students, indolents and sedentaries, as to lung capacity.

The Air of Respiration is divided by physiologists, into: *a.* Tidal—That which passes in and out in quiet breathing, 20 to 30 cubic inches. *b.* Complemental—That which can be drawn in by a forced inspiration, 110 cubic inches. *c.* Reserve—That which remains after ordinary expiration, but which can be expelled by forced expiration, 100 cubic inches. *d.* Residual—That which cannot be expelled, 100 cubic inches. The combined tidal, complemental and reserve measure the the lung capacity, which in a person 5 feet 7 inches, is 230 cubic inches. It increases or diminishes 8 cubic inches for every inch in stature above or below that height.

We Don't Get Oxygen Enough.—One-ninth of the lung capacity is tidal air; and 260 cubic inches capacity represents one pint of tidal air. Therefore, the ordinary estimate

for males and females both, of one pint of air at each respiration, *requires* 260 *cubic inches lung capacity.* Yet 230 inches is laid down in the books as the normal average for a person 5 feet 7 inches in height. Now 260 inches being the average for both sexes, it is too high for females alone, and too low for males, the difference being about 25 per cent. That would raise the average for men to 292 inches, and reduce the average for women to 227 inches. But the figures for the 1,500 Wellesley students show an average of only 150 inches, which is 77 inches short of the normal oxygen demand. May not this account for a large part of the ill health, sleeplessness and nervousness named in Miss Wood's statistics?

Bad as this showing is, it is still far short of the truth; for these 260 inches yield but 560 grams of oxygen, or 1,037 pints, while our average (from Porter and Atwater) demands 802 grams, or 1,485 pints, which would require an average lung capacity of 372 inches, or for men 418 inches, and for women 326 inches.

But such average capacity is simply impossible. Therefore, the results of chemical analyses are entirely misleading as to the amount of oxygen needed in the process of digestion; or, the system has methods of securing it otherwise than by respiration; or, a much greater quantity is inspired than the ordinary estimates allow.

The latter seems the more probable supposition, especially in view of our own experiments made with the spirometer with both sexes and of different ages, which, while not numerous enough to prove a general average, did suggest one-seventh as the normal proportion of tidal air, instead of one-ninth.

Accepting, for the moment, this ratio, it would make complete oxygenation of food easily possible upon the basis of an average lung capacity of 260 cubic inches, or 227 inches for females.

In either case, it but emphasizes all the more the necessity for free ventilation, so strongly insisted upon in this work.

The Oxygen Supply Reduced.—Inactivity and sedentary habits reduce the oxygen supply in three ways:

1. The lack of molecular activity in the muscles gives a feeble call for oxygen to effect molecular metamorphosis; that is, the atomic changes which accompany all generation and expenditure of force.

2. The blood, taking up all the oxygen that the tissues call for, absorbs but little to meet the feeble call.

3. The under-absorption fails to give proper stimulus to the lungs; hence under-breathing is the necessary physiological result.

To this may be added the danger of over-feeding, from the habitual effort of cooks to coax the appetite by savory dishes, and the common custom of loading the table with a variety of viands thus temptingly prepared.

In the case of the Wellesley students, we should add the alarming fact that of the graduating class of 104 persons, 17 had a marked hereditary tendency to consumption and scrofula, and seven to heart disease, making nearly one in four. Surely the future of that class of refined and cultured girls is sadly shadowed! Nor is there reason to believe that their experience is exceptional.

Twenty-five per cent. of invalidism is therefore the seeming outlook for America's most gifted daughters. Nor is this relieved by the possibility of individual escape from the active results of hereditary entailment, for the class illnesses already cited show that its average health was far below normal, notwithstanding the excellent results from the physical training received.

Three Reforms Are Imperative.—1. To recognize the relation between lung capacity and perfect digestion. Almost every other point in physical culture has been elaborated; but, as admitted in personal correspondence with us by some of the leading physical educators of the country, this is new to them. Yet, in reality, it lies at the very foundation of a true, scientific development of perfect manhood.

2. To secure as much breathing capacity as possible, and habitual use of that which is secured.

3. To dress so as to make full breathing possible. A slender waist, out of proportion with hips and shoulders, ought to be deemed as unfortunate a possession for a girl, as a callow skin, flabby muscles and dark-circled eyes are for a man.

But fettering skirts and constricting stays are more than fashionable, they stand for a sentiment. Nor is that sentiment modesty. It is absurd for the social etiquette that not only tolerates, but demands an almost naked bust amid the exposures

and in the embraces of the dance, to claim that long skirts are the safeguard of modesty. The sentiment is gentility, as indicated by a life of ease; hence, fetter the girl so that she cannot romp, and lace her until her breathing capacity is so reduced that the disposition to romp is eradicated; then—what next? Wifehood protesting against the crucifixion of motherhood; motherhood laying its deforming hand upon its weak-chested progeny, and thus the damning sin writing itself in the very wasp-waisted forms (and not unlikely wasp-disposition) of the progeny, until the time has come when woman's beauty is her deformity, and one of her chiefest charms is her helplessness.

Oxygen the Source of Vital Heat.—Here let us recall the statement that the chemical affinity which oxygen has for the elements of food, and the wastes of tissue, is the only source of vital heat, which, transformed into energy, is vital force. Hence, the possible vital force of any animal is measured by its normal heat production; which, in turn, is dependent upon its oxygen consumption; which, in its turn, is largely governed by its muscular activity. Therefore, to be muscularly inactive is to be under-oxygenated, physically weak, chemically poisoned, and more or less fatally diseased.

The alternative is simple, but its horns are inexorable as fate—*exercise*, BREATHE, LIVE! or *drone*, HALF BREATHE, DIE! But with this alternative before us we must not lose sight of

The Triple Counterpoise of Health.—Every adult in health has an average of 22.4 ounces of digesto- assimilative power, and 33.6 ounces of excrementitious power, or 56 together. For their normal exercise, these require more than four cubic inches of respiratory power to each ounce. Hence, if the respiratory power falls below that number, these functions can be employed only to a corresponding degree.

For example, if the respiratory power be only 180 instead of 230 cubic inches, then the digestive and excretory functions can be safely burdened with only 45 instead of 56 ounces of food in 24 hours. And in order to perpetuate the health, the activities of life must be reduced in a corresponding ratio, or about one-fifth.

Or, as in the case of the Wellesley students, if the respiratory power be only 150 cubic inches, then 37 instead of 56 ounces is all the

food that can be safely taken, yielding about 2,600 calorics instead of the average 4,000 normally required. The effect that this must have upon their prospects in life, either in business in competition with men of full oxygenating capacity, or to endure the strain of wifehood and motherhood, can be easily estimated.

Hankins attributes the germicidal quality of the healthy blood to a "defensive proteid" in the serum, belonging to the globulines. This can only be organized by oxygen. Doubtless it was by this that the two eminent scientists, Dr. Pettenkofer and Dri. Emmerich of Munich, were enabled, without harm, to eat the cholera bacilli, in order to test its effect upon their system.

"So important is oxygen in the blood, that more than five per cent. is always found, even in venous blood, except in cases of asphyxia. And a body weighing 154 pounds consists of 97 pounds of oxygen." (N. Strogano.)

Subsidiary, or Incidental Foods, are those which are neither sources of energy, nor possessed of reparative power, such as condiments and stimulants. They are declared by Bunge to be "As necessary to us as food itself is," because they so act upon the organs of sense as to produce agreeable sensations and augment the secretion of saliva, and probably also upon "all processes and movements involved in digestion and absorption."

Tea.—The tea consumed annually in the world is estimated at 1,354,500,000 pounds. In 1890, 83,494,956 pounds, 1.33 pounds per capita were consumed in the United States. This enormous consumption entitles tea to a careful examination of its merits as a food accessory. Roberts declares that the ordinary view which ascribes its deleterious qualities to its contained tannin, is erroneous, and that ten grains of bicarbonate of soda to each ounce of dry leaves completely removes its real damage, namely as a deterrant of starch digestion.

Effect of These Foods on Digestion.—For the sake of condensation, we here group together the results upon digestion, of Roberts' experiments with various incidental foods.

Upon Salivary or Starch Digestion.—The medium strength of tea, as ordinarily used upon the table, is 4 to 5 per cent.; that is, 4 to 5 parts by weight of the dry leaf to 100 parts of

boiling water. Coffee ranges from 7 to 15 per cent; cocoa about 2 per cent. With 1 per cent. of tea there is perceptible retarding of digestion. With 3 per cent. it is delayed more than 12 times its normal period; with 5 per cent., to 45 times its normal period; and a 10 per cent. decoction totally prevents starch digestion. Coffee of 40 per cent. delays 2½ times, and at 60 per cent. it delays 5 times the normal period. Cocoa has practically no effect.

Effervescent waters, 50 per cent., wholly arrest salivary digestion.

Table vinegar, one-tenth of one per cent., retards it about 8 times the normal, and two-tenths of one per cent. entirely prevents starch digestion.

Sherry, one-half of one per cent., retards about 8 times the normal period, and one per cent. inhibits. A like amount of Hock retards 20 times the normal, and one per cent. totally prevents; brandy, 20 per cent. prevents; whisky, 40 per cent. prevents digestion of starchy foods.

Effect on Stomach Digestion.—Prof. Roberts is also authority for the following exhibits:

Tea fluid containing only 5 per cent. of tea leaves, and therefore having a strength of only 5 per cent., does not materially retard the digestive action of the stomach, or stomach digestion.

Food.	*Strength.*	*Effect on Stomach.*
Tea,	10 per cent.,	retards 5 minutes.
Tea,	20 "	" 40 "
Tea,	40 "	" 80 "
Tea,	60 "	embarrassed.
Coffee,	5 "	retards 5 minutes.
Coffee,	20 "	" 40 "
Coffee,	40 "	" 80 "
Beef tea,	10 "	" 5 "
Beef tea,	20 "	" 40 "
Beef tea,	40 "	embarrassed.
Alcohol,	10 "	retards 15 minutes.
Alcohol,	20	" 35 "
Alcohol,	40 "	" 100 "
Alcohol,	50 "	almost no digestion.
Sherry,	5 "	retards 5 minutes.
Sherry,	15 "	" 100 "
Sherry,	20 "	" 200 "
Sherry,	30 "	almost no digestion.
Port wine,	10 "	retards 15 minutes.
Port wine,	20 "	" 80 "
Port wine,	40 "	embarrassed.
Lager beer,	20 "	retards 15 minutes.
Lager beer,	60 "	" 80 "

The Food Value of Alcohol deserves more extended examination. The following table from Bunge furnishes a basis :

	Calories or metric heat units.	*Kgrms muscular work.*
One thousand grms. of grape sugar, on complete combustion to CO_2 and H_2O yield,	3,939 =	1,674,000
One thousand grms. of grape sugar, when split up into alcohol and CO_2 yield,	372 =	158,100
One thousand grms. of grape sugar when split up into butyric acid, CO_2 and H.	414 =	176,000
The amount of work done by Wislicenus in ascending the Faulhorn in 6 hours, amounted to,		148,656
The amount of work done by heart and respiration during same ascent amounted to,		30.000

Bunge says that "even if we grant that alcohol is turned to account in the body as a source of energy, yet this store of *energy is far smaller than that contained in the carbohydrate from which the alcohol was prepared.* In the fermentation of a kilogram of sugar, as the table shows, an amount of energy is wasted which would serve to carry a heavy man to the top of the Faulkhorn. We must remember, too, that certain cells of our body can probably avail themselves of the energy set free in the breaking down of food-stuffs, since no free oxygen ever reaches them. We thus see how foolish it is for men to give the nourishing carbohydrates of the grape juice and grain to be devoured by the yeast fungus, while they themselves feast on the excreta of the fungus. Fruit, berries and milk, too, are deprived of all their value in this way. No carbohydrate is safe from the insatiable spirit-monger, careless whether he murders thousands, so long as he only fills his pockets. And nothing is too foolish to find support in the authority of physicians."

A. J. Mott estimates the average consumption of alcohol among civilized nations as between four and five gallons of proof spirits per head per annum. (Nat. Rev., May, 1884.)

And Rohe says: "Neither in hot nor cold climates is alcohol necessary for the preservation of health. The pre-disposition to many diseases is greatly increased by its use, and investigation shows that the average expectation of life is shortened by its use, as this table shows:

Age.	*Abstainers.*	*Alcohol Users.*
At 25	32.08 years	26.23 years.
At 35	25.92 "	20.01 "
At 45	19.92 "	15.19 "
At 55	14.45 "	11.16 "
At 65	9.62 "	8.04 "

	General male population. Per cent.	*Alcohol venders. Per cent.*
Brain disease,	11.77	14.43
Tuberculosis,	30.36	36.57
Pneumonia,	9.63	11.44
Heart disease,	1.46	3.29
Kidney disease,	1.40	2.11
Suicide,	2.99	4.02
Cancer,	2.49	3.70
Old age,	22.49	7.05

Dr. J. H. Carver states the case in this way: "Grant that alcohol can be oxidized as a food, even then one ounce of it, or two ounces of whisky, in twenty-four hours, *is all that a healthy man can oxidize*, and this must be evenly distributed over the period (say one and one-half teaspoonfuls every two hours). Even if taken in quantities too small to be injurious, it cannot be classed as a food for the healthy. The CHO (fat and force elements) are more readily oxidized than the CHNOS (*i. e.*, the fiber elements). The alcohol attacks the CHO, and leaves the proteids to generate poisonous leucomaines. This disturbs the process of oxidation. Alcohol is a poison, as its indulgence taxes the oxidizing functions of the system beyond their capacity to oxidize both proteids and CHO compounds."

Dr. Porter contends that the use of alcohol is justifiable only in cases of sickness, when ordinarily, a skimmed milk diet is used and the patient is comparatively quiet, so that there is not much loss of heat and energy. Then, should there "be a sudden demand for more heat and energy, they can be secured by judicious use of alcoholic stimulants;" *e. g.*, if faintness or extreme depression results from the diet. Then small and frequent doses can be quickly oxidized, and thus stimulate the system without the consumption of digestive energy. "But," he says, "when the system has full digestive power, and therefore produces the requisite amount of heat and energy, the alcohol becomes an element of danger to the animal creation."

The bearing of these facts upon its use in disease will be considered in the treatment of diseases. It has been demonstrated, again and again, that men can endure the extremes of temperature, exertion and hardship better without, than with the use of alcohol.

Roberts has given some reasons for supposing that retarding digestion by those races that carry the preparation of their food to a high degree of digestibility, is really a natural instinct, and goes far to account for the almost universal use of such retarding agents. There may be some force in his reasons, from the standpoint of existing dietaries, but whether there would be, were the diets right, seems an open question.

Prof. Forster says that these food accessories do not aid digestion in health, but are useful for the sick, probably chiefly as appetizers.

Dr. Porter says that the best fluid to be taken after a meal is coffee, not strong, and taken without milk or sugar.

Roberts holds that tea, coffee, alcohol and tobacco benefit the community in the long run, simply because they are so generally used. If custom makes utility, then the well ascertained laws of physiology must be deemed of no account. For instance, the examination by the college physician of Yale university as to the effects of tobacco on the physical development of college students, made on the class which graduated in 1891, showed that during the course the non-users of tobacco increased 10.4 per cent. in weight, 24 per cent. in hight, 26.7 per cent. in chest girth, and in lung capacity 77.5 per cent. more than those who used the weed regularly. This is but one of many demonstrations of a like character, all proving the utter absurdity of the above claim. The proofs concerning the effects of alcohol are even more conclusive. When he says, "We have in our generalized food habits and customs a natural dietetic standard or model, as truly natural as the food habits of the squirrel, the blackbird or the trout," he overlooks the fundamental fact of man's moral depravity, and its influence upon physical habits and customs. When he can prove that man's nature is as unperverted as that of the animals', then his argument may be accepted.

Mastication and Salivary Digestion.—Prof. John Goodfellow ascertained, as the result of experiments made for Dr. E. Densmore, that about 10 per cent. of "the gelatinized and broken-down starch of dry bread" undergoes salivary digestion during *thorough* mastication, while ordinarily not over 2 per cent. is thus changed; and of cereals and vegetables masticated raw, not 1 per cent. of the starch was digested by the saliva.

This would seem to indicate that salivary digestion is of comparatively little importance. In reality, the thorough

breaking up of the food by perfect mastication, which Mr. Gladstone considers is accomplished by 25 bites on every morsel of meat, and its insalivation rendering it more readily soluble, are probably of equal or greater importance.

This is best done, contrary to the dictum of social etiquette, by filling the mouth with a large supply, as the instinct of children and animals teaches them to do, and then using teeth and tongue vigorously in the work of pulpation.

Extractive Foods.—Prof. Atwater remarks: "Another class of food ingredients which contain nitrogen are called extractives. They make up the active principles of beef tea and meat extracts. They appear at times to aid in digestion, and have some effect on the nervous system. They were formerly supposed to furnish actual nutriment, but while they neither form tissue nor yield energy, they give strength by helping the body to get and to use strength from other materials which it has." Yet Roberts has shown that beef tea equals 5 per cent. of table tea in its retarding power upon stomach digestion, and whey equals hock.

The Amount of Food Needed.—This has been ascertained by many and varied experiments. But this knowledge alone is of little practical utility, for the food elements are so unequally distributed in different food materials, that though one knows he needs, at very hard work, 72 ounces of food a day, at hard work 50 ounces, and at leisure 25 ounces, yet he may take an excess of one element and fall fatally short in others. Thus, if a working man is restricted to a single food material, as beef or potato, a pound and thirteen ounces of roasted beef would furnish the required fiber foods and some fats, but it has no force food; three pounds of cornmeal would yield the fiber foods, and with it a large excess of force foods; one and three-fourths pounds of codfish would supply some fiber foods, but it would have very little fats and no force foods; one and one-half pounds of fat pork would give him about one-eighth the requisite of fiber foods, more than four times the needed amount of fats, and no force foods.

Because of this unequal distribution of the food elements, and the ignorance of the people concerning their proper adjustment, various dietaries have been constructed. Here is one formed by Prof. A. W. Church:

DAILY RATION FOR A MAN AT LIGHT WORK.

1.	Bread	18	ounces	@	2½	cents	per pound,	2.8
2.	Butter	1	"	@	32	"	" "	2.0
3.	Milk	4	"	@	8	"	" quart,	1.0
4.	Bacon	2	"	@	12	"	" pound,	1.5
5.	Potatoes	8	"	@	2½	"	" "	1.2
6.	Cabbage	6	"	@	2½	"	" "	.9
7.	Cheese	3½	"	@	16	"	" "	3.5
8.	Sugar	1	"	@	6	"	" "	.3
9.	Salt	¾	"	@	say	"	" "	.0

Total solid food 2 pounds 10¼ ounces at a daily cost of about 13.5 cts.

10. Water alone, or tea, coffee or beer, 66¼ ounces.

Different Circumstances Require Different Diets.—Prof. W. O. Atwater estimates the correct amount of food for a properly balanced ration to be about one pound, including waste, to every 35 pounds of body weight, divided as follows: Fiber and fat foods, of each 150 grams or 4⅓ ounces, and of force foods 450 grams or 11.2 ounces, without waste. Our food, Mr. Atwater says, is about 50 per cent. water and waste, and yields 1,200 calories to the pound, and therefore 3⅓ or 3½ pounds of properly balanced food is the normal ration. Dalton estimates that 242 parts of fiber foods to 169 parts each of fat and force foods are required by a man at hard labor. Parry gives for a man at full work an average of 70 ounces of liquid food and 47 ounces of solid food, the solid food containing an average of 21.2 ounces of water, fiber foods 4.5, fat 1.9, force foods 18.2 and mineral matter 1.2 ounces. But the amount of food required varies according to circumstances, as clearly appears from the following table compiled from Ranke, Voit, Wolff, Playfair, Bunge, Vaughan and Atwater:

AVERAGE AMOUNT OF FOOD ELEMENTS REQUIRED FOR AN ADULT IN DIFFERENT CIRCUMSTANCES.

[Without Water or Waste, Stated in Grams.]

	Fiber foods. *Grms*	Fat foods. *Grms*	Force foods. *Grms*	Calories.
Bare Subsistence requires from 50 to 70 grams of fiber foods, and the figures show the amount of this and of each of the other food elements actually consumed by the average London sewing girl; Leipsic factory girl; English weaver in hard times; cloister monk and Playfair's bare subsistence, as averaged from the authorities quoted	58	27	365	1992
Very Light Work requires from 70 to 90 grams, which figures embrace the average ration of Lombardy laborers; Munich lawyers; Leipsic cabinet makers and painters; and women with light exercise	81	74	343	2430
Light Work Requires from 90 to 110 grams of fiber foods, which figures embrace the average ration of Japanese students; German professors; French Canadians working in Canada; aged men and those with light exercise.	100	94	345	2701
Moderate Work from 110 to 130 grams, which figures embrace German soldiers; Canadians working in Massachusetts; Massachusetts mechanics; dressmakers; clerks; men at moderate work; college students; U. S. army rations; Playfair's standard for adults; well-to-do Connecticut family	119	145	486	3836
Hard Work (1), from 130 to 150 grams, which figures embrace German miners; carpenters; physicians; English tailors; men at hard work; German soldiers, war-footing; college students in Northern and Eastern U. S	134	105	516	3731
Hard Work (2), from 150 to 170 grams, which embrace German mechanics; English hard-worked weavers; German soldiers, extra rations	154	147	522	4142
Quite Hard Work requires from 170 to 190 grams, which embrace brickmakers in Massachusetts, and machinists; U. S. navy rations; college football team; and Italian brickmakers	182	214	713	5664
Very Hard Work requires from 210 to 250 grams, which embrace Munich brewery laborers; Connecticut brickmakers; Massachusetts teamsters; and marble workers	233	246	831	6653

THE FOLLOWING SIMILAR TABLE

Is compiled from Ranke, Voit, Bunge and Atwater (also stated in grams).

	Protein.	Fats.	CHO.	Total.	Calories.
Very hard work,	192	205	639	1,036	5,310
Hard work	187	168	631	986	4,916
Light work	121	72	480	673	3,136
No work	100	100	240	440	2,324

Conclusions Drawn From the Table.—The amount for bare subsistence must be increased 10 per cent. for support without exercise, 20 per cent. for light work, 175 per cent. for average heavy work, 290 per cent. for very heavy work.

The amount of well-balanced foods, without waste, needed per day is, for a man, light work, 495 grams or 17 ounces; at hard work, 895 grams or 30 ounces, and at very hard labor, 1,310 grams or 45 ounces.

A young man 15 to 20 years old needs three-fourths as much as a man at full work; and a female at the same age, one-half as much.

An old man from 50 to 70 years needs two-thirds as much as a man at full work, and a woman of the same age about four-ninths as much as a man at full work.

The man over 70 years needs only one-half as much food as when in his prime, at hard labor, and a woman at that age needs one-third as much.

On the average, three-fifths of the allowance of food for a man at full work is the amount required for the entire population. Women need one-fourth less than men in the same condition.

Children require liberal feeding during the growing stage. A child of one and one-half years needs a third as much food as a woman at light exercise. From two to six years, the child requires half as much as a man with light exercise; boys from six to fifteen years, need half as much as a man at hard work, and girls a third as much. At the same ratio, a child one to three months old needs five grams or 1.4 drachms of food; three to seven months, 12 grams or 3.3 drachms; seven to twelve months, 30 grams or 1.3 ounces; and from twelve to eighteen months, needs 75 grams or 2.7 ounces of properly balanced food daily. The author of "Cheap Dinners for School Children" says that a child under one year needs a quarter as much as a man at hard work, and from one to five years needs one-third as much; but this is certainly an overestimate.

We Eat Too Much.—Americans consume more than Europeans in similar circumstances, and unquestionably use

more than is needful, to the serious detriment of their health. This over-consumption is demonstrated by the fact that every 100 pints of oxygen required for the reduction of the food calls for 17½ cubic inches of lung capacity. Hence, bare subsistence calls for 145 inches, light work 167 inches, hard work 255 inches, and very hard work 424 inches, at the ordinary tidal ratio of one-ninth. (See Page 104.) But that ratio is greatly modified by the deeper breathing caused by hard work, to the extent of possibly one-half, as shown by the excretion of carbonic acid, which may increase nearly or quite one-half. Even this estimate calls for 212 cubic inches of lung capacity for very hard work. Now add 80 per cent., or 170 cubic inches, and the American needs a lung capacity of 382 cubic inches. While he possesses only from 200 to 280 cubic inches, such diet is simply preposterous.

A Very Important Error in most dietaries consists in unduly increasing the amount of fiber foods for hard work, on the ground urged by Liebeg, that much work causes increased loss of the nitrogenous constituents of muscle. But Voit, O. Kellner, and Pettenkoffer have shown that work does not materially increase the excretion of nitrogen; while Lavoisier, Vierordt, Scharling, E. Smith, Speck, Ludwig, Screlkow, Max von Frey, and others, have shown that the absorption of oxygen and the excretion of carbonic acid are largely augmented; and Bernard, Külz, and others, have proved that this carbonic acid is drawn from the glycogen stored up in the tissues and liver, of which there is always 100 grams in each. Bunge holds that the fats also contribute to it, and that the nitrogen of the tissues is not drawn upon until the supply of fats and glycogen is exhausted, when the nitrogen may be transformed into glycogen, and serve as a source of muscular vigor. Hence, the proportion of fiber foods requires to be increased but slightly for greater muscular activity, provided that a sufficient supply of fats and force foods be furnished.

American Waste.—Americans waste a large proportion of food by an undue use of fat, starch and sugar. In European

dietaries, the fats range from one to five ounces a day, and the starches from 9 to 24. In American, the fats comprise from 4 to 16, and the starches from 24 to 60. German professional men, amply nourished, consume three to four and one-half ounces per day of fats, while American professionals eat from five to seven and one-half ounces.

Fats and starches together constitute the fuel ingredients of food. The "nutritive ratio" for a properly balanced food requires to each part of force food from four to six parts of fuel food, embracing both fat and force foods; but Americans use from six to eight parts of these substances to one of force food.

Prof. Atwater has also shown that the dietaries of professional men in Germany, Denmark, and Sweden, including students furnish an average of 2,670 calories a day. Those of Northern and Eastern States, America, was 4,140 per day, which is 1,340 calories a day more than German soldiers in time of peace are allowed, and 155 more than the field service finds sufficient in time of war, and is 1,240 calories more than the average of European working men.

Nor is this confined to the professions, for the average of twenty dietaries of Connecticut and Massachusetts laborers and mechanics show an average of 5,275 calories, being 2,365 above the European average.

The Necessity for Dietaries.—Who has not heard the mother's sigh, as she uttered from the depths of her heart, as well as brain, the perplexing question, "What *can* I get for my child to eat?" Knowing that he must be *sustained* through the exhausting sickness, or *built up* through the weary and perilous convalescence? Her solicitude may well be shared, in view of the foregoing dietary factors, by every one who proposes to provide the nutritive supplies of the human being.

How to Make Dietaries.—In all dietary efforts these things are of especial importance: (1) The nutritive demands of the case, as affected by different periods of life, different degrees of muscular exercise and exposure, and particular hab-

its and occupations. (2) The chemical constituents of the food. (3) The relative proportions of the different kinds of food. (4) Their digestibility. (5) The number of grams of oxygen required for their reduction. (6) The excrementitious products—neither excessive nor deficient. (7) Personal idiosyncrasies. (8) Cost. (9) All these as related to conditions of disease, if such be present.

Rules to Work By.—1. *The fiber foods* must range from two and three-fourths to eight ounces (very rarely as much as this) per day, according to the systemic and mechanical work accomplished. From many experiments by Bunge and others reported by Mr. Atkinson, it is evident that an average of about 20 per cent. of fiber foods taken into the stomach passes out of the system unappropriated. Hence, while Bunge places the amount of fiber foods absolutely necessary to preserve the system from wasting, at 3.22 ounces, Vaughan, Atwater, and Porter claim 4.19 ounces as requisite. Yet these elements must not be taken in such excess as to unduly load the excretory organs with nitrogenous waste. Hence, the respiratory oxygenating capacity is a most important factor, and, if the choice must be made between deficiency of fiber foods, for a time, and sub-oxidation of those foods, by all means should the first be chosen.

2. *The Fats* may range from two and one-half to eight and one-half ounces per day, according to the temperature and exposure of the person, and the scarcity or abundance of the force foods, since they are, to a certain extent, interchangeable.

3. *The force foods* may range from 12 to 29 ounces per day, according to the heat and force required. Rohé says that men at work excrete one-half of one per cent. more carbon dioxide, therefore, need more force foods. The greater activity of the young cells, in young persons, consume these foods faster relatively, than later in life; therefore, more are required for youths, in the same circumstances, than for adults.

The fats and force foods being interchangeable, may either of them be reduced to a minimum, provided the other be

increased to such an extent as to furnish the lacking supply of calories of heat. But in no case may the fat and force foods together exceed the oxidizing capacity of the system, *i. e.*, the lung capacity and respiratory habits of the individual.

4. *Idiosyncrasies.*—Foods that have proved, in ordinary experience, unsuited to an individual, should not be forced upon his system because they may be good for others. There are some unknown reasons why his laboratory cannot work up materials that others can. It is a personal idiosyncrasy, for which there is no accounting, and against which he cannot successfully fight.

5. *The fixed foods*, water and the mineral salts, may ordinarily be left to the supply which nature furnishes in the solid foods, and the calls of thirst. For the larger consumption of water, see Special Treatments.

6. *The accessory foods* should not be depended upon in health, and in sickness should be employed with the same care and judgment that other remedial means are.

7. *The tendencies of financial condition should be guarded against.* The food of the poor is apt to contain too little fiber element, while that of the rich has too much.

It is a species of rebellion against Providence when the poor, whom God has said "shall always be in the land," ape the manners of the rich in style of living. A true appreciation of resources, and an acquiescent adaptation to them, is the basis of contentment, without which a "stalled ox" is no better than a "dinner of herbs." Within the limits of health, he who has large supply is justified in a variety according to his taste. But he who must deny himself of fiber foods because they are not in his stock, must look well to it that the nearest possible approximation be made, and should pray "that the time of this evil be shortened."

Two Meals Contrasted.—*A poor dinner:* Four ounces fat pork, twelve ounces potatoes, six ounces bread, and sixteen ounces clear coffee. It contains of fiber foods 23 grams, fats 89, and force foods 167, equal to 1,630 calories. This poor

dinner, besides being somewhat deficient in calories of energy, is so defective in fiber foods that his necessary toil will draw from his tissues to supply the wastes; while the man of luxury has abundant supply of calories for his easy life, and such an excess of fiber foods as to endanger their sub-oxidation and resulting disease, as seen in the following:

A rich dinner: Eight ounces soup, four potatoes, three turnips, two fish, four poultry, two asparagus, two stuffing, three cranberries, two bread, three arrowroot pudding, three pie, two fruit, one nuts, two coffee, one butter, and one ounce of sugar. This ration would furnish of fiber food 53 grams, fats 73 grams, force foods 159, equal to calories 1,550.

The Cost of Food.—More than half of the income of the average family is expended for food. The Massachusetts Labor Bureau reports that the families of workingmen, who earn $350 to $400 a year, spend 64 per cent. of it for food, the proportion decreasing to 51 per cent. when the income is $1,200 a year, and average 57 per cent. About the same proportion holds true in England and Europe.

Fifty-seven per cent. of earnings spent for food invests the question of *cost* in diet with great significance.

Nutrition not governed by cost. There is little difference between the nutritive value of a quart of oysters and a quart of milk, but the oysters, at twenty cents per pound, cost nearly seven times as much as the milk, at three and one-half cents. A pound of rice and three and one-half pounds of potatoes are about alike in nutritive value, but the rice costs about eight cents per pound and the potatoes about one cent. Salmon and tenderloin of beef, at 75 cents per pound, are no more nutritious than halibut or shoulder steak, at 10 or 15 cents per pound. A pound of lean beef and a quart of milk both contain about the same quantity of actual nutritious materials, but the beef costs from two to four times as much. "When the poor man buys his pound loaf of bread for eight cents, he gets no more nutritive material than the well-to-do man obtains for three cents, in the flour which he has baked at

I. THE COMPARATIVE EXPENSIVENESS OF FOODS.

Costs of a Pound of Protein and Amounts of Potential Energy Obtained for Twenty-five Cents in Different Food-Materials at Current Market Prices.

The estimated cost (in cents) of one pound of protein in each Food-material, when the latter is bought at the market prices assumed, is expressed by the lengths of the light parallel lines, thus: ═══

The estimated number of calories of potential energy in the nutrients (actually nutritive ingredients) contained in the quantity of each Food-material which 25 cents would pay for if the material were bought at the market prices assumed, is expressed by dark lines, thus: ▬▬▬

Kinds of Food-Materials.	*Assumed prices of Food-materials per pound in cents.*	
Beef, sirloin	.25	106 cents... 870 calories
Beef, sirloin, at lower price	.20	85 cents... 1114 calories
Beef, round	.16	63 cents... 1145 calories
Beef, neck	.08	33 cents... 2793 calories
Mutton, leg	.22	91 cents... 1076 calories
Smoked Ham	.14	40 cents... 3060 calories
Salt Pork, very fat	.12	25 cents... 6825 calories
Salmon, early in season	1.00	511 cents... 158 calories
Salmon, at lower price	.30	153 cents... 519 calories
Mackerel	.10	79 cents... 929 calories
Codfish	.08	75 cents... 656 calories
Salt mackerel	.12½	52 cents... 1807 calories
Salt codfish	.07	43 cents... 1103 calories
Oysters, at 40 cents per quart	.20	268 cents... 326 calories
Hens' eggs, at 30 cents per dozen	.21⅛	121 cents... 768 calories
Milk, at 7 cents per quart	.03½	53 cents .. 2178 calories
Cheese, whole milk	.15	31 cents... 3403 calories
Cheese, skimmed milk	.08	18 cents .. 3642 calories
Butter	.30	no protein. 3082 calories
Oleomargarine	.15	no protein. 6164 calories
Sugar	.07⅐	no protein. 6292 calories
Wheat flour	.03	11 cents... 13782 calories
Wheat bread	.07½	35 cents... 4255 calories
Corn (maize) meal	.03	12 cents... 13488 calories
Oatmeal	.05	15 cents... 9189 calories
Rice	.08	34 cents .. 5068 calories
Beans	.05	14 cents... 7630 calories
Potatoes, at 75 cents per bushel	.01¼	22 cents... 7689 calories

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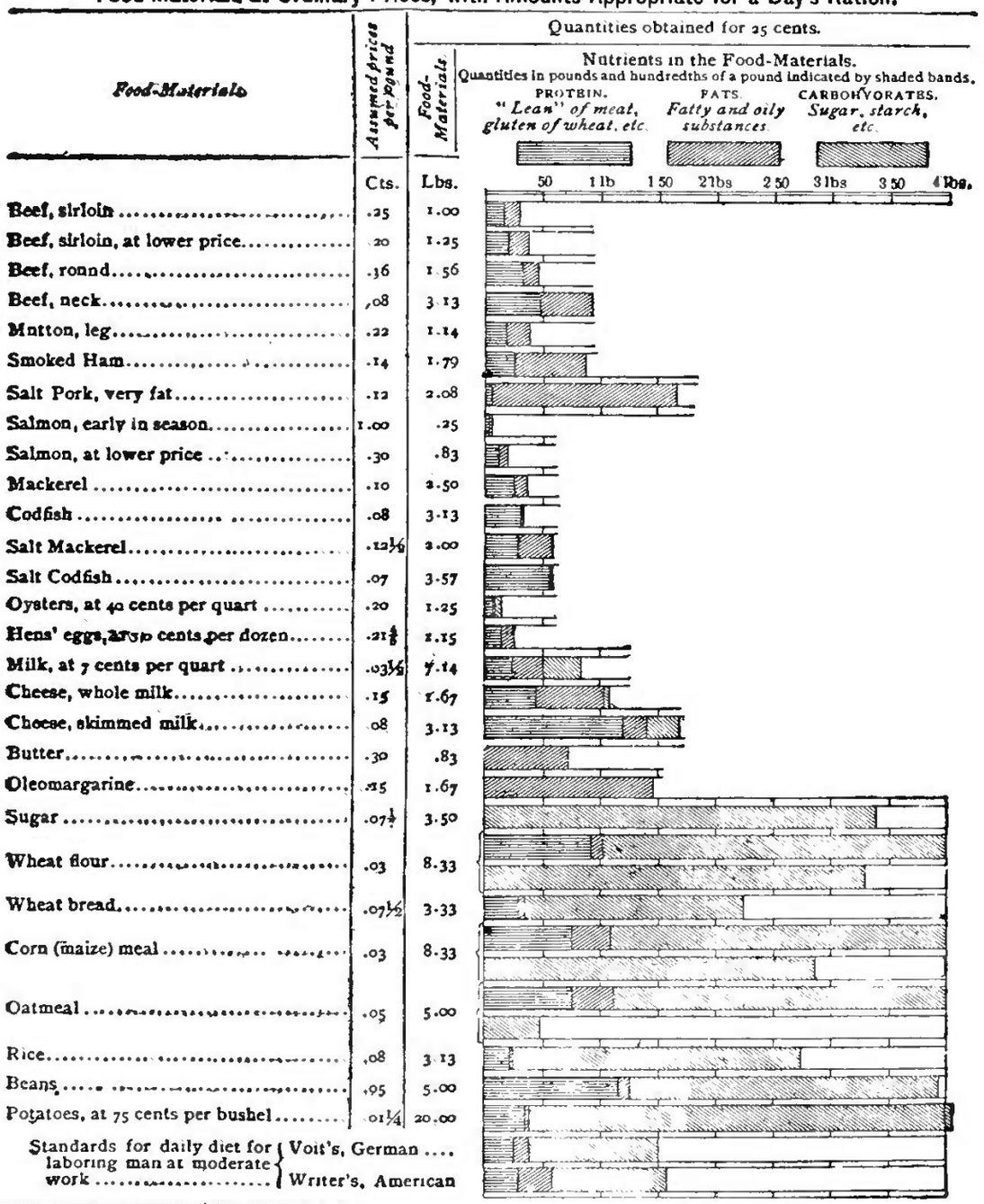
II. THE COMPARATIVE EXPENSIVENESS OF FOODS.

Amounts of Actual Nutrients (Nutritive Ingredients) Obtained for Twenty-five Cents in Different Food-Materials at Ordinary Prices, with Amounts Appropriate for a Day's Ration.



Food-Materials	Assumed prices per pound	Food-Materials
	Cts.	Lbs.
Beef, sirloin	.25	1.00
Beef, sirloin, at lower price	.20	1.25
Beef, round	.36	1.56
Beef, neck	.08	3.13
Mutton, leg	.22	1.14
Smoked Ham	.14	1.79
Salt Pork, very fat	.12	2.08
Salmon, early in season	1.00	.25
Salmon, at lower price	.30	.83
Mackerel	.10	2.50
Codfish	.08	3.13
Salt Mackerel	.12½	2.00
Salt Codfish	.07	3.57
Oysters, at 40 cents per quart	.20	1.25
Hens' eggs, at 30 cents per dozen	.21⅞	1.15
Milk, at 7 cents per quart	.03½	7.14
Cheese, whole milk	.15	1.67
Cheese, skimmed milk	.08	3.13
Butter	.30	.83
Oleomargarine	.15	1.67
Sugar	.07½	3.50
Wheat flour	.03	8.33
Wheat bread	.07½	3.33
Corn (maize) meal	.03	8.33
Oatmeal	.05	5.00
Rice	.08	3.13
Beans	.05	5.00
Potatoes, at 75 cents per bushel	.01¼	20.00
Standards for daily diet for laboring man at moderate work: Voit's, German		
Standards for daily diet for laboring man at moderate work: Writer's, American		

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home. In wheat flour the fiber element costs 11 cents, while in potatoes, at 50 cents per bushel, it costs 15 cents.

This point is clearly illustrated in the following table from Mr. Atkinson's book, "The Science of Nutrition:"

TABLE OF COST OF DIFFERENT FOODS.

Showing the cost of 3,000 calories obtained from different Food Materials.

Food Materials.	*Cost in cents.*
Suet at 6 cents a pound	$ 4.40
Potatoes at 30 cents a bushel, one-half cent a pound	5.00
Cornmeal at 3 cents a pound	5.43
Flour at 4 cents a pound, or $7.50 a barrel	7.26
Flour at 5 cents a pound, or $1.50 a bag	9.09
Potatoes at 50 cents a bushel, or one-half cent a pound	10.00
Sugar at 6 cents a pound	10.41
Beef from skin and flank, 4 cents a pound	12.00
Sausage, bacon and ham, at 12 or 12½ cents a pound	12.78
Beans and peas at 8 to 10 cents a quart	13.86
Sugar at 8 cents a pound	13.92
Rice at 8 cents a pound	15.69
Skimmed milk at 2 cents a quart	17.31
Parts of beef, mutton or pork, pretty fat, 8 to 10 cents a pound	20.00
Potatoes at $1.25 a bushel	20.60
Skimmed milk at 3 cents a quart	25.62
Apples at 45 cents a peck	27.30
Butter at 35 cents a pound	30.74
Milk at 7 cents a quart	34.74
Cheese at 14 cents a pound	36.33
Green vegetables at 5 cents a pound	61.50
Beef, medium fat, with 15 % bone, at 15¾ cents a pound	100.00
Eggs at 18 cents a dozen	106.50

8. *The circumstances which cause the demand* must be considered in providing the dietary supply. The healthy country school boy, who wades through snow a mile, to school, and frolics all the way, and whose school recesses are far too short for him to expend his pent-up energies in, will suffer the pangs of semi-starvation on the supply of food that would surfeit the city miss of his own age, who rises just in time for breakfast, minces and prims around until she takes the cars for school, and is too much of a lady to romp anywhere. And the physiological doll will be in her grave, from consumption, or a puny invalid for life, before the boy reaches the maturity that will sweep him on into the seventies.

It is as absurd to feed a whole family of aged, adults, and children, some sick and some well, some warmly housed and some exposed to storm and low temperature, upon the same fare, as it would be to expect them all to wear the same clothes. "Milk for babes," at both extremes of life, and "strong meat for men," was the apostle's view, which science has amply confirmed.

9. *The responsibility of right provision* should be considered. Hints have been given elsewhere of how profoundly the whole mental, physical, and spiritual nature of man is affected by his food. Hence, the responsibility of a right provision of daily aliment can only be measured by the immense interests at stake. What is health worth? What figures shall represent the value of sound mentality? And, so far as character affects spiritual life, who can adequately express the worth of organic helps to the noblest Christian attainments? The cloister was, undoubtedly, an extreme reaction from the pampered luxury of Roman life, but it was, nevertheless, an instinctive recognition of the fact that habitual customs do affect the inner being. The training of the schools is good, but if a child can have but one of the two, either a correct dietary or schooling, infinitely better is it for him to have the first than, having the second, to make it valueless by a wrecked physical organism.

Wrong Feeding and Disease.—*The diseases of the enlightened world are nature's protest against, and penalty for, wrong feeding.* The responsibility for it begins in the home.

There is very little doubt that consumption, with its appalling array of horrors, has its seed germ in the over-carbonaceous feeding of infants and youths. Says Dr. Porter: "The overtaxing of the digestive and oxygenating capacity of the system is the true foundation of nine-tenths of all the diseased processes to which human flesh is liable." (Merck's Bulletin, December, 1893, Page 73.) Says Dr. James Wood (Merck's Bulletin, February, 1892): "This functional perversion is largely due to the habit of feeding the growing child on a diet composed mainly of the starches and sugars."

Rev. Dr. R. N. Young says of the Sanitary Congress in England: "It was affirmed by a distinguished member of the Congress that, in England alone, there are a quarter of a million preventable deaths every year, and upward of seven millions of needless illnesses, which even an elementary knowledge of hygienic laws might have averted. It is time that lessons on the simple principles of sanitation should be given in primary schools."

Two hundred and fifty thousand preventable deaths!

Stop a moment! That means 2,000,000 more mourning parents and children every year in that little kingdom, than need be. With our greater food supply and population, at the same ratio, it means, in the United States, 4,000,000 draped in woe every year, chiefly because of wrong dietary habits, and 14,000,000 needless illnesses! How much loss of productive labor; how much useless expense, and how much suffering these entail! Verily, it is time to sound the tocsin of alarm.

The necessity for carefully-prepared dietaries rests upon the fact that the food elements are so unequally distributed in food materials. The following table compiled from several from Bunge and Wood shows the amount in grams of several kinds of food that it would be necessary to eat daily in order to give the repair materials requisite, also the amounts of fat and force foods that would be taken at the same time.

Foods.	Natural State.	Dried. (453 grams per pound)	With the 100 grams proteids taken up.	
			Carbo-hydrates.	Fats.
Apples	25,000	4,200	3,300	0
Carrots	9,000	1,000	820	20
Potatoes	5,000	1,250	1,090	8
Rice	1,250	1,100	990	11
Cabbage	3,000	440	220	21
Cow's milk	3,000	370	140	107
Maize	1,000	900	740	46
Wheat	800	700	580	14
Fat fish	750	330	0	220
Fat pork	650	360	0	250
Fat beef	600	250	0	150
Lean fish	550	110	0	3
Lean beef	480	112	0	7
Peas	430	370	230	7
Beans	435	.....	245	8
Oatmeal	710	.....	461	42
Bread	1,250	.....	687	25
Eggs	900	.....	36	90
Oysters	1,666	.....	830	277

Table of Defective Diets.—From the calculations of Porter and others, we have constructed the following table to show the defects of various diets, adding estimates not before made.

Diet.				
Moleschott's mixed.	Fiber-foods 4.19 oz. Fat " 2.89 " Force " 10.61 "	These require normal amount of oxygen, but are 16% deficient in energy.	Unfit for severe exertion long continued.
All bean. 32 oz.	Fiber-foods 8.38 "	Requires nearly ⅓ excess of oxygen but is about 8% short in energy.	Calls for more oxygen than the system can supply and doubles nitrogenous excretions overworking kidneys and inducing disease
Green vegetables. 11¼ lbs.	Fiber-foods 4.19 " Fat " 3.11 " Force " 6.05 "	Over 2-5% deficient in oxygen but 61% short in energy.	Deficient in fiber-foods from 20 to 30% because of incomplete absorption. Unfit for hard work.
Rice. 3 lbs. 10 oz.	Fiber-foods 4.19 " Fat " .47 " Force " 47.73 "	About normal in oxygen and 15% short in energy.	Unfit for energetic work, long continued.
Oatmeal. 34½ oz.	Fiber-foods 4.19 " Fat " 2.25 " Force " 22.78 "	Deficient over 1-12 in oxygen; about 10% short in energy.	20% cannot be absorbed, therefore, 50 oz. a day are needed. Overtaxed digestion, bowel irritation and sub-oxidation result.
Porter's animal.	Fiber-foods 4.19 " Fat " 4.19 "	Slight excess of oxygen; about 9% short in energy.	Deficient in force for hard work or cold weather.
Cows' milk. 115 1-5 oz.	Fiber-foods 4.19 " Fat " 5.17 " Force " 5.67 "	Requires about ¼ excess of oxygen and over 10% excess in energy.	Two to 6% undigested. Requires more oxygen than can be supplied. Generates too much force for health.
Skimmilk. 105 oz.	Fiber-foods 4.19 " Fat " 1.98 " Force " 5.29 "	Deficient over ¼ in oxygen and over 37% in energy.	Nutrition complete with little oxygen, but too deficient in energy for any save the inactive.
Cream. 155 oz.	Fiber-foods 4.19 " Fat " 41.36 " Force " 4.39 "	Nearly six times excess in oxygen and 542% excess in energy.	Energy beyond management. 37.19 oz. of fat more than can be worked up. Must prove cathartic.
Salisbury diet. 8 oz. steak per meal	Fiber-foods 3.6 " Fat " 3.3 " Force "	Three meals require but 463 grams oxygen=little over ⅓ the normal.	Very deficient in energy.
Mrs. E. H. Richards' diet.	Fiber-foods .40 " Fat " .40 " Force " 1.00 "	This gives the proportions only.	Deficient in energy.

From the foregoing table it will be seen how easily a chosen diet may prove either excessive or defective in important elements. If this be of consequence in health, how preeminently important when the vital powers are struggling with disease! The most skillful physician, with his best remedies may fail solely because the food of the patient reinforces the disease instead of the vitality.

Prof. Vaughan proposes a daily ration consisting of bread, codfish, lard, potatoes, bacon, beans, milk, sugar and tea in such proportions as to furnish 123 grams proteids, 70 grams fats, and 550 grams carbohydrates. The total cost or money value of this ration at present prices is about thirteen cents. In actual food value it is not inferior to the daily fare of the habitué of Delmonico's.

The Basis for Dietaries.—To furnish the basis for the construction of home dietaries, as well as to test those already before the public, we have prepared the following working table, giving the chemical constituents of food, and their special excreta, so that a glance will indicate with sufficient precision the particular diet required. Unquestionably, with such tables in common use, multitudes of lives would be saved, as well as the whole practice of medicine be rendered tenfold more efficient than it now is; besides, the necessity for calling medical aid would be much less frequent, because so many diseases would be prevented. The object in giving the columns of excreta is to enable the physician, by frequent examination of the urine in critical or obstinate cases, and by consulting the table, to outline a diet that shall meet the conditions of the case in a physiological and scientific manner and thus increase the probabilities of recovery. This we deem of special importance in fevers, consumption, rheumatism, malaria, etc.

WORKING TABLE.

(Compiled from Bunge, Atwater, Vaughan, König, Halliburton, with many original estimates.) Showing the food elements, excretory substances, oxygen requisites, and force evolved from 100 grams of one hundred and fifty-six kinds of perfectly digested and assimilated food. Also the percentages of digestible protein, fats and carbohydrates, based upon compilations of Atwater, König, Munk and Uffelmann, and Von Reehenberg.

Food.		Water and Refuse	Protein	Fats	Carbohydrates	Mineral Salts	Calories per pound	Pints ox.req. for 100 gr. food	Price per pound in cts.	Urea	Water	Carbonic Acid	Per cent. digested of		
													Protein	Fats	Carbohyd's
Alcohol, not car.-hy.	P.	0.75	.....	.....	99.2	.....	3480	255	$0.40	.....	116.4	189.7	.....	.....	.....
Almonds	K.	11.95	24.18	53.68	7.23	2.96	2848	248	.20	8.1	73.26	203.02	.....	.....	.....
Ale	A.	88.1	.60	5.1	6.8	.4	228	28	.25	2.01	9.92	25.33	.....	100	100
Apples	K.	85.56	.39	.....	12.9	.31	247	18	.02	.13	7.9	19.58	100	.....	87
Apricots	K.	86.49	.49	.....	11.04	.82	214	15	.08	.16	6.82	17.02	100	.....	87
Arrowroot	P.	18.	.....	.....	82.	.....	1525	108	.50	.....	49.2	120.21	.....	.....	95
Barley	K.	18.58	11.62	2.12	65.51	2.63	1523	116	.02	3.89	46.4	121.98	80	55	99
Beef, side	A.	63.7	13.8	21.7	.....	.8	1170	94	.10	4.62	29.5	84.71	97	95	.....
Beef, round	A.	70.	20.7	8.1	.....	1.2	725	68	.16	6.93	17.48	49.53	97	95	.....
Beef, extract	K.	21.70	.....	60.79	.....	17.51	2583	218	3.20	.....	66.7	104.55	.....	95	.....
Beef, neck	A.	68.15	15.4	14.3	.....	.8	890	80	.05	5.15	22.06	66.77	97	95	.....
Beef, sirloin	A.	70.	15.	14.3	.....	.7	885	79	.18	5.02	21.89	65.98	97	95	.....
Beef, flank	A.	55.8	12.4	29.2	.....	2.6	1460	128	.05	4.15	37.18	103.38	97	95	.....
		35.9	10.6	52.9	.....	.6	2430	210	.05	3.55	62.46	166.87	97	95	.....
Beef, smoked	K.	47.	27.	15.5	.....	10.5	1155	106	.25	9.04	28.16	89.99	97	95	.....
Bluefish	A.	88.9	9.8	.6	.....	.7	210	20	.10	3.28	10.10	18.54	97	95	.....
Butter	A.	10.	1.	85.	.5	3.5	3615	307	.25	.33	97.04	241.3	94	96	100
Blackberries	K.	91.62	.51	.....	6.20	.48	124	9	.10	.17	3.93	9.96	100	.....	87
Buttermilk	P.	88.	4.1	.7	6.4	.8	224	18	.03	1.37	6.3	18.3	94	96	100
Beans	Av.	13.7	23.2	2.1	57.4	3.6	1585	127	.05	7.77	56.32	129.9	83	36	96
Beans, snap	K.	89.87	4.67	.3	6.6	.64	222	18	.05	1.56	6.21	18.5	83	36	96
Beets	K.	89.	1.	.....	9.	1.	185	14	.02	.33	5.81	14.9	61	94	82
Bananas	A. *Ed.*	73.1	1.9	.5	23.3	1.1	495	36	.03	.63	15.21	38.8	100	.....	87
Bread, rye	K.	30.	8.4	.5	59.7	1.4	1285	96	.06	2.81	39.83	103.3	68–78	51	89
Bread, wheat	A.	32.7	8.9	1.9	55.5	1.	1280	97	.06	2.98	39.06	102.	78	55	99
Beer, lager	A.	90.3	.4	2.	5.8	.2	199	15	.08	.13	5.84	14.8	.....	100	100
Chestnuts	K.	53.09	5.48	1.37	38.34	1.72	872	66	.06	1.83	26.77	69.4	.....	.....	.....
Chicken, lean	A.	83.8	14.2	1.2	.....	.8	315	31	.20	4.7	7.18	27.7	97	95	.....
Codfish, dressed	A.	87.14	10.6	.2	.....	.8	205	21	.10	3.5	4.59	18.7	97	95	.....

Food.		Water and Refuse	Protein	Fats	Carbohydrates	Mineral Salts	Calories per pound	Pints ox. req. for 100 gr. food	Price per pound in cts.	Urea	Water	Carbonic Acid	Per cent. digested of		
													Protein	Fats	Carbohyd's
Cheese, skimmed	*Ed.*	41.3	38.4	6.8	8.9	4.5	1165	108	$0.08	12.8	28.66	98.2	89-99	95-97	100
" whole milk	*Ed.*	31.2	27.1	35.5	2.3	3.9	2045	181	.14	9.07	51.51	149.7	89-99	95-97	100
Cream	P.	66.	2.7	26.7	2.8	1.8	1228	106	.20	9.04	32.11	83.7	89-99	95-97	100
Cornmeal	A. *Ed.*	14.5	9.1	3.8	71.	1.6	1650	124	.03	3.04	50.53	130.4	85	83	97
Carrots	Av.	88.85	1.04	.21	9.08	.71	196	15	.05	.34	6.1	15.6	61	94	82
Duck, wild	K.	70.82	22.65	3.11	2.33	1.09	595	57	.20	7.58	14.16	50.1	97	95	.....
Cabbage	Av.	85.84	4.04	.69	4.77	1.56	192	16	.03	1.35	5.28	15.88	82	94	85
Cherries	K.	86.33	.62	.8	11.41	.73	223	16	.07	.20	7.98	17.7	100	.....	87
Cranberries		87.6	.4	.9	10.9	.2	350	18	.08	.13	7.69	19.1	100	.....	87
Crackers, soda	A.	8.	10.3	9.4	70.5	1.8	1900	146	.06	3.45	56.87	147.4	78	95	99
Codfish, salt	A.	42.1	16.	.4	.....	1.2	315	32	.10	5.36	7.04	28.64	97	95	.....
Cucumbers	K.	96.22	1.02	.09	2.38	.39	67	5	.04	.34	1.94	5.49	82	94	85
Crackers, Boston	A.	8.3	10.7	9.9	68.7	2.4	1895	146	.07	3.58	56.5	146.9	78	95	99
Eel, fat	A.	69.8	8.6	21.	.....	.6	1045	92	.15	2.88	26.6	73.8	97	95	.....
Eggs, yolks	K.	50.82	16.24	31.75	.13	1.09	1627	145	.....	5.44	41.6	117.3	.....	.....	.....
Eggs, hens	A.	76.8	11.8	10.2	.4	.8	655	64	.25	3.95	16.13	49.5	97	95	.....
Eggs, albumen	K.	85.75	12.67	.25	.....	.59	236	25	.....	4.24	5.5	22.49	.....	.....	.....
Flounder, whole	A.	93.1	5.2	.3	.....	.5	110	11	.03	1.74	2.47	9.78	97	95	.....
Flesh, horse	K.	74.27	21.71	2.55	.46	1.01	519	51	.....	7.27	12.04	45.18	97	95	.....
Flour, wheat	A.	11.6	11.1	1.1	75.6	.6	1660	125	.04	3.71	51.15	133.	79	55	99
Figs, dried	K.	32.31	5.06	.....	45.28	2.96	978	69	.20	1.69	29.25	75.08	100	.....	87
Flour, graham	A.	13.	11.7	1.7	71.8	1.8	1625	123	.04	3.91	49.77	130.15	70	49	93
Flour, rye	A.	13.1	6.7	6.7	78.7	.7	1620	141	.04	2.24	57.34	137.7	75	55	98
Flour, buckwheat	A.	13.5	6.5	1.3	77.6	1.1	1620	119	.04	2.17	50.67	128.5	.....	.....	.....
Grapes	K.	81.77	.59	.....	16.24	.53	355	23	.07	.19	10.98	24.82	100	.....	87
Goose, fat	K.	38.	16.	46.5	.....	.5	2258	197	.14	5.36	57.9	158.1	97	95	.....
Game, dressed	K.	75.5	22.5	1.	.....	1.	460	46	.25	7.53	10.39	41.5	97	95	.....
Heart, ox	K.	70.08	21.51	7.47	.16	.78	718	67	.05	7.2	17.18	58.2	97	95	.....
Heart	K.	73.	18.	8.	.....	1.	672	63	.05	6.03	16.21	53.4	97	95	.....
Hare	K.	74.16	23.34	1.13	.19	1.18	485	48	.15	7.81	10.99	43.59	97	95	.....
Haddock	A.	91.	8.2	.2	.....	.6	160	16	.08	2.74	3.60	14.66	97	95	.....
Hazelnuts	K.	7.05	15.62	66.47	9.03	1.83	3262	280	.15	5.23	84.85	226.8	.....	.....	.....
Halibut, dressed	A.	78.16	15.1	4.4	.....	.9	465	44	.15	5.08	11.06	38.3	97	95	.....
Herring, smoked	A.	69.11	20.2	8.8	.....	.9	745	70	.18	6.76	18.	59.4	97	83	.....
Ham, smoked	A.	50.3	14.6	34.2	.....	.9	1715	150	.18	4.89	43.5	121.2	97	83	.....

FOOD.		Water and Refuse	Protein	Fats	Carbohydrates	Mineral Salts	Calories per pound	Pints ox.req. for 100 gr. food	Price per pound in cts.	Urea	Water	Carbonic Acid	Per cent. digested of		
													Protein	Fats	Carbohyd's
Kidneys	K.	76.7	18.5	4.	.....	1.	512	49	$0.05	6.19	12.03	43.06	97	95	.....
Kumyss	K.	87.88	2.83	.94	7.08	1.07	224	18	.25	.94	6.44	17.88	89–99	96	100
Liver	K.	74.5	20.	4.	.....	1.5	540	52	.08	6.7	12.6	45.64	97	95	.....
Lentils	K.	16.1	24.81	1.85	54.78	2.47	1558	126	.15	8.3	45.1	128.17	82	94	85
Lard	A.	1.	.....	99.	.....	.....	4180	355	.10	.....	108.7	278.1	.....	95	.....
Leek	K.	89.21	2.83	.29	6.53	1.24	178	15	.06	.94	5.4	15.25	82	94	85
Lobsters	A.	93.1	5.5	.7	.1	.6	135	13	.18	1.84	3.09	21.1	97	95	100
Macker'l, fat, whole	A.	75.12	12.1	10.7	.....	1.	675	61	.18	4.	16.74	50.8	97	95	.....
Macker'l, lean "	A	86.8	11.2	1.4	.....	.6	265	26	.15	3.75	6.16	23.1	97	95	.....
Macker'l, ave. wh'le	A.	84.1	10.	4.3	.....	.7	365	34	.16	3.35	8.85	29.2	97	95	.....
Mackerel, salt	A.	68.5	14.7	15.1	.....	1.7	910	82	.18	4.92	22.6	67.7	97	95	.....
Mackerel, Spanish	A.	68.1	26.	9.8	.....	1.5	790	74	.20	6.9	19.26	62.9	97	95	.....
Milk, human		88.3	3.4	3.5	4.6	.2	296	25	.....	1.13	8.	22.4	89–99	95–97	100
Milk, cows	Av.	87.57	3.7	3.4	4.9	.6	310	26	.06	1.23	8.2	23.1	89–99	95–97	100
Milk, " skimmed	Av.	88.	4.	1.8	5.4	.8	175	21	.02	1.34	6.86	19.85	89–99	95–97	100
Milk, " condensed with sugar	P.	30.34	16.07	12.1	38.88	2.61	1532	125	.18	5.38	43.24	118.6	89–99	95–97	100
Milk, cond., no sug.	K.	53.7	14.6	14.	15.4	2.4	1148	98	.18	4.89	30.64	87.02	89–99	95–97	100
Melons, water	K.	91.9	.9	.7	6.2	.3	160	12	.01	.3	4.85	12.6	100	.....	87
Macaroni	K.	13.91	9.02	.28	76.79	.84	1607	119	.16	3.02	46.4	128.87	83	94	99
Muskmelon	A.	.....	1.04	.2	20.5	1.05	415	30	.03	.34	12.94	32.4	100	.....	87
Mutton, side, fat	A.	62.9	13.2	23.2	.....	.7	1225	108	.12	4.42	30.92	87.8	97	95	.....
Mutton, leg, fat	A.	68.8	15.	15.5	.....	.7	935	84	.14	5.02	23.2	69.3	97	95	.....
Mutton, should'r, fat	A.	64.15	15.	18.7	.....	.8	1070	95	.18	5.02	26.7	78.3	97	95	.....
Mutton chops, fat	A.	57.6	12.5	29.3	.....	.6	1470	$128\frac{1}{2}$	.20	4.18	37.3	103.8	97	95	.....
Molasses	A.	24.6	.....	.....	73.1	2.3	1360	$96\frac{1}{2}$	.06	.....	43.8	107.1	.....	.....	100
Oysters, in shell	A.	97.7	1.1	.2	.6	.4	40	$3\frac{1}{2}$	.16	3.68	1.03	3.33	97	95	100
Oleomargarine	A. *Ed.*	10.	.6	84.5	.4	4.5	3585	305	.22	.20	93.2	239.	97	95	100
Peanuts, fresh	K.	6.5	28.2	46.4	15.7	3.2	2773	240	.06	9.44	72.01	201.9	.....	.....	.....
Oysters	Ave. K.	87.1	6.	1.2	3.07	2.	230	$19\frac{1}{2}$	.18	2.01	5.63	18.19	97	95	100
Pigeon	K.	75.1	22.14	1.	.76	1.	468	46	.36	7.4	10.69	42.	97	95	.....
Oatmeal	Av.	10.67	14.31	6.44	65.67	2.05	1749	137	.05	4.79	52.38	138.98	.....	.....	.....
Prunes, dried	K.	31.26	2.55	.53	61.5	1.39	1213	88	.12	.85	38.5	96.03	100	.....	87
Onions	K.	70.99	2.68	.10	25.69	.54	531	39	.03	.89	16.2	41.5	82	94	85
Pork, lean	K.	72.0	20.	7.0	.....	1.	667	$62\frac{1}{2}$	.16	6.7	85.1	54.07	97	95	.....

Food.		Water and Refuse	Protein	Fats	Carbohydrates	Mineral Salts	Calories per pound	Pints ox. req. for 100 gr. food	Price per pound in cts.	Urea	Water	Carbonic Acid	Per cent. digested of		
													Protein	Fats	Carbohyd's
Pork, fat	K.	19.9	2.8	76.5	.....	.8	3280	280	$0.12	.93	15.9	219.78	97	95	.....
Potatoes	A. Av.	78.9	2.1	.1	17.9	1.	375	28	.01	.70	11.7	30.13	68	96	92
Plums	K.	89.2	.4	.....	8.24	.66	160	11½	.10	.13	5.1	12.76	100	.....	87
Potatoes, sweet	A. Av.	71.1	1.5	.4	26.	1.	530	38½	.04	.5	13.7	41.82	.....	.....	.....
Peaches	K.	86.09	.65	.....	12.65	.69	247	18	.08	.21	7.85	19.66	100	.....	87
Pears	K.	87.33	.36	.....	11.80	.31	225	16	.06	.12	7.22	17.9	100	.....	87
Pike	K.	77.45	20.11	.69	.92	.83	420	41½	.10	6.73	9.61	37.8	97	95	.....
Peas	Av.	17.3	22.8	1.8	55.6	2.5	1533	122⅓	.04	7.63	44.75	125.7	83	36	96
Peas, green		78.1	4.4	.6	16.	.9	405	31½	.05	1.47	12.07	32.7	83	36	96
Raspberries	K.	92.11	.53	.....	5.49	.49	111	8	.08	.17	3.51	8.95	100	.....	87
Porter	A.	88.1	.6	alco'l 5.1	6.8	4.	293	28	.20	.20	9.92	25.33	.....	100	100
Pumpkin	K.	91.37	.71	.05	7.23	.64	149	11	.03	.23	4.68	11.9	.....	.....	.....
Rice	A. *Ed.*	12.4	7.4	.4	79.4	.4	1630	120	.08	2.47	51.13	130.	80	93	99
Roach	K.	75.49	22.23	.47	.....	1.71	433	43⅓	.14	7.44	9.69	39½	97	95	.....
Shad, whole	A.	85.3	9.2	4.8	.....	.7	375	34⅓	.15	3.08	9.07	29.3	97	95	.....
Raisins, dried	K.	35.74	2.42	.59	62.04	1.21	1223	88½	.15	.81	38.7	95.7	100	.....	87
Salmon, whole	A.	75.9	14.3	8.8	.....	1.	635	58½	.22	4.79	24.7	49.	97	95	.....
Salmon, canned	A.	63.12	19.3	15.3	.....	1.2	1005	91	.20	6.46	15.5	76.	97	95	.....
Sardines	A.	58.6	24.	12.1	.....	5.3	955	88½	.20	8.04	23.1	75.	97	95	.....
Strawberries	K.	90.	1.07	.45	6.76	.81	164	12½	.08	.35	4.99	13.	100	.....	87
Sausage	K.	24.5	28.5	40.	.....	.7	2217	197	.12	9.54	11.77	161⅓	97	95	.....
Starch, sago, etc.	K.	14.84	1.46	.....	83.31	.39	1576	113	.05	.48	94.5	124⅓	.....	.....	95
Sugar	A.	2.2	.3	.....	96.7	.8	1800	128	.06	.10	58.1	142.	.....	.....	100
Turkey	A.	77.12	15.4	5.6	.....	.08	525	49	.16	5.15	12.5	42.	97	95	.....
Tongue	K.	67.5	14.5	17.	.....	1.	986	88	.22	4.85	24.6	72.7	97	95	.....
Tongue, smoked	K.	35.5	24.5	31.5	.....	8.5	1784	159	.25	8.2	44.7	130.65	97	95	.....
Tomatoes	K.	93.67	1.25	.33	4.08	.63	131	9	.02	.41	3.32	9.05	.....	.....	.....
Tallow	K.	1.3	.5	98.2	.....	.....	415	353½	.08	.16	108.03	276.8	97	95	.....
Trout, whole	A.	88.5	9.8	1.1	.....	.06	230	22	.50	3.28	5.25	19.94	97	95	.....
Turbot, whole	A.	84.1	6.8	7.5	.....	.7	445	39½	.10	2.27	11.04	32.7	97	95	.....
Turnips	K.	92.15	.96	.16	5.98	.75	135	10	.02	.32	4.16	10.86	61	94	82
Venison	K.	75.76	19.77	1.92	1.42	1.13	475	46	.25	6.62	11.12	41.48	97	95	.....
Veal, fat	K.	72.5	19.	7.5	.....	.1	669	62½	.16	6.36	16.08	53.75	97	95	.....
Veal, lean	K.	78.	20.	1.	.....	.1	414	41	.14	6.7	9.35	37.2	97	95	.....

Food.		Water and Refuse	Protein	Fats	Carbohydrates	Mineral Salts	Calories per pound	Pints ox. req. for 100 gr. food	Price per pound in cts.	Urea	Water	Carbonic Acid	Per cent. digested of		
													Protein	Fats	Carbohyd's
Vegetables, green	P.	88	2.5	1.7	3.2	4.5	177	15	$0.05	.83	4.81	13.76	99	80	95
Whitefish, whole	A.	85.1	10.3	3.	.....	.7	318	30	.12	3.45	7.54	26.14	97	95	.....
Wine, Rhine		86.6	.....	8.7	2.6	.25	415	34½	.75	.....	11.1	28.2	.....	.....	100
Wine, sherry		79.5	.....	17.	3.2	.3	776	65	.50	.....	20.5	52.4	.....	.....	100
Wine, French claret		88.3	.....	8.	2.3	.2	380	31½	.40	.....	10.1	25.8	.....	.....	100
Whey		93.31	.82	.24	4.98	.65	118	9	.08	.27	3.59	9.38	94	96	100
Whortleberries		90.65	.78		5.80	1.02	124	9	.08	.26	3.85	9.97	100	.....	87
Walnuts		10.83	16.37	62.86	7.89	2.03	3103	266½	.15	5.48	80.5	216.3	.....	.....	.....
Alewife	A.	37.5	9.7	2.5	.....	.8	285	27	.10	3.24	6.75	23.7	97	95	.....
Bass, Sea	A.	79.3	18.8	.5	.....	1.4	370	35	.12	6.29	8.31	33.7	97	95	.....
Cauliflower	A.	90.8	1.6	1.8	5.	.8	155	16	.07	.53	1.83	15.14	82	94	85
Cake	A.	.....	8.3	10.8	57.6	.....	2140	130	.20	2.78	19.8	129.06	78	95	99
Chocolate	A.	.....	6.2	21.	69.	.....	002	178	.40	2.07	67.01	170.8	42	95	100
Clams from shell, long	A.	85.8	8.6	1.	2.	2.6	240	22	.17	2.88	4.64	20.5	97	95	100
Drop cakes	A.	...	7.7	14.7	60.3	.....	1884	147	.15	2.57	55.5	142.9	78	95	99
Hominy	A.	13.5	8.3	.4	77.4	.4	1620	119	.05	2.78	50.3	11.34	85	83	97
Lobster, from shell	A.	81.08	14.6	1.9	.....	1.7	350	34	.15	4.89	8.11	30.45	97	95	100
Mincemeat	A.	...	4.	2.2	67.4	.....	1420	104	.10	1.34	44.5	111.8	97	.....	.....
Perch	A.	75.6	17.6	2.7	.....	1.1	485	42	.15	5.89	10.01	37.29	97	95	.....
Pineapple	A.	89.3	.4	.3	9.7	.3	200	11½	.05	.13	6.31	15.75	100	.....	87
Porgy	A.	75.0	18.5	5.1	.....	1.4	560	53	.15	6.19	13.23	46.1	97	95	.....
Rhubarb, stewed	A.	92.7	.8	1.2	4.4	.9	145	11½	.02	.26	4.28	11.19	.....	.....	.....
Spare rib	A.	...	17.	30.4	.....	.....	1598	141	.12	5.69	40.4	114.6	97	95	.....
Tomatoes, canned	A.	94.7	1.	.2	3.7	.4	95	7½	.06	.33	2.85	7.7	.....	.....	.....

The capital letter after the name of the food signifies the authority thus: *P.*—Porter. *Ave.*—our average of different estimates. *Ed.*—signifies that the edible portion only was examined. The energy is calculated on the basis of 4.1 calories per gram for protein and carbohydrates, and 9.3 for fats; and the oxygen requisites and excretory products on the basis of protein C_{72} H_{112} N_{18} S O_{22}, fats C_{57} H_{104} O_6, and carbohydrates C_6 H_{12} O_6. Approved by Howard B. Gibson, Ph. D.

Its Availability Illustrated.—In order to show the availability of this information, let us suppose a few cases from real life.

Mrs. Blank keeps a boarding-house. At one hour she feeds four hard-working men, each five feet ten or over, and none less than 180 pounds in weight. At another hour she feeds two milliners and two female clerks of small stores, with not much business, all under five feet five in height, and less than 110 pounds in weight. What should be the fare for each table per day?

For the men, five pounds, or 6,000 calories each, which might be as follows, giving a generous measure:

4	Pounds	Beef Side	½	Pound	Skim-Cheese
3	"	Sausages	2	"	Codfish
5	"	Potatoes	2	"	Bread
½	"	Butter	¼	"	Coffee
¾	"	Onions	1	"	Milk
1	"	Sugar	¾	"	Corn Meal

For the females she provides 2¼ pounds of food for each, giving 2,400 calories:

Beef,	1 Pound	Fish, fresh,	1½ Pounds	Bread,	1 Pound
Butter,	½ "	Potatoes,	1 "	Fruit, Prunes,	1 "
Sugar,	¼	Peas	¾ "	Milk	1½ "
Oat Meal	½ "	Tea.			

The Young Couple.—A young husband enters home disheartened. "What's the matter, George?" says the anxious wife. "Matter enough, Mary. The shop is shut down, and I am out of a job, and no telling when I can get another." "Well, that is bad, but cheer up, George; the rent is paid a month in advance, there are two tons of coal in the cellar, a barrel of flour in the pantry, and no one to provide for but yourself and me, and the baby (glancing, with half-tearful eye, at the crib, where little 10-months Jacob sleeps, as if it were Eden everywhere), and, besides, I have twenty dollars saved up that we can use. You will get some odd jobs, and I will see what I can do towards economy in living, after the plan that I was reading about the other day." So she searches Vaughan's tables, and, with a little ingenious adaptation, finds that she can provide, at a very small cost both a varied and healthful supply.

VAUGHAN'S DIET TABLES,

Prepared by order of the Michigan Board of Hea
Victor C. Vaughan, Ph. D., M. D. The lard in these t
for cooking. P., signifies protein; F., fats; C-h, carbohy
such as sugar, starch, and fiber.

Class I, No. 1.

Total cost, 13 cents; Protein, 4 ounces; Fats, 2.88 ounces; C-h., 24½

Breakfast.	*Cts.*	*Dinner.*	*Cts.*	*Supper*
2 oz. oatmeal,	.5	24 oz. potatoes,	1.5	4 oz. beans,
1 pt. milk,	3.0	1 oz. lard,	5/8	1 oz. lard,
10 oz. bread,	1.9	10 oz. bread,	1.9	6 oz. bread,
½ oz. sugar,	¼			5 oz. tea,
				½ oz. sugar,

Class I, No. 2.

Total cost, 14.1 cts; Protein, 4.10 ounces; Fats, 2.39 ounces; C-h, 21.2

2 oz. cheese (toasted)	1.5	4 oz. beans,	1.0	4 oz. rice,
		1 oz. lard,	5/8	1 pt. milk,
10 oz. bread,	1.9	10 oz. bread,	1.9	1 oz. sugar,
8 oz. coffee,	2/3			6 oz. bread,

Class 1, No. 3.

Total cost, 15 4 cents; P. 4.25 ounces; F., 2.91; C-h., 23.06 oun

4 oz. graham flour,	½	1 oz. macaroni,	1¼	16 oz. bread,
1 oz. lard,	5/8	4 oz. fat cheese,	3	16 oz. potatoes,
1 oz. sugar (or syrup),	½	10 oz. bread,	1.9	1 pt. milk,
8 oz. coffee,	2/3			

Class 1, No. 4.

Total cost, 13.8 cents; P., 4.51 ounces; F., 2.13 ounces; C-h., 18.32

2 oz. oatmeal,	½	4 oz. baked heart	2.5	2 oz. rice,
½ pt. milk,	1.5	8 oz. potatoes,	½	½ oz. sugar,
½ oz. sugar,	½	10 oz. bread,	1.8	½ pt. milk,
1 oz. codfish,	5/8			6 oz. bread,
1 oz. lard,	5/8			
6 oz. bread,	1.1			

Class 1, No. 5.

Total cost, 13.3 cents; P., 4.19 ounces, F., 2.49 ounces; C-h., 26.92

8 oz. buckwheat flour (as cakes),	1.5	4 oz. beans,	1.	16 oz. bread,
		½ oz. lard,	⅓	1 oz. butter,
1 oz. sugar,	½	16 oz. bread,	3.	½ pt. milk,
½ oz. lard,	⅓			
8 oz. coffee,	2/3			

Class 1, No. 6.

Total cost, 16.3 cents; P., 4.90 ounces; F., 2.54 ounces; C-h., 31.18

8 oz. cornmeal (as mush),	1.	16 oz. potatoes,	1.	16 oz. bread,
		4 oz. graham flour (as pudding),	½	½ pt. milk,
1 pt. milk,	3.	½ pt. milk,	1.5	
		½ oz. sugar,	¼	
		16 oz. bread,	3	
		1 oz. butter,	1.5	

Class I, No. 7.

Total cost, 13.3 cents, P., 4.20 ounces; F., 2.49 ounces, C-h., 19.96

2 oz. rice (as cake),	1.	4 oz. beans,	1.	2 oz. fat cheese
1 egg,	1.3	½ oz. lard,	⅓	16 oz. bread,
½ oz. lard,	⅓	6 oz. bread,	1.1	
6 oz. bread,	1.1			
1 pt. milk,	3.			

Class II, No. 1.

Total cost, 12; P., 4.28 ounces; F., 2.69 ounces; C-h., 19.36 ounces.

2 oz. codfish,	1.3	16 oz. potatoes,	1.	10 oz. bread,	1.9
1 oz. lard,	1.6	1 oz. lard,	5/8	½ pt. milk,	1.5
6 oz. bread,	1.1	10 oz. bread,	1.9	½ oz. sugar,	¼
½ pt. milk,	1.5			2 cups tea, 5 oz. each,	⅔
1 cup tea, 5 oz.,	⅓				
½ oz. sugar,	¼				

Class II, No. 2.

Total cost, 14.4 cents; P., 4.07 ounces; F., 2.10 ounces; C-h., 18.23 ounces.

2 oz. fat cheese,	1.5	4 oz. beans,	1	10 oz. bread,	1.9
6 oz. bread,	1.1	2 oz. bacon,	1.5	½ oz. sugar,	¼
1 cup coffee (8 oz),	⅔	10 oz. bread,	1.9	½ pt. milk,	1.5
½ pt. milk,	1.5			2 cups coffee (8 oz. each),	1.3
½ oz. sugar,	¼				

Class II, No. 3.

Total cost, 22.5 cents; P., 4.97 ounces; F., 3.35 ounces; C-h., 20.19 ounces.

2 eggs.	2.5	2 oz. bacon,	1.5	8 oz. mutton (moderately fat),	8.
8 oz. bread,	1.5	8 oz. turnips,	½	16 oz. bread,	3.
1 pt. milk,	3.	8 oz. cornmeal (as bread),	1.		
1 oz. butter,	1.5				

Class II, No. 4.

Total cost, 21.75 cents; P., 5.19 ounces; F., 2.43 ounces; C-h., 21 ounces.

4 oz. fresh fruit,	1.	4 oz. garden beans,	1.	8 oz. cornmeal, (as mush),	1.
8 oz. bread,	1.5	8 oz. beef (moderately fat),	8.	½ pt. milk,	1.5
½ oz. sugar,	¼	16 oz. bread,	3.		
1 pt milk,	3				
1 oz. butter,	1.5				

Class II, No. 5.

Total cost, 14.75 cents; P., 4.28 ounces; F., 2.89 ounces; C-h., 19.48 ounces.

2 oz. oatmeal,	½	4 oz. beans,	1.	11 oz. bread,	2.
½ oz. sugar,	¼	1 oz. bacon,	¾	1 oz. butter,	1.5
½ pt. milk,	1.5	8 oz. bread,	1.5	½ pt. milk,	1.5
2 oz. sausage (best quality),	1.5			½ oz. sugar,	¼
1 cup tea, 5 oz.,	⅓			2 cups tea (5 oz. each),	⅔
8 oz. bread,	1.5				

Class II, No. 6.

Total cost, 12.25 cents; P., 4.61 ounces; F., 2.96 ounces; C-h., 20.20 ounces

2 eggs,	2.5	16 oz. potatoes,	1.	8 oz. cornmeal (as mush),	1.
2 oz. codfish,	1.3	1 oz. lard,	5/8	½ pt. milk,	1.5
10 oz. bread,	1.9	10 oz. bread,	1.9		
1 oz. lard,	5/8				

Class II, No. 7.

Total cost, 12.6 cents: P., 4.33 ounces; F., 2.43 ounces; C-h., 19.92 ounces

2 oz. fat cheese,	1.5	2 oz. bacon,	1.5	10 oz. bread,	1.9
10 oz. bread,	1.9	4 oz. beans,	1.	½ pt. milk,	1.5
½ pt. milk,	1.5	8 oz. cornmeal (as bread),	1.		
½ oz. sugar,	¼				
1 cup coffee (8 oz.),	⅔				

Class III, No. 1.

Total cost, 18.25 cents; P., 4.38 ounces; F., 2.13 ounces; C-h., 18.06 ounces

4 oz. beef, (very fat),	4.	4 oz. beef (moderately fat),	4.	2 oz. oatmeal,	⅓
16 oz. potatoes,	1.	16 oz. potatoes,	1.	½ pt. milk,	1.5
1 pt. milk,	3.	8 oz. bread,	1.5	½ oz. sugar,	¼
8 oz. bread,	1.5				

Class III, No. 2.

Total cost, 20.4 cents; P., 5.27 ounces; F., 2.74 ounces; C-h., 1

1 oz. codfish,	5/8	8 oz. beef (moderately fat),	8.	1 pt. milk,	
16 oz. potatoes,	1.			½ oz. sugar,	
1 oz. lard,	5/8	8 oz. cornmeal (as bread),	1.	4 oz. rice,	
8 oz. bread,	1.5				
½ pt. milk,	1.5				
½ oz. sugar,	1/4				
1 cup coffee, (8 oz.),	2/3				

Class III, No. 3.

Total cost, 19.9 cents; P., 4.46 ounces; F., 2.15 ounces; C-h., 1

2 oz. mackerel,	1.5	4 oz. boiled mutton,	3.	4 oz. cold mu	
8 oz. bread (as pancakes),	1.5	4 oz. boiled ric ,	2.	11 oz. bread,	
½ pt. milk,	1.5	8 oz. mashed potato,	½		
1 cup coffee (8 oz.)	2/3	8 oz. boiled turnips,	½		
		½ pt. milk,	½		
		1 oz. butter,	1.5		
		4 oz. bread,	3/4		

Class III, No. 4.

Total cost, 15 cents; P., 4.52 ounces; F., 2.96 ounces; C-h., 22

4 oz. fried liver,	2.5	2 oz. bacon,	1.5	16 oz. bread,	
1 oz. lard,	5/8	8 oz. cabbage,	½	1 pt. milk,	
10 oz. bread,	1.7/8	8 oz. cornmeal (as bread),	1.	2 oz. dried fr sance),	

Class III, No. 5.

Total cost, 17.9 cents; P., 4.11 ounces; F., 2.38 ounces; C-h., 22

4 oz. fresh fruit (berries),	2.	2 oz. bacon,	1.5	16 oz. bread,	
10 oz. bread,	1.9	4 oz. string beans,	2.	1 pt. milk,	
1 pt. milk,	3.	8 oz. cornmeal (as bread),	1.		
1 oz. sugar,	½				

Class III, No. 6.

Total cost 19.7 cents; P., 4.23 ounces; F., 2.39 ounces; C-h., 1

4 oz. beef,	4.	4 oz. lean mutton,	3.	8 oz. bread,	
4 oz. bread,	3/4	8 oz. bread,	1.5	1 oz. butter,	
4 oz. buckwheat, (as cakes),	3/4	16 oz. potatoes,	1.	1 pt. milk,	
1 oz. sugar (as syrup and for coffee),	½				
½ pt. milk,	1.5				
1 cup coffee (8 oz.),	2/3				

Class III, No. 7.

Total cost, 18.9 cents; P., 5.29 ounces; F., 2.66 ounces; C-h., 2

2 oz. codfish,	1.3	4 oz. fresh fish,	3.	16 oz. bread,	
1 oz. lard,	5/8	4 oz. cornmeal,	½	½ oz. butter	
16 oz. potatoes,	1.	1 egg,	1.3	1 pt. milk,	
8 oz. bread,	1.5				

Class IV, No. 1.

Total cost, 35 cents; P., 4.97 ounces; F., 3.18 ounces; C-h., 19

2 eggs,	4.	1 oz. bacon,	3/4	1 oz. dried fr	
8 oz. bread,	3.	1 oz. string beans,	1.	1 oz. sugar,	
1 oz. butter,	1.5	8 oz. mutton,	8.	1 pt. milk,	
1 pt. milk,	4.	16 oz. potatoes,	1.	8 oz. bread,	
		8 oz. bread,	3.		

CLASS IV, NO. 2.

Total cost, 27.9 cents; P., 4.90 ounces; F., 2.98 ounces; C-h., 19.11 ounces.

4 oz. berries,	2.	4 oz. beef,	3.5	8 oz. bread,	1.5
½ oz. sugar,	¼	2 oz. rice (as croquettes),	1.	½ pt. milk,	2.
1 pt. milk,	4.	1 egg,	1.5		
4 oz. chicken (broiled),	3.2	½ oz lard,	5/8		
1 oz. butter,	1.5	2 oz. macaroni,	2.5		
8 oz. bread,	1.5	1 oz. fat cheese,	¾		
1 cup coffee (8 oz.)	⅔	16 oz. potatoes,	1.		
		4 oz. bread,	¾		

CLASS IV, NO. 3.

Total cost, 24.8 cents; P., 4.15 ounces; F., 2.76 ounces; C-h., 18.78 ounces.

4 oz. beef,	4.	2 oz. pork,	1.5	4 oz. lean mutton,	4.
1 oz. butter,	1.5	2 oz. beans,	½	8 oz. bread,	1.5
4 oz. bread,	¾	8 oz. potatoes,	½	½ pt. milk,	1.5
½ oz. sugar,	¼	2 oz. starch,	2.	2 cups coffee, (8 oz. each),	1.3
1 cup coffee (8 oz.),	⅔	1½ oz. sugar,	¾		
		2 oz. dried fruit,	2.5		
		8 oz. bread,	1.5		

CLASS IV, NO. 4.

Total cost, 20.25 cents; P., 4.35 ounces; F., 2.48 ounces; C-h., 19.82 ounces.

2 oz. oatmeal,	½	4 oz. chicken,	4.	1 pt. milk,	3.
1 oz. sugar,	½	16 oz. potatoes,	1.	8 oz. bread,	1.5
1 pt. milk,	3.	8 oz. bread,	1.5	8 oz. fruit (as sauce),	1.
1 oz. butter,	1.5			1 oz. sugar,	½
2 oz. mackerel,	1.5				
4 oz. bread,	¾				

CLASS IV, NO. 5.

Total cost, 23.75 cents; P., 4.39 ounces; F., 2.85 ounces; C-h., 19.25 ounces.

2 oz. sausages,	2.	4 oz. lean beef,	4.	1 pt. milk,	3.
1 oz. butter,	1.5	16 oz. potatoes,	1.	1 oz. sugar,	½
1 oz. sugar,	½	2 oz. macaroni,	2.5	8 oz. bread,	1.5
1 pt. milk,	3.	8 oz. bread,	1.5	1 cup coffee (8 oz).	⅔
4 oz. bread,	¾				
2 cups coffee (8 oz. each),	1.3				

CLASS IV, NO. 6.

Total cost, 18.5 cents; P., 4.20 ounces; F., 2.37 ounces; C-h., 22.46 ounces.

4 oz. pork (lean),	3.	2 oz. fat cheese,	1.5	10 oz. bread,	2.
8 oz. bread,	1.5	16 oz. potatoes,	1.	16 oz. potatoes,	1.
½ pt. milk,	1.5	8 oz. bread,	1.5	½ pt. milk,	1.5
½ oz. sugar,	¼			½ oz. sugar,	¼
1 cup coffee (8 oz.),	⅔			2 cups coffee (8 oz. each),	1.3
				1 oz. butter,	1.5

CLASS IV, NO. 7.

Total cost, 23.25 cents; P., 4.92 ounces; F., 2.26 ounces; C-h., 19.60 ounces.

4 oz. cracked wheat,	¾	4 oz. roast beef,	4.	8 corn meal (as mush),	1.
½ pt. milk,	1.5	4 oz. wheat flour (as Yorkshire pudding),	¾	1 pt. milk,	3.
4 oz. cold beef,	4.	1 egg,	2.		
1 egg,	2.	½ pt. milk,	1.5		
8 oz. potatoes,	½	16 oz. potatoes,	1.		
1 cup coffee (8 oz.),	⅔				
4 oz. bread,	¾				

The Minister's Widow.—The funeral of the good minister is over, and the heart-broken widow and her two daughters sit down to confront the cheerless future. Salary stopped; little provision in store; removal necessitated; daughters must

earn a subsistence as they can, one by music, the oth fancy work and painting. The *Century* magazine is r bered, and Addie searches up the back numbers to r Prof. Atwater's articles upon diet, and now she is re cipher. She finds that by reducing his monthly diet No. weekly ration, she can bring the table expenses within resources, thus:

Five and one-half pounds flour, 1¼ pounds oatmeal, ¾ corn meal, 1⅝ pound hominy, ¾ pound butter, ½ pound s pounds potatoes, ¾ pound cabbage, ½ pound carrots, ½ onions, ¾ pound sugar, ½ pound beef shin, ¾ pound roun ¼ beef tripe, ¾ calves' hearts, ½ pound pigs' feet, ½ pound ¼ pound cheese, 3¾ pounds skimmed milk, ⅝ pound b pound peas, 1 pound fresh fish, ½ pound salt cod, ½ bacon, ½ pound macaroni, ⅛ pound rice. This gives 26 p per week to each person, and costs only $1.28 per week.

The Young Student.—A young man, at home first vacation from boarding school, knowing the sac made for the education of the children, proposes to sa home living by a scientific dietary, and selects Prof. Atw monthly diet, No. 9, which he reduces for a week's e ment, as follows:

Five and one-half pounds flour, ¾ pound oatmeal, ¾ corn meal, 1½ pound hominy, ¾ pound butter, ½ pound s pounds potatoes, ¾ pound cabbage, ½ pound carrots, ½ onions, 1¼ pounds sugar, ½ pound beef, 1½ pounds beef 1¼ pounds mutton leg and chops, ¾ pound fowl, ¼ bacon pork, ½ pound eggs, 3¾ pounds whole milk, ½ pound mac ¼ pound cheese, ½ pound tomatoes, ½ turnips—28 p Cost $1.63 per week for each person.

Dr. J. L. Nichols lived in London on two meals a d a cost for food, of 60 to 80 cents a week, during arduous ary work. Dr. C. C. Page lived several months, in sp physical condition, on one meal a day, at a cost of less t cents a day. His diet was unleavened graham gems and We have personally known several students who lived a logical schools and colleges on less than one dollar a wee

National Examples of Diet.—National examples of the effect of diet may be found in the character and history of the Chinese, as compared with the Anglo-Saxon race. The Chinese have existed for many generations upon *rice* almost exclusively, while the Anglo-Saxons have fed bountifully upon a mixed diet. The diets may be thus contrasted—by parts in one hundred.

	Fiber.	Fat.	Force.	Salts.
Saxon, Mixed,	9.91	16.57	20.93	2.11
Chinese, Rice,	7.47	0.80	75.69	0.90

Attention is particularly called to the immense excess of starch and sugar (heat-producing compounds) of the Chinese diets, which corresponds with their similar excess of animal passions.

Then, they are largely deficient in fiber foods with a corresponding deficiency as a race, in muscular strength. Finally, the fats and salts which furnish brain and nerve constituents, only amount together to 1.70 in the rice diet, while in the mixed they are 18.68.

With such a showing, well may the Anglo-Saxon claim to be the superior race.

Taking the average supply of these constituents found in the *blood* of the Western nations as an indication of the physiological need, viz., 13.55 ounces, the Chinaman's diet is deficient 11.85, while the Saxon has an excess of 5.13 ounces, which explains at least in part why the discoveries and inventions of the age are so largely confined to these mixed-diet races.

Lest any zealous advocate of Christianity should affirm that these are the products of the higher civilization which is itself the effect of Christian influence, we will have no dispute, but simply remind him that only the race-strength has made such triumphs of Christian culture possible, and that strength is in "blood and brawn" drawn from the food consumed.

Other national examples in confirmation of this might be adduced, but this is sufficient to show the influence of diet upon national character, and goes far toward justifying Lud-

wig Feuerbach's saying "Der Mensch *ist* was er *isst*," what he eats.

"The Ideal Diet," says Dr. Schuster, "is that nation of foods which, while imposing the least burde the body, supplies it with exactly sufficient material its wants," which may be amplified thus: The ideal that which furnishes all the materials for constructive or repair; to maintain normal heat; to supply normal to keep up the mechanical elements, together with an demand little if any above the average of 802 grams in four hours, and at the lowest possible cost.

Tested by this standard, far from an ideal diet *United States army ration*, designed for service of t exhausting nature. It consists of 1¼ pounds fresh b pound salt pork and 18 ounces of bread for each 24 h which is added 1-10 pounds of coffee, 2 4-10 ounces su 19 1-5 grains of salt. This gives of fiber foods 4.74 ou foods 13.23 ounces, and salts 0.96. The amount of fiber but 1.28 ounces in excess of what is necessary for light and falls 3.32 short of the amount requisite for force On the other hand the fat foods and sugars exceed mal demand by 9.98 for light work and 4.72 ounces fo work. The British soldiers' daily ration is 20 ounces 12 of meat and 16 of vegetables daily, furnishing 3.848

Another Diet, Not Ideal, is that of a prof gentleman of our acquaintance, who works his brain sively, but takes very little bodily exercise, and is as f Meat 5 ounces, sugar 1¼, oranges 7, bananas 5, figs 1, cheese ½, butter 1, bread 3, and milk 1 pint; total, 41⅞ consisting of fiber foods 1.83 ounces, fats 2.27, force fo It requires 660 grams of oxygen to assimilate it and 1,807 calories, being deficient in oxygen 142 grams, calories 2,029. Looking more closely, he has but 53 g fiber food, while moderate work requires 119. He ha grams of fats, while he should have 145. He has grams of force foods while he should have 486 to cor

with moderate manual work. But his expenditure of nerve and brain substance requires a larger relative proportion of fiber and fat foods. Suppose then, that 10 ounces of meat and 2 pints of milk be consumed, with the other articles as named, he will then have 87.22 grams of fiber foods, 98.63 of fats, 264.74 force foods, and 2,392 calories.

Condensed Rules for the Preparation of Home Dietaries by the Use of the Working Table.

1. By reference to pp. 197-199, determine the whole amount of food requisite for 24 hours according to the age, sex, work and exposure of the consumers, ranging for adults from 14 ounces to 45 ounces each.

2. By reference to pp. 139-144, fix upon the relative amounts of fiber, fat and force foods demanded by the circumstances, ranging from 1.6 to 5 ounces of fiber foods, 1.56 to 5.44 ounces of fats, and 5.7 to 18.4 ounces of force foods.

3. By reference to pp. 197, 198, estimate the number of calories needed for 24 hours by each consumer.

4. Select the kinds of foods deemed desirable because of personal preference, convenience and cost, and add together their fiber-elements as given in the Working Table on Pages 133-137 until they shall equal and not materially exceed the amount of fiber-foods determined upon in Rule 2.

5. Do the same with the fat and force elements.

6. Add together all the calories (noting that they are given per *pound*) of all the foods selected, and if the sum is about that fixed upon under Rule 3, the diet is right, provided good judgment has been used in Rules 1, 2 and 3.

7. If the calories are much below, or greatly in excess of the number determined in Rule 3, then from the Working Table select some food or foods that will not change the fiber elements materially, but will increase or decrease the calories as required.

General Principles of Correct Diet.—1. The first is that the food must contain all the constituents needed for the building of every fluid and tissue of the body. This must be

so evident to all who have reached this page that it nee amplification.

2. *The food should contain nothing positvely obstr or perverting to the functions of life.* Certainly that wh designed to *aid* those functions, cannot, at the same obstruct or pervert them and still retain its character helper. If it is a friend it cannot in the same act be a foe the twelve elements that make up the body, there ma three or four in a particular tissue. A perfect food for tissue only would have just those elements and none o But that tissue is only one individual in a vast commu and is so related to the whole that what is not appropriat it can be used by some other part without disturbing th mony of the adjustments of all the parts. Just as beef cannot be used by the infant but is relished by and susta to the man, without at all interfering with the milk-fo the babe.

Nature's balance is such that when all the tissues find appropriate supply, each is so adjusted to all the others none are injured. Such a supply is true food. Henc inference is clearly warranted that if any substance act does obstruct or pervert any function of life, *that* i true food.

3. Food must be varied to meet the demands of t waste. At one time thought, anxiety and care eat up phosphorized tissues with amazing rapidity. At another, cular exertion drains off the nitrogen as if by an open s way. At another, perspiration steams away the water the blood like a boiler in full heat. At another, ma microbes exhaust the sodium chloride from the blood a thickens into fever. Hence, wherever the strain of loss just there must the stream of supply flow.

Food is most effective when taken with pleasant access As already stated, care, anxiety, and we might add exhaust the phosphorus of the brain very rapidly. On other hand, joy, good cheer, and satisfaction exhila

Therefore, a meal eaten with pleasant social converse, mirthful sallies and abounding cheerfulness finds the stomach prepared by the general buoyancy of the nervons system to enter at once with corresponding spirit upon the work of digestion.

Meantime the same kindly spirit has infused itself through the blood and gone rebounding to the remotest capillaries there imparting to the most minute absorbents the thrill of a quickened, exuberant life.

On the other hand, a meal partaken in gloom or discord, often "sets like lead" in the stomach, soddens the nerves, depraves the blood, and spreads a pall of half-paralysis over the little builders that would repair the wastes of the system.

The proof that this is a true statement is found in the fact that even dyspeptics who can eat but little, and with the greatest circumspection at their own uncongenial tables, can sit for an hour unharmed at a feast of luxury where host and guests are alike agreeable, and the ripple of laughter chimes in with the clatter of knives and forks, and the clink, clink of spoons beats time with the joyfulness of the occasion.

A picnic dinner of anything reasonable rarely disagrees with even confirmed dyspeptics; and a supper from the campfire, eaten with cracking jokes and side-splitting narrations, goes quietly on its nourishing way, while that same meal amid the asperities, or even sobrieties of home, would entail a night of distress.

Facts of Importance to Aid Right Eating.—*The fiber-elements* of animal structures are superior as nutrients to those of vegetable origin.

Eggs, meat and fish are almost perfect food; add a little bread and butter or sweet fruits and they become perfect.

Skimmed Milk has lost 22 pounds of butter to every 100 pounds thus treated.

Fish need more oil or grease in cooking than meats because where meats have fat they have water.

Milk and other cold or solid substances taken into the stomach excite the flow of hydrochloric acid and decreases the milk curdling ferment; the reverse occurs when taken warm.

Milk after a hearty meal meets a large supply of l
chloric acid and is therefore curdled in indigestible l
Therefore it should be taken hot and alone. Lime
favors its feathery curdling.

Food, if very compact when it enters the stomacl
vents the gastric fluid from working upon the interior
mass. Therefore, a cup of warm drink after such a n
beneficial.

The Stomach has the most vigor in the morning aft
night's repose; therefore, breakfast should be the main r

A Great Variety of food at one meal requires a greate
plexity of chemical processes; therefore, not more than
or at most four kinds of food should be taken at one me
variety be desirable, let it be found in the different meal

It is Possible to underfeed the strength while at the
time overfeeding the respiratory power; that is, dyi
repletion of carbon, and starvation of the tissues.

The Stomach lacks digestive power when very v
much troubled, or the previous meal remains partly
gested; therefore, a hearty meal should not be taken
such circumstances.

Food can only *digest* at about the temperature of
It can *ferment* at any temperature of the body. Theref
drink a glass of water at 60° during a meal, is to redu
temperature below the digesting to the fermenting degr

Desserts, if digestible and nutritious, should be tal
some of the allowed kinds of food at that meal, and if pa
larly palatable, should be eaten *first*. Instinct teach
horse to take his oats before the hay, and the child to w
what tastes best first.

Pastry is unfit for weak stomachs.

Starchy Foods should become a soft pulp in the
before being swallowed.

Disagreeing Things should never be taken. Mere
tory pleasure can never change the settled chemical aff
of a man s digestive juices.

Sweets, if made such by the grape sugar that they contain, like figs, dates, etc., are healthy, while if sweet from the cane-sugar that they have, like candies, require an extra process of digestion, and are less desirable.

Luncheons are physiological abominations, except in cases of insufficient meals.

Going Hungry to Bed, is to invite sleeplessness; better a lunch than that.

Frying is not a desirable way to cook food.

Shriveled Stomachs should be enlarged by eating a piece of dry bread after they *feel* full.

Digestion requires an ample supply of blood; therefore, do not exercise violently, yield to very painful emotions, nor think profoundly after a hearty meal.

Pork is not a healthful food.

A Frame of Mind characterized by a purpose to take things by the bright handle and trust in God when that cannot be grasped, is a dyspepsia-slayer, and worth a mint of gold. The shock of a great disappointment often proves fatal, probably because of the formation of virulent poisons in the retrogade process of excretion because of the depletion of nervous energy. Napoleon the Great died in his prime, while his less ambitious brothers attained a hale old age. Napoleon the Third survived his defeat only a year and a half; Horace Greeley, only a few months. Named in the order of their importance, the factors of longevity could be classed as follows: Peace, frugality, temperance, country air, physical exercise.

No Food should have any chemical, mechanical or vital effect deleterious to the functions of life.

Hunger and Thirst when not abused tell when food and fluids are needed.

Unvitiated Appetite tells *what* food is needed. Wild animals make no mistake. Domesticated animals, in consequence of artificial feeding may. Man does habitually; not because his physical instincts are valueless, but because they have been

perverted until there is little of nature left. But that l
should be cultivated until it becomes a sure guide as to
and quantity of food, and the time when it should be take

Reason Guided by Experience must, until that time,
trol the appetite. Hence, the practice of fixing in the m
or placing upon the plate, upon first taking a seat at the t
the quantity of food proper for that meal is highly
mended. If, at the next meal-time there is no real hun
the quantity should be diminished until the appetite is
nounced. Meantime, if faintness has intervened, the lin
proper restriction has been passed and a little more shoul
added next time. A few experiments will fix the am
necessary for the average demands of the system.

The Expense of a Meal is no criterion of its nutritive va
In Berlin in 1890, 1,750,243 noon meals were served in
People's Kitchens (Volkeskneche) at a cost of 6¼ cents each
Mrs. E. H. Richards declares that each "contained the pr
nutrition in the right proportions," as it contained 6¼ ou
of meat or fish and 1½ pints of soup.

Changes of Diet, if radical, should be made by deg
unless the person is in robust health, or under the advice
skillful phsician. But modifications of diet are often be
cial for a time, and when the benefit ceases others can be t
with renewed advantage.

Cooking the Food is not merely for the sake of plea
the palate, as it produces certain chemical changes in
foods which render them far more susceptible to the actio
the digestive fluids than they are when uncooked.

Oysters are Excepted, because its fawn-colored mass i
liver which is little else than glycogen and during life is s
rated from its own hepatic diastase, but crushed between
teeth the glycogen is at once digested by its own ferment.

All Foods Without Much Waste Material, such as e
dried meats and fish, should be eaten with fruit, vegetables
semi-liquid foods.

Starchy Foods, says Dr. N. Butiagin, when eaten by persons in ill-health, must be cooked from two to three times longer than for the well.

Prof. Sticker has shown by experiment that saliva in the stomach promotes the secretion of the gastric fluid, which is what ought to be expected from the "mouth watering" upon sight or smell of appetizing viands. Nature certainly would not pour an obstructor upon a process which she purposely quickened for the occasion.

Most Articles of food are both digestible and indigestible—that is digestible by some persons and in certain conditions of the stomach; indigestible by other persons or in other conditions of the stomach.

Experience and Observation should make every intelligent person a law unto himself as to what he shall eat. No social custom should be so imperative as to require the sacrifice of individual judgment in respect to personal diet. If one were obliged to confine himself to any one food-material exclusively, oatmeal would be the preferable article.

Time of Digestion. (Dr. Baumont.)

	Hrs.	Min.
Mutton (fresh), broiled	3	
Mutton (fresh), boiled	3	
Veal (fresh) broiled	4	
Veal (fresh) fried . . .	4	40
Fowls (domestic), boiled	4	
Fowls (domstic), roasted .	4	
Ducks (domestic), roasted	4	
Ducks (wild), roasted	4	30
Suet (beef, fresh,) boiled	5	30
Suet (mutton), boiled	1	30
Butter, melted . .	3	30
Cheese (old, strong), raw	3	30
Soup (beef, vegetables and bread) boiled	4	
Soup marrow bones), boiled	1	15
Soup (bean), boiled	3	
Soup (barley) . .	1	30
Soup (mutton), boiled .	3	30
Green corn & beans, boiled	3	15
Chicken soup, boiled	3	
Oyster soup, boiled . .	3	30
Hash (meat and vegetables), warmed	2	30

	Hrs.	Min.
Sausage (fresh), broiled	3	20
Heart (animal), fried	4	
Tendon, boiled	5	30
Cartilage, boiled .	4	15
Beans (pod), boiled . .	2	30
Bread (wheat, fresh), baked	3	30
Bread (corn) baked	3	15
Cake (corn), baked .	3	
Cake (sponge), baked	2	30
Dumpling (apple), boiled	3	
Apples (sour, hard), raw	2	50
Apples (sour, mellow), raw	2	
Apples (sweet), raw	1	30
Parsnips, boiled	2	30
Carrots, boiled	3	15
Beets, boiled . .	3	45
Turnips (flat), boiled	3	30
Potatoes (Irish), boiled	3	30
Potatoes (Irish), roasted	2	30
Potatoes (Irish), baked	2	30
Cabbage (head), raw . .	2	30
Cabbage, with vinegar, raw	2	
Cabbage, boiled	4	30

PART V.

FOODS, AND THEIR PREPARATION.

1st. FOODS IN COMMON USE—Their Nature and Classifica —When Appropriate and When Not Appropriate—T Adulterations—Economical Substitutes For. 2d. PAR ULAR FOODS FOR PARTICULAR NEEDS—Fluids—Mus Puddings, Bread, Biscuit—Meats, Fruits and Jellies—I to Prepare These Foods. 3d. INFANT FOODS: Their P aration and Use. 4th. THE MANUFACTURED OR PREPA FOODS—Tabulated for Dietary Use—Their Nutritive V Shown, This Being a Practical Key to Their Use in V ous Circumstances.

As foods should be selected with careful reference to son, climate, clothing, labor, mental states and constitutic peculiarities, a general knowledge of their individual quali is of importance. But before attempting that, some gen facts merit consideration.

1. Hot Semi-Liquid Foods.—Whatever food taken, hot semi-liquid foods, such as stews, broths and sou should constitute a part of the diet of working people, beca within three or four minutes after they are taken, a port will have reached the blood and begun to relieve the sensat of hunger, which, otherwise, might lead to eating more t the tired organism can care for.

2. Soups Without Flesh.—It is not necessary t flesh should enter largely, or even at all, into the composit of such foods. Mr. Hills gives a *recipe for soup*. To m one gallon, take one-half pound whole wheat meal and

pound of lentils and boil for two hours, then add one pound of potatoes (mashed) and one pound of mixed vegetables (turnips, carrots, parsnips, etc). Both potatoes and vegetables should be chopped or grated as fine as possible, and to make the best soup should be boiled separately from the grains. Add the vegetables to the grains, and boil furiously for another hour and stir well. Flavor to taste with butter, sweet herbs and spices. The soup can be varied from day to day by the introduction of other grains, *i. e.*, oats, barley, rice, peas, beans and maize; and where economy is the first consideration, the butter can be substituted by the best cotton-seed oil, or be omitted altogether. When properly made, this soup *cannot be distinguished* from ordinary *stock soup*, *i. e.*, such as is used in the best hotels, and contains a *far higher value of nutritious food.*

3. The Use of Meat.—Experience has shown that the use of meat as a staple article of diet is not required, either by the drain upon the vital forces of the hardest labor, or the most extreme exposure. The notions of Americans concerning the necessities of the table are so erroneous, that the subjoined statements of the diet of the common people of the old world may be useful as a corrective.

Norwegians.—Black rye bread and milk, and cheese; on high days and holidays a little meat or fish.

Swedes and Danes.—Black bread, eggs, cheese, vegetables; as a luxury only, fish.

Russians.—Black rye bread and milk, pickled cucumbers, cabbage and mushrooms. Including the upper classes, the meat eaten by the whole empire averages one ounce a day per head.

German States.—Meat on feast days only.

French and Belgians.—Brown bread, potatoes, eggs, milk, cheese and garden produce.

Italians, Spaniards and Greeks.—Porridge, bread, macaroni, vegetables and fruits.

Scots.—Porridge, peas, barley meal, milk and kail broth.

Irish.—Potatoes and buttermilk, meat at rare intervals.

English.—Including the upper classes, they average four ounces of meat per day per head.

Buenos Ayres Negroes, at the shipping ports, carry sacks of e weighing 200 pounds or more, all day long, yet never touch as a food.

After all that has been said about the necessity of fat meat tallow In low latitudes, Sir John Richardson, M. D., one of the A voyagers, says: "The servants of the Hudson's Bay Company are finding out by experience, that although wheaten bread does not them adequate support, bread composed of maize flour (which cont 10 per cent. of oily matter) answers every purpose, two and one pounds being fully equal in sustaining the capacity, both for musc exertion and for bearing cold, to the eight pounds of fat meat of ordinary ration."

Prof. Owen says: "The apes and monkeys, which man nearl sembles in his dentition, derive their staple food from fruits, g the kernels of nuts, and other forms in which the most sapid and n tious tissues of the vegetable kingdom are elaborated; and the resemblance between the quadrumanous and human dentition sl that man was, from the beginning, adapted to eat the fruit of the t of the garden.

Sir Henry Thompson, Dr. Carpenter, Dr. Richardson, Dr Lee others, leaders in their profession, freely admit that meat is n necessary food.

4. The Relative Cost of a vegetable and a meat should exclude the latter almost entirely, except as a flavo ingredient, from the dietaries of the necessarily economica all classes of society.

A given acreage of wheat will feed ten times as man the same acreage used in growing mutton.

The lentil contains about 29 per cent. of flesh-form food; lean beef but 19 per cent.

Seventy-two per cent. (nearly three-fourths) of steak chops are water; 12 to 15 per cent. of grains and pulse water; therefore they are much the cheaper.

As to nutrition, Dr. Frankland showed that one poun oatmeal will generate force enough to raise 2.439 tons one high. One pound of lean beef can raise but 885 tons.

Boiled ham, lean, can raise 1.041 tons.
Wheat flour can raise 2.383 tons.
Lean veal can raise 726 tons.
Pea meal can raise 2.341 tons.
Beef fat can raise 5.649 tons.

But olive, nut, hemp and cotton-seed oil fully equal it, and but litt that is ordinarily eaten.

The Nutritive Value of the Cereals and pulses is as three to one when compared with meat, and their economy is as eighteen to one. This is illustrated by the following table from Edenic Diet, and is worthy of study, as showing pounds of water and nutriment in the two classes of foods.

FROM THE ANIMAL KINGDOM.

Articles.	Nutriment.	Water.	Articles.	Nutriment.	Water.
Milk	14	86	Poultry	26	74
Fish	23	77	Beef (lean)	28	72

FROM THE VEGETABLE KINGDOM.

Articles.	Nutriment.	Water.	Articles.	Nutriment.	Water.
Peach	3	85	Potato	25	75
Plum	4	81	Banana	27	73
Cabbage	5	91	Sweet Potato	32	68
Blackberry	6	86	Lentil	77	14
Turnip	9	91	Barley	83	14
Currant	9	85	Bean	85	14
Strawberry	9	87	Corn	85	10
Pear	12	85	Oats	85	15
Cherry	13	80	Peas	85	14
Apple	15	82	Rye	85	13
Carrot	17	83	Wheat	85	14
Grape	17	79	Rice	87	9
Parsnip	18	82	Sugar	95	5

The celebrated Count Rumford fed the Bavarian soldiers on four cents a day. His soups as used at two dinners in Munich, cost for each guest 1½ cents, and were made by these recipes:

RUMFORD SOUP, NO. 1.

141.2 lbs. pearl barley.
131.4 " peas.
69.10 " wheat bread.
19.13 " salt.
1 gallon vinegar.

RUMFORD SOUP, NO. 2

70.9 lbs. pearl barley.
65.10 " peas.
230.4 " potatoes.
69.10 " bread.
19.13 " salt.
1 gallon vinegar.

This was carrying cheapness to the extreme of the impoverishment of the force-power of the system as seen in the fact that his No. 1 soup gave to each person but 158 calories of energy, and No. 2 but 348.

In England and Sweden many experiments have been made up a wiser basis, in the two-cent dinners for school children. The b scientific authority of the kingdom outlines the dietary for th cheap food enterprises. Five generous dishes to one person are r uncommon, and if one child fails to empty his plate a neighbor is s to beg it.

In Sweden, the social reformer called the Brandy King, gives workingmen three meals a day—"the very best food that can bought" for sixteen cents a day, and makes a profit of five cents a d on each customer at that. Care is taken to have the correct prop tion of food constituents, and meals are sent to factories in special constructed vessels so that they will keep warm for hours. He has many as sixty menus from which patrons can choose in the course the year, and offers to provide any family of man, wife and two el dren, with dinner all the year for the price of their fuel and the r of their kitchen. In this is not only practical coöperation, but a gra philanthropic and humanitarian agency.

In Birmingham, England, at a cost of one cent each, they gave d ners to the poor school children consisting of ½ pint of soup, ½ len and peas, and the other half Indian meal; a round of bread, 1-10 c pound, and ¼ of an ounce of breadland jam. This is thoroughly sa fying and is preferred by the children to bread and milk.

Sir Henry Peek, M. P., provided 179,183 dinners during ten years Ronsdon, Devonshire, in which the following materials were employ Apples, bread, currants, cabbage, carrots and parsnips, dates, flo figs, gooseberries, honey, jam, lard and dripping, marmalade, m milk, onions, potatoes, peas, beans, lentils, pearl barley, pepper, s prunes, rice, rhubarb, raisins, suet, sugar, sage, spice, treacle, turni Certainly a gratifying variety; yet the cost was but 1.6 cents dinner, *per capita*.

Cheap Soups.—In order to encourage the people check needless habits of table expenditure we have reduc several such diets prepared for hundreds, to a scale for fam use.

SOUP FOR THREE CENTS PER GALLON.

Lentil soup, 1,780 calories per pint.		Pea soup, 541 calories per pint.	
Lentils	1 pound	Split peas	1 3-5 pou
Indian meal	9 3-5 ounces	Indian meal	9 3-5 oun
Scotch barley	9 3-5 "	Dripping	1 1-5 pou
Carrots and onions	9 3-5 "	Carrots and onions	6 2-5 oun
Salt	3 1-5 "	Salt	3 1-5 "
Pepper	3-4 drachm	Pepper	3-4 drac
Mint to taste.		Sugar	3 1-5 "
Water	2 gallons	Mint	
		Water	2 gall

FRED. HARRISON'S DINNER FOR 140 PERSONS.

Manchester, at a cost of three cents each for materials.

Soup—315 calories for each person.

Lentils	10 lbs.
Rice flour	2 "
Rice	1 "
Bread	18½

Pudding—230 calories.

Flour	14 lbs.
Sugar	1 "
Butter	2 "
Baking powder	
Flavoring	
Jam	

Potato Pie—444 calories.

Flour	10 lbs.
Tapioca	1 "
Onions	8 "
Turnips	5 "
Carrots	7 "
Peas	2¼ "
Potatoes	80 "

Total, 989 calories for each person.

CHILDREN'S DINNERS FOR THREE CENTS EACH.

Liverpool, 120 children.

14 lbs.	peas.
40 "	potatoes.
10 "	onions.
4 "	carrots.
4 "	turnips.
1 "	olive oil.

Monkwearmouth, 380 children, 428 calories each.

21 lbs.	hominy.
14 "	barley.
21 "	raisins.
6 "	condensed milk.
21 "	sugar.

No. 1 *Soup*, 156 calories for each of 80 children.

5 lbs.	peas.
3 "	barley.
2 "	bones.
¼ "	beef dripping.
½ "	onions.

No. 2 *Hash*, 298 calories for each of 80 children.

49 lbs.	potatoes.
1½ "	meat.
1 "	onions.

No. 1, *Hash*, 439 calories.

70 lbs.	potatoes.
1½ "	onions.
3 "	meat.

Total, 595 calories for each child.

No. 2 *Pudding*, 488 calories.

21 lbs.	flour.
1 lb.	lard.
2 "	baking powder.
4 "	molasses.

Total, 789 calories *per capita*.

The average calories needed by boys and girls from 6 to 15 years old being 1,666 and as they are supposed to have three meals a day, each meal would equal 555 calories.

The Rumford soup dinners, therefore, fall short, No. 2, 207 and No. 1, 97 calories; the Monkwearmouth dinner is deficient 127 calories; but the Preston Patrick No. 1, is in excess 40 calories, and No. 2, 231 calories, while the Manchester ration is 434 calories in excess, or nearly double the need. The average of the whole gives 80 calories in excess of normal need, and at an average cost of less than 2½ cents per head.

Cheap Living.—Of course such food made in small quantities for family use would cost somewhat more, but these illustrations perfectly demonstrate the fact that it is possible to be well nourished on appetizing food at a cost not exceeding three to four cents per meal for each member of the family.

Dr. Densmore recommends a diet of three-fourths fr and the other fourth nuts, or eggs, milk, cheese, and cott cheese, but these last should have butter or vegetable oils adc His dietary for an average adult in good health and aver work when flesh is used, is from 12 to 20 ounces of beef, mutt poultry, or fish (these foods are about ¾ water), divided into of three meals per day, and enough fruits to satisfy the ap tite. He prefers a diet of one pint of milk, four ounces of wl meal bread and sweet fruits for each meal. But the bread meal give only 630 calories, therefore, it would be necessary order to get the 1,330 that are requisite, to consume nea three-fourths of a pound of figs, or over two pounds of ap at each meal. Rather a serious undertaking for most peo His meal of one-half pint of milk and one-half pound of da which he declares makes an ample and satisfying meal fc person engaged in sedentary labor," yields but 644 calor being 1,022 short of the requirement of boys and girls.

5. The Frequent Adulteration of many article common use as foods requires careful scrutiny, and sugg the propriety of dealing only with men of known probity, v will not only refuse to be principals in such iniquity, but v will also as far as practicable shield their customers from th who would use them as dispensing agents in the nefari business. We are indebted to the reports of the United Sta Department of Agriculture concerning food adulterations much of the information of the following pages.

OUR COMMON FOODS.

THEIR USES, PROPORTION AND ADULTERATIONS.

Arrowroot is the purest form of force-food, and i variety of starch. Is apt to be musty, and when so should rejected. Is adulterated with potato-starch. Its demulc properties peculiarly fit it for use in intestinal and urinary eases. Is much used as a substitute for milk for infants a weaning.

Asparagus is a wholesome vegetable. It transmits odorous principles through the kidneys into the urine.

Acids, in our food, are the following:

Acetic acid in vinegar. *Pectic* acid in apples, pears, quinces, cherries, blackberries, raspberries, strawberries, oranges, tomatoes, carrots, beets, and turnips. *Citric* acid in lemons, limes, oranges and unripe grapes. *Tartaric* and *Racemic* acids in ripe grapes. *Malic* acid in apples, pears and quinces. *Lactic* acid in sour milk and buttermilk.

Bacon.—See Pork.

Baking Powders.—The idea in all baking powders is to introduce a carbonate into the dough or flour, together with an acid to decompose it and liberate carbonic acid gas, which "raises" the dough. The notion generally prevails that nothing is left in the food, but this is a mistake, as the chemical salt resulting from the combination of the acid with the alkaline base, is still there, and may be more or less harmful. Bicarbonate of soda, and less frequently, bicarbonate of ammonia are the alkalies chosen, but the acids vary greatly. Not less than 75,000,000 pounds baking powders are used annually in the United States. The analyses and testimonials of chemists, when published as trade advertisements cannot be accepted. There are *three kinds of powders, Tartrate, Phosphate and Alum.*

Tartrate Powders.—The residual salt from the tartrate powders is Rochelle salt,—one of the elements of seidlitz powders. If two teaspoonfuls of this baking powder be used, that gives 165 grains of Rochelle salt in the loaf of bread or cake, or 45 grains more than is contained in a seidlitz powder, which is a mild purgative.

The Phosphate Powders have for their acid, the acid phosphate of lime, (the superphosphate of fertilizers). Two teaspoonfuls of this leaves as a residue in the food 136 grains of phosphate of lime, and 358 grains of phosphate of soda. This also is a mild purgative.

The Alum Powders are ammonia alum, according to Prof. Cornwall used in the form of "burnt alum." 119 grains of burnt alum with 126 grains of bicarbonate, will leave a residue of 106 grains of sulphate of soda, 33 grains of sulphate of ammonia and 39 of hydrate of aluminum, a total, as it would crystalize in the food of 313 grains of chemical salts, the ammonia of which is especially irritative.

The use of alum in bread-making is prohibited by law in England and France. Dr. Danglish says "Its effect on the system is that of a

topical astringent on the surface of the alimentary canal producing constipation and deranging the process of absorption. But its action in neutralizing the efficacy of the digestive solvents is by far the most important and unquestionable."

Mixed Powders are alum with either tartaric acid or bitartrate, or both, and phosphate acid. Concerning these Prof. Cornwall says "The presence of either tartaric acid or tartrates in alum powders is very objectionable."

The Phosphate and Alum powders are perhaps an improvement, as the residue is phosphate of aluminum instead of the hydrate, and the sulphate of lime takes the place of one molecule of sulphate of soda:

The tartrate powders generate	16%	of gas and leave	104%	residue.				
The phosphate	"	"	22	"	"	"	123	"
The alum	"	"	27	"	"	"	128	"
The alum and phosphate	"		17	"	"		111	"

Carbonate of Ammonia is sometimes used in baking powders. This is sal-volatile or "smelling salts," and is mostly driven off by the heat in baking, but not entirely as is evident by the soapy alkaline taste that some baker's articles have. Five grains are a medical dose, and in larger doses it is a corrosive poison. Its use in cooking should be utterly abandoned.

The cream of tartar and phosphate powders are decidedly preferable, both on the ground of efficiency and health.

A Good Home Powder.—Dr. H. W. Wiley gives the following as formulas of a domestic baking powder, better than the average powders on the market, that is made by simply mixing the ingredients. Any one can make it.

	No. 1.	No. 2.
Cream of tartar,	8 ounces.	6 ounces.
Baking soda,	4 "	3 "
Corn starch,	4 "	1 "
Available carbonic acid,	10.91.	13.70.

Dr. Wiley says No. 2 is better than the best on the market, but the materials must be thoroughly dried before mixing, and it will not keep long without deterioration.

The Strength of Various Brands.—As the percentage of available carbonic acid is the chief thing sought in the use of a baking powder, we have appended it in each case to the name of the powder, as far as ascertained by the analyses of the United States chemist. In other cases we give the estimates of Profs. H. A. Weber of Ohio, and H. B. Connell of New Jersey, designating them in their order by [1] for U. S. C., [2] for Prof. W. and [3] for Prof. C. The difference in the same pow-

der, in different packages, is in many instances over 20 per cent. and in one 62 per cent., and arises probably from the fact that most, if not all, baking powders deteriorate by age, and suggests the need of a law compelling the manufacturers to put the date of manufacture upon every package sold.

Cream of Tartar Powders.—Royal 12.74[1], Dr. Price's 11.13[1], Pearson's 11.60[2], Cleveland's 12.58[1], Snow Drift, 10.60[2], Upper Ten 11.30[2], DeLand's 10.[2], Sterling 9.53[1], Sea Foam 8.03[1], Health 6.96[3], None Such 12.64[3], Hecker's 9.29[1], Graves's Imperial 7.28[1], Our Best 4.94[1], The Best 11.60[3], Thurber's Best 10.26[1].

Phosphatic Powders.—Horsford's Bread Preparation 13.56[1], Horsford's Phosphatic 14.95[3], Wheat 3.79[1], Rumford's Yeast Powders 12.86[1].

Alum Powders.—Empire 5.80[2], Gold 6.70[2], Veteran 6.90[2], Cook's Favorite 5.80[2], Sunflower 6.30[2], Jersey 10.40[2], Buckeye 6.90[2], Peerless 7.00[2] Crown 8.40[2], Crown Special 8.60[2], One Spoon 5.75[2], Wheeler's No. 15, 11.35[2] Carlton 6.60[2], Gem 8.45[2], Seioto 8.80[2], Zipp's Grape Crystal 10.90[2], Forest City 7.80[2], Miles's Prize 9.63[3], Four Ace 10.31[3], Feather Weight 9.63[3], Vienna 6.41[1], Metropolitan 8.10[1], Cottage 6.62[1].

Alum and Phosphatic Powders.—Washington 8.81[3], Patapsco in glass 7.58[1], Tin 6.80[1], Davis O. K. 8.10[1], McDowell's G. and J. 9.70[3], Lincoln 9.73[3], Purity 7.13[1], Kenton 6.20[2], State 6.70[3] and 8.42[3], On Top 9.17[3], Perfection 5.09[3], Our Own 10.47[3], Silver Star 7.61[1], Somerville 8.39[3], White Star 10.09[3], Grape 10.02[3], Sovereign 8.96[3], Atlantic and Pacific, A. & P. 7.91[1] Higgins 6.63[3] to 11.30[3], Silver King 4.99[1], Windsor 9.36[1], Eureka 7.62[1] Brooks & Mc George 10.16[3], Henkel's 7.74[1], Mason's Yeast Powders 9.96[1], Brunswick Yeast 9.81[1], Silver Spoon 7.33[1], Dixon's Yeast Powders 10.37[1].

Unclassed Powders.—Silver Prize 8.14[3], Orange 8.00[3], Our Best 4.98[1], Doolcy's 962[1], Miles's Premium 3.56.[1]

Beans.—Contain a large excess of nitrogenous food, hence require to be mixed with fat or force-foods. The New England baked *pork* and beans is an expression of a physiological need. Taken in solid form, beans are unfit for the dyspeptic and sedentary.

Beef.—The chief danger from beef is in its diseased condition.

Poisonous Beef.—Gärtner examined the meat from a cow that had been sick with diarrhœa for two days before she was killed. Many were made sick and one died from eating the meat. He found the bacillus enteritidis, with which he inoculated good beef, and some hours later gave to rabbits, guinea-pigs and mice, and they were killed

by it. (V. and F., p. 50). The same authorities report many other cas embracing about 1,000 victims. The consumption may be given by ea ing tuberculous milk or meat.

Middle-aged meat is most digestible, nutritive and bes flavored. Meat of pale pink color is probably diseased. Me: of deep purple indicates fever, or death without being slaug tered. Good meat looks marbled, has little or no odor, is fir and elastic, will scarcely moisten the fingers, will remain di on the surface after standing a day or two, and will not shrin much in cooking. The more beef is cooked the more indigest ble it is. Smoking makes it more indigestible than any oth mode.

Beef Tea.—Experiments have proved that this is gene ally disappointing as a nutriment, sometimes beneficial an sometimes detrimental.

[In the Practitioner for Nov., 1880, p. 324, Dr. Lauder Brunto observes:—"We find only too frequently that both doctors and patien think that the strength is sure to be kept up if a sufficient quantity beef tea can only be got down! But this observation raises the que tion whether the beef tea may not very frequently be actually injur ous, and, whether the products of muscular waste which consitute t chief portion of beef tea, or beef-essence [not nutritive at all], may n under certain circumstances, be actually poisonous. In many cases nervous depression we find a feeling of weakness and prostratio coming on during digestion, and becoming so very marked at the tim when absorption is going on, that we can hardly do otherwis than ascribe it to actual poisoning by digestive products absorbed int the circulation. From a number of cases I came to the conclusion tha the languor and faintness which occurred about eleven and fou o'clock, was due to poisoning by the products of digestion of breakfa and lunch. I have seen the conclusions to which I had arrived b clinical observations confirmed by experiments made in the labor tory. Such experiments have been made by Prof. Albertoni of Geno and by Dr. Schmidt-Müllheim, in Prof. Ludwig's laboratory at Leipsic

Beef Tea and meat decoctions, Roberts declares, ar simply stimulants and restoratives, not nutrients, so of Li big's extract of meat, Brand's essence of beef, and Valentine meat juice (p. 185). This is doubtless true of many on th market as well as of much that is made in the hom The constituents of beef tea, says the London Lancet (

high medical authority,) "are mainly urea, creatin, creatinine, isoline and decomposed hæmatine,—exactly the animal constituents of the urine, except that there is but a trace of urea."

But made after the formulæ of Dr. Porter, analysis has shown a different result: Best quality bottom-round beef 5 pounds 7¾ ounces. Cut into ½ inch cubes, and cover in cold water two to three hours. Gradually warm to boiling and boil until the cubes are hard; remove and press the cones and add the juice to the other liquid; cool; skim. Prof. E. J. Wright found in every 100 parts of this beef tea, 95.79 parts of water, 3.28 of fiber food, and 0.67 of mineral salts. This contains nearly as much fiber matter as is found in most samples of milk. If the quantity had been condensed, then the fiber food would have been higher; 128 ounces of this tea, besides securing the necessary quantity of fiber material, would yield 2,003,031 foot-pounds of heat. Yet, it should not be forgotten that defective digestion might render even this tea deleterious.

Beer is made properly of barley and hops. Porter is beer with a high percentage of alcohol. Ale is also strong in alcohol and is made of pale malt, with more hops than porter. Stout has less alcohol, more extract, and less hops than porter. Export beer, is specially prepared for long-keeping. German beers, Erlanger, Münchener, etc., are names of places. The general average of alcohol in beers is 4.25 per cent. of maltose 1.88, and of dextrine 2.46, a larger proportion of dextrine to maltose gives fullness of taste and body. Deficient carbonization makes beer "flat."

Adulterations consist in using other grains than barley, rarely other bitters than hops, and often salicylic acid as a preservative. Bisulphite of lime and boracic acid are also extensively employed for the same purpose. In acute rheumatism, 3.9 grams of salicylic acid are sometimes used in twenty-four hours. In 1881 Girard found in beer 1.25 grams to the litre (2.113 pints), and Dr. Cyrus Edison reported in 1886 that "many, if not all, manufacturers of preserved foods are adding small amounts of this substance to their goods to prevent loss by

decomposition." Dr. Bartley says that it requires from eight to t grains of free salicylic acid to each gallon of beer in order to preve the growth of ferments, and quotes with approval from the reports 1881 and 1883 of the Central Committee of Hygiene to the French Aca emy of Medicine, declaring that beer contains 12 to 15 grains per g lon, and that its effect is to "delay digestion and aggravate digesti and kidney troubles."

Bicarbonate of Soda. Dr. Otto Grothe, in 1885, reported to t American Society of Public Analysts that at 100 glasses to the keg eight gallons, beer drinkers get about 12 grains of bicarbonate of so in each glass.

Yeast Cloud is incomplete fermentation, leaving yeast cells, a sometimes the bacteria of other fermentations. Dr. Simonowsl found that its effect is "to produce obstinate catarrh of the stomacl

Minerals, lead, copper and zinc are often contained in beers, b chiefly in the first glass drawn in the morning, from the contact of t liquid with metal faucets.

Berries are cooling to the blood, and Dr. Schlickeyse affirms that the most severe cases of chronic disease ma often be cured by a fruit and berry diet, and cites as authori the fact that the ancients "banished lepers to the forests whe they were obliged to remain until by a continuous diet of be ries the blood was purified and the disease removed."

Blackberries, when fully ripe, are not only palatable but ve wholesome. Where there is tendency to looseness of the bowels th should be chosen in preference to other berries.

Cranberries, on account of their acid should be cooked only in p celain, granite, or stone ware, and should not be sweetened until th have craeked open, unless they are to be preserved whole.

Currants are too acid to be eaten uncooked until thoroughly ri The foreign dried currant, Zante, used in cooking is inferior in flavor our native varieties, but needs but little sugar, and if properly cleans is wholesome. Unbroken, they pass through the bowels undigested.

Gooseberries, unripe, make excellent tarts and pies, and ripe, ma good jams and preserves.

Huckleberries, whortleberries and blueberries, contain but little ac hence need but little sugar. One of their chief merits is the ease wi which they can be preserved for winter use. Ordinary glass bott filled and set uncorked into a covered boiler with about four inches water and cooked for twenty or thirty minutes, then corked a sealed, will retain all their flavor until wanted. If much juice

desired the bottles can be filled just before corking with boiling water. Thus preserved they make splendid sauce, pies, and shortcake.

Raspberries are much like huckleberries in chemical constituents and food-value.

Strawberries are the perfection of all berries. Mrs. Poole says "A generous plateful heaped high and standing by it a tiny sugar-bowl and cream-jug, is a fitting concomitant of June roses, sunshine and greenery;" and she quotes Sydney Smith. "Doubtless God could have made a better berry than the strawberry, but He never did." There is doubtless a reason beyond the mere gustatory pleasure in the popular association of strawberries and cream, and it is probably in the fact that they are so largely composed of force elements and entirely destitute of fats; but it is a mistake to eat them with ice cream, as the intense cold operates as an anesthetic upon the nerves of taste and robs the eater of a large amount of pleasure, besides chilling the stomach below the immediately digesting point.

Beets.—When young are easily digested and from the abundance of sugar furnish about the same supply of force as beer.

Bread, unleavened, is flour or meal moistened with water, salted, kneaded, rolled into sheets and baked before the fire, or on a griddle over the fire. Such are the oatcakes and barley meal, and pease-meal "bannocks" of Scotland, the flour "scones" of the East Indies, the "dampers" of Australia, the "corn-bread" of America and the "passover cakes" of Israel. Unleavened bread with fruit constitutes the most nutritious and healthful of foods. Dr. Schlickeysen declares that lightness of spirit, gentleness of disposition and an impulse to labor are the result of its use.

Bread, leavened, requires the flour, salt, water and yeast, to start the process of fermentation, which generates the carbonic gas, which, in trying to escape, becomes entangled amid the sticky gluten particles and thus forms multitudes of tiny air-sacks which swell (and raise) the dough. Then made into loaves they are subjected to a heat of from 320 F. to 572 F., which dissipates about 55 per cent. of the water, distends the air-cells still more, partially boils (steams) both the gluten and starch, arrests fermentation and changes the starch in the crust into dextrine.

In raising 90° must not be exceeded else the acetic fermentation will sour the dough. Baking should begin at about 400, may gradually decrease to 250. When cream of tartar and soda are used to raise bread, they should be exactly in proportion of 21 soda to 47 of cream of tartar. If more soda is used, some will be left in the bread. Kneading bread breaks up the large gas bubbles and distributes the gas through the loaf. It should be done so gently as not to work the gas out of the loaf.

Good bread contains not over 33 per cent. of water. About one-seventh of the flour is consumed in the fermentive process. Bread being poor in fats and salts, needs the addition of salted butter or other fat to make it an adequate food.

Bread should be neither heavy, sour, bitter, moldy, nor too salt. Hot fresh bread is less digestible than stale because of its more adhesive or pasty quality. Bread is imperfectly made if it cannot be crumbled by the fingers into a coarse powder, if the fragments will not diffuse readily after soaking a few minutes in water, if the natural sweetness of the flour has been lost in the fermentation, or the slightest taste or odor of sourness can be detected in it.

Other kinds of grain have less tenacious gluten than wheat, therefore, their dough is more granular and the bread necessarily less light because of the easy escape of the carbonic acid gas.

Graham Bread.—Drs. N. A. Randolph and A. E. Rousel of Philadelphia, conclude as follows: The force elements of bran are digested by man to but a slight degree. Nutritive salts of the grain exist chiefly in the bran, therefore, when bread alone is eaten it should contain the bran but when these salts are found in other foods consumed, as is usually the case, white bread is better. The larger portion of the gluten of wheat exists in the central 4-5 of the grain, exclusive of the bran layer, called gluten cells. The retention of bran causes the waste of other foods by hastening the action of the bowels.

Prof. Goodfellow has shown that when an individual lives on milk alone for a considerable period, the waste varies from five to nine per cent., according to his digestive power. In a subject experimented on by him the waste was eight per cent., when fed on milk alone, but

when graham bread was given with the milk the waste rose to nearly eleven per cent.

Bread Adulterants are mashed potatoes, alum, "hards" and "stuff" which are mixtures of alum and salt used to whiten bread.

Water Gems are raised by the expansion of the water to 1,700 times its volume of steam.

Cakes made of eggs are raised by the expansion of the air to twice its volume, the air being caught by the albumen of the egg.

Butter.—Milk yields 3 to 6 per cent. of butter. A clean knife passed over it quickly looking streaky suggests adulteration. Pure butter melted on the tongue leaves the tongue perfectly smooth; adulterated, gives a sense of roughness. Butter should not be used in acute fevers but is of great value in wasting diseases. Its chief adulterations are by the admixture of oleomargarine, lard oil and cotton-seed oil.

Cabbage contain too much water, over 90 per cent., to be an economical food, yet as a vegetable it has value. Eaten raw it digests in 2½ hours; raw with vinegar in 2 hours, but boiled it requires 4½ hours.

Sauer Kraut is a form in which immense quantities of cabbage are used in Germany. The firm white hearts are sliced into thin shreds and laid in layers in a cask each layer being sprinkled with salt and sometimes juniper berries, cumin seed, caraway seeds, etc., then a heavy weight is placed on top and it is allowed to ferment slightly when it is removed to a cool place for use.

Canned Goods should always be regarded with suspicion unless preserved in glass, when, if properly prepared with not too much sugar or other preservative, they add greatly to the variety on the family table and contribute very materially to the success of military and naval operations, exploring and hunting expeditions, and the requisites of hospitals. In the use of tin can goods, the following precautions should be observed.

Pour the contents as soon as opened into glass or earthen vessels. If the inside of the can-lid seems corroded, reject the contents. If there are more than one solder holes on top, the contents have fermented, been re-heated and re-soldered; not good. If the end bulges out, fermentation has begun; unsafe.

Poisoning by Preserves in Tin Cans.—Nuger, Bodländer, Sache, Menthe, Sohner, Sedgwick, Beckurts, Nehring, Blarer, Winckel, Bet-

tink, Kayser, and Von Hamel Roos., (the names are given to show that it is no idle scare) have found dangerous quantities of tin in asparagus, pears, lettuce, meat, soups, eels, apples, apricots, purslane, sauerkraut, carrots, liquids, fruits and food materials, and very many instances are on record of poisoning by the use of articles thus preserved. The German Congress of Physicians in Heidleberg in 1889, declared that the use of such articles should be prohibited. In the case of fruits and vegetables the malic acid dissolves the tin, and in the case of meats the albuminous matter forms sulphide of tin. In Holland, C. Verwer has prepared a varnish which proteets the can from the action of its contents.

Carrots are easy of digestion, gently laxative, but with a volatile oil that gives a peculiar flavor, very disagreeable to many dyspeptics. Cut into small pieces and roasted they are used in Germany as a substitute for coffee. Boiled they are used sometimes as a vermifuge, and are of well-known excellence as a poultice. In the reign of Charles I. ladies wore the leaves as ornaments instead of feathers.

Cereals are grasses cultivated for their seeds as food.

Barley is deficient in gluten, hence cannot be baked into fermented bread, but it is rich in phosphatic salts, and on it the Greeks trained their athletes. It is the chief cereal of the most northern countries of Europe and their main dependence for vegetable food.

Buckwheat.—Though not botanically a cereal, is classed with them because so regarded. In France it is called Saracen wheat, in Germany, beechwheat. It is very nutritious, but when used as the staple grain for bread, it is thought to have an injurious effect upon the brain, but as a supplementary food it is highly esteemed, but is better adapted to cold than warm weather.

Corn (maize,) Indian corn is a principal part of the food of many countries of Asia and Africa; is the most productive cereal, and exceeds all others in fatty matter, but as it is deficient in gluten it cannot be made into raised bread. Mixed with rye meal it forms the brown bread of New England. Coarsely ground and boiled it is the hominy of the Southern states. Made into a thick porridge it is the mush of the North-

ern states. The entire grains are known as hulled corn or samp. Prepared with a weak solution of caustic soda it is corn flour, Oswego flour and maizene, which are less nutritious than the corn meal, and not fit for an invalid. The Oswego flour is used as a substitute for arrowroot.

Oats contain almost 20 per cent. of nitrogenous substance. The best are raised in Scotland and oatmeal cakes and porridge form a great part of the food of the people there. Oatmeal soup mixed with fruits is highly commended by advocates of a fruit and vegetable diet.

Oatmeal being almost as hearty as meat requires strong digestion. Says the London Lancet: "In the summer of 1872, it became necessary to shift the rails on upwards of 500 miles of permanent way on the Great Western line, from the broad to the narrow gauge, and there was only a fortnight to do it in. The work to be got through was enormous. About 3,000 men were employed,—and they worked double time, sometimes from four in the morning till nine at night. Not a soul was sick, sorry or drunk, and the work was accomplished on time. What was the extraordinary support of this wonderful spurt of muscular strength and energy? *Weak Oatmeal Gruel!* There was no beer, spirits, or alcoholic drink in any form. The principal part of the ration allowed in the above case was one and a half pounds of oatmeal.

Oatmeal adulterants are barley, flour and rubble, *i. e.*, the integuments of barley.

Groats are oats stripped of their covering, and with milk furnish excellent nourishment.

Rye bread is much used in the north of Europe. It is dark, more laxative than wheat bread and less nutritious. Rye when affected with ergot is very dangerous. This is a diseased condition of the germ of the grain.

Wheat, the most valuable and next to corn, the most productive of the cereals. The red varieties are inferior to the white. It is rich in phosphoric acid, magnesia and potash. Best spring wheat is richer in nutriment than other wheat. The best wheat yields from 76 to 80 per cent. of fine flour, while inferior gives only from 54 to 68 per cent. In general the smoother and thinner the skin of the grain the greater is the product of fine flour. The husk separated from the

grain is bran, the finest portions of which are called sharps or pollard. Pure cracked wheat is not only nourishing but electrically vitalizing. Even as late as the Roman republic, the cooking of grain was regarded as injurious.

Spelt and Lesser Spelt are distinct varieties from common wheat, the former being supposed to be the "Zea" of the Greeks and the "Far" of the Romans, and the latter is the St. Peter's Corn of the center and south of Europe.

Cheese is the Caseine of Milk and is rich in fat food, therefore, when digested is heat-producing, but when taken in large quantities is difficult to digest. Chemically, old cheese beginning to decompose, adds a fermentive principle to the meal that sometimes aids digestion, although it tends to produce costiveness. One-half pound of cheese has as much nitrogen as 3½ pounds of lean meat. Too rich for most dyspeptics.

Cream Cheese is fresh curd moderately pressed. More digestible than ordinary cheese, and is good to vary the diet of the invalid when suited to his condition. As an albuminous food cheese should not be eaten with eggs and meats, but with fruits and grains.

Adulterants.—There are some factories where lard cheese is made, containing about fourteen per cent. of lard, and the imitation cannot be discriminated, even by experts, from full-cream cheese. Filled cheese is made by removing all the cream and charging the lard with deodorized lard, cotton-seed oil, or other fat. Prof. Weber gave the following results of analyses of cheese.

Genuine.	Per cent.	*Artificial.*	Per cent.
Water,	35.42		52.73
Ash,	2.47		2.69
Fat,	34.66		2.63
Caseine, sugar, etc.,	30.45		41.95
	103.		100.

Chicken may be classed with venison and mutton as a fiber-food. Young and carefully broiled it is a favorite dish of epicures, and is valuable as a children's food and as nutriment in sickness, when the nitrogenous element is required. Care should be exercised to select those that are healthy and in good condition, and they should not be kept until the slightest change occurs in the perfect freshness of the tissue. For invalids and quite young children the fat should be discarded.

Clams are much like oysters in nutritious elements but tougher and more indigestible. The soup, however, can be borne by most stomachs, and the broth put up in glass jars and kept on sale by some grocers is a most palatable and desirable addition to the menu of either sick or well. A cupful taken warm as a restorative is infinitely superior to any of the wines, punches and sherbets which too often save from a temporary disease only to blast with the sirocco of an enkindled and then enthralling appetite which at last "stingeth as an adder."

Cloves are the flower-buds of the clove-tree, dried by exposure to wood fires and afterward to the rays of the sun, or to the latter alone. They contain an essential oil forming about 1-5 of their weight. This oil is what gives value to the clove. Out of twenty-two samples ten were adulterated with clove-stems, and roasted and ground cocoanut shells.

Cocoa, the bean or seed of the cocoa, or cacao tree (*Theobroma cacao*) is much richer in food materials than tea and coffee, but Weigmann found only 42 per cent. digestible, hence its nutritious value is largely overestimated. Cocoa decoctions, about 2 per cent. contain 12 to 20 per cent. albuminous, and 50 per cent. fatty matters. Unsuited to the bilious and dyspeptic. The actual nutrition in a cup of cocoa (2.5 grams of cocoa) is about 1-244th part of a daily ration of fiber-food, 1-150th of fat and 1-790th of force-foods. This is without the addition of milk and sugar.

Chocolate is the husked seeds of the cocoa, with 50 per cent., or more, of sugar and spices, ground to a paste at a high temperature and pressed into cakes. When not excessively sweet and spicy, is nutritious and wholesome. Hagenbuch found the amount of fat in several samples of chocolate to vary from 12 to 49 per cent. It is often adulterated by mixing rice flour and other farinaceous substances with butter or lard.

Cocoanuts.—The Samoan chiefs assert that the cocoanut was sent direct from heaven. About nineteen millions were

imported into New York in 1889. They are the fruit of a species of palm which grows from 60 to 100 feet high. They constitute a large part of the food of many tropical peoples. The kernels contain over 70 per cent. of a fixed oil called cocoa butter, which is liquid in countries with temperature above 74° F., and a white solid elsewhere.

Coffee.—Medium strength=7 per cent. Very strong=12 to 15 per cent. Contains the same principle as tea. Is more stimulating, relieves hunger and fatigue, is laxative to some and constipating to others. The least quantity to use is 1¼ ounces to the pint of boiling soft water; steep without boiling a few minutes then add ¼ as much boiling milk, and if desirable to be very rich, some sweet cream. Should be ground soon after it is roasted and made soon after it is ground. If kept after grinding it should be in a closely-stoppered glass bottle. For those not accustomed to its use it is an excellent nervous stimulant after exposure, to prevent contracting a cold. Coffee, as discovered by Prof. Carl Luderitz, and confirmed by Profs. Wees, Oppler, Rabatean and others, is a valuable antiseptic or preservative against epidemics of typhoid fever, cholera, scarlet fever, and the various malarial fevers. It has also been proven to aid digestion and enables the blood to take up more nourishment than it otherwise would. It also quickens respiration and the circulation, and causes a rise in the body-temperature. In 1890, 490,181,755 pounds, 7.8 pound *per capita*, were consumed in the United States. Unroasted coffees contain from one to two per cent. of caffeine. The volatile oil, which is developed by roasting, has a laxative effect upon the bowels. Coffee grounds are nutritious because of the legumen they contain. Some Eastern nations use the grounds as well as the infusion. To increase its nutritive properties the French method of adding an equal quantity of boiling milk is to be commended.

Adulterants.—Facing of inferior berries to sell for Java is common. Chicory is the common adulterant, although canna seed, sawdust, oak bark and baked liver are sometimes used, according to Hassall. Cocoa husks, the seeds of the Cassia occidentalis (Mogdad coffee) and of the Gærtnera vaginata (Massænda coffee) are also used.

Acorns, figs, the coffees just mentioned, leguminous seeds and cereals are employed as substitutes for coffee.

Imitation coffees made of wheat flour, coffee, bran, molasses, chicory, rye, peas, barley, oats, buckwheat, sawdust, corn, are extensively manufactured and sold to dealers at from 5 to 11 cents per pound to be mixed with genuine in the proportion of 15 to 33 per cent. to increase their profits.

Ground Coffees are very generally adulterated. Of 30 samples examined, 90 per cent. were impure, and while the average price was 25 cents per pound, the average proportion of coffee was only 45 per cent., showing how unwise it is to buy coffee in that form. One sample of "Rio," had no coffee at all. Even green coffee is imitated.

Cotton-Seed Oil is a fixed, bland, neutral oil expressed from cotton seed. More than four hundred thousand tons of seeds are used annually for this purpose in this country. The purified oil, called winter bleached, is much used as a substitute for almond and olive. Unpleasant and indigestible ; used raw in sardines and salads, but as a constituent of other foods it is extensively used and has no deleterious effect except upon the morals of the fraudulent dealers who dispose of it at enormous profit as an adulterant of various articles of prime necessity. The percentage of the oil varies from 10 to 30 in the seed. More than one hundred and twenty million pounds are used annually in adulterating lard.

Cream.—Dr. Page insists that as cows are bred and fed their milk is abnormally loaded with fat, and that the excess of cream is of an excretory nature, therefore, not desirable as food. Undoubtedly, it should not be used in acute fevers but is of great value in wasting diseases and might be substituted with advantage in most cases for the digestion-destroying cod-liver oil. Cream has more volatile oils than butter and is better for the sick and those of feeble digestion, but the same care should be used to preserve it from contamination that is necessary in the use of milk.

Custard and Egg Powder is a combination of various substances designed to use in the place of eggs. Adulterants are wheat, potato and rice flours, colored with chrome yellow, or chromate of lead, or turmeric.

Duck, Wild.—The flesh of the duck classes with game. The domestic duck is the wild or mallard. Its food is chiefly animal. The Japanese and the black dusky duck of North America are nearly allied to the common duck; as are also the summer or black duck of North America, and the mandarin or Chinese duck.

Eels are serpent-shaped fish much used as food, having a soft, thick, slimy skin with scales so minute as to be almost invisible, or entirely absent. Poisonous eels made many persons sick near Orleans, in France, after eating them. They were from a stagnant cattle ditch. Those from slimy bottoms should be avoided, as it is with them as with fish, the purer the water the better the fish. They are too hearty for weak digestive organs.

Eggs.—The white of eggs is albumen. At 160 it coagulates into a soft, tender jelly-like pulp. At 200 it becomes close-grained and tough. At 212, the boiling point of water, it is firm and solid. At 350, it becomes so tenacious that it becomes a valuable cement for marble, which shows the importance of cooking eggs at below the boiling point of water. The best way to boil eggs, is to pour on them boiling water and stand on back of stove eight to ten minutes. The yolk is more digestible than the white. The yolk of egg is the only food having the same amount of lime as milk, and should therefore be given to children when milk is not procurable or cannot be digested (Bunge, p. 111). To test the freshness of an egg, set it in a mixture of one ounce of salt to nine of water. A fresh egg will just sink in it; a stale one will float. Artificial eggs are made in New Jersey having chemically the same properties, but of course lacking in the important element of vitality.

Fish is valuable food when properly proportioned with other food substances. When unsalted it should be used only when freshly caught. It should be taken either from the sea or from deep clear water, and is most digestible when smoked. May be used sparingly by the sick. Should be boiled in salted

water. Fishes absorb the qualities of the element in which they live to such an extent that the trout caught in mountain brooks seem like a different species of fish from those taken in the mud ponds, where they are sometimes reared.

Bluefish—A salt-water fish sometimes attaining a weight of twenty pounds. An excellent table fish.

Cod almost rivals the herring as a food for man. One sometimes weighs a hundred pounds. The roe of the female contains from four to nine millions of eggs. Six thousand European vessels are employed in the cod-fishery. A man has been known to catch 500 in ten hours.

Cod-Liver Oil is obtained from the liver of the cod. There are three kinds. The livers are placed in a tub with a layer of spruce boughs in the bottom and subjected to pressure, when the light-colored oil exudes. This is pale cod-liver oil. Allowed to putrify more oil escapes which is the pale brown oil. The residual livers are then boiled with water and thus the dark brown oil is obtained. The virtues of the pale kind have been vastly overestimated, while the other kinds are unfit for use.

Haddock much resembles the cod. Is out of season in March and April, and is finest from October to January.

Halibut is one of the largest kind of flat fish. The flesh is firm but dry; has but little flavor and is much inferior to the turbot. Is much used in Greenland and other northern countries, and sometimes weighs nearly 500 pounds.

Mackerel is highly esteemed as a table fish, but they change very rapidly, hence care should be used to procure them quite fresh. Salt mackerel are much used but are unfit for weak stomachs.

Roach is not considered a superior table-food.

Sardines, much like the herring, are preserved in oil. Considered a delicacy, especially for lunch.

Salmon.—Superior to any other fresh-water fish commercially, and for its fine flavor. Sometimes reaches from fifty to eighty pounds in weight. Feeds on anything that it can capture. The salmon trout has pink flesh, richly flavored and much esteemed, though not equal to that of the salmon.

Trout.—A beautiful and delicate fish living chiefly on small crustaceans and small fish. Also eating readily almost any kind of animal food. Lake trout, inhabiting the deep waters of the Great Lakes, is much like salmon.

Turbot.—The most valuable of the flat fishes. Sometimes reaches from seventy to ninety pounds in weight. American or spotted turbot sometimes reaches twenty pounds in weight. Both kinds are highly esteemed as a food.

Flour.—Should have a slight tinge of yellow, and should not be lumpy or gritty. When compressed in the hand it should hold together and show the prints of the fingers well. When thrown against a wall some of it should stick. Good flour makes an elastic dough that can be drawn out long without breaking. One-seventh of a barrel of flour is consumed by the yeast in raising the bread. There are two kinds of flour, bread and pastry. Bread flour contains more gluten than pastry. "New process" is bread flour. The "St. Louis" is pastry flour. Good flour should make a yellow-white instead of snow-white colored bread, with a nutty, sweet flavor. A barrel should make from sixty-three to seventy-three good four-pound loaves of bread. Flour should never contain less than eight per cent. of gluten, and good flour has fourteen.

Graham Flour as ordinarily made is from inferior and often refuse wheat, and its excess of *grit* so rasps the delicate lining of the digestive tract that much nutriment is borne off with the waste.

Farina is meal or flour of any kind of grain. Sometimes mixed with potato-flour and tapioca.

Fruits encourage the natural processes by which the several remedial effects are brought about.

Under the category of *laxatives*, oranges, figs, tamarinds, prunes, mulberries, dates, nectarines and plums may be included; pomegranates, cranberries, blackberries, sumach berries, dewberries, raspberries, barberries, quinces, pears, wild cherries and medlars are *astringent;* grapes, peaches, strawberries, whortleberries, prickly pears, black currants and melon seeds are *diuretics;* gooseberries, red and white currants, pumpkins and melons are *refrigerants;* and lemons, limes and apples are *refrigerants* and *stomachic sedatives.*

Taken in the early morning, an orange acts very decidedly as a laxative, sometimes amounting to a purgative, and may generally be relied on.

Pomegranates are very astringent, and relieve relaxed throat and uvula. The bark of the root, in the form of a decoction, is a good anthelmintic, especially obnoxious to tape-worm.

Figs, split open, form excellent poultices for boils and small abscesses. Strawberries and lemons, locally applied, are of some service in the removal of tartar from teeth. * * * Apples are correctives useful in nausea, and even sea-sickness and the vomiting of pregnancy. They immediately relieve the nausea due to smoking. Bitter almonds contain hydrocyanic acid, and are useful in simple cough; but they frequently produce a sort of urticaria, or nettle-rash. The persimmon, or *diospyros*, is palatable when ripe; but the green fruit is highly astringent, containing much tannin, and is used in diarrhœa and incipient dysentery. The oil of the cocoanut has been recommended as a substitute for cod-liver oil, and is much used in Germany for phthisis. Barberries are very agreeable to fever patients in the form of a drink. Dutch medlars are astringent and not very palatable. Grapes and raisins are nutritive and demulcent, and very grateful in the sick chamber. The "grape cure" has been much lauded for the treatment of congestions of the liver and stomach, enlarged spleen, scrofula, tuberculosis, etc. Nothing is allowed but water and bread and several pounds of grapes per diem. Quince seeds are demulcent and astringent; boiled in water they make an excellent soothing and sedative lotion in inflammatory diseases of the eyes and eyelids.

Fruits should be eaten alone, or with stale bread and water, unless they are made to constitute an important part of each meal.

Sulphuring or Bleaching of Dried Fruit. Dr. Smith says: While the apparent change is only in color, there is a loss of the natural fruit flavor, even by the most careful sulphuring. Unfortunately, some people do not notice the difference, but careful comparison shows it, as is admitted by the manufacturers of such fruit. Later investigations have proved the presence of sulphate of zinc, "white vitriol," in all samples of fruit where zinc-surfaced trays were used while drying. Interested parties have charged the German prohibition of American evaporated apples to rival trade opposition, but there is no German fruit to compete with them. The real cause was the finding of zinc poison in considerable quantity.

Apples all sprung from the wild crab-apple propagated by the Romans, and are the most valuable of all our native fruits; richest in sugar and albumen. The juiciest are the most digestible, but the mealiest are the more nutritious. Contain about 15 per cent. of solids. There are over 1,200 varieties and diffused more widely over the earth than any other fruit. The largest on a single tree are the best. Red apples should be very dark, the lighter sort should have a yellow soft tint. Green apples usually have reddish spots when perfectly ripe. Thoroughly masticated, digestion begins immediately, but they should not be eaten as a dessert. The apple contains more phosphorus than any other fruit or vegetable. Is completely digested in 85 minutes. Its juices are converted into alkaline carbonates which neutralize acidity. It is an excellent antidote to the drinking habit, also a specially good food for the insane, and children should generally be allowed their fill of them at regular times other than meal-hours. Children who get half their living from apples are usually the healthiest.

Apricots.—Resemble the peach and can be substituted for it.

Bananas.—Closely resemble the potato in their constituents. In the West Indies they are almost a staple article of food, with a little salt meat or fish. Humbolt says, that a given amount of land will yield eleven times greater weight of potatoes than wheat, and 105 times greater of bananas than wheat.

Blackberries.—Are agreeable and wholesome, usually agreeing better with persons afflicted with diarrhœa than any other fruit.

Cherries.—Are especially fine for canning and cooking because they do not part with their flavor as readily as other fruit.

Dates.—Are the staple article of diet in Persia, Arabia, and a portion of Africa. They contain 58⅛ per cent. of sugar besides gum and other essential elements. Should be pulled apart with the fingers and thoroughly cleansed, and are a good substitute for citron in cooking. Cakes of dates pounded

together so firmly as to be cut with a hatchet are the food of the African caravans on their journeys through the Sahara. In Northern Africa roasted date-stones are used in the place of coffee.

Figs.—The celebrated Bulleyn, botanist and physician, wrote: "Figges be good against melancholy and the falling evil (epilepsy), to be eaten. Figges, nuts and herb grace do make a sufficient medicine against poison, or the pestilence." Figs are nourishing, but the skin is indigestible. Too rich for feeble digestive organs.

"Figs are often prepared by pouring boiling water on them (preferably distilled or filtered rain, or other soft, pure water) and allowing them to stand for some 24 hours; or they may be put into cold milk and allowed to remain over the fire until brought to a boil, then set aside, and they will be found fully softened in five or ten minutes. Many people relish cold milk with figs, to whom figs and milk cooked together are distasteful; in such cases it is very desirable that the figs be softened by proper soaking, and then eaten with the milk as preferred."—Dr. Densmore.

Gooseberries and Currants (red, black and white) are wholesome, cooling, laxative. Excellent for preserves and jellies, and unripe for tarts.

Grapes.—Dr. Schlickeysen calls the grape "the queen of the garden." Those who love wine would do well to take it in the form of these pills. In Germany and Switzerland, and at the "grape cures" patients consume from three to eight pounds a day with the best results;—the cure consisting in living almost exclusively upon ripe grapes plucked fresh from the vines, during the whole season. Grapes are refreshing, wholesome and nutritious. Eaten freely are slightly diuretic.

Lemons are too acid to be eaten alone. Good in rheumatism, and with tea. Much employed to make cooling drinks in fevers and biliousness, and in warm weather are very beneficial.

Limes are a good substitute for the lemon, and by many are considered more agreeable.

Nectarines are a substitute for the peach and are more tender.

Oranges are grateful and refreshing. Choose those that are heavy, thin-skinned, and with the greenish calyx still attached. The richest are the russet-skinned. Two million dollars' worth are imported into New York every year. One or two oranges before breakfast will do much toward restoring the natural function of the bowels in constipation. Oranges are an excellent cooling food in sickness and should rarely be denied to children or invalids.

Peaches are a pleasant and refreshing fruit. Stewed, they are useful in slight cases of constipation. When perfectly ripe and sound they can be used by nearly all invalids, if not too much carbonaceous matter is taken at the same time. Evaporated, they almost equal the flavor of the undried fruit. They constitute a delicious food to mix with the sweet dried fruits and cereals of the fruit and vegetable diet.

Pears are more digestible than apples, but more likely to derange the bowels. There are many coarse woody varieties which are usually eaten cooked, but their real value is not increased by cooking. There are over one thousand varieties existing. With peaches, plums and grapes they make a breakfast fit for a king.

The Persimmon or Virginia date-plum is not palatable until touched by frost and is then sweet and astringent, and is much enjoyed by those who are accustomed to its flavor.

Pineapples, while unfit for invalids, are one of the most delicate and richly flavored of fruits. They vary from 2½ to 12 pounds in weight. The best varieties are among the most delicious dessert fruits. Wholesome in moderate quantities but in excess are apt to produce bowel trouble.

Plums are much like cherries.

Prunes are dried from a certain variety of plums.

Prunels are the finest kind of prunes.

Plums.—The best varieties are among the most delicious dessert fruits. Wholesome in moderate quantities, but in excess, particularly if not fully ripe, apt to produce serious bowel troubles.

Raspberries, one of the most valued of the small fruits, nutritious and wholesome.

Tamarinds.—The acid and juicy pulp is valuable to make a cooling and laxative drink in sickness, but is too tart to be enjoyed as a table-fruit.

Canning Fruit.—Good ripe fruit, glass cans, and glass or porcelain covers. Pack fruit in jars two-thirds full, set open in boiler with false bottom, clean towel folded over tops. Steam until fruit is soft. Then add syrup made according to table below. Have jar tops in pan of hot water; fill up jars from one in the boiler. Run silver spoon in each jar to liberate air bubbles. Screw tops on tightly. Invert jars on table. When nearly cool twist the tops a little tighter. Label with black ink on white paper; stick on with paste containing a few drops of glycerine to one-half cupful. Keep in a cool place.

DR. SUSANNA DODD gives the following directions for canning fruits.

	Quanti'y of Fruit qts.	Water.	Cup—½ pint Sugar.	Cooking Time.
Strawberries	5	1 qt.	⅔ cup	15 min.
Red currants	5	3 "	1 "	6-8 "
Red raspberries	5	2 "	⅔ "	6-8 "
Black "	5	5 pts.	½ "	6-8 "
Raspberries and currants	5	5 "	½ "	6-8 "
Blackberries	5	3 "	¾ "	6-8 "
Gooseberries	6	2 qts.	2 "	10 "
Cherries	5	3 "	⅔ "	5 "
Sweet currants	1	5 pts.	none	.....
Black cherries	5	2 "	1 "	5 "
Raisins	1	5 "	none	6-8 "
Grapes	6	2 "	"	.....
Cranberries	2	3 "	1 "	6-8 "
Peaches	6	1 qt.	none	20
Peeled pears	1	2 "	"	20
Pears	7	1 "	.....	.....
Prunes	1	3 "	.....	.....
Damson plums	6	5 pts.	2 cups	.....
Green-gage plums	6	3 qts.	1 "	.....
Very tart plums	1	3 "	½ "	.....
Dried fruits	.....	.....	none	.....
Apples	1	2 "	"	.....
Pealed peaches	1	2 "	"	.....
Tart cherries	1	3 "	"	.....

Fruit Pastes are made by mashing the fruit, straining, boiling down first rapidly then slowly, in porcelain or granite, and then finished in a stone jar or lightly heated oven.

Preserved Fruits are too sweet to be healthful. Less used the better.

Candied Fruits, like preserved fruits are not wholesome.

Fruit gelatine, though delicious, is not wholesome.

Fruit creams, floats, and the like, are very suitable for light repasts in warm weather.

Fruit ice creams have the same dietetic value as ice cream with the addition of the fruit flavor.

Fruit ices are cooling mixtures flavored with fruit. Desirable or otherwise according to circumstances.

Fruit tapioca, combines the food elements of both ingredients.

Fruit pickles are appreciated as an appetizing relish though not wholesome. Best cider vinegar only should be used—scalded in granite or porcelain and spices added sparingly. Kept in stone or glass jars which have never held fat and kept in a cool, dark cellar.

Fruit salads are cool and delicious adjuncts of a summer meal.

Fruits in Place of Starches.—Dr. Densmore says: "It will be found that the sweet fruits of the South, preferably the fig, date, banana and raisin, abound in the same carbonaceous or heat-giving elements which predominate in bread. These fruits, however, differ from bread in that the heat-giving element is already glucose or grape sugar, perfectly prepared by nature, and when these fruits reach the stomach a large proportion of their nourishment is at once dissolved and passes directly into the circulation. The most important rule, then, for all is to discontinue starch foods and to substitute therefor such sweet fruits as those named above. If, however, it be found that after a time these fruits pall on the appetite, stewed raisins (or sultanas), prunes, peaches, apricots, or apples may be used with the sweet fruits, or in alternation with them. On such a diet the system will find its needed nitrogen in the animal foods, its heat-giving elements chiefly from the sweet fruits and the necessary phosphates from both."

Game consists of wild animals and fowl as distinguished from tame. Flesh has generally more flavor than that of the tame game. Has a peculiar flavor which renders it particu-

larly appetizing to the convalescent and gratifying to the epicure. The very wealthy have, in all ages, spent fabulous sums in order to procure the choicest and most varied supply.

Birds are especially rich in phosphate salts, therefore, peculiarly appropriate to the exhaustion of disease. Those with white flesh should be well cooked, the dark fleshed, rare.

The Goose was probably among the first of the domesticated birds. Giblets is the name given to the gizzard, legs and heads of geese, sold in sets. Goose-ham is considered a delicacy, and the liver has been esteemed a favorite of epicures ever since the time of Rome. When old, the flesh is proverbially tough, and when young and well cooked it is correspondingly toothsome, but is unfit for invalids.

Hares are very much like rabbits dietetically, but are considered game, while rabbits are not.

Venison.—When kept for a proper length of time is said to be the most easily digested of all meats. But the epicurean time, until the meat becomes tender, is exceedingly objectionable, because the tenderness is really the result of the first stages of decomposition.

Ginger is one of the most valuable and most generally used of any of the spices. Its value consists in its volatile oil called oil of ginger. It is a stimulant, carminative and aromatic. Adulterants are wheat flour and cayenne pepper, rice, potato, mustard hulls, turmeric, exhausted ginger and minerals are also much used. Of sixty-six samples tested by the United States experts twenty-nine were adulterated.

Gums have the same composition as starch, but have no nutritive value.

Hams are the cured thighs of oxen, sheep and hogs. Preserved by wood-smoke which contains pyroligneous acid, they are greatly esteemed as an article of diet by those who do not object to the use of swine. Should always be well cooked in order to obviate the danger of trichinea poison. In June, 1880, over seventy persons were poisoned by eating poisonous ham, of whom four died with symptoms like cholera,

Herring fishing has been carried on in England since the eighth century. It is the most important of all fish as a food product. They are caught all the year round. They have enormous fecundity, more than sixty thousand eggs having been counted in the roe of a single female. They are cured in Scotland, according to the instructions laid down by the fishery board.

Honey owes its sweetness to its glucose or grape sugar and requires one less process of digestion than cane sugar, because the cane sugar must be transformed into glucose before the system can appropriate it. Taken in moderate quantity it is nutritive and laxative. Sometimes it is poisonous; on account of the bees extracting it from the azalea pontica, and H. Bley affirms also from the datura stramonium and gelsemium. Its adulterants consist mainly of artificial glucose. Substitutes or factitious honeys are made of cane sugar and peppermint. Even the comb is imitated, filled and capped so adroitly that apparently good comb-honey is often bought, when in reality it is entirely manufactured without the agency of bees. Honey is apt to ferment in warm weather, and Dr. Müllenhoff believes that it is preserved in the sealed cells of the cone by the secretion with it of a little formic acid and has proved that the addition of one part of 25 per cent. formic acid is sufficient to keep permanently 250 parts of honey.

Extracted honey is obtained by shaving off the caps of the cone and revolving the cone in a basket so that the honey is thrown out. Strained honey is obtained by mashing up the cones used in the breeding partments containing honey, dead bees, bee bread, (mainly the pollen of plants) and catching what passes through the cloth. The strained honey of commerce is glucose with just honey enough to flavor it and will not granulate. Granulated or candied honey is pure honey crystallized by light and cold. The granulation is evidence of purity. Consumers may be sure of a good article by buying the granulated and liquifying it by placing a few moments in a jar of warm water. Any fruit may be preserved with honey by putting the fruit first into the can, then pouring honey over it, and seal air-tight, when the honey is poured from the fruit, it will have the flavor and appearance of jelly, making a delicious dessert.

As a food, honey warms the system, arouses nervous energy, and gives vigor to all the vital functions, provided cane sugar is not used at the same time. When Rumelius Pottio, at over 100 years of age, was presented to the Emperor Augustus, on account of his marvelous health and strength, the secret of his spirits and strength was asked by the Emperor, his answer was, "Interus melle; exterus oleo" (internally through honey, externally through oil).

Of liquid honey, 108 out of 132 stores sold adulterated articles,—many not containing a particle of honey, but being compounded of glucose and cane sugar, the glucose costing three cents a pound, while the price of the so-called honey was uniformly twenty cents a pound.

Horseradish roots are remarkable for their pungency owing to a volatile oil of powerful odor very similar to, if not identical with, oil of mustard. The roots are grated down and mixed with salads, or used as a condiment with roast beef, their stimulating property promoting digestion. They are also anti-scorbutic—that is—prevent and cure scurvy.

Ice Cream.—It seems a pity to associate with such a luxury anything having even the shadow of a horror, but in 1886, Vaughan and Novy obtained tyrotoxicon, a deadly germ poison, from an ice cream which had sickened many persons in Lawton, Mich. The cream had stood some hours (before it was frozen) in an old unoccupied building. Schearer found tyrotoxicon in ice cream which made many sick in Nugent, Iowa.

Dr. George S. Hull, in a recent number of the *Medical News*, advances a very plausible suggestion as to the cause of *Metallic Poisoning* in some ice creams, when he states that a modern ice-cream freezer with its contents, is in reality a galvanic cell or battery, in which the cream, especially if it is mixed with fruits, becomes the fluid, and the zinc and tin or zinc and copper, of the freezer becomes the positive and negative elements of the battery. Dr. Hull has proved that electrical action does take place in an ice-cream freezer, and, taking place, of course corrodes the metal in which the cream is contained, producing poisonous salts that vary in amount according to the activity of the corrosive action, and the length of time the cream remains in the freezer. Bartley suggests that cream is sometimes poisoned by poor gelatine, and Vaughan and Novy endorse the suggestion. In health ice cream should never be eaten with or soon after any other food.

Lard consists of the fat of the hog. More than six hundred million pounds are produced annually in the United

States, of which one-half is mixed with stearine and cotton oil. The stearine used in adulterating lard is derived from beef fat and cotton-seed oil. Usually there is enough lard in the adulterated article to give it the taste and odor of the genuine, so that experts only can detect the difference.

Its adulterants are beef suet, "neutral lard," "creamery butterine," (that is, 40 parts butter, 15 oleo-fat, 30 neutral lard). Oleo-fat, which is certain parts of the fat of beef (about 40 pounds per fat steer), are all used as adulterants, and there is no way of detecting them except by scientific processes. Prof. Wiley found in Armour & Co.'s mixed lard 24.83 per cent. of adulteration, not counting lard stearine as such, which if added, carries the percentage up to 37.24, and in Fairbanks's samples, 61.40, without including the stearine, and 92.10 with.

Leeks are plants allied to the onion but with no proper bulb at the root. Bleached by earthing up or other means; they are much used for culinary purposes, being much milder than the onion.

Lobsters are crustaceans much esteemed for the table. The best season is from October to the beginning of May. They frequently change their shells, and their growth takes place with great rapidity when the shell is soft. The Norway lobster is considered by some the most delicate of all crustaceans. Lobster salad is much esteemed as a luxury, but rarely agrees with delicate stomachs.

Macaroni was, originally, lumps of cheese and paste squeezed into balls, but now a peculiar manufacture of wheat which requires wheat with the largest percentage of gluten. The finest are the whitest in color and do not burst in boiling. Vermicelli and other Italian pastes are really different forms of macaroni. Largely consumed in Italy and exported to all parts of the world.

Malt is barley in which by heat a nitrogenous principle called diastase is developed, which changes starch into dextrine and sugar. It is much used in making beer. Malt extracts are infusions of malt, concentrated by evaporation, at a temperature below 170 in vacuo, to the consistency of a thick syrup. Chemically, besides water, they consist of 70 per cent. maltose,

2 per cent. salts, 6 per cent. nitrogenous compound, and a varying quantity of diastase. Hence as food, they are of little more value than so much syrup. But their digestive value is dependent upon the amount of diastase contained.

Malt Infusion.—Three ounces crushed malt, thoroughly mixed in a jug with half pint of cold water, stand over night, decant from the sediment, and strain through three folds of muslin until fairly clear. Must be prepared fresh every day or preserved by adding a few drops of chloroform and keeping in a bottle well corked. One to two dessert spoonfuls should be diluted with milk or water and sipped occasionally through the meal. If preserved, and the chloroform is objectionable, stand in an open cup a few minutes and it will evaporate. (Roberts.)

Meat.—In broiling in order to retain the juices of the meat the steak should be placed close to the coals long enough for the albumen to harden on the surface, then cook more slowly. So in boiling meat if the whole substance of the meat is desired to be retained in it it should be plunged into boiling water, but if soups or broths are desired, the meat should be put into cold water and cut in small pieces, and cooked gradually. Baked meats retain more of the volatile aroma and unctuous juices than roast meats, and for this reason are less likely to be borne by weak stomachs.

Cold Meat Infusions made from minced meat with half its weight of water, and allowed to stand for two hours, and then pressed through cloth, were found, on analysis, to contain over four per cent. of dry albumen. This amount of protein is equivalent to that contained in cow's milk. (Roberts.)

Meat powder is made by cutting boiled meat into little pieces and drying thoroughly, then grinding as fine as possible in a coffee mill. The meat should be put into boiling water to boil. This powder equals five times its weight of raw meat, as it contains 13 to 14 per cent. of nitrogen. Salted meats and fish are unsuited to the invalid.

Meat powder is of special value to the aged, to children who need this kind of nutriment, and to all who, for any reason, are unable to thoroughly masticate the fiber. May be spread on bread and butter.

Melons are rich and refreshing, but often disagree with delicate stomachs. Dr. C. E. Paige states that in 1863 he was

captured by the confederates and taken to Shreveport, almost dying with chronic diarrhœa; for ten days he filled himself twice a day with watermelons and no other food, and made a perfect recovery. We well remember the surprise and almost horror with which the nation looked upon Dr. Tanner's foolhardy experiment in 1880 (as it was regarded) of eating a large ripe watermelon for his first morsel of food after his forty days' fast. The fact is, that watermelon is one of the most healthful of foods if properly adjusted to other foods.

Milk.– One quart should weigh 2 lbs. 2¼ oz. Its specific gravity should be at 60° from 1.026 to 1.030. Fifteen grains bicarbonate of soda will prevent it from souring and make it more digestible. Diluted with one-third limewater it will rarely cause biliousness or indigestion. When constipating, add a little salt. (Dr. Buddock.)

The free use of milk promotes biliousness in many cases. Skim milk often agrees when whole milk cannot be taken. Hot milk will often be borne by the stomach while cold promotes indigestion. The chief reason why milk disagrees with so many is, because they eat so much force-foods at the same time. "Milk should take a subordinate place in the diet of the child when weaned, and in the diet of persons of poor blood." (Bunge P. 112).

When milk diet is used some carbonaceous food should be added (bread, rice or sugar) because the non-nitrogenous is deficient in milk. *Hot*, not boiled milk, slightly salted, is an excellent lunch between meals.

Milk drank warm and fresh from the cow agrees sometimes when it cannot be taken in any other way. About three and a half quarts a day are necessary in order to get the fiber foods. This requires considerable excess of oxygen and yields a very large excess of energy.

Skim Milk contains nearly all of the proteins, sugar and salts of whole milk, and may be used as an article of food with great advantage and entire safety before it sours.

Buttermilk has the nitrogenous, sugary and saline constituents of milk, but with less fat. Very nourishing, slightly stimulating to liver and kidneys.

Sterilized Milk.—Milk is safest when boiled twenty to thirty minutes. By so doing it destroys almost all of the micro-organisms that may be present. If taken without cooking care should be used as to its cleanliness and that no diseased milk be allowed to enter the supply sold. Sterilizing apparatus is kept by many druggists.

Milk for Infant Feeding.—The claim is very generally made that if it be peptonized it becomes a proper infant food. But Prof. J. L. Smith says: "The peptonizing of milk, although it seems so advantageous theoretically, meets with a serious drawback especially in the hot months. The disadvantages in the use of milk peptonized in the nursery, relate to the milk supply, and pertain to the common use of milk supplied by the milk man. From my personal observation much of the milk received in tenement houses during the summer is unsuitable for the nursery, and such milk if peptonized, or in whatever form treated, remains unsuitable. But milk from healthy cows and obtained under proper conditions and properly treated at the farmhouse, is, nevertheless, likely to undergo chemical changes, which impair its quality, and render it less suitable for infant feeding, by the long time which elapses between the milking and the reception of the milk by customers. The milk distributed in New York in the morning in open vessels or closed bottles is the product of the milking of the previous morning and evening. Part of it is twelve and part twenty-four hours old, when it reaches the family. We have seen milk apparently good at first, but not cooled immediately after the milking as it should have been by being surrounded with ice or running water, develop in eight hours a poison (tyrotoxicon) through the agency of the animal and atmospheric heat, so that it produced symptoms like those of cholera infantum in those who partook of it at Long Branch. What then must be the quality of much of the carelessly managed milk which reaches the city and is served to families twenty-four hours after the milking, and how many cases of cholera infantum are produced by it, when the cause seemed mysterious and obscure?"

Adulterants.—Milk is usually adulterated either by the removal of the cream, or the addition of water. The Massachusetts law requires that milk shall contain not more than 87 per cent. of water and not less than 13 per cent. of milk solids. This would be fat 3.7, sugar 4.9, casein 4.5, salts .7. In 1884, Dr. Harrington examined, 1759 samples from all over the State and found 799 below the legal standard. A mixture of salt, saltpeter, saleratus, a trace of caustic soda, and a large quantity of sugar, is largely used on the Pacific coast as a milk adulterant. Chalk, salt, annotto, gum, dextrine, ultramarine and cerebral matter are used for the same purpose. Girard found from 0.25 to 1.85 grams of salicylic acid in each liter examined,

In 1886, seventy-three persons were poisoned at hotels in Long Branch by the use of milk that had been canned while warm and carted several miles in the hot sun. Newton and Wallace found tyrotoxicon crystals in it. (V. and N. P. 67.)

Mutton ranks as a food with venison. Should be boiled in salted water. The thick, tough membrane just inside of the outer skin should be removed before cooking, else its peculiar, disagreeable, woolly flavor will be imparted to the meat. Mutton broth is particularly beneficial in bowel diseases.

Mushrooms are almost as nitrogenous as meat. They are used for ketchup, and dried and powdered and added to sauces and stews. Poisonous mushrooms can be distinguished from the edible by the membranous ring which in the edible is near the top and in the poisonous is near the bottom. Also by the white color of the gills, the warts on the upper surface of the pileus, and the powerful odor of the poisonous.

Mustard.—There are two kinds, the black and the white, the black being much the stronger, and contains about 28 per cent. by weight of a bland oil of mustard, obtained by pressure, also a volatile oil of mustard of exceeding pungency which gives to ground mustard its rubefacient quality, and which resides chiefly in the husk. For the sake of the color, the husk is removed and only the interior of the seed ground, which so weakens it that capsicum and other pungent materials are added. Other things are added to increase its bulk. Out of fifty samples thirty-nine were adulterated with wheat flour, turmeric, corn starch, bean meal (sometimes as high as 60 per cent.) and mustard cake (from which the oil had been expressed). The prepared table mustards are simply condiments compounded according to the recipe of each manufacturer.

Nuts are especially valuable to vegetarians in winter as their oily substance furnishes a large amount of fat food. They contain more elements of nourishment than butter and meat combined, are not uncleanly, and cannot be adulterated. Salt should always be used with them.

Chestnuts form a principal part of the food of the poor in the South of Europe, used roasted or boiled, or made into flour. They are nutritious, but tend to produce flatulence unless the digestive organs are remarkably vigorous.

Hickory Nuts are exclusively North American. They are much like walnuts, although belonging to another genus, and include the shell or Shag bark, the Kisky Thomas nut, the Springfield nut, the Pecan, Mocker, the Gloucester nut, and Pig and Bitter nut.

Brazil Nuts are the seeds of a tree that grows from 100 to 120 feet high, in the northern parts of Brazil. The seeds grow in a seed-vessel as large as a man's head and so hard that it requires a sledge-hammer to break it. The white kernel of the seed when fresh is very agreeable. They yield a large quantity of oil.

Hazelnuts on pressure yield about half their weight of a bland, fixed oil called nut-oil in Briton; but in Germany walnut oil is called nut-oil. Hazelnuts not kiln-dried lose their agreeable flavor unless kept in air-tight vessels.

Filberts are a cultivated variety of hazelnuts as are also cof-nuts.

Walnuts were cultivated by the Romans in the reign of Tiberius. An excellent pickle and a kind of ketchup are made from the unripe fruit. Ripe, it is one of the best of fruits, wholesome and nutritious. Nut-oil is used as a common article of food in some parts of Europe. Black walnuts are much inferior to the common walnuts.

Olives, gathered before quite ripe, steeped in lime water and pickled, are much enjoyed by those who have learned to relish them both as appetizers and promoters of digestion. But with these, as with many other articles thus designated, their effect depends so largely upon the other things eaten with them, that the assumed effects must not be depended upon in any general way. Dried olives are also used as food in the South of Europe. The Spanish are considered the best. The flowers of the fragrant olive of China and Japan are used by the Chinese for flavoring tea.

Olive oil is the most digestible of fats, and should be pale, clear and free from rancid odor, and without flavor. It is adulterated with cotton-seed oil, poppy oil and the essence of lard. Says Mr. Mason, United States consul at Marseilles: "Very few brands or firm-names are any longer a guaranty of purity." Over 2,000,000 gallons of cotton-seed oil are exported to Marseilles from the United States every year, more than half of which is used to adulterate olive oil and return to the United States under a heavy duty, to be sold as pure olive oil.

Onions.—In Spain and Portugal a raw onion is often eaten like an apple, and with a piece of bread forms the dinner of

the working man. It contains a large proportion of fiber-food as well as sugar and an acrid, volatile, sulphurous oil which is largely dissipated by boiling. The Bermudas are considered the best. They stimulate digestion under the right conditions, but are not tolerated by some stomachs. They stimulate the secreting organs, hence are very wholesome to those who can use them.

Oysters are very nutritious and easily digested when not over-cooked. Should not be cooked until they shrivel. Can sometimes be tolerated (especially raw) when all other solid food is rejected. Poisonous oysters were taken from an artificial bed near the outlet of a drain from a public water closet in Havre, France. (Pasquier.)

Peas like beans are very rich in nitrogen; so much so that during the Franco-Prussian war of 1870 the chief food of the German army was *erbswurst*,—pea meal and bacon fat, pressed into skins and boiled, and enabled them to endure great fatigue. Should not be freely eaten with meats or eggs but as a vegetable substitute for them, and when constituting a considerable portion of the diet, fats should be added. (A kind of pulse food like beans is rich in nitrogen). In Europe they are much used ground into meal, in soup made from split peas and roasted. Stewed while green they form a nutritious vegetable food.

Pepper.—White pepper is simply the black divested of its outer coat. It is an irritating stimulant, rarely if ever as useful as the red. Prof. S. A. Lattimore's analyses in New York, 1881, of 180 samples, showed 122 adulterated to the extent of 63 per cent. Samples from Baltimore mills had very little of the poorest pepper, being made mostly of cracker dust, yellow corn, cayenne, and charcoal.

Ground Pepper, black and white. In Canada of 60 samples 28 were adulterated, most of them from ten to 20 per cent. and some up to 75 per cent. with mustard husk, pepper hulls, clay, sand, and ground cocoanut shells. That a similar condition exists in the United States is evident from the fact that

in 1882 Dr. E. E. Wood examined 205 samples of spices, etc., and found 135 of them adulterated to an average of over 60 per cent. And in 1885 he examined 446 samples, of which 231 were adulterated to the extent of over 52 per cent.

Red Pepper (cayenne) is a pure stimulant and increases the flow of the gastric juice. Should be used in place of the black in all cases of cold stomach, inactive mucus membrane, and deficiency of capillary circulation.

Adulterants.—Wheat flour and colored earths. Ten samples out of 24 adulterated.

Pickles are made of a variety of green fruits and vegetables, and to a limited extent have a useful place in the dietaries generally used, although it is doubtful if they would be allowed in a strictly hygienic diet. Those cured in manufactured vinegar should be discarded, and the acetate of copper should be suspected if they have been prepared or kept in copper vessels. Colored pickles should also be rejected.

Pork.—The flesh of the hog, deemed by most hygienists as unfit for human food, yet very largely consumed.

Bacon.—The chamois hunters of the Alps on their hunting expeditions sometimes go for days together with bacon fat and sugar as their only food. Easy of digestion, and by Boland considered "a valuable food for children four or five years old. Given with bread or potatoes it will often be taken when bread is refused." But it may be seriously questioned whether some vegetable oil would not be better, if any food at all is required in such cases. We deprecate such general statements of the utility of certain things, for, while they may be true in particular conditions the recommendation becomes a license for their use in conditions vastly different.

Potatoes are a starchy vegetable greatly overused in this country in connection with the other starches and sweets so generally employed. From September to June they should be steamed. If boiled it should be with the skins on because when peeled the salts waste to the extent of 14 per cent. while unpeeled only 3 per cent. are lost. They are most nutritious

roasted, and generally agree better with weak digestions thus. They should be large, firm, not frosted nor growing, and when cooked should be mealy.

Pumpkin.—Common gourds are pumpkins. Sometimes reach 70 pounds. In many countries they form the principal part of the food of the poorer classes, and even of the wealthy. The squash is nearly allied to the pumpkin. The pumpkin is apt to disagree with weak digestion.

Raisins, the dried fruit of sweet grapes, contain more sugar and less acid than grapes undried. More nutritious, less cooling. Muscatels best, because dried on the vine. Especially valuable in the fruit and nut diet, but not very digestible or desirable in ordinary diets consisting so largely of cane sugar. The skins and seeds should be rejected by those with feeble digestive power.

Rice is the starch food of one-third of the human race. Should be thoroughly cooked and eaten with some fat or albumens, or both. Easily digested. Especially good in bowel diseases.

Rice Jelly, is rice boiled five or six hours, cooled, water strained off, and jelly eaten in warm milk.

Sago is a force-food prepared from the pith of the sago-palm. A variety of starch that must be soaked one to two hours before using, and possesses the ordinary qualities of starch-foods.

Salt is chloride of sodium, and as it exists in considerable quantity in the blood, it seems to be a physiological demand that it be furnished in the diet. Herbivorous animals take three or four times as much of salts of potassium in their food as the carnivora. Hence, vegetable food is the cause of the need for salt in the herbivora, because common salt is withdrawn from the blood by the union in it of a part of its chlorine with the potassium making chloride of potassium instead of chloride of sodium. Besides, the soda disengaged by the union of the chlorine and potassium unites with the acid that was in union with the potassium, and thus a sodium carbonate

is also formed. These are expelled by the kidneys as foreign substances, and instinct immediately calls for a fresh supply of chloride of sodium from without to restore the integrity of the blood-plasma. (Bunge.)

A man living on potatoes takes forty grams of potassium per day. In France it has been shown by statistics that the country people eat three times as much salt as the city people who live more on meat.

Sausage.—Chopped pork and beef salted and peppered, and encased in the entrails of the hog in the form of links. Objectionable upon the ground that pork is used, that they are a mixture of pork and beef, and that frequently refuse portions are incorporated. Only fit for strong men at active labor. Müller reported 124 cases of sausage poisoning, forty-eight of them fatal. Probably from putrefaction resulting from the method of preparation. (V & F., P. 43.)

Von Faber observed sixteen persons made sick by eating fresh sausages from the flesh of a pig that had had an abscess on the neck. Five died.

Sea Weeds, richer in nitrogen than oatmeal or maize. Steep in water to remove salts, then, if bitter, add a little carbonate of soda and stew in water or milk until tender. Flavor with pepper and vinegar.

Soups, generally esteemed so healthful at the beginning of a meal, Bunge says, should not be taken then, because they dilute the gastric secretion too much. This is doubtless true if solids immediately follow, but if time be given for the absorption of the fluid, the objection does not hold. In so far, however, as soups partake of the character of beef extracts they are open to the objection thus vigorously stated by an English writer.

*One of the greatest blunders of Liebig, as a physiologist, was associated with one of his greatest chemical triumphs; we refer to the substance (obtained from chopped flesh, from the smooth muscles, from the blood, and the urine) called *creatine* (C^8 H^9 N^3 O^4), and to its alkaloid, *creatinine* (C^8 H^7 N^3 O^2), which is ammonia conjugated with a highly

* 'Liebig's investigations,' says Lehmann, 'constrain us to regard *creatine* as a product of excretion." *Phys. Chem.* i. P. 139.

nitrogenized substance, containing one atom less of hydrogen than caffeine. It is found, like *creatine*, in the muscles, the blood, and the urine, where the two occur in an inverse ratio (*creatine* never in *putrid* urine), facts which clearly indicate that *creatinine* is the derivative. Yet how confidently was this substance, for a season, bruited as the nutrient essence of beef!—ready-made nourishment—and the solid fiber cast to the credulous cats! Under the guise of beef-tea, or gravy soup, and commended as the at last discovered *Elixir Vitæ*, gentlemen and ladies *drank basins of the Excretive Soup!* The poisonous stimulus which it gave to the weakened system, was, as in the case of strong coffee or alcohol, mistaken for strength! "This substance" (creatinine) says Moleschott, "may be considered as decidedly *an excrementitious body, which has passed into that stage in the tissues themselves.* The acid *peculiar to the flesh* technically called *tyrosinic acid*, which is to be found in the muscles associated with lactic acid, most probably belongs also to the products of regressive transformation." *Tyrosene*, says Lehmann, is formed during the *putrefaction* of albumen, fibrin and casein: formula C_{16} H_9 NO_5†.

Spices.—The present method is for the retailer to order goods at a certain price; the miller then sends a mixture containing such a percentage of pure materials as the price warrants, the weight being made up with cheap but harmless diluents; *e. g.*, one New York firm sold 5,000 pounds of cocoanut shells in their "pure," "extra" and "superior" spices.

Starch, useful to form fat and force. Should always be cooked, else the envelopes of the granules will prevent digestion. Corn starch is too heavy for the invalid.

Sugar (cane) very sweet, from the cane and beet root. Grape sugar (glucose) not so sweet; abounds in grapes, fruits and vegetables,—produces fat and force, and is absorbed without digestion. The West Indies' negroes are said to always grow fat about cane-pulling time. Milk sugar (lactose) found in the milk of the mammalia. "Demerara crystals" sugar contains chloride of tin as a coloring agent, which passes into the molasses as a poisonous element. Sugar is rarely adulterated at present prices. Of sugar candies twenty-five samples were examined, and not one was pure. Of 250 samples, 218 were colored, and forty-eight different adulterants were found in them.

Syrup.—The uncrystallized sugar solution drained from raw and refined sugars, called also treacle and molasses. Golden syrup is syrup drained from refined sugar, reboiled and filtered through animal charcoal. Laxative if freely used. Girard found from 0.5 to 1.50 grams of salicylic acid to the

liter of syrup. Of fifty samples of molasses only nineteen were found pure by one analyst.

Maple Syrup from the sugar maple. A large part on the market has very little, and much of it no maple whatever in its composition, the maple flavor being given by extract of hickory bark. Sometimes called "mapleine." As a rule, the stronger the statement of purity is on the label, the more reason there is to believe it adulterated.

Tallow, the fat of beef. Sometimes used as a shortening in place of lard. Furnishes about as much force but is less palatable than lard.

Tapioca is a starch force-food prepared from the root of the tropical plant Cassava.

Tea is made from the leaf of the tea-plant. Chinese tea has eight per cent. of tannin. One part of tannin in 10,000 of food prevents salivary digestion. There is about one-tenth of a grain of theine in an ordinary cup of tea.

"Theine is a restorative agent to the nervous system, and is opposed in its therapeutic properties to the action of the essential oil. The infusion, therefore, of tea or coffee may induce palpitation in a heart liable to excessive or inco-ordinate action; but theine, on the contrary, may be looked to, therapeutically, to quiet palpitation." Dr. Shapton.

"Theine is built on the chemical type of the alkaloids, a class of bodies which nature forms in plants, but not in food-plants,--bodies that include narcotics, stimulants, hypnotics, deliriants, poisons, tonics." Prof. A. B. Prescott.

Tea, four to five parts, by weight, to 100 parts boiling water, ranges from 2% to 7%, is beneficial (1) to the overfed and sedentary, for they need increased vital action; (2) to the old whose vitality is deficient; to those who have a non-perspiring skin; (3) late in the day to quicken digestion; (4) during excessive heat to relax the skin; (5) for those of strong nerves. Tea is harmful (1) to those of spare habit and to the underfed; (2) to the young who are full of vitality; (3) to those who perspire much; (4) early in the day, for it then increases tissue waste; (5) to the nervous and hysterical and those whose hearts are weak. (Dr. Buddock.)

The best teas color the water the least. Pouring hot tea over a slice of lemon with the rind on improves the flavor and allays thirst. The later investigations of Dr. Roberts have proved that both tea and cof-

fee retard digestion in a degree proportioned to their strength, which he considers a needed effect in order to prevent our foods which are so prepared as to yield up the maximum of nutriment from being too rapidly passed out of the system. There are few spurious, but many inferior teas on the market. The practice of "facing," *i. e.*, coloring is common, and renders the sale of inferior teas as of better quality very easy, but is probably not specially deleterious to health because of the minute quantity of the coloring material used.

Tomatoes.—Much used for sauces, catsup, preserves, confectionery, and pickles. A popular notion attributes the increase of cancer to the use of tomatoes. But it probably has no foundation.

Turkey.—One of the most valued kinds of poultry.

Turnips.—About ninety to ninety-six parts of its weight are water. Young leaves are good for greens, especially those of the Swedish kind or rutabaga. Its strong flavor and woody fiber disagree with delicate stomachs.

Veal is too hard of digestion to be a desirable food for the feeble.

Vegetables require soft water, and cabbage and carrots can hardly be boiled too long.

Asparagus.—Very wholesome, eaten as soon as cut. Greenest heads best. Good for rheumatism, gout and gravel.

Cabbages while not very nutritious nor easy of digestion are richer in nitrogen than any other vegetable. They are apt to produce flatulence on account of the large proportion of sulphur contained.

Carrots and Parsnips.—Pleasant, may produce flatulence.

Celery contains much woody fiber. Should be eaten with a light lunch of bread and cheese.

Cucumber. raw, is indigestible. Stewed, is wholesome.

Leeks, if white and of little smell, are good and digestible.

Leguminous Seeds (pulses) are peas, beans, etc.

Peas are delicate and nutritious, boiled without their pods, if so young that the skin cracks in boiling; otherwise indigestible unless soaked, stewed and crushed.

Lettuce, cooling, digestible, mildly soporific.

Onions, very wholesome, if readily digested.

Pumpkins, not very nutritious, but easily digested.

Rhubarb, contains oxalate of lime; should be avoided by those subject to calculus.

Spinach, wholesome, laxative.

Vinegar is the product of acetous fermentation of a saccharine material. Cider vinegar is the only kind in general use. One part in 5,000 delays salivary digestion one-third. One part in 1,000 delays salivary digestion more than seven times. One part in 500 absolutely prevents it. (Roberts.) Yet is useful in moderate quantities in some cases of biliary difficulty. Where cider vinegar cannot be obtained an artificial vinegar can be prepared. To one gallon of water add 1¼ pounds of sugar and a pint of yeast; keep three days at a temperature from 75 to 80. Draw off into a refining cask and add one ounce of bruised raisins and one ounce of crude tartar to each gallon. When the sweet taste has entirely disappeared, cork tightly and bottle.

Distilled Vinegar is simply acetic acid distilled from wood and diluted with five times its volume of water. This contains five per cent. of acetic acid, and is called proof vinegar. Is much used by pickle manufacturers. Adulterants consist of burnt sugar and sulphuric acid.

Venison, the flesh of the deer, is less nutritious than beef but more digestible, hence is much sought for by the convalescent.

Water is hard when it contains carbonate of lime in solution. It is six degrees hard when a gallon consumes as much soap before making a lather as will combine with six grains of carbonate of lime, and so on. Hard is useful for rickety children. Water is unfit to drink if it contains more than one-tenth of a grain of iron or copper to the gallon, or a very much less quantity of lead. Deep well and deep spring waters are best. Water in which ice is melted is unwholesome. Better fill bottles with water that has been boiled and cool them by contact with ice. Cold water should not be taken with meals. Dr. Beaumont gave St. Martin a gill of cold water and the tem-

perature of his stomach fell at once from 100° F. to 70° F., and it was more than half an hour recovering the heat it had lost.

Whey.—One pint of milk mixed with one teaspoonful of liquid rennet set in a warm place until it curds, then strain. Is a useful variety of milk food in sickness.

Wines.—The grape juice is about 60 to 70 per cent. of the weight of the grapes. The sugar of the juice is about 20 to 30 per cent. of its weight. The fermentation of the sugar generates about 50 per cent. of its weight of alcohol.

Antiseptics.—Prof. E. W. Hilgard has laid down the broad prineiple that "whatever impedes fermentation also impedes digestion." Sulphuric acid, or plaster (sulphate of lime) is often nsed, as are also salicylic acid and boracic acid. Of sev nty samples analyzed eighteen had salicylie aeid, thirteen had sulphurie aeid, and two had both.

Alcohol in wines varies from 5.7 to 27.15 per cent., the average being 11.5 per cent. The New York law allows alcohol to be added ("fortifying") to the extent of eight per cent. of its volume, which would give 17 or 18 per cent. in the wine. Girard found from .81 to 3.50 grams of salieylie acid in each liter, while Dr. Edson condemned over 5,000 gallons made of dried fruits, water and sugar which contained four and a half grains of salieylie acid to the pint.

Sweet Wines.—Prof. Parsons found in a "Sweet Museatel" 31 per cent. of sugar, and in a "California Port" 21 per cent. of alcohol by weight, and Prof. Crampton says of the Museatel and Angelica, "very little grape juiee enters into their composition," "they arc eliefly composed of aleohol, sugar and water."

3. PARTICULAR FOODS FOR PECULIAR NEEDS, AND HOW TO PREPARE THEM.

It is an unquestionable fact that very many sick people have been actually starved to death, and multitudes have been crowded from curable to incurable conditions by the sick-diets (called diets for the sick) that have been relied upon in the past. And it is the burning shame of the medical education of even the present, that every year hundreds of students are graduated from our medical colleges, without any instruction whatever upon how to feed those whose lives are entrusted to their care.

For the purpose of showing the real food-value of many of the articles named in this section, they are compared with whole milk, lean meat and wheat bread, these being rated as follows, viz. :

	Fiber.	*Fat.*	*Force.*	*Minerals.*	*Water.*	*Calories per lb.*
Milk,	3.7%	3.4%	4.9%	0.6%	87.5%	310
Bread,	8.9 "	1.9 "	55.5 "	1.0 "	32.7 "	1.280
Meat,	19.5 "	16.0 "	....	1.0 "	63.5 "	1.034

The reader should bear in mind the facts that a man at moderate work needs every day 125 grams (4.3 ounces) of fiber-foods yielding 512 calories of heat, and also enough fat and force foods to increase the calories to 3,500.

Also that the ratios for persons of different classes as given by Prof. C. D. Woods are: In a state of health, for man at moderate work, 10; woman at moderate work, 8; child, 6 to 15 years, 7; child 2 to 6 years, 5; child under 2 years, 2½. This would require fiber elements and calories as follows: For a man 125 grams of fiber elements and 3,500 calories per day; woman, 100 grams and 2,800 calories; child, 6 to 15, 87½ grams and 2,450 calories; 2 to 6 years, 62½ grams and 1,750 calories; under two years, 31 grams and 875 calories.

The last period should be subdivided into at least three. A child two years to 14 months old as stated, requires food containing 31 grams of fiber elements and enough fat and force foods to supply 875 calories daily; 14 months to six months, about 15 grams and 437 calories; under six months, about 7.5 grams and 218 calories. But comparison with mother's milk shows that 370 calories a day are required under two months, and 20.1 grams of fiber elements at 20 ounces per day. Hence the lowest figure should be over 350 calories.

Substantially the same ratios may be fairly assumed to exist where the similarity of diseased conditions approximates the likeness in health conditions, but the nature of the disease will necessarily largely modify both the quantity and character of the food required. A perfect food in health for light work has about eight per cent. fiber element, and yields an average of 1,200 calories to the pound. That is about the average of good bread.

The Following Diets are meant to merely suggest how selections of foods can be made for certain conditions, not to direct such selections ; nor are all the articles under one diet to be used simultaneously. The various articles are described in detail in the subsequent pages.

1. *For Convalescence from Typhoid Fever, Dysentery, Cholera, Inflammation of Bowels, etc.*—Albumen water, blackberry cordial, Carnrick's diet, milk thickened, oyster broth No. 1, and rice water.

2. *For Same.*—Blackberry cream, chicken milk No. 1, mutton broth No. 2, rice boiled, and rice milk No. 2.

3. *For Recovery from Acute Gastritis, Acute Cystitis, Acute Inflammation of Kidneys, etc.*—Fortified gruel, gum arabic and homemade koumyss.

4. *The Same.*—Beef pulp, smoked beef broth and our toast.

5. *Exhausting Hemorrhage.*—Beef broth No. 1, bean bread soup No. 2, buttered toast, eggnog No. 2, date pudding, oyster broth No. 2, puree and our tea.

6. *Shock.*—Beef broth No. 2, beef essence, milk punch, milk substitute and restorative jelly.

7. *Starvation.*—Eggs boiled and egg coffee.

8. *Anæmia.*—Beef tea, Porter's, chicken milk No. 2, codfish creamed, fruit pudding, grape juice No. 2, malt and milk, our coffee No. 2.

9. *Blood Poison, Uræmia, etc.*—Fruit, oatmeal soup, oysters roasted, unleavened wafers, raw diet No. 6.

10. *Plethoric Apoplexy.*—Baked potatoes, banana sauce, lemonade, barley and orange cream.

11. *Fevers.*—Barley water, buttermilk, cracker gruel, kefir and toast water.

12. *The Same.*—Chicken panada, custard, fish boiled and peach bread pudding.

13. *Nervous Prostration.*—Barley gruel, beef tea nutritive, corn coffee, egg and milk, potatoes creamed and unleavened wafers.

14. *La Grippe.*—Beef tea stimulating; oatmeal pudding, wine whey and our toast.

15. *Acute Rheumatism.*—Alkaline drink, apples and bread and milk, raw diet No. 1, raw diet No. 6, raw diet No. 2.

16. *Biliary Dyspepsia.*—Egg lemonade and puree, raw diet No. 1.

17. *Nervous Dyspepsia.*—Beef scraped, dyspepsia crackers, fig water, malt and milk, and broiled chopped meat.

18. *Pneumonia, Bronchitis, etc.*—Blanc mange, clam broth, demulcent drink No. 1, lemonade, elm, flaxseed or gum, and linseed tea.

19. *Diabetes.*—Bran water No. 2, gluten bread, gluten cakes and gluten gems.

20. *Bright's Disease.*—Elderberry syrup and raw diet No. 3, 4 or 6.

21. *Consumption.*—Raw diet No. 6 or 3.

22. *Chronic Rheumatism.*—Celery toast, mustard dressing, oysters broiled and puree.

How to Prepare Special Foods for peculiar needs is fully set forth in the following pages. The character of each food or of each combination of foods is described, the reasons given for its peculiar uses, and full directions and recipes are set forth so plainly that any housekeeper can prepare these foods without the doctor's assistance or advice.

Infant's foods are accorded a section by themselves.

Albumen Water—Cold water one-half pint, whites of two eggs, sugar of milk, one teaspoonful; stir gently until well mixed. Nourishing fiber food, particularly useful as a drink in inflammatory bowel diseases.

Alcohol is undoubtedly a food of great value in certain conditions. It is very easily and quickly oxidized along the digestive tract and yields its heat and force just where it enables the liver-cells to transmute the fiber elements to the best advantage. Its danger lies in the generation of too much heat. The proper time to use it is when there is an inability of the liver to extract from the glucose in the blood enough heat to maintain the vigor of the vital processes. Then, with sufficient oxygen supply, just enough alcohol to furnish the requisite heat without an excess, is beneficial. But it is generally given to excess

even in medical practice, *e. g.*, one teaspoonful of alcohol yields 826,676 foot pounds of energy. This repeated every two hours is an ounce and a half a day, which gives 9,920,112 foot pounds or 3,906,823 (based on Dr. Porter's standard), in excess of the entire normal heat expenditure per day, aside from any other food. This requires an oxygen supply of only 72 pints, leaving a surplus of over 1,400 pints. The human system is not adjusted to run on any such plan. That excess of oxygen would burn the tissues all out in a few days.

Alkaline Drink.—Slice the peel of one lemon very thin, and put into a pitcher with a tablespoonful of sugar; pour on enough hot water to dissolve the sugar, then add half a pint of pure cold water and half a pint of Vichy water. A pleasant drink; for use in rheumatism and other acid states of the blood.

Apples, Baked No. 1.—Peel, core and slice large sour apples; sprinkle with sugar and a little nutmeg. Add one-half teacup of water to every quart of fruit, cover and bake slowly three hours. Let them cool in the dish and turn out solid. Excellent with meat diet when there is not much flatulence or looseness of the bowels. About one-tenth the fiber, no fat, and nearly three times the force that milk has, giving about the same heat production,=320 calories.

Apples, Baked No. 2.—Take large sour apples, core and put in baking dish. Fill cavities with brown sugar and pour a cupful of hot water in the pan and bake. When done, remove all but the softest, which leave in the juice. Remove their skins and mash, adding nutmeg, salt and teaspoon of butter and pour over the apples. Considerably more nutritious than No. 1, but not as easy of digestion.

Apples, Baked No. 3.—Peel and core sour apples. Fill cavities with sugar and pour in a cup of hot water. Cover and simmer until soft. Lift them out without breaking, and dust nutmeg into the syrup. About as nutritious as No. 1. The same uses.

Apples and Bread and Milk.—Pare and slice eight ounces of ripe, sweet apples into a pint of milk and crumb in four ounces of bread. If preferred, bake the apple until soft. The heat production is about 753 calories. Excellent for children, invalids, and the aged. If it promotes flatulence a little fennel tea will correct it.

Apple Snow.—Drain and press through a sieve a cupful of apple-sauce, add one ounce of sugar and set on the ice. Put over it the whites of two eggs. Beat together for twenty minutes, or till the mass is light and snowlike. Delicate and nutritious, with 1.9 percentage of fiber-food and 216 calories.

Apple Water.—Two large, juicy, sour apples sliced into a pitcher; one quart boiling water poured on and tightly covered till cold. Strain and sweeten. A good fever drink, slightly nourishing.

Arrowroot Jelly.—Dissolve two teaspoonfuls of sugar in a cup of water. Bring to a boil. Wet and rub smooth two teaspoonfuls of arrowroot. Stir into the boiling water. Add one teaspoonful of lemon juice and boil until clear. Put in a mold. Eat cold with cream and sugar. An agreeable and easily digested force-food; its food value largely depending upon the quantity of cream and sugar taken with it.

Artificial Fibrin.—Pour the white of an egg into cold water and let it stand until it becomes a snow-white solid. Heat to the boiling point. Appetizing and very easy of digestion, less nourishing than albumen water. Good in bowel disorders.

Baked Potatoes.—Bake a nice potato and when done cut off one end, scrape out the inside, season with salt, pepper, cream and butter, beat up light, put back in the skin and brown in a quick oven. The fiber value is about one-fourth, and the fat and force are raised by the cream and butter to nearly one-half that of bread.

Banana Sauce.—Make a syrup of a cup of sugar and half cup of water, and boil. Thicken with one tablespoonful of corn starch wet in a little cold water, and stir in a teaspoonful of butter. Mash one large ripe banana and beat into the sauce. Should be used as soon as it is cool. A pleasant force-food, but should not be taken with a hearty meal of fiber-foods.

Barley Gruel.—Mix one tablespoonful (say two ounces) of barley flour, one saltspoon of salt, and one scant teaspoon of sugar together with a little cold water and one cup of boiling water and boil ten minutes. Add one cup of milk, just bring to the boiling point, strain and serve hot. May be made without milk, using one pint of water. A pint of this yields about 580 calories of energy, giving fiber value nearly one-half greater than milk.

Barley Water.—Wash two tablespoonfuls of barley and soak one-half hour in tepid water, and stir without draining into two cups of slightly salted boiling water. Simmer one hour; stir often. Sweeten and strain. It can be made slightly relaxing by adding two or three tamarinds. A nutritive drink when sufficient solids cannot be taken When milk disagrees this yields more than half as much fiber value, while its force product is 380 instead of 310 as in milk.

Beef Broth No. 1.—One heaping teaspoonful of Mosquera's beef meal in a cup of hot water, seasoned with capsicum or pepper. A fiber food having about one per cent. of fiber element, and yielding only twenty-four calories.

Beef Broth No. 2.—Cut into thin slices a pound of beef, free from fat. The neck or shoulder is best. Pour over it a quart of cold water some salt, and simmer over a slow fire one hour. Boil one hour, strain and season. Has too little nutritive value to be relied upon at all, but is

slightly stimulating and may aid the absorbents to appropriate other nutriment that otherwise might be excreted.

Beef Essence.—Lean, juicy, pounded beef one pound, broiled two minutes over very hot fire, then put into a fruit jar with one pint of cold, salted water; soak four hours. Tie cloth over the mouth, set in kettle of cold water, and boil slowly ten hours. Strain and season Its component parts are quite similar to beef tea (Dr. Porter's)which see, except that the coagulation of the albumen by the broiling diminishes its fiber elements, while its long boiling concentrates and thus increases its extractive stimulating properties. Should only be used as an emergency food, when this kind of stimulation is deemed desirable.

Beef Juice.—Cut a pound of rump steak into small pieces (one-fourth inch) add a pint of cold water,twenty drops of dilute hydrochloric acid and half teaspoonful of salt, cover and stand two hours in a cool place; strain (pressing the meat) and gently simmer ten minutes. A tablespoonful may be mixed with the white of an egg when wanted. Rich in nutriment. Without the egg, its nutritive value is considerably in excess of ordinary beef tea because of the partial pre-digestion of the meat.

Beef Panada.—Beefsteak broth with the meat-pulp left in the broth and rolled cracker crumbs added. This approximates in food-value the Beef Tea Nutritive, which see, and is much more easily made, but lacks the partially pre-digested quality of that.

Beef Pulp.—Scrape a raw steak with a silver spoon until all the pulp is extracted. One to two tablespoonfuls for an adult. A dessert spoonful mixed with red currant jelly, or with a little salt between bread for children. Has the food value of lean meat.

Beef Scraped.—Cut tender steak into pieces half an inch thick. Scrape the soft part off with a knife until there is nothing left but the tough, stringy fibers. Season the pulp with salt and pepper and make into cakes one-half inch thick, and broil. Serve on toast. A safe way to prepare steak for one who is just beginning to eat it. Practically of the same food-value as beef-pulp but its digestibility modified by broiling.

Beefsteak Broth.—Scrape the pulp from a pound of round or sirloin steak, or mince fine in a chopping tray. Cover in saucepan with cold water; slowly heat to boiling, then simmer half an hour. Strain. Take off fat with sheet of paper and season with salt. Practically about the same as Dr. Porter's beef tea, but more expensive.

Beef Tea (stimulating).—A pound of tender, lean meat chopped fine and soaked two or three hours in a pint of cold water. Heat on the stove (not to boiling), two or three hours longer, until the water has evaporated to half a pint. Has the same food constituents as beef-broth No. 2, but in a much more concentrated form.

Beef Tea (Dr. Porter's).—Five pounds and 7¾ ounces of best quality of bottom round beef. Remove the fat. Cut beef into one-half inch cubes and place in a saucepan with just cold water enough to cover. No salt. Soak two hours, then gradually warm to boiling and boil until the cubes become hard and contracted. Remove and press the cubes and set liquid aside until cold. Remove the congealed fat. This yields 34.5 ounces of tea, having to every 100 parts, fiber 3.28, fat 0.25, mineral salts 0.67, that is, almost as much fiber food and mineral salts as milk, but only 1-16 as much fat, and no force foods while milk has 4.7. It yields only 72 calories per pound,—23 per cent. as compared with milk. Hence, when it is desirable to sustain the tissues without much generation of heat, this is preferable. But when both are required in a fluid diet and milk is distasteful or cannot be borne, then the addition to each pint of one-fourth ounce of butter and 1¾ ounces of barley, will about make up the deficiency in that respect and give a slight excess of the fiber element. If the butter be undesirable, add a little more barley and omit the butter.

Beef Tea (nutritive).—One pound of round beef cut fine, and soaked in one-third quart of cold water over night. Pour off and save the water. Simmer the meat two hours in two-thirds of a quart of water, supplying the loss by evaporation. Pour this broth into the saved water and squeeze the meat as dry as possible, then slowly dry it in the open oven, and powder it in a mortar. Then mix the powder with the fluid, salt to taste, and add twenty drops of muriatic acid and three grains of pepsin. One pint of this contains fiber 6.9, fats 3., and aside from the acid and pepsin, yields 725 calories of heat. It is practically a homemade Mosquera's broth, with the very important difference of 725 calories instead of 144, which would in some cases be a great advantage and in others detrimental, *e. g.*, to a fever patient give the beef broth No. 1, but to one who is to undergo exposure give the beef tea nutritive.

Blackberry Cordial.—Wash and mash some fresh berries. Strain out the juice, and to every four quarts add a quart of boiling water. Let it stand in a cool place twenty-four hours. Stir occasionally. Strain again and add two and a half pounds (two pints) of sugar to every gallon. Stir and cork in jugs or seal in cans. No alcohol needed to keep from fermentation. A small fraction of one per cent. of fiber elements, and yields about 340 calories per goblet.

Blackberry Cream.—Mash and sweeten two quarts (say three pounds) of blackberries with half a cup of sugar. Set aside for two hours, then strain. Partly whip one pint of sweet cream, then add juice, sweetened with another half cup of sugar. Whip again and gradually add the stiff beaten whites of two eggs. This has about 2.8 fiber, and yields about 3,419 calories of heat.

Blanc Mange.—Soak for half an hour in warm water one-third of a cup of dry moss. Put in a pudding bag and cook in a quart of milk for one hour. Take out the bag, squeeze, and throw away the moss. Add one quarter of a cup of sugar, strain, and put in molds. Serve with cream and sugar. This adds to the components of the milk the nutritive and demulcent constituents of the moss, and the fat and force elements of the cream and sugar.

Bran Bread.—Mix bran flour into a dough with hot water. Set in a warm place to raise. Bake in small loaves 1¼ hours, then thrust into boiling water four seconds and return to the oven a few minutes Keep in cool place, and if crust becomes hard, cover with damp cloth. Acts mechanically in cases of constipation but causes the loss of other nutriment, hence is unfit for the poorly nourished.

Bran-bread Soup No. 1.—Toast without burning four ounces of bran-bread and pulverize. Into a pint of boiling beef broth No. 2 stir enough of the powder to make a thick soup. Fiber value 1.8.

Bran-bread Soup No. 2.—Stimulating and somewhat nourishing. Made like No. 1 except that beef broth No. 1 is used Its nutritive value is 27; calories 354.

Bran Water No. 1.—Boil wheat or rye bran three-fourths of an hour, squeeze out the bran, add honey to the water and boil one-fourth hour. One-half pint twice a day. Rich in mineral constituents and in the glucose of the honey.

Bran Water No. 2.—Wheat bran two quarts, cold water three quarts. Soak over night. Rub and squeeze the bran; strain. Nutritious and safe for diabetics.

Bread Coffee.—The crust of bread pulverized coarsely and treated as other coffee. This, according to Reichenbach and Von Bibra, contains a bitter substance called assamar having effects on the system similar to coffee. Is a good substitute for coffee, but owes its nutritious properties mainly to the milk or cream and sugar taken with it.

Bread Jelly.—Toast stale crusts without burning, put in a dish with sugar and a little salt. Cover with boiling water and set, with a tight lid on, in a pan of boiling water. Simmer until like jelly. Eat warm with sugar and nutmeg. Has substantially the qualities of bread plus the sugar.

Buttermilk.—Consists of the albuminous sacs which have been broken from around the oil globules by churning, together with all other elements of the cream except the oil, which has massed as butter. In fiber and force elements it is a little stronger than milk, while it has less than one per cent. each of fat and mineral salts It keeps up the full constructive and reparative work of the system, with only two-thirds the normal oxygen demand; therefore, in all conditions of

incomplete oxidation conjoined with inaction of body and mind, it is superior to any other single food. Consumption, pleurisy, emphysema, interstitial pneumonia, sclerosis of the lungs and fevers are best dieted on buttermilk alone, or mainly. May be served in a goblet or china saucer with bits of strawberry ice floating in it.

Buttered Toast ("Our toast").—Spreadw ith one-fourth ounce of butter to one ounce of bread. This adds to the 80 calories of the bread 56 from the butter; total 136. Should not be eaten in fevers, nor when, for any reason, it is not desirable to take strong heat-making food.

Calves' Feet Milk.—Calves' feet prepared in the same manner as Chicken Milk No. 1, are an excellent substitute for beef tea, and form variety in the limited menu of the invalid.

Carnrick Diet.—Kumysgen, Carnrick's food, lacto-cereal food or lacto-preparata, every two to four hours, from one to three weeks; then, gradually add milk, eggs, meat, fish, and finally vegetables in moderation. Very uncertain in the ratio of its food constituents, yet of great value in cases of under oxygenation with excess of uric acid, as in rheumatism, many cases of dyspepsia, etc.

Celery Toast.—Cut up the celery and boil in a little water until tender; add milk and stew for awhile, salt and pepper to taste, thicken slightly with flour. Pour over toast. Said to be of benefit in chronic rheumatism. More nutritious than milk.

Chicken Broth—Cut the chicken in two longitudinally, removing lungs, skin and fat. Cut into small pieces; pour on a quart of cold water, salt, and let it simmer for an hour and a half; then set back for half an hour longer. Strain, season and thicken if desired. Aside from the thickening this has considerably less food elements than Chicken Jelly, which see.

Chicken Jelly.—Half a spring chicken, bones and meat. Put into a pan with one quart of cold water. Cover and simmer until meat is reduced to shreds and the liquid boiled down one-half. Remove from fire and strain twice. Season with salt and pepper. Return to the fire and simmer five minutes longer. When cool it forms a jelly. Slice and serve cold, alone, or on toast, or wafers. The jelly may deceive some into the supposition that this is an extremely nutritious food, but it jellies because of the gelatinous substance of the cartilages, etc., which has very little food value although nitrogenous. Chicken has fiber 24.4, fat 2, calories 540 per pound. But this rejects the substance of the tissues and produces a chicken-food analagous in its nutritive properties to the broth from beef as compared with beef itself. Of course, if toast be added its nutritive properties are correspondingly increased.

Chicken Milk No. 1.—Cut a chicken into small pieces, clean carefully, remove skin. Put into a china-lined sauce pan, with the bones

and neck, the white part of a head of celery, and the stalks (not leaves) of a fresh bunch of parsley, a few pepper-corns and a little salt. Cover the meat with a little cold water, and let it simmer till it is in rags and falls from the bones. Strain into a flat basin or large bowl. When cold it should be in a stiff, clear jelly. Carefully skim off the grease, gently wipe over the top of the jelly with a clean cloth wet in hot water so that no greasy matter remain. Take equal quantities of the jelly and fresh milk, put them into a small, china-lined sauce pan, and let them boil together. Boil up the mixture three times and strain into a cup. A teacupful is generally considered sufficient at a time. The finest strips of dry toast are an agreeable addition. It can be eaten hot, or allowed to cool and form again into jelly, according to taste. This jelly is about equal to Chicken Jelly, which see. The milk adds 3.6 fiber, and 310 calories per pound, and the toast gives 8.9 fiber and 1,280 calories per pound, so that as a whole in the absence of special analysis, it is safe to estimate its fiber at 6.2 and its calories as 802 per pound. Excellent for very delicate stomachs plus the chicken elements.

Chicken Milk No. 2.—Prepare the chicken in the same manner as in No. 1, but instead of using water, cover it with a quart of fresh milk in a very large jam-pot, and setting that in a sauce pan nearly filled with cold water; when the milk in the jam-pot boils, the "chicken milk" is ready for use. Cream may in some cases be substituted for milk, and sometimes equal quantities of cream and milk are used. In this case, over and above the chicken elements are the 3.1 fiber and 769 calories of the mixture per pound. If cream alone be used, it will stand—fiber 2.7 and calories per pound 1,228—too full of force for ordinary conditions in sickness.

Chicken Panada.—One-half cup of bread crumbs, soak in milk enough to cover them. One cup of chicken meat chopped fine. One pint of chicken broth. Press bread crumbs through a coarse strainer into the meat, pour in the broth (first removing fat), and add pepper and salt. Boil one minute. Should be of the consistency of thick gruel. May be seasoned with celery-salt or curry powder. Two tablespoons of sweet cream may be added. This gives fiber 18.4 and calories per pound 1,072, about equal to lean meat. If cream be added it will increase fiber 2.7, and calories 1,228 per pound, in the ratio used.

Children's Food.—See Infant's Food.

Clabbered Milk is thick sour milk; called also loppered milk and bonny-clabber. Use when it is firm before the whey has separated. Eat with cream and sugar, or cream and nutmeg. Dyspeptics should not eat it with sugar. Has about the same fiber value as milk but with slightly diminished force in itself, but which may be made considerably larger by the cream and sugar added.

Clam Broth.—Wash six large clams and pour over them a cup of water. Put in a kettle on the fire. The broth is the juice of the clams with the water boiled a minute. As soon as the shells open, the broth is done. Clams contain fiber 8.6, fat 1, force 2; 240 calories per pound. This broth cannot contain fat and force elements to produce over 100 calories of heat, while the amount of soluble albumen taken up must be very small. Hence, as a food, it cannot rank at more than one-fourth or one-third the value of milk.

Codfish Creamed.—Cut and soak over night, one-half pound of fish into thin pieces crossways of the grain. Pour off the water in which it has soaked, put in fresh water and cook half an hour. Add teacupful of milk and tablespoonful of flour. Before serving, stir in a beaten egg. This is the usual dish and gives more fiber food than meat, yielding about 508 calories. The addition of three-fourths of a cup of cream would raise the calories to nearly 888, and make it adequate to sustain under severe labor.

Cod Liver Oil is looked upon as the panacea for all the ills of innutrition, and has been employed to an extent that has populated cemeteries beyond comprehension. Fats are oxydized in the cells of the lungs and thus exhaust the oxygen supply at its very fountain-head, besides dissipating a large proportion of the heat before it can reach the liver, which is really the normal furnace of the animal organism. Besides, in lung diseases, the local effect is to raise still higher the temperature, which is already at the point of congestion, and thus hasten the congestive and suppurative changes that should be prevented if possible. This waste of heat in the lungs also robs the nutritive organs of the heat which they need, and thus prevents the very process of absorption, to promote which, the oil is given. Hence, it becomes a carbonaceous poison in the blood, throwing an extra work of elimination upon the weakened and already overtaxed lungs, which, unable to expel it, pass it along again in the circulation only to debilitate all the nutritive functions of the system. Therefore, in the great majority of cases, codliver oil in consumption means *death*. For the same reasons all other fats should be carefully adjusted to the conditions of the case.

Coffee Cream.—Soak one-fourth of a box of gelatine in one-fourth of a cup cold water half an hour. Pour on one-half cup of boiling, strong coffee, to dissolve it; add one-half cup of sugar and strain. When cool and about the consistency of syrup, pour in 1½ cups of cream or 1¼ cups of milk. Stir for about ten minutes and put in mold to harden. The gelatine is of so little nutritive value that its worth need not be estimated. The coffee is a nervous stimulant. The cream and sugar have about half the fiber value of milk and yield 1,371 calories of heat, to which the gelatine and coffee will add somewhat.

Coffee Syrup.—Make strong coffee with two tablespoons of the ground berry, a little white of egg and one cup of boiling water. Simmer together one cup of sugar and a third of water five minutes, then add one-half cup of the coffee. Strain and bottle. The whole will yield about 900 calories of heat, the stimulating properties of the coffee, and an inappreciable quantity of fiber from the egg.

Corn Coffee.—Common field corn, roasted as brown as possible without burning, ground coarsely and steeped like coffee. Add milk and sugar. Much more nutritious and less stimulating than coffee. Made quite strong, with cream and sugar it equals milk.

Corn Meal Gruel.—Stir one cupful of corn meal into a paste with cold water and turn into a quart of boiling water and boil forty minutes. Salt. Richer than bread in fiber constituents and yields 825 calories.

Cottage Cheese No. 1.—Tie in a cloth and drain clabbered milk. Hang in a cool place over night. Without special analysis, this would be rated as a fiber food as stronger than meat and approximating cheese, while rich also in fats.

Cottage Cheese No. 2.—Heat sour milk. Pour off the whey and put curd in a bag and drip for six hours. Chop and salt. Work to consistency of soft butter adding cream and butter. Mold and put in a cool place. Eat while fresh. The addition of cream and butter makes this one of the strongest foods in *both* fiber and fat constituents. Should be used sparingly except with great muscular exertion or very great exposure, and with little or no other foods having these elements in any considerable proportion.

Cracker Gruel.—Mix one scant saltspoon of salt and one scant teaspoon of sugar with two ounces of rolled soda cracker crumbs; then pour on one cup of boiling water, and one cup of milk, and simmer for two minutes. Five-eighths the fiber value of bread; yields 406 calories.

Custard.—Three eggs well beaten, a quart of fresh milk, and an ounce of sugar, slightly baked. This gives 912 calories of heat and a fiber value 4.2.

Custard, French.—Put into the bottom of the custard cups a teaspoon of raspberry jam. Then with a tunnel pour custard in slowly. Bake twenty minutes. The jam, if firm, will not mix with the custard, and imparts a nice flavor. Slightly diminishing the fiber value of custard, but increasing the number of calories to a small degree.

Date Pudding.—Sprinkle in a buttered pudding dish half a cupful of dry crumbs wet with a little milk; cover with layer of dates, then another of bread crumbs moistened with milk. One quart of milk taken from fire when nearly boiling; add yokes of four eggs beaten with one-half cup of sugar; then the whites, stirring lightly. Return to the fire until it thickens. Add a little salt and half teaspoon

of vanilla. Put a spoonful of the custard upon the crumbs and bake. The quantities are too uncertain for a safe estimate of food-value, but it unites the qualities of a good custard with those of fruit.

Demulcent Drink No. 1.—Mix two ounces of sugar of milk, eight ounces of white powdered sugar, and one ounce of powdered gum arabic together. Dissolve half an ounce of this in a pint of water. Makes a demulcent drink for use in bronchitis, pleurisy, or pneumonia, with considerable energy.

Digestant No. 1 for fiber-foods.—Pepsin and dilute muriatic acid of each, two drams. Glycerine and cinnamon water of each, two ounces. Mix. Dose, a teaspoonful after each meal.

Digestant No. 2 for force-foods.—Crushed malt three ounces, cold water half a pint. Mix and stand twelve hours. Filter through paper until clear. Prepare fresh, daily. One to two tablespoonfuls sipped along through the meal.

Digestant No. 3.—Our liquid malt; one-half teaspoonful with meals.

Dyspepsia Crackers.—Take good wheat to the mill and have it ground; sift out only the bran, leaving the middlings and flour together. This is wheat meal. Take wheat meal one quart; butter one tablespoonful; water to make a *very stiff* dough. Beat this on a bread board with a rolling pin thirty minutes; then roll *very thin*, cut, prick, and bake in a quick oven. Upon the same basis as graham crackers, the fiber value is slightly in excess of bread, while they yield 2,050 calories per pound.

Eggs, Boiled.—Pour a pint of boiling water on each egg, the warmed dish standing on a thick woolen cloth, cover and stand six minutes. Mix yolk and white thoroughly, and if the stomach will digest it add one-half to three-fourths of an ounce of fresh butter to each egg. The eggs alone are in fiber value midway between bread and meat, and yield 720 calories per pound, or 60 each. If one-half ounce of butter be added it will give 238 calories to each egg.

Egg Coffee.—To a cup of strong coffee add one-half cup hot milk, sweeten well and boil; then pour it over a well-beaten egg and serve at once. Has about 4.9 fiber value and yields nearly 243 calories.

Egg Lemonade.—The juice of one lemon in one goblet of lemonade. Beat one egg to a froth and stir in and add pounded ice. Has the fiber value of the egg, and yields about 102 calories.

Egg and Milk.—One raw egg stirred into one-half pint of milk is palatable and nourishing. Flavor with cinnamon, spice, vanilla. More nutritious than bread and yields 210 calories.

Eggnog No. 1.—Scald and cool one tumbler of milk slightly salted. Beat together one egg and one dessert spoonful of sugar and add one dessert spoonful of brandy and mix with the milk. The fiber element is about 5. per cent. and the calories 252.

Eggnog No. 2.—Milk as in No. 1. Yolks of two eggs, two tablespoonfuls of sugar and one tablespoonful of brandy. Mix as in No. 1. The fiber in this is 4.3 and the calories are 396. The brandy is too strong for any but exceptional cases or very temporary use.

Eggs, Scrambled.—Beat two eggs, a saltspoon of salt and a little pepper in a bowl until light; add two tablespoons of sweet cream or rich milk, and set the bowl into a kettle of hot water, and stir constantly until it coagulates. Serve alone or with our toast. Alone, this is midway between bread and meat in fiber elements, and yields 225 calories. If toast be added, see Toast.

Egg Toast.—Mash up the yolk of a hard-boiled egg and spread on a slice of "Our Toast" with butter and salt. With one-third ounce of butter and two ounces of bread, and yolk estimated at one-half of an ounce we have 289 calories of heat, and fiber value about one-half more than bread.

Elderberry Syrup.—Boil elderberries down with honey into a rich preserve. One teaspoonful in a glass of water makes a pleasant drink with a slightly stimulating effect upon the kidneys.

Farina Gruel.—Salted, boiling water one pint. Stir in briskly one tablespoonful farina and simmer thirty-five minutes. While hot stir in a tablespoonful of cream or fruit cream. If the cream be used this has no fiber value, and yields but 233 calories of heat. If fruit cream be used, there is a trace of fiber element.

Fig Pudding.—Chop together one pound of figs, one pound of fine bread crumbs. Add one pound chopped beef suet, one pound brown sugar, cup of milk and six eggs. Boil three hours and serve with eight ounces cream or liquid sauce. The fiber constituent is about 4.3 and the energy of the whole 5½ pounds is 5,569 calories, giving enough construction material and energy to support one man two days at moderate work.

Fig Water.—Boil one-half pound of figs with half an ounce of ginger in two quarts of water until reduced to a pulp. Strain and bottle, or use at once. Has the food value of figs together with the carminative, stimulating effect of the ginger. May be used in flatulence, and in cold states of the digestive tract.

Fish.—When fresh is firm and hard and will rise at once when pressed with the finger. If the flesh is soft, eyes dull or sunken, gills pale, it is not fresh. With red blood is nutritious but not easily digested. Average fiber value is fifteen per cent., and calories per pound, 431.

Fish, Boiled.—Select any white fish, fresh cod, for instance, two pounds. Clean and put into a wire vegetable basket, drop the basket into a dish of boiling salted water, and let it simmer from fifteen min-

utes to three quarters of an hour according to the size of the fish. Do not allow it to boil rapidly as it will break. When done serve with drawn butter as follows: Simmer together two minutes four ounces of butter and two ounces of flour; then add, a little at a time, a pint of boiling water, or chicken broth, stir constantly. Makes enough for two pounds of fish. Season with parsley, grated yolks of hard-boiled eggs, few drops of lemon juice, bit each of cayenne and mustard and a few drops of onion juice. This will make a moderate meal for three persons, and will give to each (excluding chicken broth and eggs) a fiber value of about ten per cent. and 1,520 calories of heat.

Fish, Broiled.—Small fish, as perch, young cod, etc., are excellent broiled. After washing and cleaning, split lengthwise, if thick, sprinkle over it salt and pepper, squeeze over it lemon juice, dip in melted butter and broil over clear coals, quickly at first, then very slowly, allowing ten minutes for each inch of thickness. Serve with butter or cream. Has the general nutritive constituent of fish, about ten per cent., and a force production of 431 calories per pound augmented by the cream or butter according to the quantity used.

Fish, Creamed.—Cream some butter and season with salt, cayenne pepper, lemon juice and vinegar. A teaspoonful of butter is enough for small fish with a speck of salt and pepper with teaspoonful of vinegar and lemon juice (half of each). Spread on the fish or serve separately. See Fish, for nutritive value, aside from the condiments which are too uncertain to be estimated.

Fish, When in Season.—Cod, haddock, halibut, flounder and clams all the year; cusk and white fish in the winter; shad in spring; perch, spring and summer; salmon, May to September; bluefish, June to October; swordfish, July to September; smelts, September to March; and oysters, September to May.

Flaxseed Lemonade.—Pour upon four tablespoonfuls of whole flaxseed one quart of boiling water, cover and steep three hours. When cold add juice of two lemons and sweeten. Serve ice-cold as a demulcent drink.

Flour Ball.—Mix one pound of flour, one teaspooonful of salt, one teaspoonful of sugar of milk and four tablespoonfuls of cold water, and tie into a firm ball in a pudding bag and boil twelve hours. Hang up to drain. After twenty-four hours open and peel off the layer of dough. Dry the hard solid ball in the sun or an open oven. Keep in a dry, cool place. Two or three teaspoonfuls shaved off and made into a paste with water, then stirred into a pint of scalded (not boiled) milk makes a very digestible and nutritious food The little of the flour ball used adds but very slightly to the fiber value of the milk, but its long exposure to heat has changed its starch, partially digesting it, and thus causing it to become a digestive ferment to the milk.

Fruits, How to Serve.—The beauty of fruit depends upon the manner in which it is put upon the table. This means even more to the sick than to the well.

Apples.—Polish well, pile high, yellow and red together; serve with silver knife.

Bananas should be heaped with oranges or grapes.

Berries should be served without sugar as that draws out the juice and toughens them.

Grapes.—Clip all unripe and unsound ones from the cluster. Arrange the green and purple together upon some of the leaves or with oranges. Grape scissors are now frequently used.

Melons.—Keep on ice for a few hours before using.

Watermelons should be brought on the table entire, and cut across the middle.

Nutmeg and Muskmelons should be cut lengthwise, seeds removed, and served with ice on each hemisphere, and with both salt and sugar.

Peaches should be peeled thin and sliced. Reserve a few of the finest for a central dish, garnished with some of the leaves, as many prefer to pare their own.

Pears.—Serve in a high dish with green leaves.

Plums, purple and green gage, with a few sprays of nasturtium leaves and blossoms.

Fruit Minute Pudding.—Scald a pint and a half of milk with one cup of sugar and turn over five tablespoons of flour previously mixed with half a pint of milk. Stir. Return to kettle and cook until it thickens. Take off and beat while cooling. When half cold, add one and one-half pounds sliced bananas, or any fruit. If made with bananas this will give a fiber constituent of about 3.2 per cent. and the whole will yield 3,782 calories of energy.

Fruit Oatmeal Soup.—Soak one-half pound dates, figs or other dried fruit in one-half pint of milk until soft. Chop fine and stir into a quart of oatmeal porridge. The quart of porridge, fiber 1.5, gives 460 calories to which the fruit and milk add enough to raise the fiber to about 5.7, and the calories to 1,100.

Fruit Pudding.—Soak for half an hour a pint of stale bread crumbs in a quart of milk. Then stir in a cup of sugar and the yolks of three eggs beaten together. Mix in one teaspoonful of butter and beat all thoroughly together. At the last add the juice and grated rind of a lemon. Bake half an hour in moderate oven. Beat the whites of three eggs with as many tablespoons of sugar. Spread over the top with jelly, jam, or marmalade, or fresh fruit mashed and sweetened. Put in the oven and let it brown. Aside from the uncertain top-jam or fruit this affords less than bread in fiber constituents, and about 2,800 calories.

Fruit Tapioca.—Wash one-half pint tapioca and soak one hour in two cupfuls of cold water. Boil in farina kettle until clear. Lay in pudding dish a pound of sliced fruit and three ounces of sugar and pour over it the tapioca. Bake one-half hour. Serve hot or cold with three ounces of cream or custard to taste. Omit the custard, and the fiber value is considerably less than one per cent., while its calories are 2,000. Making an almost pure force-food.

Fruit Temperance Beverage.—Twelve lemons, one quart ripe raspberries, one pineapple, two pounds sugar, and three quarts of soft cool water. Peel and squeeze the juice of the lemon over the peel; let it stand two hours, add the sugar; mash the berries with one-half pound of the sugar, cut the pineapple into thin slices and cover with sugar. Add the three quarts of water and strain. Not quite two-tenths of one per cent. of fiber element and 4,800 calories in the whole, or 200 per goblet.

Fruit, Stewed.—Any sub-acid fruit, perfectly sound and ripe, stewed until soft in just enough water to soften it and sweetened with glycerine. May be eaten sometimes by the dyspeptic when sugar disagrees.

Gluten Bread.—Mix a pint each of milk and warm water; soak one-half of a yeast cake in a little warm water and add to it two eggs well beaten and mix with the milk and water. Stir in gluten flour to a soft dough and work into this a heaping teaspoonful (one ounce) of butter. Raise and bake in a quick oven. Estimating the flour at one pound of sixteen per cent. gluten, this will give a fiber value of about one and a half times that of wheat bread, and about 2,800 calories. There are special gluten meals that contain a much greater per cent. with corresponding yield of fiber element. Gluten bread is chiefly for dyspeptics and diabetics, because of its relatively small proportion of starch.

Gluten Cake.—Mix thoroughly one cup of gluten flour, two tablespoonfuls butter, two of grated cheese, two of cream, the yolks of two eggs, half a teaspoonful of salt and a little nutmeg; roll out thin and bake in quick oven. This gives a little over fourteen per cent. of fiber element and only 774 calories.

Gluten Gems.—Beat up one egg, add it to a pint of water salted; sufficient gluten flour (say eight ounces) to make a thin dough; mix with the dry flour a tablespoonful of baking powder; add the egg water and a small tablespoonful of butter (two ounces); stir, bake in quick oven. A little over twelve and a half per cent. of fiber and 720 calories.

Grape Juice, No. 1.—Put into a kettle, with a little water, grapes not too ripe, and scald slowly. Drain over night. Express the juice

and drain again; then boil the juice, skimming frequently, and sweeten to taste; bottle full and cork tightly. as it cools, press down the corks so there is no space between the cork and the juice. If there is, seald, bottle and cork as before. Too indefinite to be estimated.

Grape Juice, No. 2.—Put in a double boiler one quart of washed Isabella, Concord, or Black Hamburg grapes, with water to just cover. Heat slowly until soft, then hang in a pointed bag until the juice all drips out without squeezing. To each quart of juice add one cup of sugar and keep hot, but below boiling, one hour. Pour into sealded bottles, seal with wax and keep cool. Number 2 has about a half of one per cent. of fiber and 1,610 calories.

Gruels, if made with over four to five per cent. of cereal flour, become too thick and pasty, and if of this strength, only contain one-half of one per cent. of fiber material, and about 5 to 6 calories per ounce

Gruel, Fortified.—Make a gruel by stirring an ounce of flour slowly into a pint and a half of salted water. Cook one-half hour. Cool. Add one to two tablespoonfuls of malt infusion and an equal quantity of milk or beef tea. This adds to the gruel the strength of the milk or beef tea, and partly prediges it, thus making a very good dish for those who are confined to the bed, but insufficient for the active.

Gum Arabic, dissolved and flavored with sugar, is a demulcent drink, that also furnishes enough calories of heat to make it desirable in some diseased conditions.

Honey Tea.—Boil a tablespoonful of honey in a pint of water fifteen to twenty minutes Cool and strain. Honey has about the nutritive value of good syrup.

Jelly.—Three-fourths of a pound of sugar to a pint of well-cooked juice. About four-tenths of one per cent. of fiber element and 2,091 calories.

Jelly Water.—One tablespoonful of any jelly, stirred into one glass of ice water until mixed.

Kefir.—About same as homemade koumiss, with the exception that the kefir fungus is used to start the fermentation, instead of the yeast cake.

Koumiss, Homemade.—A number of clean, stout, quart bottles. Put into each one-seventh of a cake of compressed yeast, one tablespoonful granulated sugar, and two of hot water, and shake till the yeast is dissolved, then add 1¼ pints fresh milk and stir constantly while being brought to a blood heat. Cork tightly and tie on; shake, lay on sides, and keep at a temperature not lower than 75° three to five days, turning daily. When it looks thick and smooth put on ice for

twenty-four hours. Draw with champagne-tap, or uncork cautiously, as it will fly. This has a fiber value of 2.04 per-cent., and yields 190 calories per pound. A very insufficient food for any out-of-bed conditions, and to be relied upon even in bed only temporarily, or as adjunct to other foods on account of its carbonic acid being so acceptable to the stomach.

Lemonade.—Wipe two lemons and peel off the outer rind, but none of the white of the rind. Now peel off and throw away the white. Cut lemons into thin slices, seed; put the slices and the rind of one lemon into a pitcher with a tablespoonful of sugar, pour on 1½ pints of boiling water and stand on ice till cold. Strain. This has less than a quarter of one per cent. fiber and yields about 200 calories.

Lemonade Barley is lemonade with one teaspoonful of barley flour added to the goblet, the flour having been previously boiled fifteen minutes in just enough water to keep it from being a thick paste. This adds to the lemonade one-fourth of an ounce of barley to each eight ounces, giving a little over one per cent. of fiber, and raising the calories to 225.

Lemonade Cream.—Beat white of an egg to a froth, add strained juice of one lemon and three teaspoonfuls of powdered sugar; beat well, and pour into a tumbler half full of chopped ice, and add four tablespoonfuls of fresh cream. Nearly 1½ per cent. fiber and 600 calories.

Lemonade, Egg.—To a goblet of lemonade add an egg beaten to a froth, and a little pounded ice. Has the nutritive value of the egg with the acid of the lemon.

Lemonade, Elm.—Use elm instead of gum and proceed as for gum-lemonade.

Lemonade, Flaxseed.—Pour one quart of boiling water on four tablespoonfuls of whole flaxseed and steep three hours. To each goblet of *lemonade* add the *juice* of one lemon and a goblet of the flaxseed water, and give in portions ice cold. Similar to lemonade-gum, but stronger of acid.

Lemonade-Gum.—Gum arabic four teaspoons, hot water one pint, stand on stove until dissolved. Then, to each goblet of gum water, add a goblet of lemonade. Use cold. A demulcent acid drink suitable to feverish conditions with a local irritation of throat or stomach.

Lemonade, Hot.—Boiling water one-half pint, lemon juice two tablespoonfuls, sugar one tablespoonful, red pepper just enough to taste well, and drink hot when not liable to exposure soon.

Limed Milk.—One tablespoonful of lime water, one tablespoonful of cream, five tablespoonfuls of milk. This preparation simply dilutes the milk one-sixth without increasing the proportion of lime; in fact, slightly diminishing it (see Lime Water), and adds one-seventh of

cream, thus raising the fiber element about four-tenths of one per cent. and almost doubles the fat, yielding, instead of the milk equivalent of 310, about 600 calories.

Lime Water.—Put a piece of unslaked lime, size of an egg, into a quart bottle of rain water. Stand twelve hours. Pour off the clear water for use, and refill as long as the lime lasts. This is the saturated solution usually ordered for children and contains but 1.3 grams of lime per pint, while milk contains 1.7. (Bunge). To mix this with milk as an ant. acid or to supply the mineral is equally useless. If the latter be the object, and the milk be poor or wanting, give the yolk of egg instead.

Linseed Tea.—On one ounce of bruised linseed and one-half ounce of sliced licorice root pour one quart boiling water. Cover and set near the fire two hours. Strain through muslin; flavor with sliced lemon and sugar candy. One to two tablespoonfuls as necessary. This is a slightly nutritious demulcent preparation of service in irritable conditions of the respiratory tract, when the diet otherwise affords sufficient fiber elements.

Malt and Milk.—Ground malt four tablespoonfuls, boiled ten minutes in a pint of water. Pour off and add a pint of new milk. Its value as a food is about that of milk as the malt adds only a little starch element, and partly predigests the milk.

Broiled Chopped Meat.—Reduce to a pulp, first removing the skin, connective tissue, gristle, etc. Make lightly into a cake. Heat frying pan very hot and place upon it without water or grease, and allow to remain until the surface is seared over; then turn. When this side is seared also set back, cover until the red color of the meat changes to a drab. Season with fresh butter and a little salt. This furnishes a fiber and fat diet excluding the force constituents altogether. It is not properly a sick diet, but is well adapted to furnish strength in active conditions, and is often curative in dyspepsia, liver complaint, etc., by reason of its simplicity.

Meat Infusion.—Mince the breast of chicken, add half its weight of water, stand two hours and press through cloth. Flavor with lemon, or with extract of meat. Has the value of other meat extracts substantially. Not to be depended upon for subsistence.

Milk.—Is safest taken after it has been scalded, and in the main, is then more easily digested than uncooked. The invalid may, at first, take a quarter of a pint at a meal, increasing the amount until after considerable exercise is taken, when a pint may be used at each meal. A pint of milk is as nutritious as, or even more than, six ounces of lean beef or mutton. (Densmore.) Should not be boiled.

Milk Diet.—Divide the day into even periods, say six, and at each period drink one-third of a pint of fresh milk. Increase each day until

five or six quarts are taken daily. Increase the number of perlods for the larger quantity, so as not to take more than one-half pint at a time. Take it cold or warm but it must not be boiled, and nothing else must be eaten. For variety, clabbered milk may be taken part of the time. Many times those who are unable to take solid food, and who, in health, are unable to digest milk, can take it in this way in any quantity, as it passes directly through the stomach and is digested in the duodenum. (Roberts.)

Milk Gruel, Peptonized.—Add to hot milk gruel an equal quantity of cold milk, and to each pint of the mixture two teaspoonfuls of liqour pancreaticus or its equivalent, and twenty grains of bicarbonate of soda. Set in a warm place two to three hours, raise to boiling point and strain. In uræmic vomiting, gastric catarrh, cardiac disease, pernicious anæmia, gastric ulcer and pyloric and intestinal obstruction peptonized milk gruel is of especial value. (Roberts.)

Milk, Peptonized.—Dilute a pint of milk with one-half pint of lime water, or with one-half pint of water containing twenty grains of bicarbonate of soda. If in the winter slightly warm the ingredients. Add three teaspoonfuls of liquor pancreaticus, or an equivalent in other pancreatic extract, and set aside in a jug for three or four hours. Then use at once, or boil a moment, so as to stop the process of digestion.

Milk Punch.—One goblet of milk sweetened to taste, two dessert spoonfuls of brandy, stir well and season with nutmeg if desired. This quantity of brandy may be allowed as an emergency supply, but is more than double what should be used if the punch is taken every two or three hours. See Alcohol.

Milk Substitute No. 1.—For digestive troubles of infancy when milk cannot be tolerated. A strong gruel predigested with malt infusion mixed with an equal volume of beef tea or other meat decoction (Roberts.) Should not be used in the first eight or ten months of a child's life, as its starch element is too strong even though partly digested.

Milk Substitute No. 2.—Soak two tablespoons of washed barley half an hour in a little lukewarm water, and stir into two cups of salted boiling water. Simmer one hour, stirring often. Sweeten and strain. Should be used with the same caution as No. 1.

Milk Substitute No. 3.—One pound of raw beef, chopped fine, in a bottle with one pint of water and five drops of muriatic acid. Stand on ice twelve hours. Stand in a pan of water at 110 F. two hours. Strain with pressure and salt. Add a flavor of cinnamon, celery or pepper. Much more stimulating than either of the others, but must not be relied upon to sustain life during long periods.

Milk Thickened.—Stir flour into cold milk to a thick paste, then stir the paste into boiling milk until thoroughly cooked, and salt to taste. Has a nutritious value between milk and bread, and is excellent in bowel complaint of adults or children.

Mustard Dressing.—Boil one heaping tablespoon of butter, or beef fat, and add one tablespoon of flour; stir. Gradually add a pint of water, teaspoon of salt and a fourth of a teaspoon of pepper. Add a little mustard. Or, half teaspoon of beef fat can be used and one-half teaspoon of butter, cut in small pieces.

Mutton Broth No. 1.—Take one pound of mutton, without fat, cut into thin slices. Pour over it one quart of cold water, let it simmer one hour and boil one hour. Stir. Strain and season. Belongs to the beef tea and meat extract varieties of food. Stimulating from its large proportion of mineral salts, but having no fiber element.

Mutton Broth No. 2.—One pound of mutton from the neck, or better, the loin, one quart cold water, and teaspoon of chopped onion Remove tough skin, fat and all membranes, and cut meat into small pieces. Put all into saucepan and simmer three hours, strain out the meat, dip off the fat with a spoon, remove small particles with paper; season with salt and pepper. Serve hot with toasted cracker. This gives zest to the crackers, which constitute the real nourishment of the meal and as far as they go, are about half as strong again as bread. The onion amounts to little more than flavoring.

Nut and Fruit Pudding (Densmore's).—A pound of shelled Brazil nuts, or walnuts, or filberts, or hazelnuts, may be added to a pound of dates, a pound of dried figs and a pound of raisins; the dried fruit well washed, sliced thin; stones removed from the dates, the nuts are also better sliced. Mix in a pudding dish, and cover with enough water to give the desired consistency to the pudding after baking two hours, or, the jar may be placed in boiling water and the water kept boiling two and a half or three hours. A portion of this pudding may be eaten with the more acid fruits, well ripened. If it be desired to eat only a small portion of the pudding and more of the fruit, it may be made with double the quantity of nuts, and thus the needed amount of oil can be obtained with a smaller bulk of pudding. This pudding made with one pound of hazelnuts and the dried fruits, gives 5,829 calories, or 1,457 per pound of ingredients besides water. About equal to fat beef flank

Nutritive Enema and Embrocation No. 1.—One grain pure Papoid dissolved in one ounce of water (two tablespoonfuls; mix six ounces of raw lean beef, chopped fine, keep two hours at a temperature of 130 degrees. Strain through cheese cloth, and add a little boiled water. If desired, five per cent. of brandy may be added. Use as an embrocation when absorption is wanted.

Nutritive Enema No. 2.—To equal parts of Milk Gruel and Beef Tea (stimulating) add a dessert spoonful of liquor pancreaticus, or its equivalent, and administer immediately.

Nutritive Enema No. 3.—A tablespoonful of Beef Pulp, one of Coffee Syrup, and two of sweet cream with a dessert spoonful of liquor pancreaticus.

Oatmeal and Fruit.—Over one-half pint of oatmeal mush lay half a pound of sliced fruit, bananas, oranges, peaches, etc., and over that pour four ounces (one-half cup) of cream and sprinkle on an ounce of pulverized sugar. Nearly the same as milk in fiber, and yields about 1,000 calories.

Oatmeal Gruel.—Make a smooth paste with two tablespoonfuls of oatmeal and same of water. Stir in a pint of boiling water; boil half an hour. Salt, and strain through muslin. If too thick, thin with milk. Without milk its fiber value is a little less than two per cent., and its calories 230.

Oatmeal Mush.—Boil in a double boiler five hours, one-half cup (four ounces) of oatmeal with one-half teaspoon of salt, with one pint of boiling water. Put upper vessel on stove for two minutes to start boiling. Serve with cream or jelly If rolled oats are used three hours is sufficient to cook them. Estimating twelve ounces of the food, its fiber will be five per cent and its calories 460, aside from cream or jelly.

Oatmeal Porridge.—Mix two ounces of oatmeal with small teacup of cold water until of uniform consistence Pour over it one pint boiling water. Boil, and stir for forty minutes It is now ready for use or can be kept simmering, adding more water as needed. Its fiber value is about 1.5 per cent., and it gives 230 calories.

Oatmeal Porridge (thick).—Put two quarts of boiling water, salt, and six ounces of oatmeal into a farina kettle. Cover and boil one hour. Do not stir Eat hot with six ounces of sweet cream. Assuming that the porridge equals three pounds, its fiber value is nearly two per cent., its calories 690, which are raised by the cream to over 1,400

Oatmeal Pudding.—Take two pounds oatmeal porridge, add yokes of four eggs, three ounces of sugar, salt and lemon, and the whites of the eggs, well beaten. Bake one hour. Serve with five ounces of sweet cream. This gives a fiber percentage of about three per cent. and 4,842 calories; that is in fiber nearly equaling milk, and in calories nearly four times as much as bread.

Oatmeal Tea.—On a tablespoonful of oatmeal pour a pint of boiling water, sweeten with honey and flavor with lemon-rind, cut thin. Stir and stand till cool. Warm for drinking if desired. Before the addition of the honey its fiber value is one per cent., and its calories 115.

Oatmeal Water.—Stir a tablespoonful of oatmeal into a goblet of cold water and stand an hour. Strain and drink cold. Fiber value two per cent., calories 115.

Orange Cream.—Squeeze the juice and pulp of three oranges into a bowl. Add the juice of half a lemon, three ounces of sugar, one and a half pints of cold water; boil and strain. Dissolve two tablespoonfuls of corn starch in a little cold water; add to the juices; let it boil fifteen minutes to cook the corn starch. When cold, beat up the whites of three eggs to a foam and whip it into the corn starch. The fiber element is but a fraction of one per cent., and the whole quantity yields less than a thousand calories, so that in small portions it is rather a pleasant amusement than a diet.

Orange Sherbet.—To every quart of water add juice of four oranges and juice of two lemons. When nearly frozen stir in the beaten whites of three eggs. An albuminous food, with good sustaining properties, when an acidulated fiber food is required in fluid form. But it should always be remembered that, in drinks, the food elements are greatly diluted.

Our Coffee No. 1.—A favorite mix is two-thirds Java and one-third Mocha. Should be ground just before needed. For a pot of coffee use one heaped tablespoon to a cup of water. Add a little yolk or white of an egg to the grounds, diluted with a spoonful of water. Mix thoroughly, then pour on boiling water and simmer for five minutes, and steep ten minutes more. Should be served at once. A nervous stimulant.

Our Coffee No. 2.—A tablespoonful of coffee soaked over night in one-half cup of cold water. Heat almost to boiling, add one-half cup of boiling water, and set back five minutes. Stir in one-half of the mixed white and yolk of one egg. Settle, and serve with one-half cup of scalded milk and loaf sugar. A nervous stimulant to which is added by the egg, milk and sugar about 100 calories of heat, and a fiber value over half bread.

Oyster Broth No. 1.—Chop eight fresh oysters fine, and put into a saucepan with a cup of cold water. Slowly heat to boiling, and simmer five minutes; strain, flavor with salt, and serve hot. Supposing this to make seven-eighths of a pint, its food value as compared with milk is, fiber about one-third less and calories 85. While not the equal of milk in sustaining or heat-generating power it is a pleasant and appetizing variety for totally inactive conditions.

Oyster Broth No. 2.—Oyster Broth No. 1 eaten with buttered toast (see B. T.). This adds to the nourishment of the broth 136 calories for each ounce of toast, and is subject to the same restriction as that toast but in a less degree.

Oysters, Creamed.—Clean a pint of oysters and dry on a napkin, then spread on a plate and season with salt, pepper, and a suspicion of cayenne. Make a rich cream sauce of one pint of cream, one even tablespoon (one ounce) of butter, and two tablespoons of flour. After cooking, pour over the seasoned oyster and bake ten or fifteen minutes. This cooks, but does not harden the oyster. The mixing of oyster and sauce should be done quickly so that the sauce may not become cold before being put in the oven. Also requires more time for cooking. This gives a fiber food somewhat stronger than milk, and heat production nearly three times as great; being for the whole, 1,588 calories requiring about eighty-two pints of oxygen for its complete transmutation.

Oysters, Broiled.—Drain large oysters on a cloth, and turn from one side to the other to make as dry as possible. Soften some butter, and season some cracker crumbs with salt and pepper. Then, holding each oyster, dip into the crumbs, then the melted butter, then the crumbs. Arrange on an oyster broiler and broil over hot fire for about two minutes. Turn the broiler frequently. Should not be shriveled, but soft, plump, tender and juicy. In fiber constituent midway between milk and bread; fats and calories uncertain because of the variable quantity of butter and crumbs, but probably about midway between bread and meat. Unfit for feeble digestion.

Oyster Stew.—One-third of a teacup of oyster liquor in a stewpan with half as much water; salt and pepper, and add one teaspoon of rolled cracker. Have ten oysters ready, and the instant the liquor begins to boil pour in the oysters, and as soon as it begins to boil again count thirty seconds and pour immediately into one and a half tablespoonfuls (¾ ounce) of cold milk, and serve. Supposing the oysters of the same size as in Oyster Broth No. 1, the whole product will give about 160 calories, and is somewhat richer in fiber than is Oyster Broth No. 1.

Oysters, Roasted.—Place twelve oysters in the shell upon the fire until the shells open a little. Take off, open, retaining juice; serve hot with pepper and salt. If the "hard part" is at all tough, do not eat it. Delicate, digestible, and of the nutritious value of oysters.

Peach Bread Pudding.—Pour boiling water on a pint (eight ounces) of fine stale bread or cracker crumbs, with a small tablespoon of butter (one ounce). When thoroughly soaked, stir in two well-beaten eggs and half cup of sugar. Put first a layer of batter, then of peaches and sugar, until full. Eat with cream, four ounces. Peaches two pounds. This gives about three per cent. fiber constituent and 2,200 calories.

Peach Foam.—Peel and cut ripe peaches into small pieces so there will be a cupful when done (eight ounces). Beat for half an hour with

half cup of powdered sugar and white of one egg. This gives about 1.5 per cent. of fiber and 600 calories.

Pie Crust, Hygienic, No. 1.—Mix equal quantities of graham and white flour together with cream, in the proportion of three cups of flour to one scant cup of cream. Stir rapidly and lightly. Without kneading, set in a cool place half an hour before rolling out. Two teaspoons of baking powder will make the crust lighter. In that case roll and bake at once.

Pie Crust, Hygienic, No. 2.—Take equal quantities of white pastry flour, Indian and oatmeal, and wet with cream as above directed. Roll very thin. No. 1 has about 9 per cent. fiber and produces 3,077 calories. No·2 has 9.3 per cent. of fiber and 3,143 calories.

Peach Paste.—Pare half a peck of peaches, weigh them, and to each pound allow a quarter of a pound of sugar. Stew slowly. When cooked dry enough to spread in a thick paste, spread over a buttered board, and stand in the sun to dry; if necessary, put it out the second day. When dry, so that it does not stick, roll up like leather and keep in a dry place. The sugar will add 450 calories to the 250 of each pound of the uncooked fruit, making 700 each. The condensation by drying it is difficult to estimate, but is not less than three-fourths, which would give the dried article a heating power of 2,800 calories, more than double that of bread, and a fiber element of about two per cent., or more than half that of milk.

Peach Pie, Deep.—Fill dish with two quarts ripe, peeled peaches, leaving in pits to increase the flavor. Fill half full with cold water, sprinkle in eight ounces sugar, and cover with a light paste of Pie Crust, Hygienic, No. 1, rolled to twice the thickness used for pies. Bake in a slow oven three-fourths of an hour. Eat with cream, half pint. Supposing the water to measure one pint and the crust to weigh two pounds, the fiber element will be about 5.3 and the calories of the whole 5,579.

Pomarius.—Filter new cider through flannel bag and heat until it begins to thicken. Finish drying in shallow dishes till it is of the consistency of jelly and about one-tenth of its first measure. Pack in glass or earthen, and it will keep during the summer. May be diluted for sauces or beverages.

Potatoes, Creamed.—Cut boiled potatoes in half-inch dice, put in a pan with salt and pepper, and pour on milk until even with the surface of the potato. Simmer until all the milk is absorbed. For every pint of potatoes make a pint of white sauce, season with a saltspoon of salt and teaspoon of chopped parsley. Chopped onion may be used. Supposing eight ounces each of potatoes and milk to constitute the above ingredients, the fiber element will be 7.5, and the calories for the whole 1,078.

White Sauce.—Butter two ounces, two ounces flour. Cream them, and pour a cup of boiling water over them. Fiber element two per cent., calories 658.

Pudding, Strawberry.—Make a jam by mashing one quart fresh strawberries and sweeten to taste, say four ounces of sugar. Spread slices of wheat bread (one pound) with it, and pile one above the other in a pudding dish. Pour over thin cream, one pint, to moisten well, and cut into pieces. Custard may be used in place of the cream. The fiber constituent of this pudding is 3.8, while the whole yields 3,286 calories,—enough for three hearty meals at light labor for a woman.

A Puree.—A tablespoonful or two of water or bouillon in a saucepan over a fire, add chopped meat, stirring it until the red color has given place to a drab; season with salt and butter. One, two, three, or four ounces of this meat should be given to the patient at a meal, as strength may warrant and stomach allow. No food when there is no appetite, and none after appetite has been satisfied.

Raspberry Shortcake.—Rub three tablespoons (six ounces) of butter or lard into a quart of flour, sifted with three teaspoons of baking powder until it is fine, then add milk until it is as soft as can be rolled out. Handle as little as possible. Make about one-half inch thick, bake, and invert the bottom of the cake for the layer of berries. Pile them on an inch thick with bits of butter, dredge with sugar and put over them another layer like the first. Pour over whipped cream, or, in place of it, use a sauce made by creaming together three times as much sugar as butter. Then add an egg, and stir in, slowly, half a cup of rich milk. A delicious dish of which only those with strong digestion should partake, or, if the dyspeptic does indulge, it should be the sole food for that meal.

Raspberry Syrup.—Six pounds of raspberries, one quart of water, and two and one-half drams of citric (or tartaric) acid, stand twenty-four hours. Strain without bruising the fruit, and to each pint of the juice add one and a half pounds of sugar and stir till dissolved. After a few days bottle securely. Makes a pleasant drink, or flavoring.

Raw Diet No. 1.—Bovinine, oysters, lettuce, tomatoes, cabbage, fruits.

Raw Diet No. 2.—Beef pulp, milk, fruits.

Raw Diet No. 3.—Bovinine, milk, raw eggs.

Raw Diet No. 4.—Fruits, nuts, milk.

Raw Diet No. 5.—Grapes, cereals.

Raw Diet No. 6.—Bovinine.

Raw Diet No. 7.—Mosquera's beef meal.

The food value of all these will depend upon their combinations, and can be learned under the several articles named.

Restorative Jelly.—Put one-half box of gelatine, one cup of port wine, and two cloves, and a half-inch square of cinnamon into a double boiler. S t on the fire and when the gelatine is dissolved put in one tablespoonful of powdered gum arabic, two tablespoonfuls of lemon juice, and three tablespoonfuls of sugar. Stir thoroughly; strain, and put into mold an inch thick. Cut in cubes; served two or three at a time; to be held in the mouth until melted. An aromatic stimulant, grateful to the stomach in certain conditions of weakness, affording a fair degree of energy, but not to be relied upon to replace wornout fiber.

Rice, Boiled.—Boil in sufficient water to cover it, for one hour. Season with salt or butter, and serve with milk, or plain. If cooked properly, until the grains are soft, it is an excellent dish in bowel diseases. If the grain can be felt it is not done. Will support a life of no great activity, but needs to be combined with some strong fiber food for ordinary consumption.

Rice Bread.—Make a sponge of one quart of warm water, one teacupful of yeast, one tablespoonful of sugar, two tablespoonfuls of lard and one quart of white flour. Beat, and in about five hours, when it has risen, add three pints of warm milk, and three teacupfuls of rice-flour wet to a thin paste with cold milk, and boil four minutes as you would starch. Should be a little more than lukewarm when stirred into the batter. If not thick enough to make into dough, add a little wheat flour. Knead and treat as wheat bread. This has about one per cent. less fiber than bread, but adds considerably to its heat production.

Rice Gruel.—Boiling milk, one pint; ground rice, one tablespoonful; wet the rice with cold milk, making a smooth paste, and stir into the boiling milk. Boil for ten or fifteen minutes and salt. Stir well for it will burn easily. About one-half of one per cent. stronger in fiber element than milk, and the whole yielding over 400 calories.

Rice Milk No. 1.—Wet two tablespoonfuls of rice flour in cold milk and stir into two cups of boiling milk and boil ten minutes, stirring constantly. Sugar, one ounce, and eat warm with one ounce of cream, or fruit cream. A little over one per cent. stronger than milk in fiber constituent, and yields about 700 calories.

Rice Milk No. 2.—Boil a tablespoonful of rice for an hour and a half in a pint of fresh milk. Rub through a fine sieve. Add a tablespoonful of white sugar and boil again for two or three minutes. Supposing the product to be reduced by the boiling to twelve ounces, we have about five per cent. fiber and 524 calories.

Rice Water.—An ounce of well-washed rice soaked three hours in a pint of tepid water, then slowly boiled an hour. Add salt, sugar, or

nutmeg. About one per cent. of fiber, and 100 calories in the whole without sugar. A good drink in bowel diseases.

Rusk.—Toast, without burning, dry crusts of bread in a moderate oven until brown. When cold, pound in a mortar or grind fine in a coffee mill until reduced to a coarse meal. Eat with milk or cream. Sweeten if desired. Has the value of the milk or cream, plus the bread contained. An excellent light dish for warm weather for those with whom milk agrees.

Smoked-beef Broth.—Cover one-half pound chipped beef with one pint cold water in a double boiler. *Simmer* one hour. Add one pint of sweet milk that has *simmered* in another vessel; strain, and season. This affords, if not much concentrated by boiling, about 7.5 per cent. of fiber, and 720 calories for the whole.

Strawberries and Whipped Cream.—Sift two ounces powdered sugar over a pint of hulled strawberries alternating, first the berries then the sugar, until the dish is full. Should be done before they are served. Pour over them a cup of whipped cream with the whites of two eggs and one tablespoonful of powdered sugar. This gives about the fiber strength of milk with nearly three times its energy, so that it will support far more active exertions than milk can.

Tamarind Water.—Stir one tablespoonful of tamarinds into a goblet of ice water, add a teaspoonful of sugar; strain, and drink cold. A pleasant acid drink in fevers.

Tapioca Jelly.—Put in a two-quart dish, one cup of tapioca with water to cover it, and soak four hours. Put the dish into a saucepan of boiling water. If too thick pour more warm water over it. Boil and stir frequently. When clear, add juice of a lemon and sweeten to taste. Put in molds. Eat cold with cream, flavored to suit. Tapioca is, substantially, pure starch, and the addition of the sugar only increases its power of heat production. It is a dish on which child or man would starve if restricted to it alone. Good in small quantities with foods rich in fiber, but is unfit for feverish conditions, and for dyspepsias with fermentive flatulence, and for rheumatics with the uric acid tendency.

Tea, Our.—Best black tea one heaping teaspoonful. Boiling, soft water, one cupful. Infuse three minutes in a covered earthen pot, previously heated, and pour off, and keep covered till used. Exhilarating, socializing, and used at the end of a meal of solids, not so strong as to affect the nerves, beneficial.

Toast, Our.—Stale bread cut about one-fourth of an inch thick, and held just near enough to the fire to dry it through, then brought close enough to give a delicate straw color; this is toast, digestible and enjoyable, with much of its starch turned by heat into glucose.

Sprinkle with a little salt, and butter after it reaches the invalid's plate. With the salt, less butter will be desired. Has the nutritive value of the bread partly predigested, plus the energy contributed by the butter.

Toast Water No. 1.—Three slices of "Our Toast" broken into a pint bowl. Cover with cold water and soak an hour, then squeeze out, and serve cold with cream and sugar, or with fruit cream, or acidulated with lemon juice.

Toast Water No. 2.—As above, except boiling water is used. Both are slightly nutritious but chiefly valuable as an agreeable drink in sickness.

Tomato Soup.—Peel and cut into small pieces six good-sized tomatoes (say 24 ounces); put in a pan with a quart of water, boil until tender; season with salt and pepper. Stir into the water half a teaspoonful of baking soda. Lift from the stove when stirring in the soda, or it will run over. Boil again and add a pint of sweet milk. Pour over one-half pound broken crackers. Excellent dish for convalescents and may be used in all cases except where there is a tendency to looseness of the bowels. Its fiber element is about three per cent., and it yields 1,450 calories as a whole.

Unfermented Bread.—One ounce of bicarbonate of soda (baking soda) and one-quarter of an ounce of salt. Mix with four pounds of flour. Mix this with a quart of cold water containing half a fluid ounce of muriatic acid; make a thin dough with as little kneading as possible; put in the oven without delay. Requires longer time for baking than it takes for fermented bread. Has about the nutritive elements of wheat bread, and is better in fermentive states of the digestive organs.

Unleavened Wafers.—Mix good, dry flour, little salt, to a stiff dough with milk. Roll thin. Cut into round cakes and roll again as thin as letter paper. Bake quickly. May be mixed with water. Easily digested, and fill an important place in the dyspeptic's dietary. Has the nutritious value of good bread made with milk.

Wine Whey.—Bring to a boil, one pint of milk. Pour on one-half a gill of sour wine; let it simmer, and skim off the curd which rises. After a few minutes pour in another half gill of wine, skim the remaining curd, and add one teaspoonful of sugar, and when cold is ready for use. Good in fevers where its 300 calories of energy are not objectionable.

Whisky Drink.—Whisky diluted to the taste with water. Allowing two ounces of whisky, at 50 per cent. alcohol, this will give 217 calories to each drink, with no fiber element.

INFANT'S FOODS.

Infants,—from birth to near the end of the second year. Some facts of prime importance should precede the discussion of this subject. Dr. W. R. Pritchard is authority for the statement that, in 1886, 500,000 children under five years of age died in the United States, and that more than 333,000 of them died in consequence of improper feeding. That year was not exceptionally fatal. Look at the appalling fact! Since that year more than two million children, under five years, have died in the United States from improper feeding! More lives than were lost by all the armies of the Union and the Confederacy during the entire four years' war of the Rebellion. Said Sir C. Clark, the eminent London surgeon, "The ignorance of mothers in feeding their children is worth a thousand pounds ($5,000) a year to me." This ignorance is chiefly as regards proper substitutes for mother's milk, although the time of feeding and the quantity furnished are of great importance.

Cow's Milk.—The first substitute usually thought of is cow's milk. Cow's milk contains more albuminous matter, and mineral constituents, and less fat and sugar than human milk, and is acid, while mother's milk is alkaline. A gallon contains seven pints of water and one pound of solid matter. The casein of cow's milk forms a hard, insoluble curd in the stomach of the infant. The calf has four stomachs, and exercises the day it is born and grows rapidly, is therefore in need of the extra fiber element, and capable of digesting the tough casein of cow's milk; but it is not appropriate for the babe. Nature has prepared human milk for the infant, in which the casein is light and flocculent, and will not form into hard and indigestible curds in the stomach like the casein of cow's milk. The fact that rugged, country-born infants often thrive on cow's milk is no proof of its general adaptation to the needs of infancy, particularly in cities.

"The albuminoids in woman's milk are only about one-half the amount of those contained in cow's milk; but the amount of albumen—that part of the albuminoids readily

digestible and not coaguable by acids—is, in woman's milk, nearly double that in cow's milk; while in cow's milk the caseine—that portion of the albuminoids difficult of digestion and coagulable by acids—is nearly fivefold greater than in woman's milk." These are differences of immense significance.

Starch Foods.—The next substitute usually sought is some form of starch. But under about six to ten months the infant has no salivary ferment with which to digest starch; therefore, indigestion must result, with its consequent pain and bowel derangements. It is true that Dr. Christopher claims that all the ferments of the child are capable of digesting starch, but his admission that starch food is not proper as a continuous diet for the young child, robs his assertion of all value, if quoted in favor of starch as an element of its food.

There are a few fundamental principles to be observed in the production of a substitute for mother's milk, namely:

1. Human Milk is the Correct Standard.—Dr. A. V. Meigs has made a series of very carefully-conducted analyses, ten in number, comprising the milk of forty-three mothers, in which he has reached conclusions differing from all others. His reasoning in support of the claim that all others had followed defective methods does not seem decisive, yet his conclusions cannot be ignored. There is no dispute as to the amount of water and fats in human milk. There is diversity of opinions about the amounts of fiber constituent and sugar. There is about the same range of variation between the total amounts of sugar and fiber element. L. 'Heritier found a difference between the fiber constituents of blonds and brunettes of six-tenths of one per cent., by the same methods of analyses. A. V Meigs, himself, found a difference by his method between the milk of different women of over one-half of one per cent.

The average of all analyses at hand (over 100) gives 2.3 per cent. of fiber element. Meigs claims that 1 is the correct figure. It is evident, therefore, that from 1. to 2.3 is the range

of variation. Enduring vitality unquestionably depends upon a sufficiency of the fiber element; therefore, any food that does not contain one per cent. of that should be rejected at once, whatever may be its excellences in other respects. The fat and force elements may impart a seeming plumpness, the delusion of which is very apt to fade away before the ordinary diseases of childhood.

Composition of Human Milk.—Allowing what may be termed a variable average obtained by comparison of the general average above quoted with the Meigs' table, we reach the following as *the composition of human milk:* Water, 87; fiber element, 1 to 2.3; fats, 4; force, 6.5 to 7.4; salt, .15. The complete digestion, assimilation and excretion of this evolves from 19¼ to 21½ calories of energy per ounce, and requires the absorption of from 7½ to 8 pints of oxygen per ounce.

2. Quantity of Food Required.—Mother's milk is the correct guide as to *quantity* as well as substance. On the average, healthy mothers secrete, and infants consume a little over two ounces of milk in every twenty-four hours for every pound of their weight.

Hence a child at two months weighing 9½ pounds requires twenty ounces in seven or eight feeds; at six months and fifteen pounds, 31½ ounces in six meals; at ten months and nineteen pounds, forty ounces in five meals, and at one year and three times its birth-weight (28½ pounds), fifty-eight to sixty ounces. Parrot estimated 14½ ounces at two months, Bonchard twenty ounces, and A. F. Meigs 35 ounces, the mean of which is 23 ounces.

It should be understood, however, that these are only averages, and the only true rule is, if a healthy child leaves a part of every feed, he is getting too much; but if he cries after every feeding, evidently not from pain, but from dissatisfaction, he is not having enough.

3. The Substitute Food should contain no elements not found in mother's milk. No mother's milk ever contains starch in any form; therefore it should be excluded from the

substitute. No mother's milk contains cane sugar or ordinary table sugar, but instead lactose or milk sugar, which is readily assimiliable, while cane sugar must first undergo a special process of digestion into glucose before it can be assimilated at all,—a process which is in itself irritative to the delicate digestive organs of the babe.

4. The Elements in the Substitute Should be Proportioned as they are in mother's milk, except as different digestibility may require slight variation. For example, the albumen of the substitute may necessarily be a little less digestible than that of human milk, therefore its percentage should be correspondingly increased in order to compensate for that deficiency.

So, likewise, the substitute must lack the animal vitality with which mother's milk is charged as it is drawn warm from the breast; hence a slight increase of the fats in order to compensate for that deficiency, may also be allowed. From 1.5 to 2.8 for the protein, 4 to 4.3 for the fats, and 6.5 to 7.8 for the force element, should embrace the allowable range of variation.

5. The Energy Evolved by the working up of the substitute in the physiological processes, should correspond with that of human milk, that is, 19¼ to 21½ calories for each ounce consumed. Any considerable deficiency will necessarily entail corresponding lack of vitality, while a large excess will produce abnormal restlessness, inflammations and fevers.

6. The Oxygen Required for the generation of the above amount of energy must correspond with the amount required for the production of the same amount of energy from mother's milk, namely 7½ to 8 pints per ounce of food. Less than the normal demand will be attended with less serious results than an excess, because the little exercise and feeble respiratory power of the infant render its procurement impossible, with consequent sub-oxidation of the blood and tissues.

That the Construction of a Substitute that shall fulfill all these conditions is not easy, is evident from the

almost uninterrupted series of failures of the past thirty years, notwithstanding the chemical and physiological knowledge that has been brought to bear upon the subject. This fact might be less deplorable were the statements of the manufacturers of infant's foods more reliable. Their published analyses, unless very explicit, are of no account, because with infant's foods, as with baking powders and patent medicines, few are so poor that they cannot find some chemists venial enough to serve their purpose; *e. g.*, it is easy to testify that a certain food has as much albuminous matter as human milk, which may be literally true as in the case of cow's milk, but a larger part of it may be in such an insoluble form as to be practically worthless.

Says Dr. Stutzor of Bonn, "The analysis of this limited number of infant's foods shows how far incomplete and inferior most of them are, and how rarely they meet the requisite conditions of a rational food."

Prof. Everhart says that, 1. No infant food now sold can be made up either with or without cow's milk into a liquid having as great an amount of total solids (13.75 per cent.) as are in woman's milk, unless they consist of starch or the casein of cow's milk. 2. The nitrogen of not one of them is as easy of digestion as that in mother's milk. 3. The percentage of fat is uniformly too low. 4. The soluble carbohydrates are different in chemical properties, and most likely in physiological, from the sugar in woman's milk. 5. The most of them contain starch which is never found in mother's milk, and cannot be assimilated. 6. Where there is an approximation to woman's milk it is due to the use of cows's milk.

These are sweeping statements, but we shall show that with few exceptions they are correct, yet it must be conceded that many children actually thrive on perhaps every kind of infant food ever largely sold, which proves not the good quality of the food, for many diseased mothers nurse apparently healthy children, but that the vitality of the children is superior to the defects of their diet, or that the time of the appearance of unfavorable symptoms has not yet come. In many cases that time is puberty.

Substitutes are Needed.—None the less imperative is the demand for a substitute that shall be a substitute and not

a sham. Thousands upon thousands of anxious mothers are asking every day: "What and how much food must we give to our bottle-fed infants?" The manufacturers have answered in the way indicated by the testimonies of Dr. Stutzer and Prof. Everhart. What, then, can the poor mothers do? Turn to their physicians? But they are just as much in the dark as are the mothers!

In demonstration of this statement we have tabulated many of the best foods that are recommended by physicians as follows, only promising that the Children's Hospital food is from the published formulæ of The Children's Hospital of Philadelphia (after reducing it as far as practicable to definite standards) under the management of some of the most skillful physicians in the country.

To the two fundamental tests formerly recognized by the most careful practitioners, namely, the presence of a sufficiency of fiber element, and the absence of starch, the advances made by chemists in physiological researches during the past fifteen years now enables us to add two more of very great, if not equal importance, namely, the amount of oxygen required to consume the food taken, and the amount of energy generated by the food elements,—that energy being estimated in calories.

The fifth and sixth principles before mentioned as fundamental, require close attention to these new tests of the adaptability of infant's foods.

The Various Foods Compared.—It seems scarcely necessary to say that the following exhibit is made in the light of all the facts obtainable and with no prejudice against any, and with no interests to serve except those which are common to every lover of humanity for humanity's sake. In a very few instances manufacturers have refused analyses or any specific information concerning the constituents of their products, and, in all cases, as far as practicable, the analyses of interested parties have been carefully compared with others, and corrections made if deemed necessary.

TABLE OF INFANTS' FOODS.

According to analyses of Stutzer, Soxhlet, Chittenden, Rach, and Lee & Chandler, when reduced to the consistency required for actual feeding according to the directions accompanying the foods.
(Quantity estimated after Bouchand as 20 ounces at second month, and 52 ounces at one year).

Name of preparation, constituents, and directions for use.	Prot'in	Fats	C. H. O.	Calories		Oxygen		Food p'r day ozs.
				Per d'y	Per oz.	Per d'y	Per oz.	
Mother's milk	1to 2.30	4.00	6.5-7.40	385-430	19¼-21½	150-160	7½-8	20
1. Children's hospital, 4 tablesp. each of milk, cream, lime-water, arrowroot water* and a lump of sugar	1.60	7.50	1.90	1,049	24	396	9	44
2. Highland evaporated cream 1 oz., water 7 oz.	.55	.69	.72	60	3	20	1	20
3. Highland evaporated cream (12 mos.,) 1 oz., water 3 oz.	1.40	1.80	1.80	416	8	150	3	52
4. Dr. Parker's, Alderny milk 8 oz., water 16 oz., limewater ½ oz., sugar of milk ⅛ oz.	1.20	1.10	2.07	130	6½	50	2½	20
5. Dr. Everhart's, cow's milk 16 oz., water 12 oz., cream 2½ oz., milk sugar 1½ oz.	2.50	3.40	7.10	400	20	150	7½	20
6. Dr. I. T. Meigs', arrowroot water 1 oz., milk 1 oz., cream 1 oz., limewater 1 oz.	1.60	7.50	1.90	480	24	180	9	20
7. Dr. Sieberts', milk 12 oz., gruel 12 oz., sugar ½ oz.	1.80	6.10	7.60	624	26	240	10	24
8. Dr. Starrs', milk 1¼ oz., cream ½ oz., milk sugar 1/16, water 1¼ oz.	1.90	5.70	4.20	440	22	170	8½	30
9. Dr. Warcks', barley flour ¼ oz., milk 16 oz., sugar ¼ oz.	1.90	3.40	3.60	310	15½	120	6	20
10. Dr. Rochester's, yolk of egg ½ oz., sugar of milk ¾ oz., water 7 oz.	.97	1.90	8.70	320	16	120	6	20
11. Dr. Jacobis' (special), white of egg ¾ oz., water 6 oz.	1.40	.02	.....	30	1½	15	¾	.....
12. Dr. Rach's, Ideal food 12 oz., water 87½ oz.	2.80	2.80	5.70	360	18	130	6½	20
13. Lacto-Preparata ¼ oz., water 2¼ oz.	2.20	.70	6.40	351	12	124	4¼	29¼
14. Carnrick's Soluble Food ¾ oz., water 6¾ oz.	1.90	.36	7.50	240	12	85	4¼	20
15. Malted Milk ⅜ oz., water 3 oz.	2.10	.55	7.50	250	12⅓	90	4⅓	20
16. Lactated Food ⅝ oz., milk 4 oz., cream 2 oz., water 10 oz.	1.50	4.10	4.30	350	17⅓	130	6½	20
17. Baby Brand Condensed Milk 1 oz., water 13 oz.	.38	.35	.57	40	2	15	¾	20

*Arrowroot water; 1½ teaspoonfuls of arrowroot rubbed smooth in a tablespoonful of cold water, then stir in one pint of boiling water.

TABLE OF INFANTS' FOODS (Continued).

Name of preparation, constituents, and directions for use.	Prot'in	Fats	C. H. O.	Calories		Oxygen		Food p'r day ozs.
				Per d'y	Per oz.	Per d'y	Per oz.	
18. Baby Brand, 12 mos., 1 oz., water 6½ oz.	1.20	1.10	1.60	312	6	117	2¼	52
19. Dr. E. Smith's, whey 1 oz., cream ½ oz., hot water 2 oz.	.84	5.40	2.50	360	18	140	7	20
20. Condensed milk, sweet, 1 oz., water 10 oz., cream 1½ oz.	1.60	4.10	3.40	330	16½	125	6¼	20
21. Albumen Food, white of egg ¾ oz., shaken in 8 oz. of sweetened water (⅛ oz. sugar); add 2 grains of lacto-peptine	.94	.01	1.20	50	2½	20	1	.....
22. Keating No. 3 (?), 8 oz. milk, 8 oz. water, 1 oz. cream, ¼ oz. sugar of milk, 4 grains of bicarbonate of soda	1.80	3.10	3.80	300	15	120	6	.....
23. Weaning Food, cream ½ oz,, milk 4 oz., sugar of milk ⅛ oz., water 1½ oz.	2.60	4.30	5.30	410	20½	160	8	20
24. Lœflund's Kinder-milk, 1 teasp. to 8 of water	1.08	1.30	6.04	240	12	80	4	20
25. Lœflund's Kinder-milk, 1 teasp. to 6 of water	1.30	1.70	7.70	780	15	260	5	52
26. Mellin's Food 2 oz., water 8 oz., milk 8 oz.	2.80	2.30	6.80	340	17	130	6½	20
27. Rose's Beef Peptone Food, ⅛ oz., water ¼ oz., milk 4 oz.	4.30	3.20	4.50	360	18	150	7½	20
28. Ridge's Food, ¼ oz, water 8 oz., milk 3 oz.	1.10	.91	3.02	140	7	60	3	20
29. Wagner's Infant Food, an even tablesp. (½ oz.) in 8 oz. of water	.97	.58	3.40	130	6½	40	2	20
30. Biedert's Substitute, cream 4.3 oz., boiled water 13 oz., sugar of milk $\frac{52}{100}$ of an ounce	.65	6.40	3.40	430	21½	160	8	.....
31. A. V. Meigs' Substitute, cream 1 oz., milk ½ oz., limewater 1 oz., sugar water 1½ oz.†	.82	5.10	7.20	450	22½	170	8½	20
32. A. V. Meigs' Milk Substitute, humanized, cow's milk ½ pint, water ½ pint, cream 2 oz., peptogenic milk powders (Fairchild's) 4 measures‡	2.00	4.50	7.00	520	26	200	10	20

† Sugar water; 17¾ drams of milk sugar dissolved in a pint of water.
‡ These powders contain pancreatic ferment, milk sugar and various mineral salts.

The New York Infant Asylum is stated to have used nearly 1,000 pounds of one of these foods in 1889 in its undiluted form. Showing both their appreciation of the importance of good food, and their confidence that the particular kind used by them is the best that the market affords, yet that food shows only about one-half of one per cent. of fats when it should have four per cent., a little over one-half the necessary calories and oxygen requirement, yet its full proportion of fiber element goes far toward making it superior to most other foods upon the market.

Conclusions from the Table.—Omitting No. 11, which is designed only for special uses, and recalling the six principles named on Pages 233-5, particular attention is called to the following conclusions established by the foregoing tabulation.

1. Of the whole thirty-two, seven are deficient in fiber elements, while five have an excess, and twenty have a sufficiency. The deficiency runs as low as 38-100 of one per cent., which, expressed in plain words, means a lack of *two-thirds* of the most important constituent of human food, of which more is needed during the period of growth than in adult life.

2. Of the whole thirty-two, twenty-one have less than the normal amount of fats, while eleven have an excess (in two the excess is very slight), and none have this constituent in precisely the right proportion. The deficiency falls to 35-100 of one per cent. (excluding No. 11, also No. 21 as possibly a special food only), which is but about *one-twelfth* of the necessary amount. Babies fed on such foods may be fat, yet as Christopher has shown may be suffering from fat-starvation; that is, the fat is unphysiological. The growth of bone requires in the child a relatively much larger supply of fat than the adult needs. A child a year and a half old requires about three-fourths as much fat in twenty-four hours as an adult. This necessity arises also in part from the fact that the force foods contain hydrogen and oxygen in the proper portions to form water, leaving the carbon, alone, available to produce heat, but the fats have an excess of hydrogen, which excess, during its combustion, produces two and a half times as much heat, or heat and force, as the force foods.

3. Of the thirty-two, five have an excess of force elements and twenty-four are deficient. Nine of them have less than half the needed amounts, thus entailing lack of energy and power to resist chills and depressions, unless the deficiency is supplied by an excess of fat element. Three are right.

4. The lack of due proportion is most obvious. That of human milk, taking the mean of 1.6 for the fiber and 6.9 for the force element, is as fiber 1 to fat 2.5, and force 4.3. Not one of the whole thirty-two foods here tabulated exhibits this proportion, and most of them are glaringly wide of the mark.

5. Applying the fifth principle named (on Page 235), we find that 19¼ to 21½ calories of energies, per ounce, should be produced by the food when worked up in the body of the child. Twenty-three of the 30 are deficient, six are excessive and three only are right. This may seem a small matter, but a deficiency of only five calories from the mean of 19.9 means *one-fourth less than normal energy*,—no insignificant thing with which to run the fearful gauntlet of the 20 to 100 chances at the best, against infant life. On the other hand, the more than five calories of No. 7 and No. 32 in excess, increase the heat generated almost one-half beyond the normal, thus predisposing to conditions of inflammation and fever perhaps equally perilous to the health of childhood.

6. The sixth principle laid down by which to test the value of infant foods is the oxygen requirement of 7½ to 8 pints for each ounce of food. Twenty-two of the thirty-two are deficient, ten of them more than fifty per cent., six are in excess, four only are right.

Number 20 stands really as representative of the whole class of sweetened condensed milk; so that if all the brands were separately added, our list would run up to forty-five or fifty instead of thirty-two, thus making the foregoing conclusions still more striking.

These Foods Often Satisfactory.—Notwithstanding all the deficiencies enumerated, the fact remains that nearly, if not quite, all of these foods have given satisfaction to some

mothers, and had the endorsement of some honest and skilled physicians.

Another fact equally apparent is that, in many instances, an inferior food has been successfully substituted for a disagreeing superior food.

These facts would seem to indicate upon the surface, that the quality of the food is really of but little moment. Not at all. Many healthy children grow up in the slums of cities, but that fact does not prove that such places are good for the rearing of healthy children. If it does, then all reasoning upon hygienic matters is mere folly. The second fact named, simply shows that personal idiosyncrasies in the matter of diet begin very early in life, and that when present, that which is insufficient for the average may be sufficient for the individual.

Which Foods to Employ.—The great necessity remains for a substitute for human milk that will correspond with it both in chemical constituents and in physiological effects. Until that necessity is met, the best that we can do is to select from the foregoing table several manufactured foods that most nearly approximate mother's milk in their elements, and rely upon them until something better appears.

The following table reproduces several of the foods named on Pages 238-239, concerning every one of which the manufacturers affirm in substance, with great positiveness, that "It is the nearest approximation to human milk ever made."

	Protein.	Fats.	Force Foods.	Calories per oz.	Oxygen pints.
Human Milk,	1 to 2.30	4.00	6.5 to 7.40	19¼ to 21½	7½ to 8
No. 2,	.55	.69	.72	3	1
" 13,	2.20	.70	6.40	12	4¼
" 15,	2.10	.55	7.50	12½	4½
" 16,	1.50	4.10	4.30	17½	6½
" 17,	.38	.35	.57	2	¾
" 20,	1.60	4.10	3.40	16½	6¼
" 24,	1.08	1.30	6.04	12	4
" 26,	2.80	2.30	6.80	17	6½
" 29,	.97	.58	3.40	6½	2
" 32,*	2.00	4.50	7.00	26	10

* Of this the peptogenic powder only is "manufactured."

With these figures it is apparent that only one of the manufacturers of these articles speaks the truth, which one we

leave to our readers to decide; but of this list of ten, Nos. 16, 20, 26 and 32 are chemically to be preferred.

Errors in Choice of Foods.—As an illustration of the facility of error, the author may state just here, that not one of the three foods which, prior to this investigation, he has approved and publicly commended, appears among the four.

Physiology vs. the Chemistry of Foods.—While this presents the purely chemical aspects of the question, it should be borne in mind that food may possess physiologial qualities of which chemical analysis can take no note. Such is the anti-scorbutic (anti-scurvy) property of human milk, and such is the same property of cow's milk which disappears, no chemist can tell how or why, upon its sterilization. Hence, beneficial as that process may be in some respects, the effects of the continued administration of sterilized milk needs always to be closely watched, and the first appearance of rachitic (rickety) symptoms such as sweating (particularly about the head), restlessness at night, convulsive indications, delayed teething and bony deformities, should be regarded as a warning that must be heeded to restore the anti-scorbutic element by the use of unsterilized milk. True, scurvy and rickets are different diseases, but as both are diseases of innutrition, proper nutrition is the cure for both.

Number 20 of the table, chemically one of the best of the foods tabulated, is open to this serious objection, and we have seen very grave, almost fatal results, follow from its continued use.

The objection that is sometimes made that the malt-foods are peculiarly liable to fermentation is probably incorrect in those cases where maltose is the form employed, as that is a saccharose, not a glucose, which, according to Bruce, is a form of sugar that does not ferment.

The Question Properly Arises just here, how far we may accept the physiological tests of experience as against chemical errors in the constituents of an infant's food. The answer must be, if chemical analysis is of any worth, only to the extent that exceptions are conceded to all general laws, as for example those of personal idiosyn-

crasy in diet, after allowing for the known transformation of fats and force foods, and of the fiber foods into fat and force effects. But as there is no reverse transformation of either the fat or force elements into fiber element, it is clear that whatever modification of chemical formulæ may be allowed, it must not materially change the normal proportion of the fiber.

The experiments of A. Béchamp, confirmed by Leeds, prove that both human and cow's raw milk have a starch-digesting ferment (galactozymase) which goes far toward explaining the apparent anomaly of young infants' thriving on starch foods, when they have no starch-digesting saliva; the milk taken with the food acts in that capacity. But that does not remove the objection that starch is unphysiological for the infant.

A Marketable Ideal Infant's Food should contain all the elements of nutrition in proper proportions, be suited to the infant's digestive capacity, be in a convenient form for use at home or abroad, not readily liable to deterioration or decomposition, and be inexpensive. Tested by these conditions, the candidates for the honor of being such can come from neither the farinaceous nor milk-foods in ordinary use, because the first contain from sixty-five to seventy-eight per cent. of starch, and the other from thirty to forty per cent. of starch and about as much cane sugar, both utterly unsuited to the digestive functions of the babe under six or eight months, yet they are freely recommended and prescribed by the profession. With such a showing what can the poor mothers do?

If they turn to the prepared infant's foods on the market and take their directions as guide, they are only substituting a commercial ignorance in place of professional. Certainly, when God created the infant to draw from its mother's breast its own sustenance, He knew all the adaptations necessary, and His work must be the ideal standard for our imitation.

Yet the attempts of honest and skillful men have generally failed to even closely approximate it, which emphasizes the tremendous necessity of having healthy mothers who can nurse their children, and the terrible iniquity of the bottle-raising of infants whose mothers might, if they would, feed them in Nature's way.

And it still further emphasizes the remark of Dr. F. I. Knight before the Climatological Association in 1890. "At present the usual preparation of food is so bad that after one has found out the class of nutriment a patient requires, it is well-nigh impossible to secure it to him,"—as especially pertinent to children.

The Indigestibility of Cow's Milk can be overcome by peptonizing it, but Prof. Vaughan is authority for the statement that "milk digested with the pancreatic extracts of the markets swarm with bacteria." The following table, given in KÖNIG'S "*Chemie der Mensch, Nahrungs-und Genussmittel,*" shows the variations between the component parts of woman's milk and cow's milk :—

Components.	Woman's Milk.	Cow's Milk.
Water	87.09	87.41
Sugar	6.04	4.92
Albuminoids: Casein	0.63	3.01
Albuminoids: Albumen	1.31	0.75
Fat	3.90	3.66
Ash	0.59	0.70
Reaction	Alkaline.	Acid.

This table shows that condensing the cow's milk will only increase the disproportion, therefore, condensed milk must be discarded. The disparity will be only slightly modified by any food that requires the admixture with it of cow's milk to any considerable extent, unless the analysis shows that it is prepared expressly to make the compound like breast milk.

Six cows in every hundred kept in the neighborhood of our large cities for milk have tuberculosis, and are capable of communicating consumption by their milk. They only live from twelve to eighteen months, and the post-mortems of children who have died of marasmas show the bacilli in the absorbents and lymphatic glands of the intestines and nowhere else, thus proving that their food was the cause of their death. Hence, the importance of reducing the milk-product to a minimum, and also sterilizing it by heating. As milk so readily absorbs deleterious matters and even generates poisons under some

circumstances, the heating is also essential whether in the city or country.

Substitutes for Cows' Milk.—Some other article not liable to these mishaps is certainly very desirable, provided its composition be such as is required by the conditions of the case.

The claim is made that the malt in some prepared foods aids infant digestion of the casein in cow's milk, but we know of no fact in the chemistry of digestion that substantiates the theory, yet it is constantly put forward by the makers of foods that require the addition of cow's milk.

Dr. H. C. Routh says that sugar of milk "allays morbid irritation and will often check diarrhœa." Dr. T. C. Duncan says "sugar of milk is to be preferred to cane sugar because it is an animal product, undergoes no change in its assimilation, and contains phosphates and other salts." Prof. Kuss says that sugar of milk "is the principal element in woman's milk," and Dr. Ruschenberger declares that "it allays even extreme irritability of the stomach."

Dr. F. Krauss of Vienna has used Mosquera's Beef Meal and Beef-Cacao successfully in many cases of disease, and many physicians have employed the whites of eggs as a substitute for human milk, while Bunge and others recommend the yolks as desirable in certain conditions.

Our Own Formulæ.—Profiting by all these hints, in the interests of the suffering innocents, and with no financial interests to serve, we shall propose some formulæ for trial as emergency foods. It should be understood in advance that these formulæs are purely theoretical, having had no opportunity to observe their practical operation. But should their physiological effects harmonize with their chemical elements, proportions, capacity of heat production and oxygen demand, we can see no reason why they should not meet a long-felt want. Yet it is very probable that they will need some modification to suit individual cases. Should they be too rich for certain conditions they may be diluted with soft boiled water.

Palatability.—If means could be devised to improve their palatability without detriment to their constituents it would be very desirable. Yet the question of palatability is of only secondary consideration. Certainly the most unpalatable food that we ever tasted was Murdock's Liquid Food; yet that at the time of its greatest use probably saved the lives of more children than any other food ever made within an equal period. We have seen it lift the wretched, diseased, syphilitic waifs of the poorhouse into stalwart health to a far greater extent than the better-born children of city hospitals have reached under their best dietaries. Another product far more palatable and quite similar in chemical constituents is now known under the name of Bovinine.

Yet the children who were fed on the Liquid Food seemed to relish it as well as nurselings do their mother's breast milk. Few adults, we fancy, would greatly relish that. The facility with which a taste is acquired for the nauseous tobacco proves but too well that relish is a thing of habit very largely.

The Variety in the elements of the proposed foods enables the parent to select from the number that one which promises best, and *to change from one to another* as the exigencies of taste, disease, or circumstances may require, with the assurance that whichever one is adopted it approximates closely the chemical and, probably also, the physiological characteristics of breast milk, and is in strict harmony with all of the six principles named as fundamental in the construction of a substitute for human milk.

In all cases these foods should be strained before use for small infants. Uffelmann, the well-known authority on dietetics, says: "There is no general diet for the sick," and Dr. Carl Rothe recommends the Mosquera preparations in alternation and combination with other things for older children. The food captions are merely suggestive, and not to be rigidly adhered to.

1. When a Strong Food is Needed.—Whites of eggs 3 oz., yolks 2 oz., cream 7 oz., sugar of milk 4 oz., water 43 oz. This yields of fiber 1.5 per cent., fat 4.2, force 6.8, calories per oz. 20½, oxygen per oz. 7⅓.

Boil and cool the water to such a temperature as will equal blood-heat after the other constituents are stirred in. Make only such a proportion of the whole as may be needed for the time.

Add soda bicarbonate as in No. 2 when it seems desirable. This food costs in the country about three mills per ounce.

2. When a Strong, Partly Predigested Food is Required.—Rose's Beef Peptones 1 oz., cream 5¼ oz., whey 32 oz., sugar of milk ⅞ oz. This furnishes fiber 1.8 per cent., fat 3.9, force 6.6, calories per oz. 20½, oxygen per oz. 7½. It costs about two mills per ounce in the country.

To a pint of fresh milk add two teaspoonfuls of liquid pancreatin or liquid rennet; heat gently until it begins to curdle, then stir until complete separation of the curd is seen, then strain off the whey. Dissolve the peptones and sugar in a portion of the whey, add the cream and the remainder of the whey. If desirable to keep a portion until the next feeding, do not mix in the peptones until the time arrives. Make as needed.

Ten grains of soda bicarbonate to the pint is a desirable addition if any tendency to acid fermentation is seen in the child.

For an Inexpensive Rennet Preparation get a stomach of your butcher, turn inside out, rinse two or three times only, in soft water, sprinkle it freely with table salt, draw over a forked stick, rub the outside well with salt, put a handful inside and hang in a cool place. When well dried, take from the stick, roll, and put in a tight box in a cool, dry place. For use, the night before it is wanted, cut off a piece about one-half inch square and soak in a teacup with just tepid water enough to cover it. In the morning, after warming the milk to blood-heat, stir into every pint about a teaspoonful of the rennet-water and keep warm. If it does not begin to curdle in twenty minutes add another teaspoonful, and so on. When the strength of the rennet is learned use just enough to cause the milk to begin to curdle in twenty minutes. The solution will keep through the day in any cool place. Prepare a fresh piece every night.

3. A Convalescent Food.—Mosquera's beef meal ¾ oz., cream 6 oz., sugar of milk 2½ oz., water 32 oz. This contains of fiber 1.7 per cent., fats 4.2, force 6.2, calories per oz. 20¼, oxygen per oz. 7½, and costs about 2½ mills per oz.

Boil the water and pour ¾ into a separate dish, in which dissolve the sugar, and when cooled somewhat, the cream also. To the remaining ¼ add the meal and boil 20 minutes. Mix. If any is kept until the next meal, keep the meal broth separate until the time.

4. For Anæmic Conditions.—Bovinine ½ oz., yolk of egg 1 oz., sugar of milk ½ oz., water 6 oz. It yields of fiber 2.8 per cent., fats 4, force 6, calories per oz. 21, oxygen per oz. 8, and costs about 7½ mills per

oz. in the country. Boil the water, dissolve in it the sugar, and cool until the addition of the bovinine and egg will make it about blood warm.

5. In Acute Diseases.—Bovinine 1 oz., cream 1½ oz., sugar of milk ¾ oz., water 6¼ oz. It analyzes of fiber 1.8 per cent., fat 4.3, force 7.5, calories per oz. 22, oxygen per oz. 8; costs in the country nearly 9 mills per oz. Make in the same manner as No. 6.

6. Chronic Affections With Anæmia.—Beef cacao ½ oz., cream 1¼ oz., milk 4 oz., sugar of milk ⅝ oz., water 7 oz. This gives of fiber 1.7 per cent., fat 3.7, force 6.9, calories per oz. 20, oxygen per oz. 7¼, and costs about 2 to 2½ mills per oz.

Boil the water, milk and sugar together, add the cream and cacao, and boil one to four minutes if preferred. A delicious food in convalescence.

7. Anti-Scorbutic Food for young infants.—Milk 2 oz., cream ½ oz. sugar of milk ¼ oz., limewater 2¼ oz. Yields of fiber 1.7 per cent., fat 4, force 7, calories per oz. 20½, oxygen per oz. 7½.

Notes on the Above.—Mosquera's Beef Meal and Beef Cacao and Bovinine may be obtained of any druggist.

In cases of specially weak digestion, the peptonization of Nos. 1, 4, 5 and 7 may be an advantage, in the same proportion as for milk; see Page 251.

Two processes are much talked of in respect to cow's milk, each of which is strongly advocated by high authority as sufficient to fit it for the sustenance of infants—sterilization and peptonization.

Sterilization.—A substance is deemed naturally sterile when the transplanting of bacteria into it will not form colonies of freshly-generated germs. It is difficult to say what fluid is absolutely sterile to all germs, but, practically a fluid is sterilized when the micro-organisms within it are destroyed, and it continues sterile so long as none are formed.

Sterilization is ordinarily effected in milk by heating it one hour at a temperature of 190° F. in vessels with narrow mouths that are stoppered with long cotton wads. Repeat on the second and third days if the milk is to be kept; but if for immediate use, it is sufficient to pour into a pitcher that has been thoroughly cleansed and then boiled, and cool quickly by setting in a pan of cold water. The latter purifies but does not

fully sterilize the milk. Indeed we question whether complete sterilization is desirable, for the following reasons:

1. Many instances are known where children have not thrived upon the best of foods "closely resembling human milk" (Christopher), but when put upon sterilized milk have improved, which would seem to favor the sterilized milk; but there are perhaps as many instances in which unsterilized milk has done as well for those who were "wasting away upon sterilized milk." (Dr. E. P. Davis.)

2. The experiments of E. Duclaux, W. D. Halliburton and A. Béchamp, as repeated and conclusions corrected by A. R. Leeds, prove that the effects of sterilization are:—

a. The starch-liquifying ferment—"galactozymase" is destroyed.

b. A portion of the lactalbumin (a nitrogenous substance not coagulable by acids), is partly coagulated, giving to the milk a ropy or mucilaginous character.

c. The casein is less coagulable and yields more slowly and imperfectly to the action of pepsin and pancreatin.

d. The fat globules become less assimilable.

e. The milk sugar is completely destroyed. From all this it results that "sterilized milk is less readily and less perfectly digestible than raw milk."

f. To the foregoing should be added the damaging fact that sterilization destroys the anti-scorbutic property of raw milk.

After many tests at the Philadelphia Hospital and elsewhere, Dr. Davis concludes that infants fed on sterilized milk recovered from acute diseases "only to succumb after two or three weeks from gradual starvation." He continues, "It was the invariable experience, that sterilized milk, whether peptonized or not, resulted in but a temporary improvement and, as a food, the ordinary process of sterilization renders milk unfit for nourishment."

Prof. Leeds recommends heating the milk to 155° F. for six minutes which makes it practically, though not completely sterile and says, "The appearance and properties of the milk heated to this temperature are in no wise noticeably different from raw milk." He adds, "A still more advantageous method consists in sterilization and peptonization at the same time, the proteid matter of which the micro-organisms are composed being digested away and their vitality destroyed."

Peptonization originated with Prof. Pfeiffer of Weisbaden, and consists in more or less perfectly digesting the

albumen of the milk into peptones by the agency of the trypsin of the pancreatic ferment.

It is done by adding to a pint of the milk warmed to about 100 to 110° F. (*i. e.* as hot as the hand can be held in one minute) a dessert spoonful of liquid pancreatin, or five grains of pure pancreatin with twenty grains of sodium bicarbonate previously dissolved in a gill of water, then kept in a warm place until the milk assumes a grayish color and a slight bitterness to the taste, when it should be cooled rapidly or further digestion will render it unpalatable. Should not be kept many hours. If the pure pancreatin be used it should macerate in the water fifteen minutes before adding to the milk.

The Cost of a Prepared Infant's Food should not greatly exceed that of cow's milk, or about two mills per ounce. No. 16 is a cheap food. Poor people who cannot afford to use the best prepared foods, on account of their expense, would do well to make a little of one of them into a thin gruel with which to dilute their cow's milk. If this be done the tables should be consulted and that one selected, by the addition of which, the product will be more, instead of less, like human milk.

Conclusion.—In view of this examination of infant's foods, the conviction forces itself upon us more and more of the profound significance of the words of Dr. Porter. "With a complete knowledge of the chemical composition of the food-stuffs, and a careful study of the digestive possiblities and the oxygenating capacity of each individual treated, the thoroughly scientific physician is in possession of a solid basis upon which he can select at once the most available diet."

PREPARED FOODS.

In this section the attempt is made to describe most of the prepared foods in the market, in alphabetical order, in the light of such analyses as were procurable and such other information as could be found.

As a General Caution the statement should be made that the proportions of "nitrogenous," "albuminous" and

"nutritious" elements affirmed to be contained in any food is no criterion of its value, because much of it may be indigestible or unassimilable, and, in fact, most of the combinations of nitrogen are utterly valueless as food, only a small part being utilized in the animal body; thus, a food may be full of the nitrogenous extractives of the muscle serum yet be incapable of sustaining life. The importance of nitrogen has been well stated by Dr. E. A. Parkes,—"Every structure in the body in which any form of energy is manifested is nitrogenous, and even the digestive liquids are not only all nitrogenous, but the constancy of this implies the necessity of the nitrogen to perform their functions."

The Beef Preparations may be divided into five classes:

1. Beef extracts (Liebig's), already sufficiently characterized. See Pages 163-4.

2. Blood-preparations and egg, or blood albumen. Too nauseous to be generally acceptable, whatever may be their nutritive value.

3. Beef extracts containing beef dried and ground to a fine powder. The main objection is the excess of the salts of beef, and the fact that when beef is thus administered, much of it is lost because of feeble digestive power.

4. Mechanical mixtures of beef-powders, milk, gluten, etc. The same objection as to loss as stated under class 3, but to a more limited extent.

5. Preparations in which the albuminoids of the beef are predigested into peptones. These are to a great extent prepared for immediate absorption without the labor and delay of peptic digestion, hence are peculiarly appropriate in cases of very weak digestion, great prostration, etc. The use of predigested foods, while it saves the digestive organs some labor, is not always to be commended. Brunton has suggested that even beef tea may, occasionally, form peptones which, absorbed at once into the circulation, may act as poisons. Hofmeister proved that they undergo a change in

the mucus membrane, and Von Ott demonstrated that the change was from peptones to serum albumen. Hence these foods should be employed only as directed by a physician.

TABLE OF PREPARED FOODS

Compiled from Stutzer, Chittenden, Fresenius, Hassall, Rach, Lee, Atfield, Macadam, Tichborne, Soxhlet, Endemann, Tscheppe, Chandler, Henry & Chevallier, Wyatt, Mott.

Food Materials.	Water and Refuse.	Protein.	Fats.	Carbo-Hydrat's	Mineral Salts.	Calories per Pound.	Pints Ox. req'd 100 gms. food
Porter's Beef Tea*	95.70	3.20	.25	.....	.67	71	7
Kumysgen*	86.81	4.10	1.02	8.60	.02	280	23
Johnston's Fluid Beef	.....	9.12	1.20	.....	.....	224	22
Kefir*	90.73	3.80	2.00	2.40	.27	200	17
Matzoon*	87.69	3.90	4.90	.59	.78	292	26
Dr. Roehester's Infant Diet	.....	3.70	6.60	10.30	.....	539	44
Nestle's Food	5.44	11.09	4.60	76.60	1.70	1,825	138
Carnriek's Sol. Food	6.14	16.40	5.00	67.70	2.90	1,778	138
Mellins' Food	8.34	7.30	.05	79.20	3.50	1,611	120
Wells, Riehardson & Co's Lactated Food	8.06	8.30	2.10	78.40	2.20	1,701	127
Horlick's Food	6.30	10.80	.60	.79	2.70	1,707	127
Dr. Ridge's Patent Food	9.04	7.90	1.20	84.00	0.48	1,708	126
Anglo-Swiss Milk Food	7.27	11.20	2.37	76.03	1.95	1,732	130
Imperial Granum	9.22	9.50	.80	78.80	0.37	1,688	125
Liebig's Ext. of Beef	20.06	·06	.91	.....	24.00	39	3
Armour's Ext. of Beef	14.03	.68	1.20	.....	28.20	66	6
Valentine's Meat Juice	60.31	.55	.78	.....	11.30	43	4
Wyeth's Beef Juice	57.88	.47	.85	.....	17.50	44	4
Bovinine	81.09	13.90	1.40	.....	1.00	279	32
Mosquera's Beef Cacao	.....	13.90	5.70	27.00	.....	1,001	82
Arlington Chem. Co's Beef Peptonoids	6.80	27.60	2.90	.....	5.00	642	62
Mosquera's Beef Meal	6.68	77.20	13.60	.....	4.20	2,022	94
Rose's Peptonized Beef	.....	34 25	3.00	.....	.....	766	75
Wagner's Infant Food	.....	2.50	1.50	8.80	.....	275	21
Lœflund's Kinder-milk, Av.	.....	8 60	9.30	44.50	.....	1,380	108
Liquid Pep., Av.	.....	70.00	9.40	10.30	.....	1,890	167
Laeto-preparata	.....	14.50	12.30	63.60	.....	1,972	155
Condensed Milk sweetened	30.34	16.07	12.10	38.80	2.11	1,532	123
Beef Peptones, Rudiseh es'	.....	35.70	.....	.....	41.50	664	67
Polnboskos	7.50	91.00	0.50	.40	0.60	1,721	173½
Swift's Extract of Beef	18.66	50.75	.....	.....	30.47	944	95½
Lacto Cereal Food	1.64	22.99	4.18	67.39	3.80	1,857	147

The * indieates prepared for use.
Av. signifies averages of different analyses.

Ale and Beef Peptonized.—Made of Rose's Beef peptones, and a superior quality of ale specially brewed for this purpose. Contains all the nutritions properties of beef prediges ted together with the stimulating properties of the ale. An excellent eombination of food and stimulant. 3.6 per eent. of alcohol. One to two wineglassfuls three or four times a day. Belongs to class 5 of beef preparations.

Alpine Milk Biscuit.—About one-fourth of this dry product is the substance of milk combined with wheat and maltose, and rich in phosphates. Designed for children between six and twenty-four months.

Anglo-Swiss Milk Food.—A condensed milk. For constituents see Table on Page 253.

Avenola —Wheat and oats thoroughly cooked, and partly digested; with milk and fruit, an entire dietary for the feeble in certain conditions.

Beef Extract.—There are several brands of this preparation, in nature similar to Liebig's extract of beef. This contains only seven-tenths of one per cent. of available protein, and its nutritive value is only one-third of one per cent. compared with lean beef as 100. Useful to quicken appetite by the temporary stimulation of the vital functions, and possibly also to promote absorption, but must not be depended upon for nutrition. Dose, one teaspoonful or more in a little warm or hot water. It is composed mainly of the soluble extractives and inorganic salts of muscle tissue. The extractives are the waste products of muscle transformation, utterly useless for nutrition although largely nitrogenous. According to Kemmeriek, an animal fed on such beef extracts alone, will die of starvation sooner than if absolutely without food; yet they have some value as stimulants. Dr. Stutzer of Bonn has shown that a patient must drink two quarts of beef tea to get as much nourishment as is in one-fourth of a pound of steak. He also declares that Liebig "never intended his beef extract as a food but only as a relish." Liebig himself said "I have declared repeatedly that in the preparation of the extract the albuminoids *remain in the residue*, and that this certainty is a defect of the extract." Prof. Austin Flint says, "Not very inaptly, beef tea has been compared to urine, and a few years ago a German experimenter, whose name I cannot recall, declared that he produced fatal toxæmia (poisoning) in dogs by feeding them with this popular article of diet."

Beef Peptonoids (Rudisches').—The albumen of fresh lean beef artificially digested. Nutritious value as compared with fresh lean beef at 100, is 14.3. Belongs to class 5 of beef preparations.

Beef Peptone (Sarco Peptones).—A pure, soluble beef jelly containing the nourishing elements of beefsteak predigested into peptones, one pound equal to eight pounds of beef. Palatable. May be sweetened for children. One-half to one teaspoonful every half hour, hour or two hours; rectal use, one tablespoonful in four oz. milk for an adult. Belongs to class 5 of beef preparations.

Beef Peptonoids (Powder).—Lean beef separated from the larger muscular tissue, and an equal quantity of milk having seventy-five per cent. of its water removed, and gluten from wheat. About one-

fourth of the albumen is digested, and all the water except about four per cent. is expelled. Contains all the nutritive and stimulating properties of beef and milk with the addition of the gluten. Contains ninety-five per cent. of nutritious matter, of which about twenty-seven per cent. is protein and the rest mostly starch and sugar; about 1.4 times as nutritious as lean beef. Thoroughly sterilized. May be added to broths, soup, punch, oatmeal, rice, etc. Belongs to class 4 of beef preparations. From one-half to one tablespoonful three to six times a day.

Bovinine.—The juices of lean, raw beef expressed by a mechanical process yielding both the albuminous and extractive properties of the meat, to which is added the albumen of the egg, enough glycerine to make the compound bland and agreeable, and sufficient old whisky to aid in its preservation. It is a raw food giving in a twelve-ounce bottle the nutriment from ten pounds of steak. The blood corpuscles of the meat are preserved intact and ready for immediate absorption. Compared with ordinary beef tea, one bottle is equal to eighty pints prepared from eighty pounds of lean beef. As a local nutrient by subcutaneous injection around old ulcers, but five per cent. of failures are reported from 300 cases. Belongs to class 2 of beef preparations. Dose for babes from five drops every hour or two up. For adults, maximum, four tablespoonfuls daily.

Biardot's Concentrated Preparations for Invalids.—Beef tea, chicken broth, mutton broth, beef. To be reduced for use with seven times their quantity of water to retain their delicate flavor, and avoid the burnt taste of meat extracts. Class 1 of beef extracts.

Bullock's Blood.—Defibrinated and dessicated. Used for wasting diseases. The removal of the fibrin prevents the clotting, but leaves the albumen and salts as a liquid beef, which is carefully dried, dessicated and packed in tin. Dose one-half teaspoonful prepared as directed on label. For rectal feeding, six teaspoonfuls as directed. Belongs to class 3 of beef preparations, practically.

Carbon Wafers.—A food for acid states of the digestive organs, made with wheat charcoal and deemed almost a specific if the patient will avoid sweets, cakes, pastry, raw fruits, desserts, rich gravies, coarse vegetables, fried foods and fats. The charcoal prevents fermentation, and absorbs irritating acids.

Carnrick's Soluble Food.—Solid constituents of cow's milk 37½ per cent.; 37½ per cent. of wheat; 25 per cent. of milk sugar; cocoa butter in place of milk fat, partly digested; only three per cent. of moisture. Made of 50 per cent. of lacto-preparata and 50 per cent. wheat in which the starch is converted into soluble starch and dextrine, easily digestible; the fat is nearly all removed. In hermetically sealed cans

Designed to follow lacto-preparata as the exclusive food of infants (If healthy mother's milk is not available) from the first six or seven months to the end of the nursing period. Dextrine is a non-fermentable form of carbohydrate, not irritating to the stomach and easily assimilated. In diluting children's foods only water that has been boiled should be used, and not cooled by putting ice into it.

Clam Bouillon.—A nourishing and appetizing canned clam broth or juice. One tablespoonful, more or less, in a glass of hot or cold water, and seasoned with salt, pepper or celery salt.

Cod Liver Oil.—See Cod Liver Oil, also Hydroleine in index.

Condensed Milk.—Made by evaporating a large part of the water from milk and adding about 40 per cent. of cane sugar. Useful for cooking and on the table, but should not be used as an infant's food because its excess of saccharine material forms an unnatural appetite for sweets, and produces stomach and bowel troubles, while, as a whole, it is defective in some essentials of a complete diet. Open to all the objections to completely sterilized milk. See Page 250.

Cream Milk.—A condensed milk from the Alps in Switzerland, of great richness and purity. Same uses as other condensed milks. Preferable to many others for many purposes because it is preserved without sugar.

Cream, Highland Brand Evaporated.—This is really an unsugared condensed milk, with its casein mechanically broken up so that it is said to curd flocculently like human milk. If this be so it is far preferable to cow's milk and other kinds of condensed milk as a standard food for invalids and infants; but for the latter the effect of its sterilization should be watched, and its defective elements should be supplied by the addition of cream and milk sugar.

Diabetic Food.—This consists mainly of gluten and is designed as a perfect substitute for lean meat and bread.

Dukehart's Fluid Extract of Malt and Hops.—Claims the highest per cent. of diastase to be obtained from Canada barley, free from alcohol; very palatable; not subject to fermentation One tablespoonful three or more times a day

Fruit Crackers.—Made of dried and preserved fruits, without lard, and of unadulterated sugar and flour While not good for dyspeptics, as a luxury for those who can digest them they are unmatched.

Gluten Wafers.—A crisp, palatable cracker chiefly gluten, without lard, and very suitable for dyspepsia and nervous exhaustion accompanied by inability to digest vegetable food, and as a substitute for a meat diet.

Gofio.—The whole grain of wheat, rye, barley or corn parched, browned, then ground in a mortar. Contains a large amount of nutri-

ment in a given weight, partly digested, and in a very palatable form. We suggest its use in the place of coffee in cases where coffee does not agree. Ten cents per pound,

Graham Crackers No. 1.—Made of best Graham flour, granulated sugar and butter. For persons with fair digestive power, but inactive bowels, they are far superior to cakes and puddings.

No. 2.—The same without the sugar. Very crisp and nice.

Graham Grits.—Made of the germs of wheat, the most nutritious portion of the grain. A concentrated vegetable nutrient of the highest value.

Granula.—Prepared from the choicest portions of wheat, oats and corn, containing all the elements of adult nutrition in perfect proportion. Valuable for invalids, children (not infants), travelers, and all who are exposed to special exhaustion.

Gelatine (All Makes).—"Another worthless product, though not pernicious, is the refined glue called isinglass, calf's-foot jelly, gelatine, etc., used for Invalids and in soups. It is no more food than is sawdust." (Dr. F. R. Lees, Leeds, England.)

Hoff's Malt Extract (Tarrant's).—Alcohol four per cent. Extractive matters eight to eleven per cent. Pleasant appetizer and invigorant; a digestive agent for starches, and easily assimilable. Good where a mild stimulant and a slight nutrient are required.

Horlick's Malted Milk.—Cow's milk, malted cereals and sugar with the casein of the milk partly predigested, the malt digesting the starch of the cereals when in proper solution. The manufacturers claim that the casein is partly digested "not by animal pepsin or pancreatin, but by the action of the vegetable ferments of specially malted grain."

Hydroleine.—This preparation is named here (although it is partly a medicine, as each dose contains with its eighty drops of Norwegian cod liver oil, five grs. of soluble pancreatin, forty-three grs. of soda and one-fourth grn. of salicylic acid), because we regard it as the best form in which the nauseating oil can be used. Even this mixture is best used as a nutrient enema. Most human stomachs rebel against cod liver oil in any form. See Cod Liver Oil under consumption.

Imperial Granum.—As a flour-food it is useful for invalids and children, provided a sufficiency of mineral salts and fiber food can be obtained elsewhere, but its calories and oxygen requirement are excessive.

Kefir.—A derivative food resulting from the fermentation of milk by the agency of the Dispora Caucasia, until the nitrogenous portions are peptonized. There is a kefir, so called, on the market, made by the agency of brewer's yeast, but that yields only an alcoholic fermen-

tation, which does not predigest the fiber elements. Dujardin-Beaumetz gives the constituents of kefir as in the table, 0.4 of the carbohydrates being lactic acid and there being also 0.8 of alcohol. This gives nearly an ounce of alcohol per day if enough kefir be taken to give the normal quantity of fiber food, *i. e.*, 110.5 ounces of kefir for 4.19 ounces of protein. The oxygen-demand is small and the stimulation considerable, making it valuable in those cases where a milk diet is ordinarily deemed necessary, and its predigested state renders it preferable to skimmed milk.

Koumyss.—The original article is made in Tartary from mare's milk. In this country a number of products made from the milk of cows are now largely employed as a diet for the sick. According to the analysis of Prof. C. A. Doremus, nearly thirteen pints every twenty-four hours of Dr. Brush's koumyss would be requisite to furnish the normal quantity of fiber foods, for one in health. But in many cases of disease it furnishes adequate nutriment for a brief period in an easily assimilable and agreeable form. Koumyss poured a few times from glass to glass becomes like whipped cream and is then most palatable. As ordinarily made its food value is seen in the table.

Koumyss Cream.—Contains every element of pure milk in an easily assimilable form, with tonic, stimulant and diuretic properties that render it valuable in many cases of diabetes, dyspepsia, albuminuria, pregnancy, sea-sickness, amenorrhœa, malnutrition, etc. Half a pint or more at a time, from four to twelve times a day.

Kumysgen (a Koumyss Powder).—The great objections to koumyss are, the necessity of frequent preparation, of ice for preservation, and the constantly increasing acidity the longer it is kept, hence its varying acid character. These difficulties have been successfully overcome in the preparation of the powder kumysgen, which, besides furnishing a superior koumyss, makes the preparation of it as easy as the making of a cup of tea, and the powder is palatable, always the same in chemical and nutritive constituents, keeps perfectly, is ten times more nutritious than cod liver oil, is about thirty-five to fifty-five per cent. less expensive than ordinary koumyss (according to size purchased), about thirty per cent. of its casein in soluble form, and may be varied at pleasure in its lactic acid, carbonic acid gas and alcohol constituents. It is diaphoretic in warm and diuretic in cold weather. Increases the flow of the gastric juice, increases flesh faster than many other foods, is tonic and stimulant, and adapted to a great variety of conditions. One-half pint to four pints in twenty-four hours.

Liebig's Food.—Kept at most drug stores. Malted barley, wheat flour, wheat bran, bicarbonate of soda. Its starch is converted into maltose by the action of the malt. Must add seventy parts cow's milk

to five parts of the food. Has been much used in constipation and as an infant food. The maltose is in excess and is liable to produce diarrhœas. When used for constipation it should be used alone rather than with milk. The hard coagula of the casein of the added cow's milk, the maltose has no effect upon. Therefore, the child is exposed to the double danger of indigestion from coagula, and diarrhœa from the maltose.

Lacto-Preparata.—Cow's milk, milk sugar, cocoa butter substituted for a part of the milk-fat which has been removed. The casein is partly digested, and the remainder coagulates in soft curds; a powder (only three per cent. water); add water, and it has the taste and appearance of mother's milk. From one even dessert spoonful in twenty-four hours in first week to thirty-six dessert spoonfuls at fifteenth month.

Lactated Food.—See table, Page 253, which shows its food-value to be almost precisely like that of sweetened condensed milk when both are prepared for infant feeding. Valuable as an adjuvant for invalids, while for infants its worth is represented in the tables on Page 238.

Lacto-Cereal Food.—Powdered milk sterilized and partly digested, dextrinated wheat, malted barley, dessicated bananas, cocoa butter, manna, and some parched corn. It contains the ferment that digests starch, is nutritious, easily digested, neutral in its effects upon the bowels; contains fruit to keep liver and bowels in a normal condition; may be added to water, milk, soups, broths, milk punch, eggnogg, or mixed with any food. Valuable as a food for invalids.

Maltine.—A thick, syrupy extract of malt. Combines wheat and oats with the barley. Has the highest attainable diastastic power; is superior in palatability, uniformity and stability. Its nitrogenous constituents almost identical in composition with the chief constituents of the blood. One part of maltine will digest thirty-two parts of starch, *i. e.*, convert them into dextrin and sugar. Also made with peptones. Two to four teaspoonfuls at a time.

Matzoon.—Sterilized milk with its sugar converted into lactic acid by fermentation. Easily digested, nutritious and refrigerant; does not curdle like milk; its casein finely subdivided; very acceptable to the palate. An excellent preparation in all otherwise appropriate cases where its lactic acid is not objectionable. Dose one-fourth to one-half pint up.

Medium Oatmeal Crackers.—A combination of oatmeal with a certain proportion of wheat flour. About the same as oatmeal biscuit, but not fermented; palatable and wholesome.

Mellin's Food.—Its starch predigested into maltose, entirely free from cane sugar; to be used mixed with cow's milk. One to four even

teaspoonfuls to one and one-half to four and a half ounces of milk for babes, and one to two tablespoonfuls to eight to twelve ounces of milk for adults. It is assumed that the malt will aid the digestion of the casein of the milk, which we regard as doubtful.

Mosquera's Beef-Cacao.—Made of equal parts of Mosquera's beef meal, Dutch chocolate and sugar. Combines the palatableness of a beverage with the value of a concentrated meat food. One to two teaspoonfuls in a cup of milk. A valuable addition to the food products of the age.

Mosquera's Beef Jelly.—The albumen (fifty-three per cent.) of the meat digested by a vegetable ferment into peptone. Contains all the stimulating properties of the beef extracts also. A concentrated nutrient; palatable, entirely devoid of bitterness and disagreeable odor. Class 5 of meat preparations.

Mosquera's Beef Meal.—The elements of beef sterilized and partially peptonized by the addition of the pineapple, which possesses remarkable power to digest egg albumen and blood fibrin. Protein matter available for nutriment sixty-nine to seventy-seven per cent., of which thirty to forty-one per cent. is prepared for immediate absorption. The water is extracted leaving a highly concentrated nitrogenous food. Class 3 of beef preparations. One teaspoonful per meal.

Nestle's Food.—A carbohydrate dextrinated food which has value as a starch food for invalids in suitable cases, and as an adjunct for children over one year old, who obtain nearly a sufficient supply of fiber foods from other sources.

Murdock's Liquid Beef.—Has 14.31 per cent. of soluble albumin, and is an extremely valuable food, but its taste and odor are so objectionable that patients prefer other things. "The fresh blood of beeves and sheep defibrinated by churning, to which is added ten to fifteen per cent. of whisky and egg and blood-albumen. Raspberry leaf tea or other astringents are also added." (Boston Journal of Health.)

Oatmeal Biscuit.—About twice the thickness of an ordinary cracker, slightly sweetened, shortened with butter and made light by yeast; very palatable. Highly recommended for persons troubled with constipation with no acidity or flatulence.

Plain Graham or Dyspepsia Crackers.—Best graham flour and soft water subjected to processes that make them so crisp and palatable that one can hardly believe that they are not shortened. Sometimes lose crispness somewhat by absorbing moisture in damp weather, but it can be restored by placing the crackers in a hot oven for ten or fifteen minutes.

Plain Oatmeal Crackers.—Unfermented, and contain neither sugar nor shortening; exceedingly agreeable, crisp and nice.

Poluboskos, a Gluten Food.—Most of the gluten foods in the market contain from twelve to fifty-four per cent. of starch. Poluboskos contains only four-tenths of one per cent. Gluten is the element of the vegetable world which gives force and energy to animal life, and is the equivalent to the albumen of the animal kingdom. Poluboskos needs no special preparation; it is ready at a moment's notice. Mixed with milk it makes a nourishing, stimulating and refreshing food and drink for convalescents and dyspepties; readily assimilated by the weakest stomach. Valuable as a nerve food. Two teaspoonfuls contain as much nitrogenous matter as one pound of meat. Excellent for diabetics.

Ridge's Food.—An oatmeal and barley preparation, neutral to the bowels, of utility when appropriately used for invalids, and, as a children's food to be estimated by the tables on Page 239.

Rose's Peptonized Beef.—A therapeutic nutrient, primarily a food and secondarily a digestive agent. Each pound contains nearly five pounds of fresh lean beef, both the albuminous and extractive constituents. Useful in derangements of the digestive canal; in diseases attended with elevation of temperature, conditions of debility or tissue waste, as being assimilated with the least expenditure of force, and in all nervous maladies, as being the important factor in the elaboration and nutrition of fat. For alcoholism one-half teaspoonful in hot milk every two hours will be found of great service. Class 5 of beef preparations. One teaspoonful each dose; begin with one-fourth and increase. Dose every one to three hours. For enemata, double the quantity.

Rye Wafers.—Rye meal and whole wheat flour. Crisp and palatable. For all kinds of dyspepsia accompanied by constipation, except gastric dyspepsia when whole wheat crackers should be used.

Universal Food.—A dry powder made from the germs of wheat and barley thoroughly cooked, ready to be eaten by simple maceration for a few minutes in milk. Easily digested, and taken with milk or cream, very fattening.

Wagner's Infant Food.—A predigested milk food with the gluten of wheat and digested meat juice and mineral salts. Its true value as an infant food can be seen in the table of Infant Foods.

Wheat Gluten.—Nearly all the gluten in the market contains seventy-five per cent. of starch. This, according to Prof. Attfield, has only a mere trace of starch. Diabetics who must use gluten will find this what they need.

Wheat Preparations.—*Wheatena* is prepared from wheat excluding the inert portions. One part of wheatena powder poured into six or seven parts of salted boiling water is ready for use in one minute.

Appetizing, nutritious, easily digested. *Wheat Granola, Arlington Whole Wheat Meal, Sanitarium*, whole wheat flour, etc.

Zwieback No. 1.—Made of whole-wheat flour, sanitarium brand, containing more than fifteen per cent. of gluten; nutritious, palatable and digestible; said to be superior to the original Carlsbad manufacture; with milk or cream it is a real delicacy.

No. 2 is made of wheat flour and rye-meal bread for slow digestion and constipation.

No. 3 is specially prepared for acid dyspepsia with tenderness and painful digestion.

PART VI.

SPECIAL TREATMENTS.

1. The Faith Cure—2. Mind Cure—3. Christian Science Cure—4. Hygienic Treatment—5. Fasting Cure—6. Abstinence Cure—7. Dietetic Cure—8. One Meal Cure—9. The Salisbury Treatment—10. Grape Cure—11. Fruit Method—12. The Fruit-and-Bread Cure—13. The Natural Method—14. The Camp Cure—15. The Rest Cure—16. The Oxygen Treatment—17. The Movement Cure—18. The Massage Treatment—19. The Magnetic Cure—20. Electrical Method—21. The Hall Treatment—22. Our Doctor's Colon Flush, an Exhaustive but Plain Statement of the Simple but Effective Treatment by Means of Bowel Injections—23. The New Method Cure—24. The Inhalation Treatment—25. The Biochemic Cure—26. The Densmore Preliminary Treatment—27. The Kneipp Cure—28. The Climate Cure, the Objects Sought by it, How They are Accomplished, and Where to Find the Desired Climate—29. The Tractor Cure—30. The Earth Cure—31. Our Doctor's Water Treatment, a Comprehensive Discussion of Hydropathy, Who May Employ It, When and How.

Our purpose is not to sketch all the special treatments now recognized, to a greater or less extent, for the cure of disease, but simply to glance at those which have some particular merit that can be appropriated in a work like this, with more detailed directions concerning those treatments that are within the reach of ordinary families. These treatments should not be considered in the sense of different schools of medicine, but

particular applications of the healing art which all schools can, to a considerable extent, accept and practice. All schools agree in anatomy, physiology, chemistry, preventive measures, and the arts of obstetrics and surgery, but disagree as to the remedies to be employed and the method of their administration. A momentary survey of the three leading schools may be of interest just here.

The Allopaths, or "regulars," so-called, do not admit that there is any law of cure for disease, but believe in experimenting to find the effect of drugs, and give medicines, "because they have been used with advantage in similar cases."

The Eclectic believes that the law of cure is to produce an effect opposite to the diseased action, which is always an excess, defect or perversion. Hence, their remedies are selected according to the symptoms which indicate which of the three forms of disease is present.

The Homœopath holds that the law of cure is "similia similibus curanter." Like things cure like, *i. e.*, a drug that has produced like symptoms in a healthy man, will cure the same symptoms in a sick man; and that the power of drugs is increased by subdivision. By carrying these principles out they have amassed a symptomotology that is almost unmanageable, and have run their dilutions to such a degree that what part of the medicine is left is incomprehensible. Thus, the single remedy aconite has 2,400 symptoms and 800 conditions; while the thousandth potency of some drugs is sometimes recommended. Yet, absurd as this extreme may be, within reasonable limits homœopathy is often more successful than the "regular" practice in its treatment of disease, as proven by hospital statistics and health-board returns.

1. Faith Cure.—By this is meant the cure of disease by the agency of faith in prayer. The method is founded mainly upon the passage found in James 5, 13-15: "Is any sick among you? let him call for the elders of the church; and let them pray over him, anointing him with oil, in the name of the Lord, and the prayer of faith shall save the sick, and

the Lord shall raise him up." The advocates of this method are divided into two classes: (1) Those who believe that the anointing should be literally accomplished, and that all sicknesses of believers may be cured at any time; (2) those who hold that the healing is a special privilege of some, while others must suffer in common with other men.

The fact of multitudes of cures through these means can only be denied upon grounds that would invalidate all historical evidence. Many attribute the cures, however, to mental emotions, hopefulness, or other purely natural agencies. But this cannot be admitted; because, however potent such agencies may be, there is a peculiarly Christian fact in these "faith cures" that is entirely ignored by their assumption. This fact is the personal consciousness in the subjects of faith-healing, of an in-working, Spirit-helped faith. This consciousness is just as much a fact of experience in their case, as is the consciousness of personal salvation in the heart of the believer. No philosophy can ever account for these faith-cures upon any hypothesis that precludes or ignores this consciousness. And any denial of this consciousness, either as to its validity or value, as an element of proof, must be upon theoretical grounds, that would, with equal weight, bear against personal salvation itself.

Admitting, then, the fact that faith cures do occur, the question arises, what relation does that fact sustain to a book like this? The answer is, to Christian readers it may emphasize a possible privilege of any one of them. And therefore its mention, at this place, is proper, in order to suggest further reading of works specially illustrative of the subject.

2. Mind Cure.—This is based upon the creed of the German philosophy, which holds that there is no reality but mind. Matter has no existence. Pain is only an imagination. Sickness exists only in belief. Therefore, cure consists in changing the conceptions of the mind, relative to its supposed physical state. That change to be accomplished by the impression which the healer produces on the mind of the patient.

When that impression is sufficient to work the necessary mental change, the cure is complete; but when obstructed by doubts and hesitancy on the part of the patients, the cure is but partial and unsatisfactory.

That many cures are wrought by this agency, no student of science can deny. And to the extent that it can inspire hopefulness in disease, it is many times an agent of great value, but ought not to be relied upon to the exclusion of other measures which experience has proved of great service, even if not absolutely required.

3. Christian Science Cure.—Christian Science is a misnomer; for that which denies the fundamental postulates of Christian faith, ought not to bear the cognomen of "Christian Science." In 1864, Mary Baker Glover made her first "discovery" concerning healing by this method. Her doctrines, as stated by herself, are:

"God is an impersonal principle; man is his idea. Matter is but a belief, and mind the only reality. To believe in the possibility of pleasurable sin, makes all that is sin. Life is not structural and organic, but without beginning and without end. Soul is not in body, it is the unlimited intelligence. Man is an idea, and soul the principle that produces it; therefore, man and his maker are inseparable.

"The five personal senses are beliefs. There is no personal sense. Repulsion, attraction, cohesion and power, supposed to belong to matter, are constituents of mind. Spirit cannot act through matter. Disease is a belief only. Electricity is not a vital fluid, but an element of mind. Belief is mortality's self, nothing whatever but illusion. Man never dies; it is only a belief of man (that dies). Man born to-day and dying to-morrow, as if something was newly created and lost, is a dream and illusion. Mind, not matter, embraces all suffering. When the sick are made to realize the lie of personal sense, the body is healed. What if the lungs are ulcerated or decayed; mind has done this. Change, therefore, your belief in the case, and you will form the lungs anew, and they will resume their healthy functions. It matters not what the body indicates, in reality all is mind. The battle lies wholly between minds. Dismiss the first mental admission that you are sick; never admit sensation in matter, or that the body can be pained. Battle the old belief until you destroy it, and you will get well. Pains of the body are unreal, but not more so than its pleasures. Food neither helps nor harms man. You can prevent or cure scrofula,

hereditary disease and the like, in just the ratio you expel from mind a belief in the transmission of disease and destroy its mental images. For a broken bone or dislocated joint it is better to call a surgeon, until mankind is further advanced in the treatment of mental science. The time approaches when mind alone will adjust joints and broken bones."

These verbatim extracts from "Science and Health" present a condensed summary of the principles of this method of healing, based upon a pantheistic God, a Deified humanity, experience a universal lie, and the idealistic figment of one school of Germany philosophy the one saving truth of this universal sham. Yet its teaching has a place, to a limited extent, in leading the sufferer to match will-power against pain.

4. Hygienic Cure.—This consists in a careful conduct of the life, in accordance with the laws of health; embracing eating, breathing, sleeping, exercise, baths, sanitary surroundings, social relations and mental employment. Whatever careful adjustment of personal condition with these factors will not do towards the restoration of health, it is not deemed advisable to attempt by any other means.

As an adjunct to other measures of established value, this system cannot be overestimated. But it has the disadvantage of supposing a knowledge and control of circumstances on the part of those who employ it, both of which are entirely beyond ordinary human attainment. Therefore, as a sole reliance, it will often be found most disappointing in the time of greatest need.

5. Fasting Cure.—This is based upon the assumption that people ordinarily eat too much, and that the main cause of disease is the clogging of the fluids and tissues of the body with the surplus material of the food and the wastes from tissue change. Therefore, when sickness occurs, the proper thing to do is to cut off the source of superabundant supply. In other words, abstain from food until the system has not only appropriated all the surplus, but expelled the excrementitious matter, and thus restored the normal balance between the in-take and the output of the organism.

With this method, as with the last, held in a subordinate position, it may contribute largely toward recovery; but when the blood is filled with the microbes of some diseases, starvation alone is likely to exterminate the patient much sooner than it will the parasites. As an illustration of the proper use of this method, we cite the following case:

6. Abstinence Cure.—A personal friend, who was at the head of a very large mercantile agency, the business of which required the constant expenditure of an excessive amount of brain vitality, was subject to occasional attacks of prostrating illness.

His uniform practice, at such times, was to retire to his bed, in a partially darkened room, and there remain, without food, medicine, or any kind of employment, until his sickness passed away. He never failed to find relief within a few days.

7. Dietetic Cure.—The hope of the advocates of this system is, that by the careful adjustment of the diet to the needs of the system, the seeds of disease may be extirpated. Like other single agencies, it has a value not to be overlooked as an auxiliary, but as a sole contingent with which to fight the array of physical ailments that besets men, it is lacking in two fundamental elements of success. The first of these is the general, popular and professional ignorance concerning what constitutes the best diet in certain conditions. The second is the inability of the mass of people to regulate their diet according to the standards that may be deemed authoritative.

For these reasons, it is unwise to trust to diet exclusively for the relief of most diseases; although there may be dyspeptic and kindred ailments that are amenable to it. Proper diet and forms of food, under various conditions, are fully set forth in previous parts of this book.

8. One Meal Cure.—This is recommended especially for those slaves of appetite who find all their good resolutions of prudence vanishing before the temptations of a well-spread table.

The London *Lancet* says: By active employment or outdoor sport the patient can manage, for hours, to divert his mind from the thought

of the dinner-table, and when he at last sits down to a late meal, it is too late for the demon of the besetting vice to retrieve the lost opportunity, and the invalid will be neither able nor inclined to eat more than his digestive organs can utilize in the course of the next twenty-four hours. By the simple plan of masticating every morsel of food slowly and thoroughly, a feeling of satiety can be made to assert itself before it is too late; and the idea that one meal a day might fail to supply the alimentary wants of the system is refuted by the experiments of modern sanitarians, as well as by the habits of the ancient Greeks and Romans, who, for a long series of centuries, limited themselves to one daily meal, eaten in the cool of the evening, or, at least, not before the completion of the day's work.

9. The Saulisbury Cure.—In 1850 Dr. J. H. Saulisbury began a very thorough course of microscopical and chemical analyses in order to discover the causes of the incurable diseases. In 1854-7 he added many experiments made upon himself and upon men whom he hired for the purpose, in order to ascertain the effect of living exclusively upon one food at a time. In 1858 he amplified his experiments upon two thousand hogs, which he personally fed and dissected. In that year he discovered the cause of disease, as he believes, in unhealthy alimentation. The diseases thus caused are consumption, in all its phases, chronic diarrhea, summer complaint of children, dyspepsia in all forms, rheumatism of all kinds, gout, Bright's disease, diabetes millitus, locomotor ataxia, ovarian tumors, goiter, cretinism, all fibrous tumors, cancerous growths, all paralytic diseases, (1) softening of the brain, insanity, (1) purpura hæmorrhagica, deafness, diseases of the eye, catarrhs, gravel, urinary and biliary diseases, asthma, (1) fatty diseases of heart and other organs, (1) most prolapse cases of bowels and uterus, most cases of dementia, loss of voice, erysipelas, eczema, scald head, Anæmia, etc.

His system is epitomized in these words: "Healthfully feeding those tissues which require nourishing, and starving such as have been over and unhealthfully fed, will, in time,

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(1) Except when caused by injuries, poisons, infections, effusions or parasites.

restore the equipoise of an unbalanced organism." "By structure we are two-thirds carnivorous and one-third herbivorous."

Sip one-half to one pint of hot water, 110° F., from fifteen to thirty minutes, about 6 and 11 a. m., and 4 and 9 p. m. A cup of clear tea, coffee or beef tea slowly sipped, near the close of each meal. Hot water or beef tea, if thirsty, between two hours after and one hour before meals. Preferably the center of the round steak, chopped; all the coarse portion removed, made into cakes one-half to one inch thick, and broiled. Put on hot plate, season with butter, pepper, salt, Worcester or Halford sauce, mustard, horse-radish or lemon juice to taste. After the urine becomes clear and free at 1.015-1.020, add side dishes of broiled lamb, mutton, game, chicken, oysters, fish, dried beef, boiled codfish (fresh or salt), baked fish, or soft boiled egg. Bread, toast, boiled rice or cracked wheat, one part by bulk to four to six parts of meat. No other food. Soap and hot-water bath twice a week, then oil the entire body with glycerine and water; rub well. Nightly sponge bath of hot water one quart, aqua ammonia one to four teaspoonfuls; wipe dry and rub well. Every morning sponge off with hot water, wipe dry and rub well.

10. The Grape Cure in Germany and France consists in living exclusively, for several weeks, upon grapes, freshly picked from the vines. Several pounds a day are consumed at regular hours, and for some ailments it has proved very beneficial. But the small proportion of nitrogenous constituents renders it unfit for active life or for long-continued subsistence. Sometimes a little dry bread is allowed.

11. The Fruit Cure.—This is based upon the statement that fruits not only afford the needed carbon, with much less vital strain than is required for the digestion of bread and cereals, but supply the organism with the antiscorbutic fruit elements and phosphates that are absolute requisites to any complete system of nourishment. Fruits abound in elements whose office is to dissolve out and carry off many salts and earthy matters, that otherwise remain to obstruct, and induce

ossification. These fruits are also nature's aperient, and promote the normal action of the bowels, and are the surest means of overcoming constipation.

The fruits preferred are figs, prunes, dates, raisins, peaches, pears, apples, berries, oranges, bananas, thus making this cure simply a broadening of the general idea of the grape cure, with this advantage in favor of the former, that whereas grapes have only fifty-nine one-hundredths of one per cent. of nitrogenous matter, figs contain over five per cent., and their force element is nearly three times as great, or forty-five per cent., and the average of the fruits named give nearly one and a half per cent. fiber element, and one and one-half times more force constituents than grapes. Any greater variety than the fruits named is not deemed desirable.

12. The Fruit and Bread Cure of Dr. Gustav Schlickeysen is based upon the theory that the natural manner of living all over the globe, before the glacial epoch, was on fruits, nuts and grains, and that as the tertiary fossil-bones of man are larger and stronger than those of the historical period, therefore, their food was more favorable to physical development.

The order of maturity of the fruits and nuts is adapted to the necessities of the seasons. Great variety should be allowed. They should be taken uncooked, mainly because cooking destroys the electrical vitality of the food, which is a quality entirely distinct from its nutritive element. Salt and other condiments should be rejected. Preferably the grains are eaten raw, but if bread be used, it is of the unbolted wheat, prepared with water, thoroughly kneaded, set to rise near the fire, then baked two hours. The only beverage allowed is pure water. An abundance of fresh air day and night is insisted upon.

Ample experiment has demonstrated the curative virtues of this treatment, and it likewise possesses economical and labor-saving features, that strongly recommend its adoption; but the reputation for oddity that, in the present state of soci-

ety, must attach to those who depart so far from the ordinary customs of the people, is an insurmountable barrier against its being generally practiced.

13. The Natural Cure of Dr. C. E. Page is substantially Dr. Schlickeysen's theory, but favoring the one meal a day system most of the time, as largely increasing the working capacity. The following is Dr. Page's experience while living on a dozen meals a week:

"I have walked in snow and slop with low shoes, until both shoes and socks were soaked through, and have sat thus for an hour or more; after wearing all-wool flannels during moderate weather, I have, upon the approach of *colder weather*, removed my under-garments, and have then attended to my outdoor affairs, minus the overcoat habitually worn; I have slept, in winter, in a current blowing directly about my head and shoulders; upon going to bed I have sat in a strong current, *entirely nude*, for a quarter of an hour, on a very cold, damp night in the fall of the year; I have worn a flannel gown, and slept under heavy-weight bed covers one night, and in cotton nightshirt and light-weight bedclothes the next. These, and similar experiments, I have made repeatedly, and have never been able to catch cold. I become cold, sometimes quite cold, and become warm again, that is all. On the other hand, changing the form of my experiments, returning to my old way, the prevalent style of living—a "generous diet," and a full meal every five or six hours through the day—I have found no difficulty in *accumulating* a cold; and within a reasonable length of time could count upon it."

Lest the force of this example should be broken by the plea that Dr. Page was exceptionally rugged, it should be stated that he reached this degree of resisting power by substantially this method of cure, from a state which he thus characterizes: "Personally, I have been a lifelong sufferer from 'colds' in a variety of forms, from the 'snuffles' of crammed infancy, and the 'hay fever' of adult age, to neuralgia, rheumatism and the like."

14. The Camp Cure.—This consists in living for several months under canvas, preferably in the forest, away from all the exactions of ordinary life, in the freedom and abandon of a vacation, in the company of congenial spirits, and with nothing to do but get strong. The merits of this cure are

known to many, but still remain to be illustrated on the large and systematic scale that the best interests of the people require. Elegance of appointments, fashionable attire, and the exacting conventionalities of social home-life, are all to be rigidly excluded. No book but the Bible; no used communication save with companions and Heaven, and no luxuries but the pure air, the limpid water, good food, sleep and breath.

If any invalids in the world can "throw physic to the dogs" with impunity, it is those who have thus broken loose from the restraining, constraining and distraining duties of home and business life, and given themselves to a temporary nomadic kind of existence, that brings them back toward the healthfulness, buoyancy and gladsomeness of humanities' youth. To consumptives, especially, this method offers a most inviting and efficient remedy, particularly in the early stages. And the victims of stuffed stomachs, laggard livers and nerveless nerves, may find in it something better than specialists' prescriptions, mineral waters or self dosing.

15. The Rest Cure of Dr. Weir Mitchell is especially for debilitated nervous systems. The cure consists in lying on a clean spring cot, in a perfectly lighted and ventilated room, with nothing to distract the attention, waited upon by a healthy young nurse of a disposition suited to the case. No letters, books or friends admitted. Absolutely nothing to do but rest. Daily massage, and warm sponging before 8 p. m. If the digestive organs be very weak, raw milk is the only diet. If that disagrees, boiled milk is substituted. If that cannot be borne, two ounces of skimmed milk every two hours for two or three days. Then the full milk diet of eight eight-ounce glasses of milk (64 ounces) a day. After a week or more, bread and butter. After a few days more farina, fruits, chops, oatmeal, chicken and vegetables. After a suitable time the patient is dressed and sits up for five minutes, which period is extended as the strength returns, until two hours are allowed morning and evening. Then one letter may be allowed a day; later, a magazine, and so on. Then a walk of a single block, which is

gradually extended to three or four miles. Upon leaving the hospital, a schedule regulating hours of meals, exercise and sleep is given for future use.

In cases of less digestive debility, the rest-diet consists, the first five days, of five and one-half pints of milk every twenty-four hours. This yields but 1705 calories of energy, and requires 946 pints of oxygen; but as the rest is as nearly absolute as practicable, the diet is found to be sufficient, and the treatment has proved to be very efficient in a class of cases that has been the despair of nearly all other methods.

16. The Oxygen Treatment.—This consists in the inhalation of either pure oxygen gas, or a compound of oxygen and nitrogen, and, in some cases, medicating the gas. When this is judiciously done it is a most effective treatment, but a large proportion of the so-called oxygen treatments are unmitigated frauds. We could name one largely used whose claims are endorsed by several reputable physicians, but whose circulars are tissues of falsehoods, and whose product has been proved by chemical analysis, to contain not one particle of oxygen that can be absorbed by the patient. Deep inhalations of pure air may accomplish most of the results arrived at by this treatment.

About twenty per cent. of the oxygen inspired by an adult is absorbed directly into the blood, which has such an affinity for the oxygen that it absorbs two and a half times more than water does. Magnus has shown that arterial blood contains ten per cent. by volume of carbon dioxide, and twenty-five per cent. of free oxygen, and venous blood ten to forty per cent.

The objection is made to all oxygen treatments, that the amount of free oxygen in the blood can not be increased beyond the quantity which it receives by inspiration. If this were true it would still lack any force, because most people live in an habitual state of suboxydation. Yet there are very strong reasons for believing that it is not true, but that an indefinite quantity of oxygen may be taken up by the tissues.

No atom of nutrition is ever converted into blood or tissue, and no atom of blood or tissue ever passes through the retro-

gressive changes backward toward inorganic matter, without the agency of oxygen. Further, usually both the nutritive and excretive processes, in their activity, bear a direct relation to the amount of oxygen inspired. Therefore, the best of physiological reasons favor the employment of oxygen in nearly all forms of disease, and the weight of clinical testimony is overwhelming as to its efficiency.

17. The Movement Cure.—Ling, of Sweden, has the credit of introducing and systematizing this very efficient mode of treatment. It is based upon the fact that exercise strengthens. Hence, this system has elaborated special forms of exercise, adapted to the development of every muscle of the human body. It also recognizes the fact that, in order to strengthen by exercise, it is of imperative necessity to allow periods of repose. Great institutions, with elaborate and costly machinery, have been erected both in Europe and this country, for treatment of disease and malformation by this method. Many books have also been written expounding the method.

The institutional treatment is necessarily very expensive, on account of its immense outlays. But those who desire the system, and cannot afford the institutional treatment, will find adequate instruction in "Nisens' Swedish Movement and Massage Treatment," "Taylor's Health by Exercise," or "Checkley's New Method of Physical Training." The exercises found on Pages 29-36 of this volume are selected as adaptations of the general principles of the movement cure, and will be especially applied in Part Eight, on diseases and their treatment.

18. The Massage Treatment.—Massage means kneading, handling, manipulating of the flesh. It is divided into passive, in which the patient receives quietly the movements of the operator; and active, in which he resists those movements. It is estimated that there are one thousand miles of tubing in the human system; that the sweat tubes alone are thirty miles long, and therefore, any manipulation that can effectually open all these miles of tubing, must have a pronounced physiological result. Experience has proved that the temperature

of an arm may be raised five degrees in a few minutes by the process.

The primary movements are friction, percussion, pressure and movement. The effect of these is to stimulate the terminal nerve-fibers, quicken and tone the circulation in the skin, promote its secretions through those miles of tubing, and the interchange of gases. It should be applied from the extremities towards the trunk.

Deep massage is a combination of pressure and movement. Its effect is to improve the muscular circulation, tone the motor function, stimulate the lymph glands, restore nervous energy, relieve pain and promote sleep. Massage of the abdomen excites bowel movements, stimulates the genital organs, improves appetite and digestion, strengthens the heart, deepens respiration and increases oxygenation.

The best method of performing massage is as follows: "1. Sponge off the entire surface of the body of the patient, both morning and evening, with castile soap and water, and dry well. 2. The operator should be a young, healthy, vigorous person, full of vital force, intelligent and well posted in his or her work. Massage should last for half an hour in the morning, and the same length of time in the afternoon, increased daily until two and a half hours are thus occupied morning and evening, making five hours daily, and after its performance, each time, one-half or three-quarters of an hour of electrical manipulation to follow. This massage is to consist of taking a leg and thigh, beginning at the toes, foot, leg, up to groin, first rubbing from the extremity up; then grasping the parts between both hands, from foot up, moving each joint as you go along; then a careful painstaking kneading from the sole of the foot up, manipulating the joints well; this to be followed by beating, or patting with the fingers of both hands, coming down on the part at the same time, and the whole to be followed by a rubbing with the points of the fingers, always moving the joints. After one limb has been well done, then the other; then one arm; then the other; then the back; and, lastly, the abdomen, spending upon each a little over half an hour. If there is great sensitiveness, it is often best not to spend the entire time on one member at once, but to go from one to the other, going over each several times. The intensity of massage will depend altogether on the sensibility of the patient. In no case is there any violence or roughness to be used; neither is the skin to be irritated nor much redness induced. During the manipulation

the patient is to remain perfeetly passive, not to make a single effort. All to be done by the operator. This systematie shampooing, grasping, kneading, patting, beating and exereise of all the museles and nerves of the body, extremities and trunk, has a truly magical effeet Its advantages are, the periphera nerve stimulation, carried to brain, cord and other centers, raises the standard of central vitality, and the vital force and stamina of the operator is planted into the nervous system of the patient by reflex emanation. All his reserve vitality accumulated is thus given to the devitalized." Key Notes.

It is a most successful measure for the amelioration or removal of nearly all the ailments of humanity.

19. The Magnetic Cure.—Certain individuals are endowed by nature with a surplus of animal magnetism. So much so, that by contact with others they impart a measure of their supply. By some process of transformation not understood, this added increment of energy becomes increased vitality in the subject.

Many cures, seemingly marvelous in their character, have been wrought by persons thus endowed. The ordinary experience of the removal of headache by gentle touches of the hand of another person, is an illustration of the same process. In this case, all that is requisite is that the operator shall be at the time, more fully charged with magnetic influence than the patient. Nurses should always be selected for the sick with reference to their capacity in this direction.

The treatment is particularly beneficial in nervous diseases, care being taken that the operator be of a congenial temperament, and not exhausted by previous treatment of other persons. If this cannot be assured in any other way, the patient should insist on being the first one treated on that day, and the treatment should be received often enough not to allow the system to drop to its old level in the interval. Exercise should be carefully adapted to the strength, especial care being taken not to waste vitality by useless activity when under the invigoration of a recent treatment. Food should be increased as appetite and strength improves, and the habit of sleep should be cultivated.

20. The Electrical Cure, as properly employed. This consists in passing the current of a battery—either Faradic, galvanic or frictional—into the body of the patient. The philosophy of the remedy lies in the general facts that such is the effect of the current upon the nerves that the application of the positive pole reduces abnormal sensibility, dissipates congestion, and carries away obstructive material. On the contrary, the application of the negative pole increases the circulation of the part, quickens sensibility and exalts vital function. Undoubtedly, also, by the great law of conservation of energy, a part of the electrical force becomes transformed into nervous vitality.

Hence, it is a potent factor in the relief of pain and cure of disease, when rightly applied. But the common practice of keeping a battery for home treatment, without the directions of a competent advisor, is often extremely detrimental, because nerves tire as well as muscles, and over-treatment may cause nerve debility or excitability, that will be hard to overcome. The kind of electrical current, its direction, force, duration, intermittency, frequency of application, are all matters of importance to be determined, in critical cases, only by the experienced. In his hands there is no mightier agency for the relief of human suffering. But just as gunpowder is not a suitable thing for children to play with, so electricity (notwithstanding the assertions of battery-makers) is not a proper agent for the untrained to employ.

21. The Hall Treatment.—For many years physicians in various parts of the world have been experimenting with more or less flushings of the rectum and colon, in order to determine their precise value as curative measures. But it remained for a scientific layman experimentally to outline a system now known as the Hall treatment, which consists in the daily or tri-weekly injection into the colon of from three to four quarts of cold water, and its retention as long as practicable. The utility of the measure consists in these facts:

First.—The highly concentrated foods of civilized life, combined with sedentary occupations and unphysiological dress,

produce, in the great majority of the people, a diminished peristaltic movement of the bowels, which results in the accumulation of the feces in the colon and rectum, either packing the tube with a solid mass, or covering its interior with a pasty substance, leaving a sort of fluid core, which may be expelled in daily evacuations.

Second.—But in either case the mouths of the absorbents are furnished with the foul excreta of the organism, to be taken up and carried as a poison, throughout the entire system.

Third.—Headache, foul breath, muddy skin, indigestion, liver complaint, palpitation and nervous disturbances are the result.

Fourth.—The effect of the flushing is to soften and expel the impacted matter and take up and remove the pasty lining, thus making the colon what nature designed it should be, an organ of transmission, not a receptacle of decay.

After many years' use of this method, Dr. Hall claims to have passed from the condition of a hopeless consumptive to that of the healthiest man of his years and generation, and thousands of others have employed it temporarily with great advantage. Yet, as a system of cure, we believe it to be essentially defective.

First, because lacking in adaptation to very many cases.

Second, because it neglects those means of cure which nature itself teaches us to employ. When the dumb animals are sick their instinct teaches them to find, in some growing plant or running stream, or elsewhere, a means of relief. Human reason and experience have proved the utility of similar agents, and while they have been many times abused, that is no reason why they should not be properly used.

22. Our Colon Flush.—This is a system of flushing the bowels employed by the writer for several years. It originated in suggestions accompanying various clinical reports in different medical journals. In this treatment an attempt is made to adapt the quantity, temperature and frequency of the flushes to the condition of the patient, and special medication

is added as required. In order that the subject may have the comprehension which it merits,

1. *The anatomy of the parts* should be clear in the mind of the reader.

Fig. 19, Page 64, shows the lower part of the ascending colon in the right lower abdominal (*hypogastric*) region, and the place where the small intestine empties into the colon through the ileo cæcal valve, which allows the passage of matter from the small intestine, but prevents its return, Fig. 40.

This valve is a transverse fissure like a buttonhole, with flaps like eyelids, the upper projecting most. From the starting point, three inches below the valve, the colon passes up eight inches to the under

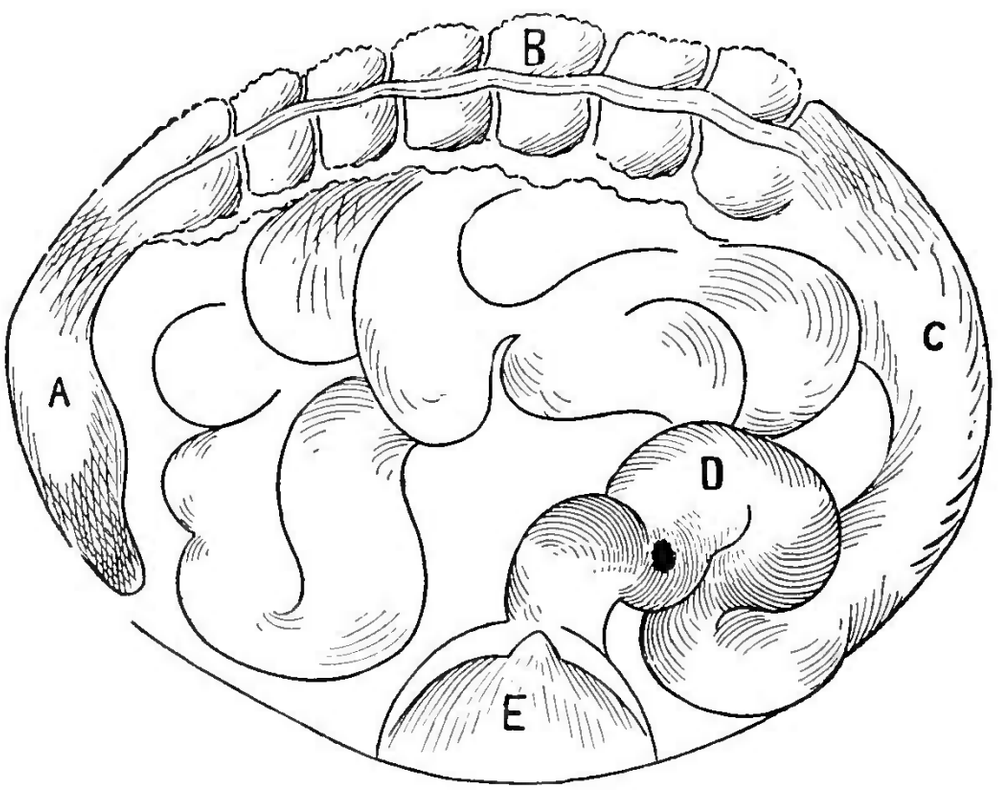

FIG. 36. THE BOWELS OR COLON.

A. Ascending Colon. *C.* Descending Colon.
B. Transverse Colon. *D.* Sigmoid-flexure.
E. Bladder.

surface of the liver, then across twelve inches, then down eleven inches, then bends around twenty-two inches, and ends in the rectum eight inches, constituting a tube about five feet long, one and one-half to three inches in diameter, with an average capacity of about four quarts. See Fig. 34, Page 84.

It should be observed that it comes in close contact with the under side of the liver, gall, bladder, stomach, spleen and pancreas, and the front of the kidneys, and borders the uterus and bladder. The struc-

ture of these organs is such that they have the power of osmosis (transfer of liquids through their membranes).

An important feature of the descending colon is the sigmoid flexure (Fig. 36), named from its shape, resembling the Greek letter sigma, and about twenty-two inches long. Possibly the design of that form may be to partly hold back the crowding feces, and somewhat relieve the pressure that otherwise might be too strong for the sphincter muscle. However that may be, it is an obstruction that must be carefully provided for in the administration of the flush. The feces are probably stored a few hours above the sigmoid, in order to give opportunity for the absorption of their fluids.

The Bowels Consist of Three Coats.—The external peritoneal, or serous; the middle, muscular; and the internal, mucus. The object of the serous is the same as the serous membrane of joints, protection from friction. That of the muscular is to produce the peristaltic movements that carry the contents on toward the exit, and that of the mucus, to lubricate. The colon readily absorbs watery solutions, although its absorbents are not as numerous as those of the small intestine. When the feces reach the rectum, the desire for defecation is felt, and, if not gratified, it is thought that the feces reascend into the descending colon.

The Small Intestine, fifteen to twenty feet long and one and one-half inches in diameter, is described on Pages 63-64.

The inner membrane has a velvety appearance, from the great number of villi (small projections), each of which has an artery, a vein and capillary net work, as shown in Figs. 37 and 39. These villi are estimated to number 10,125,000 in the small intestine.

FIG. 37. CAPILLARIES OF THE SMALL INTESTINE.

The glands of Brunner lie under the mucus membrane of the duodenum (for their use see Page 85), while "Peyers patches" are collections of so-called solitary glands in the lower part of the intestine, whose purpose is to secrete intestinal fluid.

The follicles of Lieberkühn (Fig. 38) are scattered through both large and small intestines, and secrete most of the intestinal fluid or ferment.

2. *The Natural Physiological Processes* of the intestines have been briefly referred to, Pages 85-88, in considering digestion, but we must now repeat and amplify.

Some very recent discoveries of great importance have been made by Drs. Macfadgen, Mencki and Sieber, in a case of strangulated hernia, in which it became necessary to remove about three inches of the small intestine, and one inch of the colon, in Prof. Kocher's clinic at Berne. An artificial fistula was formed by connecting the small intestine with the wall of the abdomen, by which means the contents could be collected and examined at pleasure, and it was learned that a given article of food requires from two to five and one-fourth hours to reach the valve; that its complete passage may take much longer time, as in the case of green peas which are from fourteen to twenty-three hours

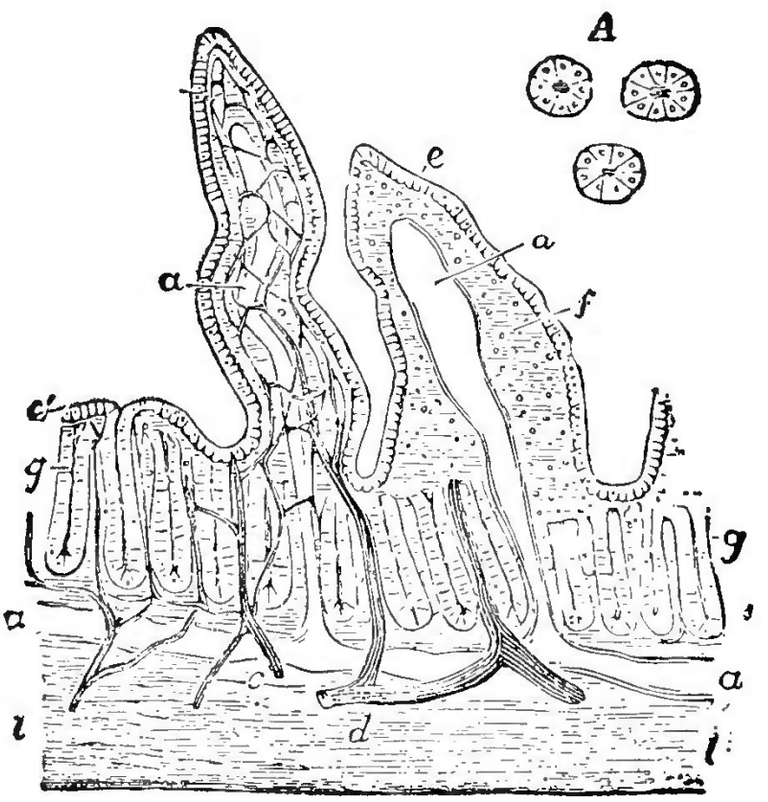

FIG. 38. VERTICAL SECTION OF MEMBRANE OF RABBIT.

a. Lacteal vessel.
b. Capillary blood-vessels.
c. Small artery.
d. Vein.
e. Epithelium.
f. Substance of a vilus.
g. Tubular glands of Lieberkühn.
i. Submucus tissue.
A. Cross-section of Lieberkühn glands, highly magnified.

in being removed; that the matter is usually almost odorless; that it has an acid reaction equal to one-tenth of one per cent. of acetic acid; that there is no appreciable decomposition of proteids in the small intestine by bacterial organisms; that many forms of organized ferments exist there, but of such as act upon the force-foods with the formation of volatile fatty acids, only one of the six identified could act on protein; that the fiber-foods are subjected to putrefactive processes first in the colon; that 85 per cent. of them are digested and absorbed before reaching the colon, thus leaving only 15 per cent. sub-

ject to the liability of putrefaction; and that a much greater percentage of the force-foods resist the action of the small intestine, and remain to be worked up in the colon (probably 20 to 30 per cent.).

It was also found that the patient gained in weight on the percentage of fiber-element absorbed by the small intestine, and was therefore consuming more than was necessary for nutrition. She took food five times a day and passed 19.3 ounces in 24 hours, of which 5.9 per cent. was solid matter. When the food was more concentrated, the quantity passing the fistula was only 8.1 ounces, of which 11.2 per cent. was solid.

Some of these facts are of great importance.

1. Eighty-five per cent. of the fiber-foods are digested in the stomach and absorbed by the small intestine. This is sufficient for nutriment, so that the remainder is waste; provided

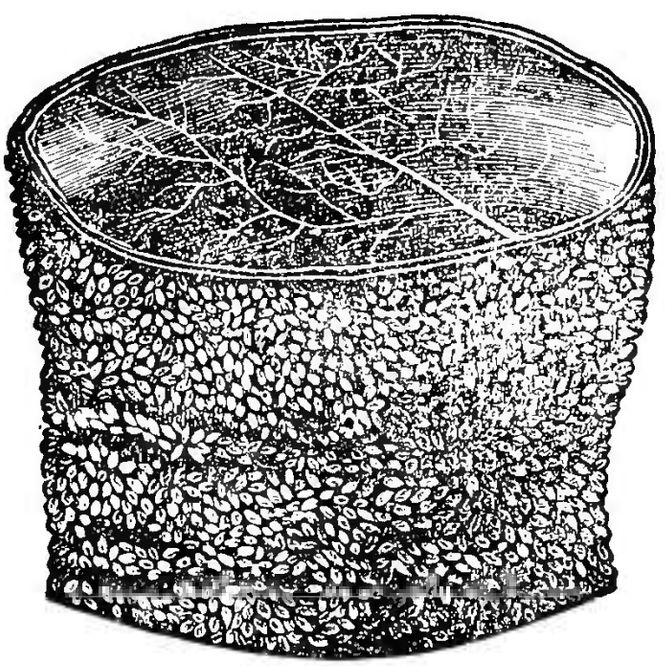

FIG. 39. A PORTION OF THE BOWEL TURNED INSIDE OUT, TO SHOW THE ABSORBENT VESSELS CLEARLY.

that enough of the fiber element is digested so that 85 per cent. of it can meet the demand for tissue repair, but if that be not the case, then it is absolutely necessary for complete nutrition that the remaining 15 per cent. be appropriated from the colon.

2. Only 70 to 80 per cent. of the force foods are digested by the saliva and the pancreatic and intestinal ferments, leaving, say, 25 per cent. to pass on into the colon.

3. The colon, therefore, has a total of about 40 per cent. of the foods to dispose of, three-eighths of which is specially

liable to putrescent fermentation in the colon, which yields no ferment except that of the follicles of Lieberkühn.

4. The selective power of the absorbing lacteals is there the only security for the integrity of the organism against the poisons that float therein, interningled with the nutriment.

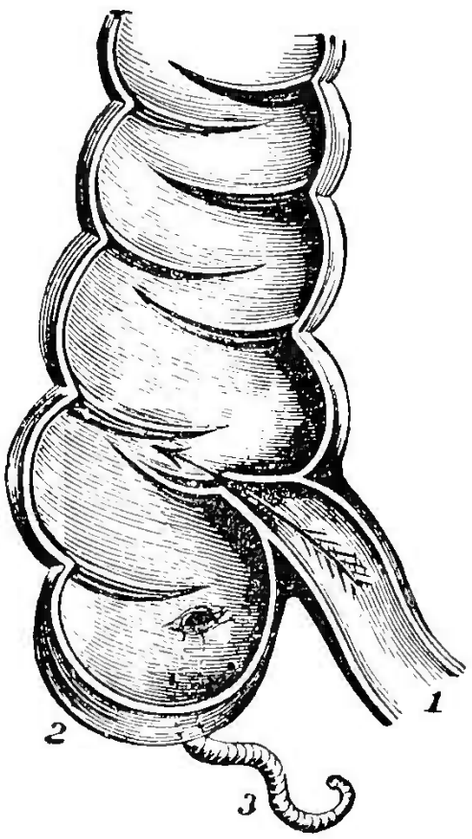

FIG. 40.

1. Small intestine.
2. Ascending colon.
3. Appendicitis arrow, valve.

Another fact of great importance is that nature designs that the whole of that 40 per cent. shall be either absorbed as nutrient material, or passed on to be expelled as waste every day.

For the first of these purposes, the lacteals line the small intestine, as seen in Figs. 20 and 21, p. 65, and in Fig. 39, as so many hungry mouths lon ing to be filled.

For the second purpose, the muscular coat, by its vermicular action, passes on the residue into the rectum to be expelled.

Constipation.—While this describes nature's normal process, sedentary habits, inattention to the calls of the desire to stool, and unsuitable foods, have instituted an abnormal physiological process known as constipation. This is diminished peristaltic action of the intestines.

All healthy physiological actions move downward from the head towards the feet, while all physic (soul) move upward from the feet to the head. The downward peristalsis travels the length of the body about once every minute, and manifests itself in the muscular fibers of the blood vessels, glands and digestive proeess. The peristalsis of the bowels is but a part of this general movement. The eauses of its diminished aetion are:

1. General poverty of nerve foree.
2. Enfeeblement of the bowel by over-distention or purgatives.
3. Diminished special sensibility of the bowel.
4. *a*, Deficiency of bile-stimulation; or *b*, of fluid from the glands of the large intestines.

5. *a*, Food susceptible of nearly complete absorption; *b*, change of habits.

6. Weakness of the abdominal muscles.

7. From mechanical obstruction, spasmodic contraction of the walls of the bowel, collections of worms, or indigested food, the pressure of tumors, or the flexed or pregnant uterus.

To these seven causes Salisbury has shown conclusively that *the fermentation of starchy food* must be added as the chief. The process is this:

As the stomach is not designed to digest starches and sugars, when they are too exclusively eaten, it does not feel stimulation enough from their presence to pass them along at once. Hence, they ferment and form carbonic acid gas, sugar, alcohol, and acid and alcoholic yeast plants. These soon begin to paralyze the follicles and muscular walls of the stomach, rendering it flabby and baggy, and distended with gas. Armand Gautier has shown that the fermentation of organic products causes the formation of special toxines. From these come gastric disturbances and neurasthenia.

The stomach has now become an apparatus for the manufacture of beer, alcohol, vinegar and carbonic acid gas. This gas soon paralyzes the gastric nerves, and the mucus follicles pour out quantities of stringy, viscid mucus. This partial paralysis dilates the blood vessels, and a sort of passive congestion supervenes. Then the epithelial surfaces and connective tissue beneath begin to thicken, which may go on into gastric fibroid, or even scirrhus.

If the person is active enough to shake the food along, or if the pyloric valve be so paralyzed as to remain open, so that the food quickly passes on, the danger of fibroid is lessened, but the disease is then transferred to the small intestine, where it may remain as intestinal dyspepsia (vegetable dyspepsia, flatulent dyspepsia, etc.), for many years, in which case the following results are to be expected:

These foods excite abnormal actions in the parent epithelial cells of the mucus surfaces and glands, thus causing vitiated intestinal fluid which proves incapable of digesting the food.

Thence comes fermentation, the production of carbonic acid gas, lactic acid, alcohol, and the yeast fungus. The peristaltic action is reversed, bringing the bile up into the stomach and back into the gall bladder, causing biliousness.

The ileo-cæcal valve may be so paralyzed by the carbonic acid gas that it allows the fermenting mass to pass on into the colon. But before this results, the intestinal walls lose much of their normal sensibility and contractility, and furnish but a scant supply of digesting fluid.

By reason of diminished sensibility the absorbents lose much of their selective power and suck up any pabulum that may be offered. This carries the poisons into the blood-current, where the acid yeasts aggregate in masses which, as the spores multiply, finally become too large to pass through the capillaries of the lungs, hence lodge, fasten and become the nuclei of future tubercles.

The blood vessels of the intestinal walls dilate because of their state of semi-paralysis, causing stacis, and a hypernutrition that thickens them, by a great increase of connective tissue, with a low grade of vitality. In some cases the thickening of the colon has elongated it a foot or more, and in others entirely closed up the passage.

The system is now becoming saturated with yeast plants. The white blood corpuscles begin to get sticky, spongy and soft, and the fibrin filaments formed from them are soft and rotten.

These soft filaments are liable to fix themselves to the epithelial lining of the blood vessels in or near the heart, and become gradual accretions of fibrin, until thrombi results. These breaking loose and floating in the blood may become emboli. This is especially liable to occur with an excess of acetic acid fermentation.

The absorption of these poisons from the intestines also affects the heart, giving it inadequate nutriment for its ceaseless work, and sometimes paralyzing it when the carbonic acid gas remains collected too long in the cardiac end of the stomach.

The partial paralyses due to the carbonic acid gas causes the shrinking of the chest in the consumptive, while the breathing with elevation of the shoulders is the result of paralysis of the diaphragm from the same cause.

Returning now to the colon deluged with the vile products of fermentation of the starches and sugars, we find frequent attacks of yeasty diarrhea, which is nature's effort to expel the enemy; and may really prevent consumption and prolong life for many years, by furnishing a sluice-way for the damaging compound to escape from the system.

Should a healthier action take place, elongated folds from half an inch to twelve inches long, and from an eighth of an inch to an inch in diameter of the thickened intestine may die, loosen, and hang for weeks slowly rotting away, to the great danger of the patients life, or may be broken loose and appear in the stools.

All this from the fermentation of starchy foods.

On the other hand, if the fiber foods are not digested, they ferment and evolve enormous quantities of sulphides of hydrogen and ammonium, which taste like rotten eggs, and which are apt to paralyze the mucus surfaces, when they are at once absorbed, and produce paralysis of organs and tissues, which often result fatally (Salisbury).

All these systemic results are hastened by the preliminary semi-paralysis, which stops the peristaltic movements and packs the colon with the products of waste.

It becomes, therefore, an all-important question how to extirpate this root of so many and such serious evils. In many cases the colon is loaded constantly with a nearly solid mass, three or four inches of which may be discharged in each occasional evacuation, but leaving sixty-seven to seventy inches remaining.

The Remedy.—For ages the one remedy has been chemico-vital irritation of the bowel by drugs, causing an extra secretian of mucus, or an intensified action of peristalsis, with the uniform result of increased dryness, less sensitiveness to bile stimulation and diminished movements, unless the stimulus was kept up by increasing doses.

Resort has also been had to mechanical irritation in the form of the silica coat of the wheat in flour, and of coarse fiber

in vegetables, with temporary success many times, but disheartening failures many more times. Bowel kneading, shaking and percussing have been tried, but have rarely proved satisfactory except under the direction of a massage operator.

At last relief seemed to come when the Hall system burst like a noon-day sun upon the dark sky of man's bitter experience. Hundreds of thousands rushed to it as the mecca of their hopes, and very many were benefited; but it has been found too inelastic to suit all conditions. To raise four quarts of water from 50° or 60° to 98° requires an expenditure of vitality that those who are poorly equipped with that indispensable product cannot afford. Hence, however good it may be for the vitally strong, the Hall system is positively dangerous to those who are vitally weak and in a cold, unfevered condition.

Our Flush provides for this contingency. Its elements are: Water of any temperature required by the case; water holding in solution any benign drug or chemical; water as a decoction of any beneficial herb; water always, pure and simple, unless something more is actually needed to afford relief.

Our flushes together not merely wash out the end of the sewer, but *cleanse the entire extent of it.* As its position and construction are such that it cannot be flushed from end to end, the only practicable way is to *pump it full* and cleanse by emptying. This will require from four to eight pints of fluid, and cannot be done by the one-half pint or pint enemas that have been ordinarily used hitherto. A late authority upon the subject says: "There are formed in the intestines of a healthy adult in twenty-four hours a quantity of cadaveric alkaloids, which, if excretion were stopped and all were absorbed, would be sufficient to destroy life." Bacteriology, p. 1,348. These *flushings* effectually remove these deleterious alkaloids.

The chief characteristics of these additions to the water will be summarized upon a future page, but it should be distinctly understood that water alone, modified as to temperature, quantity, and frequency of administration, constitutes a

very effective treatment for most ailing conditions, and ordinarily should be the dependence of the people.

Our flushes are divided into three classes, and named: 1, Rectal, comprising from one gill to one pint of fluid as the element; 2, sigmoid, from one to two pints of fluid; 3, cæcal, from one to four quarts of fluid.

Modification.—These flushes are all modified by several circumstances.

1. The sensitiveness of the lining membrane of the bowel. This is sometimes so great that it will instantly reject even a small quantity of fluid, unless it contains some soothing potency.

2. The natural divisions of the bowel. To fill the rectum may be easy, while to fill the sigmoid may be hard, and to fill the colon exceedingly difficult.

3. The contents of the bowel are often a modifying agent of great importance. If fluid, the flushing may be easy; if thick and pasty, it may be quite an undertaking; if hard and packed, it may be simply impossible until they are removed.

4. The position occupied by the patient while taking the flush is of importance. An injudicious position may bring the force of gravitation to bear against the process, or may subject some portion of the membrane to needless friction, or may add muscular resistance that must be overcome.

The Essentials are a good bulb or fountain (preferably both) syringe, with a tube not less than eighteen to twenty-four inches long between the bulb and the delivery pipe. Two delivery or injection pipes; one the ordinary vaginal pipe of a family syringe, about four inches long and nearly one-half inch in diameter at the end, and about one-fourth of an inch near the attached end; the other pipe should be of such rubber as catheters are made, stiff yet flexible, eighteen to twenty-four inches long, and used only to carry the stream well up into the sigmoid. A rolled blanket for the hips, and a smaller one or a pillow for the head.

Having provided these, the way to take the injections should be carefully observed.

Position for Rectal Flush.—If rectum is empty, any that suits best. If packed, on back with hips on rolled blanket,

shoulders on bed or floor; take very slowly so as to give time to soften the mass, and pass as soon as practicable. If very sensitive, same position, take very slowly, soothing flush; retain five to thirty minutes.

If rectum is prolapsed, same position, astringent flush, retain five to twenty minutes, repeat as often as difficulty returns. If engorged, or hemorrhoidal (piles), same position; if painful, first relaxant flush until relieved, then absorbo-astringent flush retained.

Position for Sigmoid Flush.—This should never be attempted until the rectum is empty; then if the bowel is packed above sigmoid, on left side, hip on rolled blanket, left breast to bed or floor, thighs bent close to the pelvis; inject very slowly to soften; retain only until desire to stool is felt; repeat if necessary. If only moderately full and soft above sigmoid same position, or on back if preferred, and take as fast as may be comfortable; expel at pleasure.

Position for Cœcal Flush.—If packed and hard, then proceed as in rectal packed, and follow as in sigmoid packed. Repeat at as frequent intervals as strength and circumstances allow, until the hardness and fullness are removed from the whole of the left side. Then, after injecting as for sigmoid packed, turn first on the back (hips still elevated), and take very slowly until full, rest a few minutes, turn on right side and very slowly fill again; retain ten minutes, if no desire to stool is felt, and fill again, and so on as long as there is room for more; but in all packed conditions the offending matter should be removed as quickly as possible without violence.

Principles.—Flushes hot enough to excite free perspiration should never be given when the bowel contains a mass of foul matter, lest its poison be carried through the system.

The sigmoid should never be attempted until the rectum is clear.

The cæcal should not be tried until the rectum and sigmoid are clear.

Congestion requires very little relaxation, and that always with stimulation. Inflammation requires pure relaxation. Collapse requires stimulation. Flaccidity requires astringents. Flaccidity with coldness requires astringents and stimulants.

In cases of deficient nutrition, either flush should be followed by a retained nutrient enema containing not less than the fifteen per cent. of fiber-foods that are thrown from the colon.

In fermenting conditions they should be given with sufficient frequency to prevent the absorption of the poisonous products into the blood-stream.

In such conditions the best time is in the evening, so as to prevent the all-night absorption of the deleterious matter.

In simple constipation without special fermentation, the best time is on rising in the morning, to give time for the all-night absorption of the nutriment, and to give a healthy stimulus to the whole digestive tract.

It is better to use the flush regularly, and not infrequently, as long as it is needed at all.

Retained Enemas.—When a decided impression is desired from the medicine, the flush should be given as required and passed off, then, after a few minutes for rest, a retained enema consisting of not over one to four ounces of a suitable vehicle containing the medicament should be thrown into the rectum or sigmoid, and not allowed to be discharged. Should there be difficulty in retaining it, this can be done by lying on the face with hips elevated for a few minutes.

Experiments have proved that medicines thus administered produce the same effect, with from one-fourth to one-half less quantity than is required when taken into the stomach. The rapidity of such absorption is seen in the fact that iodide of potash deposited in the rectum has actually been found in the urine twenty-one seconds afterward, and in the saliva forty-six seconds afterward.

Medicines taken by the mouth necessarily undergo the changes which result from mixture with the acid of the gastric fluid in the stomach, and further on with the alkali of the pancreatic secretion, besides whatever chemical action the bile may excite, so that it is impossible to tell whether they are unchanged when they reach the

absorbents or are something entirely different, and with totally dis similar properties. The only exceptions to this necessity are those medicines that are absorbed directly through the membranes of the stomach into the blood. The stomach is designed as a receptacle for food, not drugs.

The flushing fluid, properly medicated, plants the medicine in the precise place where it is needed in all bowel, stomach, liver, bladder, urinal, ovarian, kidney and seminal diseases, without the necessity of its first running the risk of loss and change in the digestive tract, or of being first dispersed through the entire circulation, because its immediate transfer through the membranes of the bowel brings it in direct contact with the diseased organs; while in such diseases as lung, heart, spine, head and nerves, the *purification of the blood* and the *vitalization* of all the *lower organs* of the frame by the flushing and medication often work wonders in their restoration after even many years of suffering.

It follows that a well devised system of *medicated* injections is the most thorough, scientific, direct and effective treatment that can possibly be used for the preservation of health, the invigoration of the digestive and generative systems and the radical purification of the blood, and consequent cure of all diseases dependent on a bad state of that fluid.

Retained Nutriment Enemas, are retained enemas consisting of nutriment instead of medicines, and should be thrown as far up the sigmoid as practicable, and may be repeated every three to six hours, to sustain vitality when the stomach is incompetent to do its work. Life is often sustained for weeks upon such enemas alone, and they are invaluable aids even when not required as the sole dependence.

The Effects of the different flushes are as various as the flushes themselves. Of course, in each case, when medicines are used, the nature of these will determine the physiological result. But when water alone is employed, the effect will vary with the temperature and quantity. If the full flush is given, then temperature is the main factor to be considered.

For the first few times that copious injections are used, the patient is apt to be frightened at the mucous or slimy discharge that may come away later. This is nothing to be afraid of, it is simply cleansing the bowel of stuff that ought not to be there.

There are three points of fixed effects, from which all calculations of results should be made.

a. Hot flushes stimulate, draw the blood to the viscera, increase vital heat and energy, open the pores, and, in some conditions, may cause prostration by excessive perspiration; and if in large quantities, may cause waste of nutriment from the colon. They also astringe locally.

b. Cold flushes abstract vital heat rapidly, force the blood away from the viscera, and prove depressing, unless the power of reaction is very strong; in which case they are tonic. The shock is too great for persons of low vitality, as the chill may cause suspension of the circulation in the colon; or, if reaction does ensue, it is with an expenditure of vitality that cannot be afforded. Hence, if used at all by such persons, it should be in small quantities, with immediate expulsion, and with some stimulant taken into the stomach, like hot coffee, hot beef tea, etc.

c. Tepid flushes simply relax the structures, soothe the nervous system, cool the surface, without reducing the temperature below the normal standard. They also promote perspiration.

Midway between the tepid and hot, the warm flush partakes of the characteristics of the hot to a modified extent, when it is almost immediately expelled; but when it is retained a considerable time its effects more closely resemble those of the tepid.

Cool flushes are midway between cold and tepid. When almost immediately expelled there is a quick reaction, and the effect is similar to that of the cold to persons of vigorous vitality. But when retained a half hour or more, the results are those of a modified cold bath.

To those of low vitality, the cool flush may be equivalent to the cold with those of a good degree of vigor; while in fevered conditions, without much impairment of vitality, the cool may be as soothing as the tepid is to the healthy.

It is clear, from the foregoing, that the indiscriminate use of any single temperature may be productive of harm instead of good. A clear conception of what is needed should be the groundwork of judgment in every case, and that need should be expressed as an answer to one of three questions: 1. Does the system need stimulation? 2. Does it need relaxation? 3. Does it need toning? Having settled the need, then how much stimulation, relaxation or toning, can the patient advantageously bear?

In these statements, the primary cleansing effect of the flushes has been purposely omitted, because such prominence

has been given to it in the preceding pages. But that effect should never be lost sight of in the use of flushes as a remedy for disease.

As the cold cæcal and sigmoid flushes abstract such a large portion of heat from the liver, stomach, pancreas and pelvic organs, it is well to exercise freely as soon as it is taken, and until the proper balance of heat is restored. As the hot cæcal and sigmoid flushes impart a large amount of heat to those organs, free perspiration should be favored, and after proper rest a cool sponge bath is desirable. As the cæcal sometimes proves exhausting, the sigmoid should take its place. If that is too prostrating, the rectal only should be used.

When the Flushes are Needed.—When the skin is blotched and unsightly. When the kidneys are disordered. When the liver is laggard. When suffering from dyspepsia, constipation, poor appetite, rush of blood to the head, piles, jaundice, blood poison, inflamed bladder, occasional sick headaches, diarrhœa, dysentery, consumption, fevers, rheumatism, cholera morbus, colic, leucorrhœa, uterine irritation, diseases of the prostate, seminal weakness and obesity; also in epilepsy reflex from the intestines, genitals or urinary organs. In insomnia from gastric derangement, paralysis from incomplete digestion, biliousness, muddy complexion, and in all "general-ailing-and-not-much-the-matter" conditions.

In health, flushes are indicated in all cases where the feces are retained over twenty-four hours. How is this known? If the track of the colon is hard to the touch on external pressure, and if there is not a full and soft satisfying movement every day, it may be reasonably assumed that the peristaltic movement is too slow and the mischiefs of constipation resulting.

General Rules for the temperature of the flushes:

Cool or cold when used for inflammations, fevers without marked prostration, and as a tonic.

Tepid when used for relaxation, to promote absorption, and in obese conditions.

Warm to soothe.

Hot for antiseptic use if water only is employed, to relieve pain, promote perspiration, as a stimulant, and to recuperate in fatigue.

Any temperature, as an ant-acid, and as antiseptic when chemicals are employed.

What Medicaments to Use.—For convenience of prescription in the "Diseases and their Treatment" part of this work, the various articles recommended with which to medicate the flushes are named numerically below.

1. AMERICAN GENTIAN, Yellow Gentian, Marsh Gentian, Sampson Snake Root (*Gentiana Ochroleuca*).—Roots; tonic, both relaxing and stimulating, slow, but intense and permanent. Acts chiefly on stomach and gall ducts, but distinctly on the liver, bowels, and general glandular system. Useful in liver torpidity, skin affections, dropsy, scrofula. Ten to fifteen grains in retained enema twice a day.

2. BARBERRY (*Berberis Vulgaris*).—The bark is stimulating, slightly relaxing, tonic; acts specially on the gall ducts and liver. Five to ten grains in a retained enema twice a day.

3. BICARBONATE OF POTASSA.—Ten to twenty grains in a cæcal or sigmoid flush, as an ant-acid.

4. BLACK COHOSH, Rattle Root, Black Snake Root, Squaw Root (*Cimicifuga Racemosa*).—Root; moderately prompt, diffusive, relaxant, leaving a slight astringent impression. Its relaxation is peculiar to itself alone. Soothing to the nerves, relieves pain dependent on local irritation, calms body and mind, relieves the head, disposes to placid sleep, lowers and softens the pulse, and produces gentle perspiration; allays irritation of serous tissues. Especially useful in articular and neuralgic rheumatism, cerebro spinal meningitis, puerperal mania, painful menstruation, rigid os-uteri, vaginitis, congested kidneys, ovarian irritation, chorea, snake bites, and other poison wounds. Not to be used when the pulse is low, skin cold, tissues relaxed and general sensibilities reduced. Dose: powder five to ten grains in a retained enema. Sometimes called Bugbane.

5. BLOOD ROOT, Red Puccoon, Red Turmerick (*Sanguinaria Canadensis*).—The dried root is a slow relaxant and stimulant of the mucus membranes, gall ducts and secreting organs. Specially valuable in chronic torpid liver, in bilious temperaments and chronic jaundice. To be used only in sluggish conditions. As a tonic alterant, two to five grains twice a day in retained enema; as an expectorant, one to two grains in retained enema every three hours.

6. BLUE COHOSH, Squaw-root, Papoose-root, Blueberry (*Caulophyllum Thalictroides*).—Root; a mild, diffusive, stimulating and relaxing anti-spasmodic. Especially valuable in nervous feebleness with irritability, twitching of the muscles in typhoid and child-bed, hysteria, painful menstruation, colic, neuralgic rheumatism, nervous restlessness during pregnancy and in asthma. Infuse a half hour in covered vessel in a pint of boiling water; one to two ounces twice a day in retained enema. Much oftener in severe cases.

7. BONESET, Thoroughwort (*Eupatorium Perfoliatum*).—Leaves and flowers almost a pure relaxant of the muscular structure of the stomach, gall ducts, bowels and uterus, but also affects the nervous peripheries and skin. One ounce of powder infused in a quart of water; one to three ounces of this fluid in retained enema. Given cold, it promotes the secretion of bile and the action of the bowels; given warm, it promotes slow, gentle perspiration. Gives relief to the aching of limbs in recent colds and rheumatism. Not good in relaxed conditions.

8. BORACIC ACID.—A teaspoonful in a quart of water as an antiseptic.

9. BUTTERNUT, White Walnut, (*Juglans Cinerea*).—The inner bark of the root is a slow relaxing and stimulating cathartic, affecting the

gall ducts and gall cyst, and muscular fibers and mucus membranes of the bowels. Good in jaundice, biliousness, chronic costiveness, chronic and sub-acute diarrhœa, camp diarrhœa, irritable piles; not good in dysentery. Digest two ounces of the crushed bark in a quart of hot water two hours; strain with strong pressure; evaporate to one-half pint, add one-half ounce tincture of ginger; dose, one ounce in a retained enema twice a day.

10. CATNIP (*Nepeta Cataria*).—Herb; diffusive relaxant, diaphoretic and anti-spasmodic. Of special use in colic and restlessness of children, to relieve dysmenorrhœa and difficult menstruation, nervous headache, hysteria and scanty urination.

(*a*) Digest one-half ounce of herb ten minutes in a pint of water much below boiling point, and strain with pressure. Use the whole as a flush, or one-half as retained enema. Repeat at pleasure.

(*b*) Cut up fresh herb, add under moderate pressure a small quantity of 30 per cent. alcohol, stand twenty-four hours, then put under powerful pressure. Preserve juice. A teaspoonful for nervous convulsions of children.

(*c*) The juice obtained by *b*, combined with equal quantities of essence of anise and fluid extract of valerian, makes a valuable antispasmodic nervine. One to two teaspoonfuls, as required.

11. CLEAVERS, Goose Grass, Bed Straw (*Galium Aparine*).—Herb; soothing relaxant to kidneys and bladder. Suited to scalding urine, oxalic acid gravel, irritation at the neck of the bladder. Digest two ounces in a quart of tepid water one-half hour, strain with pressure. Retained enema of one to three ounces three times a day.

12. CINCHONA BARK, Peruvian Bark, Jesuits Bark (*Cinchona*).—Bark; slow and permanent astringing stimulant to the nervous structures, acting first on the sympathetic nerves, then on the sensory nerves, and finally on spinal cord and brain, inducing a marked state of tension. Valuable in atony and laxative tissues, and consequent excesses of secretion. Not good when structures are tense, tongue and throat dry, secretions deficient, or in febrile or inflammatory excitements. For ague chills, a hot cæcal flush three hours before the chill; two hours before chill a retained enema of seven or eight grains, repeated one hour before the chill. As a tonic, two to three grains in retained enema two or three times a day.

13. COFFEE.—Half a cup, moderately strong, as a retained enema for a nervous stimulant, in fatigue and depression.

14. CORN SILK, fluid extract.—One teaspoonful in a retained enema two or three times a day for chronic cystitis.

15. CREAM OF TARTAR (*Bitartrate of Potassa*).—Cooling, diuretic and cathartic. A dram in a cæcal or sigmoid flush.

16. DANDELION (*Taraxacum Dens-Leonis*).—The root is a mild relaxing tonic alterative, chiefly affecting liver, small intestines and kidneys. Should not be used when stomach or bowels are irritable. Digest four ounces of the bruised root an hour in one and one-half pints hot water, boil a few minutes and strain. One to three ounces in a retained enema twice a day.

17. GIANT'S SOLOMON'S SEAL (*Convalaria Multiflora*).—Mild, relaxing and stimulating tonic; chief effect, diminishing excessive mucus discharges. Specially useful in all forms of female weakness, chronic coughs with excessive mucus discharges. Bruised root three ounces, boiling water twenty ounces; macerate an hour in covered vessel with gentle heat, add one dram each of caulophillum and grated orange peel, stand ten minutes, and strain; two ounces three times a day as retained enema.

18. GOLDEN SEAL, Yellow Puccoon, Ohio Kercuma, Ground Raspberry (*Hydrastis Canadensis*).—Root; pure stimulating tonic, but with relaxing properties. Acts slowly and for several hours, especially upon mucus membrane of the digestive tract and the female organs. Never excites the pulse, but sooths the irritation of congestive conditions of mucus membranes. Specially useful in leuchorrhœa, catarrh of the bladder, second stage of dysentery, chronic diarrhœa and dysentery or chronic typhoid, ulceration of the bowels, gleet, second stages

of gonorrhœa, chronic prostatitis, chronic jaundice and cellular dropsy. Not to be used in acute irritations. Five to fifteen grains in a retained enema twice a day. Large doses for depressed conditions.

(*b*) *Hydrastine.*—A resoinoid or alkaloid tonic. Dose, one to five grains, used in same way. Ten to fifteen grains as an antiperiodic.

19. HEMLOCK, Hemlock Spruce (*Abies Canadensis*).—A tea of the inner bark is a very drying astringent, useful in all hemorrhages when pure astringents will answer. To a pint of the tea add a teaspoonful of ginger and one-fourth teaspoonful of red pepper, three quarts of warm or hot water, and use as a cæcal flush for flooding and bleeding from the lungs.

20. HOPS.—A tonic and mild hypnotic. Five to ten hops infused in four ounces of hot water. A retained enema, or a very weak hop tea as a cæcal flush, warm.

21. JUNIPER (*Juniperus Communis*).—Berries; mild stimulant and relaxant, chiefly affecting kidneys and bladder. Not good in inflammation of kidneys or bladder. Especially good in retained uric acid. Crush one ounce of the berries and macerate in a pint of warm water one hour in covered vessel; two ounces in retained enema thrice a day.

22. LADY'S SLIPPER, Nerve Root, Umbel, American Valerian, Moccasin Flower (*Cypripedium Pubescens*).—Roots; Pure relaxant, acting slowly and upon the nervous system only. Soothe and calm the entire system, ease pain, induce quiet and sleep. Of special use in hysteria, headache, sleeplessness from feebleness and irritability of nerves, chorea, neuralgia, neuralgic rheumatism, and the late stages of fevers. Too relaxing to be often used alone. Ten to thirty grains in retained enema, as needed. Use stimulants or tonics also.

23. LOBELIA, Emetic Weed, Indian Tobacco, Eye Bright (*Lobelia Inflata*).—Herb; a pure relaxant. Transient, acting most upon the fauces, glands and mucous membranes of the mouth and respiratory organs, but reaching every part of the body. Small doses every thirty to fifteen minutes relax first the capillaries and nerve peripheries, then the general circulation, then the muscular and glandular system. Especially appropriate in phreuitis, meningitis, pneumonia, pleurisy, hepatitis, peritonitis, nephritis and periostitis, and all forms of fever; also to relieve nervous suffering, as acute hysteria, delirium tremens and the like. Should not be used in gangrene. Of peculiar advantage in spasmodic asthma and whooping cough, strangury, occlusion of the gall ducts and strangulated hernia. Not good in humid asthma nor the difficult breathing of heart disease. Very effective in rigidity of os during labor, in hour-glass contraction of the uterus, and in all ineffectual forms of labor in which the uterine fibers are rigid. Not good in diphtheria, malignant scarlatina, typhus and typhoid fever after the first few days, nor in puerperal or pleuritic fevers when effusion is present. Excellent to aid in reducing dislocations. If carried to complete relaxation a free discharge of bile, perspiration, urine and fæces follows. Not good in diseases in which relaxation is already present. As a mild relaxant, one to two grains an hour; as a medium relaxant, two to five grains an hour; as a strong relaxant, ten to fifteen grains an hour; as an emetic, forty to sixty grains. As a retained enema, one to three grains every two or three hours until the system begins to relax, then double or treble the dose for the effect desired. Infusion, a dram to a half pint of water considerably below the boiling point.

24. MANDRAKE, or May Apple (*Podophyllum Peltatum*).—Root; a slow, persistent stimulant to salivary glands, mucus membranes, gall ducts, liver and kidneys. Excites the uterus, ovaries and bladder. Not to be used with any irritability of any internal organs. Full dose as a cathartic fifteen grains.

(*a*) *Podophyllin* is a resinoid from the root. Full dose one to two grains in a retained enema.

25. MARSH MALLOWS (*Althea Officinalis*), soothing to mucus membranes.—Root; simmer an ounce of root in a pint of water, add one-half dram of Lobelia herb. One to two ounces as retained enema every four hours.

26. MULLEIN (*Verbascus Thapsus*).—The leaves; relaxant, soothing, moderately anti-spasmodic. Of special use in promoting absorption, in

cellular dropsy, chronic abscesses and pleuritic effusions. Make a strong decoction of the leaves; wilt other leaves in this and bind on the part. Also for synovial dropsy, scrofulous and other swellings, though not on carbuncles, buboes, cancers and the like. Mix the decoction with equal quantities of sassafras tea, and give two to four ounces as a retained enema. Boil an ounce of the leaves in a quart of milk, and give two to four ounces as a retained enema in diarrhœa and dysentery every two to four hours.

27. BAPTISIA TINCTORIA, Wild Indigo, Indigo Broom, Rattle Bush Horsefly Weed, Indigofera.—For devitalized, fœtid conditions, scrofulous, syphilitic and atonic rheumatic cases. One-half ounce of root-bark or leaves boiled a few minutes in a pint of water. A tablespoonful as a retained enema every three or four hours. Antiseptic, positive stimulant, mildly relaxant.

28. FOR CONSTIPATION.—Two quarts hot water, one teaspoonful of molasses, one teaspoonful of strong suds of castile or ivory soap. As a sigmoid or cæcal flush.

29. POKE BERRIES, Scoke, Garget, Coakum, Pigeon Berry (*Phytolacca Decandra*).—Glandular relaxants. Especially useful in scrofula, salt rheum and similar affections, chronic and sub-acute rheumatism. Crush the berries, and to each pint add a half pint of whisky. A tablespoonful in three ounces of retained enema twice or thrice a day.

30. QUININE.—Like Cinchona bark but much more powerful. One grain represents thirty to fifty of bark. As an antiseptic, ten grains to a quart of water as a flush. As a tonic, two or three grains in a retained enema.

31. SALT (*Chloride of Sodium*).—Stimulant and antiseptic. One to two teaspoonfuls in a rectal injection, lukewarm for pinworms. Teaspoonful in retained enema every hour for four hours for ague chills. Two teaspoonfuls in cæcal or sigmoid flush to hasten evacuation.

32. SASSAFRAS.—The bark, an aromatic and relaxant stimulant, diaphoretic and nervine. Acts especially on the capillary tissues and the absorbants. Infuse in warm, not boiling water.

33. SCULLCAP, Blue Scullcap, Hood-Wort (*Scutelaria Lacteriflora*).—Herb; must not be boiled. Equally relaxant and stimulant, antispasmodic and tonic, acting upon and through the nerves. Specially suited to wakeful conditions and feebleness, such as typhoid, delirium tremens, abstention from opium, also in uterine sufferings, nervous headaches, neuralgia. Not good in inflammatory conditions. One-half ounce digested in a pint of warm water. One to two ounces in retained enema two to four times a day.

34. SMART-WEED, Water Pepper (*Polygonum Hydropiper*).—Herb; sharp, diffusive stimulant, moderately relaxing. Increases capillary action, free warm perspiration and expectoration and the flow of the menses when checked by exposure. Useful in all crampings, neuralgic pains, and congestive pains of the abdominal and pelvic organs. Half an ounce of dry herb digested in a quart of water not above 150°. One to three fluid ounces in sigmoid or cæcal flush, warm or hot, often as needed.

35. SPIKENARD, Spignet, Pettymorrel (*Aralia Racemosa*).—Root; prompt, mild relaxant, slightly stimulating to the mucus membrane and skin. A soothing expectorant, and slightly tonic. Specially valuable in bronchial and pulmonary congestions, measles and the like. Moderately strong tea used as a retained enema three or four times a day.

36. SUMACH, Upland Sumach (*Rhus Glabra*).—The same general character as Witch Hazel but much stronger. One-half ounce of leaves to a quart of boiling water, simmered ten minutes (not in an iron vessel). One to two ounces as retained enema two or three times a day. The bark of root is excellent for laxity (not acute) of bowels, chronic and camp diarrhœa, intestinal hemorrhage and foul leucorrhœa.

37. WAHOO, Spindle Tree, Indian Arrow Wood (*Euonymus Atropurpureus*), E. Americana, Burning Bush, Strawberry Root.—Bark of the root; largely relaxant, moderately stimulant to the gall ducts, liver

and bowels, slightly influencing stomach and kidneys. Excellent for intermediate treatment for ague, and in dropsy with torpid liver. Also in biliousness, some skin eruptions, persistent constipation and chronic liver complaints. Crushed bark two ounces, boiling water one quart. Digest one hour, strain with pressure. Two ounces in retained enema two or three times a day.

38. WHITE ASH, Grey Ash (*Fraxinus Americana*).—The bark; a slow but persistent stimulant, but especially relaxant to the gall ducts and the muscular fibers of the bowels. Also diuretic. Useful in jaundice, biliousness, costiveness from liver torpor, and skin affections arising from bile. Also for snake bites. Two ounces of the crushed bark digested an hour in a quart of hot water, strained, evaporated to half pint, and an ounce of tincture of orange peel added. One to two fluid ounces in retained enema two or three times a day.

39. WHITE ROOT, Pleurisy Root, Butterfly Weed, Swallowwort, Wind Root (*Asclepias Tuberosa*).—Root; diffusable, relaxing, diaphoretic. Specially valuable to relieve arterial and nervous excitements. Not suitable for depressed conditions, or when the pulse is small and feeble, or when perspiration is excessive. One ounce to a quart of boiling water, stand covered twenty minutes. Use with hot cæcal or sigmoid flush, or two to four ounces as retained enema.

40. WHITE SNAKEROOT, Pool Root (*Eupatorium Ageratoides*).—Root; relaxant, stimulant, prompt and diffusive. One-half ounce to a quart of warm water. Two ounces as retained enema every two hours, given cold, increases expectoration and urine. Given warm increases perspiration and flow of blood to the surface, and thus given is very valuable for the nervousness, restlessness and headache of ague, congestive chills and bilious intermittents. Not good in irritable or sensitive conditions. Good in hysteria, painful or suppressed menstruation, and in tardy labor, with coldness and depression.

41. WITCH HAZEL, Winter Bloom, Spotted Alder (*Hamamelis Virginiana*).—Leaves; mild, reliable astringent and gentle tonic, also a difusive relaxant. Specially useful in the second stages of dysentery and diarrhœa, hemorrhage from the bowels and bladder, catarrh of the bladder, nursing sore mouth, leucorrhœa, prolapsus, purulent ophthalmia. Two drams digested in a half pint of hot water. One to two ounces in retained enema every two to four hours.

42. YELLOW DOCK, Curly Dock (*Rumex Crispus*).—The root is a slowly relaxing and stimulating alterant, leaving a mild tonic effect on the system. Acts chiefly upon the skin, gall ducts, intestines and kidneys. Especially valuable in scrofulous affections of the skin, and scrofulous ulcers and scrofulous diarrhœa. Boil two ounces of dry, crushed root ten minutes in a pint of water, strain by pressure. One or two ounces three times a day as a retained enema.

43. ONIONS.—Four large onions simmered several hours in a pint of milk, and one-half the liquid used as a retained enema to promote urinary and perspiratory secretions and hasten absorption. Not to be used when there is acute irritation or inflammation.

44. MYRRH (*Balsamodendron Myrrha*).—Must not be used in sensitiveness, irritation, deficient mucus secretions or febrile conditions. In phlegmatic temperaments, atonic conditions with excessive mucus secretions, and coldness, it is valuable as a retained enema. Antiseptic; slow, mild stimulant, moderately astringent, with the effect of a stimulating tonic. Increases capillary circulation and the force of the pulse. Excellent in general debility of mucus membranes. Two to five grains two or three times a day in retained enema.

45. ABSORBO-ASTRINGENT, Mullein and any one of the astringent articles best suited to the case.—Repeated as a retained enema two or more times a day.

46. CAMOMILE FLOWERS half an ounce, boiling water one pint. Macerate ten minutes. Good for scant and painful menstruation, used as cæcal flush retained as long as practicable, and repeated if necessary, when the operation can be well borne; in other cases, first as a rectal flush, then three or four ounces as a retained enema. As a tonic one ounce cold, as retained enema three times a day.

47. CAMOMILE FLOWERS half an ounce, mallow leaves one ounce; steep in hot water ten minutes and use as a retained enema two or three times, then as sigmoid or cæcal flush (small in quantity), planting it at the seat of irritation if practicable, in irritation of the bowels.

48. WINTERGREEN, Durberry, Chicken Berry, Partridge Berry, Mountain Tea, Box Berry (*Gaultheria Procumbens*).—Leaves; relaxing, gently stimulating diffusive carminitive. The tea as a cæcal or sigmoid flush in flatulence, wind colic, etc.

49. CAYENNE PEPPER, Red Pepper (*Capsicum Annuum*).—The fruit is an intense, pure stimulant, spreading slowly but acting permanently, first upon the heart and large blood vessels, later the capillaries, increasing the power rather than the frequency of pulsations. Suitable in all forms of depression and atony. A powerful antiseptic either externally or internally. Not good in inflammatory states with full, hard pulse. Average dose, one grain in elm, gum arabic or starch water or molasses.

23. The New Method Cure of W. E. Forest. This is published as a prescription for patients. The doctor holds that the proper place for drugs is in acute diseases, but in chronic diseases other measures are more important. Drugs should be used, if at all, temporarily, and in a secondary place. It claims to be a system founded upon a number of principles, namely, diet, exercise, colon and stomach flushing, and massage. For the last purpose he employs some mechanical expedients, as the muscle roller, muscle beater, and the like. His system of exercises is good, his forced respiration very commendable, and his directions for diet, in certain cases, of such value that we quote as follows:

Anti-Ferment Diet.—On first awakening in the morning take a cup of hot, not warm, water, sipped slowly. Then rub and knead, or roll, the stomach for five minutes. Then rise and take a little non-fatigueing exercise, such as bending over and trying to touch the floor a few times, crawling around the room on hands and feet three times, and spend ten minutes in taking as deep breaths as possible. Then rest until breakfast time.

Breakfast—Two to four broiled mutton chops, seasoned to taste, and eaten hot with plenty of toasted or stale bread and butter; food at all the meals to be well chewed, and cheerful conversation to be indulged in *ad libitum*. No drinks with the breakfast.

At 11.30 a. m., another cup of hot water. At 12.30, noon, dinner of beefsteak chopped to a pulp, rolled into a cake and broiled over a hot fire, after having been salted and peppered to taste. Plenty of stale bread or toast, or zwieback, or Italian stick bread, any or all of these taken with butter as desired. No limit as to quantity; the appetite the guide.

At 5.30 p. m. the hot water; at 6.30, supper; cold roast beef or mutton, with salad or mustard dressing, and bread and butter; or the chopped beefsteak instead of the cold meat. If dinner has been hearty a light supper will do.

At the end of the week, if all goes well, a little change may be made in the dinner. Roast tender beef or mutton, or the dark meat of chickens, may be substituted for the chopped steak at noon. During the second week a few cooked greens may be added to the dinner bill of fare. No sweets, no fruits, no tea, no potatoes, no indulgencies.

Fourth week, a little mashed potatoes, with roast meat; juices mixed may be tried. Gradually one thing after another may be added, but sweets and vegetables must always be taken sparingly.

In cases of fermentation of food, where the system has not yet become profoundly affected by the absorption of the yeast germs, the foregoing is an excellent diet.

24. The Inhalation Cure.—The simplest idea of inhalation is that of drawing in the breath, and is usually accomplished automatically, *i. e.*, machine like, without special thought concerning it, or will to secure it. It is one of the vegetative processes of animal life which goes on of itself as long as life lasts. However, when the word is used in medical relations it adds to the simple idea, that of voluntary inspiration, as in forced, deep breathing. Also, the inspiration of vapors and gases in either or both the methods named. Still further, inhalation, as a remedy, embraces the idea of being timed to secure a certain result, *i. e.*, the inspirations continued to a certain period, a definite number of times every hour, day or week.

The means employed are various: By fluids heated and the steam conveyed to the mouth or nose; by fluids atomized and the air, loaded with the atoms, inhaled; by fluids saturating fabrics, sponges, absorbent cotton, etc., and the air drawn through the saturated material into the lungs; by powders drawn or blown into the respiratory orifices; by solids loosely packed in tubes through which the air is inhaled; by gases mixed with air and inspired; by gases breathed for a time in place of air; by gases passed through medicated solutions and inhaled.

The physiological effects of inhalation can be best understood by a brief resume of the process of inhalation.

By a downward movement of the diaphragm (floor of the lungs) and an expansive movement of the walls of the chest, the air is drawn into the bronchial tubes down as far as the second or third bifurcation (forking) of the bronchi, with the rush of an unobstructed stream. Thence onward into the air cells, the stream is continued through the minute centers of the bronchi, while all around the centers the epithelial cells lining the tubes are armed with cilia (hair-like appendages) which keep up a constant motion outwardly, thus surrounding the indriven outer air stream with an outward-carried inner air current. By this process a kind of suction pump effect is caused within the air cells, producing in the intervals between inspirations a partial vacuum in each cell, which removes, to some extent, the atmospheric pressure from its walls, when the carbon-dioxide (carbonic acid) that is in the blood passes at once into the cells, and is hurried outward by the ciliary action of the bronchi. Meantime an inspiration has carried a fresh supply of pure air down through all the centers into the air cells, and a portion of its oxygen slips through the walls of the blood vessels into the blood, just as the carbon dioxide had slipped out of the blood into the air cells. By this interchange of gases the blood is relieved of its burden of impurities that has been gathered from the tissues ; the carbon dioxide expelled and water being two of the final compound products of all the chemical changes that the substance of the tissues have undergone, in their passage downward, from molecular death in and by activity, into their original, inorganic, elemental condition; for, as we are made of gases, so to gases do we continually return. (The few mineral constituents of our bodies are excreted through the bowels, kidneys and skin, and need not to be considered in this connection.)

The oxygen that has passed through the walls of the air-cells into the blood, has a much more dignified work to do. The blood is filled with the fluid nutriment that has been poured into it as the product of digested food; but that food is yet dead matter. Oxygen thrills it into life-plasma fit for the myriad little workmen of the tissues to build into new tissue structures.

The animal heat must be maintained; oxygen finds the iron-molecules of the blood and burns them as coal is consumed in the parlor grate.

The nerves need a vital stimulant, and the chemical action of the oxygen upon the iron, in the burning process, generates electric excitations that quicken the nerve vitality from the largest nerve-centers to the outermost filaments of the extremities.

Thus oxygen performs the one vitalizing part in the whole round of life processes.

It is the magic wand that life uses with which to hold in check the chemical forces that are incessantly seeking to disorganize the frame by decomposing the tissues, and so long as vitality can thus be sustained, life will be triumphant.

Inhalations of oxygen, or pure air, therefore mean constant reinforcements of the blood-supply that is incessantly battling against the forces of destruction.

Hence nature has ordained that about eighteen times in every minute, every adult shall inspire sufficient oxygen to keep up the struggle until his allotted time is reached, when, like a "run-down machine," the weary wheels of life shall stand still, not because there is no more oxygen to be had, but because the balance of life-adjustment can no longer be upheld.

But while it is sustained, there come frequent periods when forced inspirations must be resorted to, as in lifting heavy weights, leaping, etc., in order to keep up the equipoise between expenditure and income.

So, in disease, it is sometimes instinctive, and often beneficial, to employ artificial means to deepen the breathing, and thus more fully oxygenate the blood.

As air is a vehicle, it has naturally occurred to very many to use it as a means of transit for other substances which it has been deemed important should be brought into contact with the pulmonary tissues.

Thus, inhalation has come to be a system of cure, as well as a natural process.

Inhalation carries the inhaled substance into the cells of the lungs and expands them. Were there no other benefit, in many cases this would be sufficient to warrant the method. The healthfulness of mountain-regions and mountain-climbing is owing largely to the forced expansion attending the inspiration of the rarified air, and to the muscular exertion that increases it.

Inhalation also carries the inhaled substance, if a gas, directly into the blood by the law of diffusion of gases; and if a vapor, or an odor, it is absorbed to an extent, and with a rapidity depending upon the nature of the substance; in some cases permeating the general circulation much more quickly than it would if taken into the stomach. Inhalation also mod-

ifies the temperature of the air passages. This is sometimes extremely essential. When the lungs are congested, the breath is hot and dry, an atmosphere laden with moisture and tempered to the condition, is as grateful to the sufferer as water is to one who is scorching in the flame of a violent general fever. Further, inhalation affects the nerves locally, and through the blood, in all the nerve-centers of the frame. Every one of the millions of air cells is meshed all over with a delicate net work of nerves and blood vessels. Inhalation, with deft fingers, touches every one of these myriad of tiny nerve points, and thrills, or soothes, according to its nature.

Inhalation is, therefore, very effective in blood and nerve diseases, and can often be employed to better advantage than drugs. In fact, one of the most valuable adaptations of inhalation is to protect the stomach from the effects of drug medication. By inhalation the patient is often saved from the depressing nervous dread that may attend the use of stomach remedies. The mechanical effect of inhalation is always beneficial—the operation is essentially one of health. Inhalations act locally, and the inhaled substance can act unmodified.

Take a Case of Ordinary Spring Biliousness in a young lady who has been housed in all the winter, and whose pallid cheeks and listless air at once suggest "a course of spring medicine." What is better? Just this. Let her rise at 6 a. m., don a pair of good stout shoes, a loose dress without corset or stays, and with sufficient wraps to keep her from chills if she sits on a fence to rest, let her walk one-half a mile to the highest point she can find at that distance, and when there take ten deep, long, slow, way down inspirations in pairs, resting a few minutes between each two; then return and lie down if necessary, well covered, until thoroughly rested. Then drink one-half to one pint of hot water, and twenty minutes later take a breakfast of brown bread, beef steak and baked potatoes. For dinner give her brown bread, boiled meat or poultry, one kind of vegetables, and for dessert one kind of fruit.

In the afternoon, attired for the same freedom of movement, she may walk or saunter to precisely the same spot as in the morning, repeat the ten inspirations, rest, then take a moderately deep breath and move swiftly as much further as she can comfortably before drawing another breath. That spot will be her goal the next morning,

and a like distance beyond it the next afternoon. Her supper should be brown bread with butter, one kind of fruit, a glass of hot lemonade, or a cup of very weak black tea and a speedy retirement from the table before the cake is passed. At 8.30 a sponge bath of strong salt water with much friction of coarse towel in her own hand, and in bed by nine o'clock, with a window slightly open for free ventilation Then six to ten very quiet, but deep inspirations; then the sleep of the just.

The next morning away for the goal, and that afternoon plant it the prescribed distance beyond, and so on every day for four weeks, and our word for it, she will be better than if she had taken all the tonics and blood purifiers of the apothecary shops, and had eight visits of the family doctor thrown in.

25. The Biochemic Cure.—This was originated twenty years ago by Dr. Schussler, of Oldenburg, Germany, and has been regarded as a branch of homœopathy, but this is a mistake. Its fundamental ideas are:

(1) The structure and vitality of the organs of the body are dependent upon certain necessary quantities and apportionments of the mineral salts existing naturally in the blood. (2) Disease is some disturbance of either or both the quantity and apportionment of some one or more of those inorganic (called cell) salts. (3) The particular disturbance is indicated by the symptoms of the disease. (4) What is necessary to remove the disease is to restore the lost balance, by the administration of the salt indicated by the symptoms. (5) The twelve tissue remedies are these salts, either singly or in dual combinations.

These salts are potash, lime, silica, iron, magnesium, sodium, phosphorus, sulphur, fluorine and chlorine. This system has the advantage of being perfectly harmless, and, at the same time, efficient, but it requires a skill in diagnosis that places it beyond the successful use of any but very acute observers.

26. The Densmore Preliminary Treatment.—The general outline of this treatment is excellent, but may be advantageously modified in many cases. Its rules are thus briefly epitomized:

No food for forty-eight hours. After that continue the fast until the patient has decided hunger. Administer frequent copious draughts of soft hot water; after the second day, substitute cold water if desired. Apply heat to the feet and cold to the head.

If there be pain anywhere, apply hot fomentations. In severe pain of stomach or bowels, give one-half pint of hot (132°) water every five or eight minutes until relieved. Administer an herb tea cathartic once in twenty-four hours until there is a thorough movement. (He does not name any particular cathartic, hence we suggest mandrake, aloes, berberis or butternut.) Induce free perspiration by a hot bath. After the pain yields, give a bath of warm soft water to one part after another, rubbing each dry as the process goes on. If pain returns after the first relief, give another sweat before the bath. The first food should be beef, mutton or chicken.

27. The Kneipp Cure.—About thirty-six years ago Sebastian Kneipp, now parish priest of Wörishafen, Bavaria, then a student, broken down by excessive study in order to become a priest, read a little book on water cure and began to practice its instructions. He regained his health, and for several years devoted himself zealously to his parish work. Also, being benevolently disposed, and sympathizing with the suffering, especially of the poorer classes, he freely prescribed water treatment for them. His success was such that at length many sought to avail themselves of his skill, until now it is widely used in Europe by all classes. Numerous great institutions make a specialty of it, and the cures effected have been marvelous. Since he published, in 1886, his system of water healing, more than two hundred thousand copies in thirty-three editions have been issued in various languages. His system is unlike the practice of the ordinary water cure establishments, and the essence of his theory may be found in this statement.

"According to my present convictions, now fixed for seventeen years, and tested by innumerable cures, he who knows how to apply the water in the plainest, easiest, most simple way, will produce the most profitable effects and the safest results. Three times I found myself induced to change my system, to loosen the strings, to descend from strictness to softness, from great to still greater softness."

He holds that disease is disturbed circulation, or corrupted ingredients of the blood, and that cure consists in correcting the irregularity

of the blood circulation, or evacuating the morbid matters from among its constituents.

Water cures by (1) dissolving the morbid matters in the blood, (2) by evacuating what is dissolved, (3) making the cleansed blood circulate rightly again, and (4) hardening the enfeebled organism.

The applications that Kneipp uses are wet sheets, baths, vapor baths, shower baths, ablutions, water bandages and water drinking. In general the dissolving is brought about by the vapors and by the hot baths of medicinal herbs. The evacuations are caused by the water bandages, and partly by the shower baths and wet sheets. Strengthening is induced by the cold baths, the shower baths, and partly by the ablutions, and finally by the entire system of hardening.

His maxim is: "The gentler and more sparing, the better and more effective." Many will think that this maxim is forgotten when his means of hardening are named: Walking barefooted in wet grass, on wet stones, in newly fallen snow, or in cold water, with cold baths for arms and legs, and a knee shower with or without upper shower. But if proper attention be given to his other directions, nothing but benefit may be expected. The application of ice has no place in his cure.

To the water applications he adds about sixty simple herbs and oils, all of which are described and directions given for their use, with the exception of his "secretive oil," which is, undoubtedly, a mixture, of which croton oil is the efficient ingredient. To describe his treatments would be to copy a large part of the nearly 400 pages of his book,—which is well worth a study,—but the essential parts are incorporated (with modifications suggested by our own experience) in *Our Doctor's Water Cure*, in a following section.

28. The Tractor Cure.—Dr. Perkins, of Connecticut, introduced the use of discs of different kinds of metal, which were applied over the affected parts with almost marvelous results in the relief of pain and removal of disease. It has been proved that wooden tractors had the same effect. Magnets have also been used, but with no better results. Charcot, of Paris, member of a committee appointed by the Sociétié de

Biologié, attributed the effects to electricity, but Bennett, of England, disproved that, hence English physicians substituted the theory of "expectant attention." (Shoemaker and Aulde.)

In reality it seems to be but a special application of mind cure, the chief field of its operation being hysteria and paralysis without organic lesion.

29. The Earth Cure.—Dr. Addinell Hewson, of Philadelphia, introduced earth dressings twenty years ago. The mud baths of Pistyan, in Hungary, are famed all over the world for the relief of chronic rheumatic and gouty affections. Sir Spencer Wells also recommends such baths for bone diseases and metallic poisoning. Maïzel has used white modeling clay for uncomfortable fullness and inflammation of the breasts. For local swellings and inflammation, ordinary brickyard clay is one of the best of remedies. Boils, carbuncles and felons should be treated early, the clay kept moist, and calcium sulphide given internally.

30. The Climate Cure consists in sending the patient to some climate not only different from his own, but which furnishes such qualities of moisture, temperature, elevation, and shelter or exposure, as will best fit his particular infirmities. Intelligent prescriptions in this direction presuppose a knowledge of the latitude, longitude and altitude of resorts in question, as well as their proximity to ocean, lake or river, and their situation in regard to mountain, plain or valley, and marsh or timber land. Knowledge of the temperature should embrace both extremes, because while the mean may be equable, there may be 40° difference between night and day. At Fort Yokon, Alaska, the day extremes are from 100° above to 70° below zero.

The effect of the climate upon the development of diseases and the longevity of its people should also be known. Whether it is a spring, summer, fall, winter, or all the year resort, is also important. The character of the soil and water supply should not be overlooked.

What are the facts and principles upon which a change of climate should be predicated? The facts have relation to five

supreme needs of the patient, namely: (1) More complete oxidation. (2) Greater healthful assimilation. (3) More thorough elimination. (4) More rest. (5) Increased activity. Some invalids may not have one or two of these needs, but in general they are absolute. The facts also have relation to various local conditions.

1. **Humidity or Moisture.**—Moisture and equability of temperature always go together. The point of saturation, that is, when fogs and dews are produced as a natural condition, is often found on the sea coast, while on the eastern plains of the Rocky Mountains the saturation is little more than half as much. For example, New Orleans gives 5.6 grains of vapor per cubic foot of air, while Denver has only 1.91.

2. **Temperature,** which includes not only the mean for the year, but the absence of great extremes, and sudden violent variations. Low temperature is favorable because of the greater expansion of the inspired air, thus stretching open the air cells. Cold contracts; heat expands; hence when air at 20° above zero is inhaled, the heat of the body instantly expands it to a far greater degree than when inspired at 60°.

Cold stimulates, while heat depresses. Cold also checks the formation of disease germs. According to Koch, the tubercular microbe thrives best at 98° to 100°, while its growth ceases entirely below 82° and above 107°.

Heat lessens the number of respirations per minute from 16.5 in England to 12.7 in the tropics, and lessened the amount of air respired from 239 cubic inches at 54° F., to 195 at 82°, a difference of over 38 cubic feet in twenty-four hours.

Heat is opposed to stimulation, so far as the nervous system is concerned. "In experiments on frogs, when a temperature much above the natural amount is applied to nerves, the electrical currents through them are lessened and at last stop," says Eckhard Henle.

Dr. Bodington affirms that cold, pure air, at the interior surface of the lungs does more to heal ulcers than any other means. Under certain conditions cold is also sedative, producing the most refreshing sleep.

3. **Altitude,** or height above sea-level, the importance of the fact consisting in the rarefaction of the air and its increased purity. The superficial area of a man's body is reckoned at sixteen square feet. Atmospheric pressure is three pounds less per square inch at an elevation of 6000 feet than at the sea-level. This relieves man of an outside pressure of 7000 pounds. Leibas Kuhn, endorsed by Dalton, computed

the area of the respiratory surface in both lungs to be 1,400 square feet, equal to 870 times as much as the surface area, hence at that elevation the lungs are relieved of a pressure of 612,500 pounds.

The first effect is, respiration is more frequent. After a while it becomes much deeper. A corresponding increase of the circulation occurs throughout the lung tissue, thus removing the stasis of the blood, which is an early stage of inflammation, loosening up and throwing off both the morbid deposits which predispose to congestion and the products of inflammation. This improved respiration and circulation are followed by increased digestion and nutrition, more complete oxygenation of the tissues and more thorough elimination of effete material, with correspondingly improved general condition.

Electric Tension in the atmosphere is increased with elevation. With a clear sky the electricity of the air is always positive. The continued mediumship of the human body between the negative ground and the positive air, whether one is on foot or on horseback, is a constant renewal of vitality. Here is the secret of the great utility of camping out and roughing it in dry, elevated countries (Dr. T. W. Miles), and is one of the most important elements of cure for the invalid.

Air is Rarified one-fifth at an altitude of 6000 feet. The objection is made that this greater rarification diminishes the oxygen supply, but this overlooks the difference in temperature. Lombard has shown that as much oxygen is had at an elevation of 3000 feet with a temperature at 32°, as at the sea level with a temperature of 65°, with the added benefit of the stimulated respiration by the cold.

From an elevation of 8000 feet in the southwestern part of the United States, to about 4000 on our northern boundary, there is an approximate immunity from phthisis, testified to by Jourdanets, Weber, Jaccond, Denison, Lombard, Williams, Kuchenmeister, Bremer, Archibald, Smith, Fuchs, Mobry, Spengler, Kirch and Guilbert.

Until acclimated there is increase, both in frequency and depth of respiration. The increase in depth is permanent.

Transpires More Water.—Dr. Dennison has shown that at Denver, Colo., an ordinary man transpires eight ounces more of water from his lungs in one day than at Jacksonville, while at Cheyenne, Wy., in winter the excess is thirteen ounces over Charlestown, S. C., in summer; and if the modifying effects of exercise be added, the difference is over one pint a day. The value of this fact is seen in the diminished moisture of the lungs, that furnishes a convenient medium for the growth of the microbes of disease; and in the solvent and carrying power of the exhaled vapor transporting noxious matters out of the lungs.

Dr. Boyd Cornick has ably controverted these views, affirming that dryness is the only quality that is really beneficial, whether at high or low altitudes; and that the good arises, not as Dr. Dennison claims, from the increased transpiration of aqueous vapor from the lungs, but from the rapid evaporation of serum transuding from the engorged superficial capillaries of inflamed pulmonary areas. In our view, both are right, and the processes are, perhaps, equally valuable.

Higher altitudes also *enjoy immunity from bacteria.* In July, 1883, Miguel found no bacteria in the air of Switzerland at an elevation of from 6,500 to 3,000 feet, but in 35 cubic feet of air on the Lake of Thun he found eight bacteria, near a hotel on the lakeside 25, in a room of the hotel 600, in the park at Montsouris 7,600, and in the air of Paris 50,000.

4. Sunshine.—The number of days in a year in which the sun is not obscured by clouds is important. The variation of cloudiness ranges from above 60 per cent. of the time over the interior lake-region, to less than thirty over Colorado, New Mexico and Arizona.

Dr. Miles asserts that the beneficial effects of sunshine increase with high altitudes. Lombard states that light stimulates and darkness impedes respiration, which is in accordance with the facts stated on Pages 8 and 9 of this treatise.

5. The Soil.—Remembering that for every inch of rainfall one hundred tons of water fall on every acre, the character of the soil becomes of great importance in determining the healthfulness of any locality. Heavy clay soils retain a large portion of the surface drainage, to return its deleterious contents in unhealthful exhalations, or in the solutions which constitute the drinking supply. On the other hand, light sandy soils, being more permeable by the sunbeams and gases, undergo a constant process of purification, by which the decayed products of vegetation and surface drainage become decomposed and harmless.

6. The Water Supply stands closely related with the character of the soil, and from a hygienic standpoint is of no less consequence. Sandy soils allow the surface water to percolate long distances, becoming, thereby, natural filters which pour forth their purified products in sparkling streams of the purest water. If the reader will turn back to Page 11 he will find facts which strikingly illustrate the importance of this element in estimating the comparative advantages of different localities.

7. Shelter.—By this is meant not equability, but the proximity of mountain ranges protecting from cold and raw winds, also from the sudden and violent changes that come from being situated in ravines. Variability is desirable, violent changes the reverse. Variability and dryness go together, and often, from the damage that ensues, the change gets the blame that belongs to humidity, which is always

excessive when the change is injurious. A moderate degree of change s required, in order to properly tone the system, as no climates are so lebilitating as those that are most warm and equable.

8. Ozone is nature's disinfectant, resolving all putrescent matter nto its primitive and harmless forms. Dr. Shrieber, of Vienna, says hat the turpentine exhaled from pine forests possesses, to a greater legree than all other bodies, the property of converting the oxygen of he air into ozone. The breaking of the water of falls into spray also produces ozone in large quantities.

A stream of ozone passed through a mass of black, offensive and putrescent blood, effects a change in it as if by magic; immediately, as soon as the operation has commenced, all disagreeable odor is removed. If ozone be diffused through apartments or elsewhere, it not only disinfects by removing noxious vapors and poisonous germs, whatever their character may be, but being, itself, in the gaseous form, it is inhaled during respiration, and passing into the blood through the lungs, it oxidises the used-up and effete matters produced during assimilation and the renewal of various tissues, thus effecting a certain resistance to these pernicious influences if retained within the human body. (Dr. Day.)

9. Drainage is a very important factor, because when deficient, poisonous products are constantly exhaled in the air and taken into the system through the water supply, as already stated. Sandy and loamy soils, with mountainous configurations, furnish the best soil and advantages for complete drainage.

10. Clearness or Transparency of the Air.—This is a decided indication of its purity. As with water, the greater distance one can see through it the greater is its purity, so with air.

Special Hints.—No climate should be regarded as curative, but simply palliative; yet changes can often be made that will restore health and prolong life many years.

Patients should rarely seek a change of climate after disease has reached such a stage as to render home comforts absolutely imperative. These comforts may seem necessary, but many a consumptive owes his life to having left his luxurious New England home for a life on the plains of Colorado or Arizona.

Patients afflicted with a particular disease should not seek a locality where that disease abounds. For example, in Florence, Malta, and Maderia, consumption is prevalent among the native inhabitants; therefore they are unfit refuges for consumptives from abroad. This reasoning has been abundantly confirmed by experience.

At Nice, which has been a favorite resort of English invalids, especially those afflicted with lung complaints, there are more native inhabitants that die of these maladies than in any English town of equal population. Naples (only mentioned here by way of contrast), the climate of which is the theme of so much praise, shows in her hospitals a mortality by consumption equal to one in two and one-third, whereas in Paris,—whose climate is so often pronounced villainous—the proportion is only one in three and one-fourth. In Madeira no local disease is more common than consumption.

The principles deduced from the foregoing facts are as follows:

1. *Concerning Humidity.*—Consumption requires a dry air, because, as shown by Dr. Dennison, it has so much greater power to absorb the aqueous vapor from the lungs, and with it the germs of the disease. Thus, in 1883, with a mean temperature of 71.3° at Yuma, Arizona, and Jacksonville, Florida, a man at rest threw off 864 grains a day more at Yuma, which (on the basis of Dr. Edward Smith's calculation that a man walking three miles an hour at sea level consumes three times as much air as when at rest) gives about a gill more a day exhaled at Yuma than at Jacksonville.

Dr. C. J. Williams, after a thorough analysis of 593 winters spent by 251 consumptive patients in foreign climates, says "the dry climates are the most likely to arrest the disease."

All invalids should seek the dryest air procurable, the rule being qualified only by these exceptions:

First—In acute irritation of the respiratory passages, with dry, irritable coughs and scant viscid expectorations.

Second—In irritable, nervous diseases, with not much debility.

Third—In old age, attended with nervous irritability or febrile tendencies.

In the above conditions an atmosphere loaded with moisture may be a temporary benefit. The most desirable mean humidity is 68. Other local conditions of importance will be referred to in the following brief general rules, for guidance in the selection of an appropriate climate.

1. *Concerning Humidity.*—Humidity and equability being always associated, there is an absence of the nervous stimula-

ion that characterizes dry and more elevated localities, and if he humidity be considerable it may have a sedative virtue.

2. *Concerning Temperature.*—In tuberculous diseases, the coldest temperature available should be sought, provided it possesses the other necessary conditions of the climate for such cases. Individual adaptability should always be considered. This may be best learned, as to temperature, by one's own experience in health, *i. e.*, he should seek a colder or warmer climate, according as he has felt best in winter or summer when in health.

3. *Concerning Altitude.*—When the usable area of the lungs barely supports respiration at low levels, it is unwise to seek higher, because the only compensation for the diminished oxygen (owing to the increased rarefaction of the air) is the added increase of the lung capacity.

Only those invalids should seek high altitudes whose heart and blood vessels can bear the strain of the accelerated circulation, resulting from nature's effort to oxygenate the system with the diminished supply, excluding those who have serious heart weakness or existing pulmonary hemorrhage.

Those of great nervous excitability should avoid high altitudes, because of their extra stimulation to the nervous system.

4. *Concerning Sunshine.*—As the chief value of the sunshine to the invalid is outdoor life, if the case has become too critical for that, a change of climate seems scarcely desirable. The extent of the outdoor life should be measured only by the opportunities afforded by the sunshine and the physical capacity of the individual. A gradation may sometimes be of benefit, increasing the habits of outdoor life as the health improves, and corresponding climates may be sought.

5. *Concerning the Soil.*—A soil of sand or light loam should always be preferred to one of marsh or clay, for reasons already sufficiently detailed. An unfavorable soil may neutralize all the benefits accruing from other excellent climatic conditions. A favorable soil may secure benefits in the absence of other desirable conditions, that ordinarily would be attributed to their operation.

6. *Concerning the Water Supply.*—Pure spring water should be preferred to that of large lakes, rivers, or excavated wells. This is especially important in rheumatic and kidney diseases. Where the speckled trout is found, we may be sure that the streams are pure.

7. *Concerning Shelter.*—Localities situated where, by the topography of the country, they are liable to become channels, through which storms gathered upon adjacent mountains are poured upon the plains below, should be avoided.

Localities directly in the path of winds gathered over wide areas of cold water or snow-covered territory, should be shunned; yet the shelter should not be so complete as to shut out the breezes necessary for invigoration.

8. *Concerning the Ozone Supply.*—Whatever may be the ailment, the larger the supply of ozone in the air, the better is that feature of the climate for the invalid. Hence, other things being equal, proximity to the long-leaf turpentine pine forests (not the white pine) affords the best attainable supply of health-giving air.

9. *Concerning Drainage.* — Where nature builds and flushes her own sewers independently of the effort of man, is where the invalid may be insured of immunity from the deleterious effects of stagnation and accumulated decomposition.

10. *Concerning Clearness of the Air.*—An atmosphere so transparent and pure, that meat hung in the open air cures perfectly without putrefaction, must be more favorable for the perfect elimination of effete and poisonous material from the system, than one where sight and sound are both greatly circumscribed, and nitrogenous material can only be preserved by use of antiseptics.

In the Application of these Principles, we have not the material at hand for anything more than a casual comparison of some of the more noted places within our own borders.

AIKEN, S. C.—Six hundred feet above sea, surrounded by pine forests; pure, tonic air; loose soil; mean temperature of November, January, 48½° F. Pure water supply and excellent drainage.

ASHVILLE, N. C.—Altitude 2350 feet. An all-the-year resort. Average rainfall, 40.2 inches per year; mean temperature, 55.3°. Sheltered

by mountain ranges on the east and west, soil sandy, excellent drainage, and wind comparatively dry. Ratio of deaths for that vicinity, compared with New England, 30 to 250; compared with Minnesota and California, 30 to 150.

CALIFORNIA.—*Valleys* wet and malarious. Daily variations of temperature from 80° to 100° days, to 40° or 30° nights. *Mountains.* High altitude and too great variation of temperature every twenty-four hours. Affects the nervous system and heart unfavorably. (Dr. Samuel Clark.)

In the valleys of California the summer variations of temperature are from 100° in the day to 30° in the night, causing rheumatism, neuralgia, and inflammation of the lungs. The mountains have but two seasons, the rainy and the dry. The daily variation of temperature is so great, together with the altitude, that nervous and liver diseases, rheumatism and inflammation of the lungs are prevalent. Some places in *Southern California* are free from these objections as a winter resort, and hence much frequented at that season and with benefit.

COLORADO furnishes almost any altitude or climate desired. Few changes or extremes are so severe as to prevent outdoor exercises, in the more favored localities. Dry, sandy soil. Rains are short, and soon succeeded by bright sunshine. Winter temperature averages 29°. Drainage usually good; sheltered by the Rocky Mountains on the west. Altitude from 4,000 to 15,000. Little humidity and great clearness of the atmosphere. Water supply abundant and of the purest quality. Fogs and clouds are rare.

EL PASO, Texas.—Altitude 3,764 feet. Average of 53 days per annum when the temperature falls below 32°, the freezing point. Very dry; average cloudy days, 29.6 per year, or 2½ per month. Annual rainfall is 12 inches. Least wind during winter months. An all-the-year climate for invalids, and from Oct. 1 to May 1 almost perfect, with a mean temperature of 44° in January.

DENVER.—According to the records of the signal service office of Denver, Col., from Jan. 1, 1873, to Sept. 1, 1878, sixty-eight months, there were but seventeen days during which the sun was invisible during the whole day. Dr. Baldwin has shown that Denver has about one-third the moisture that New Orleans and Jacksonville have, and less than one-half that of Santa Barbara. Altitude over 5000 feet. Mean temperature, 49.2°; moisture 51, rainfall 12 inches. Superb water supply, sheltered from the cold winds of the Pacific by the Rocky mountains. Soil, drainage, and clearness of air as in other choice localities of Colorado.

FLORIDA.—Low altitude, raised comparatively but a few feet above the sea. Sunny, genial climate during the winter months, but oppressively hot and relaxing in the summer. Soil sandy. Water near the shore poor. Drainage imperfect. Humidity excessive.

LAS VEGAS, New Mexico.—6767 feet above sea level. Dry climate. August is the cloudy month. Total rainfall 20 inches. In a region of pines, air clear and pure, water good, drainage excellent. The hot springs are celebrated for the relief of chronic rheumatism, syphilis, asthma, chronic malaria and consumption. The hot spring waters have the qualities of dilute Carlsbad. Population 6000.

MINNESOTA.—Cold, dry. The pine woods of the Minnesota Lake Superior region are better for consumptives than tropical places, and constitute a good medium between the sea shore and the higher altitudes of Colorado. Average altitude 1000 feet. Over 8000 lakes within its borders. Soil moist, with cold winters and warm summers. Average temperature, 44°; rainfall, 35 inches.

NASSAU, New Providence (one of the Bahama Islands). Most equable climate of any of the American sanitaria, the temperature for a period of years not having risen above 88° F., nor fallen below 60° F., mean 78.3. During the winter months bright, clear weather, with little or no rain. Soil of coral formation, light, thin, low and flat.

SOUTHERN NEW MEXICO.—Moderate altitude, pure, dry air. Dr. A. Petin traveled all over the United States as commissioner of "The Societe Medicale" of Paris, in search of the best locality for a sanita-

rium for consumptives, and reported the vicinity of Los Crucces, N. M., as the best," and Dr. Brown, of Victoria, N. M., affirms that the area two or three hundred miles up and down the Rio Grande possesses the same advantages. Heat is never oppressive, and the temperature seldom falls to 32°, averaging 50°. Sky usually cloudless. Rainfall from 10 to 30 inches. Air so pure that meat may be preserved without salt. No consumption among the natives nor among Americans born in the territory. The winds are chiefly in February and March, and are then dry and cool. Dr. Wrouth deems the climate bad for emphysema, bronchial dilatation, consumption in the aged or those too weak to take exercise, and when so much lung tissue is destroyed that the remainder is insufficient at lower levels.

ROCKY MOUNTAINS.—The western slope has a rainfall of 65 inches for the year, while in the same latitude and less than two degrees longitude east, the average rainfall is but seven and one-half inches. Dry, sandy soil. Protection is afforded by the mountains on the east and northeast. Special resorts described under their proper names.

SANTA FE, New Mexico.—It has been said, the most important elements in any climate for treatment of disease are pure air, free from dust and organic particles; an abundance of sunshine, so that the invalid may spend much time in the open air; equability of temperature, that the body, weakened by disease, may not suffer from extremes, and a sheltered position from hot or cold winds. Santa Fe possesses all these characteristics to a great degree. It has the pure mountain air of the regions, in view of perpetual snow; shut in from the north, northeast and the east by the adjacent mountains. It is never extremely hot; lowest winter cold 5° below zero, mean temperature 49°. The valley has sunshine 360 days in the year.

SOUTHERN PINES, North Carolina.—Protected from northwest winds by the Appalachian mountains. Mean annual temperature 58°, summer 77°, winter 44°; latitude 32° 12″ north, and longitude 72° 21″ west. Sandy soil of great depth, covered with long leaf pines; 600 feet above sea level; rainfall 45 inches; dry air; water abundant and fine; winter climate modified by Gulf stream. The drainage is perfect, forming the water shed between two streams. Ozone much greater in a country covered with the long-leaf than one invested with the white pine.

TENNESSEE.—The climate is mild both in summer and winter; temperature, winter, 38°; spring, 57°; summer, 75°; autumn, 57½°. It might be termed the Eden of the South, if not of the whole country, owing to its altitude, character of soil, and mild temperature. Altitude 7000 feet on the east to 300 feet on the west. Soil in the east rocky, in the west rich. River loam.

Our Doctor's Water Cure.—This contains nothing mysterious nor outside the domain of ordinary laws.

(1) *The Qualities of Water.*—Water has four qualities only that need to be considered, namely, moisture, temperature, impact, and as a solvent.

The moisture loosens and is absorbed, i. e., poultices and evaporates.

The temperature ranges from the freezing point to 120° F.

The impact is graduated by the force of the stream, and the amount of protection, and the time of exposure.

The solvent property takes up and removes obstructive matters with which it comes in contact on the surface, in the pores and in the blood vessels.

As remedies these properties stand related to (2) *certain physiological phenomena*, namely: Stimulation, reaction, relaxation, absorption, astringency, tonicity, secretion and elimination. The laws (that is, uniform sequence of facts) of their action are:

(A) *Concerning Moisture—*

1. It poultices, that is, relaxes and absorbs, according to its temperature and the degree and time of its confinement upon a surface. The extent of the absorption is indicated by the fact that immersion of the whole body thirty minutes at 95° F., has increased the weight eight ounces.

2. Its evaporation cools or chills, in the ratio of the rapidity of the process, and the time of its continuance.

3. It loosens to the extent of its absorption by any tissue.

(B) *Concerning Temperature.*

1. Cold applications—33° to 55° F.—by the abstraction of the heat from the body drive the blood from the surface, hence constrict the blood vessels because cold contracts, and astringe the tissues to which they are applied; and if at all extensive, excite shivering, which is nature's effort to restore the balance of the circulation. Muscular contraction is the principle source of heat in the body. Billroth and Fisk noted more than 5° C. increase of heat in warm blooded animals from a spasmodic condition for ten minutes.

2. If the application be soon removed, a revulsive effort of the circulation returns the blood with such force as to expand the blood vessels to a greater extent than before the application, and increases the quantity of blood in the part, thus proving a tonic, because it increases the nutrition of the part, together with a slight molecular astringency.

3. If the cold application be continued, the abstraction of heat also goes on, prolonging the blood-expelling effect, and thus proves a vital depressent, because it robs of heat and nutrition necessary to vitality.

4. If the application be only cool—55° to 65° F.—and for a short time, and if the power of reaction be good, there is

first a gentle abstraction of heat from the surface, then a slight increase of the local circulation. Cold air (much less efficient than cold water) at 64° to 68° F. so constringes the superficial vessels and contracts the muscular fiber of the skin that arterial pressure is raised from 200 to 300 grams—i. e., from 7 to 10 ounces. (M. ch. Féré.) It is as a result of this increased pressure that the local circulation is elevated in the reaction which ensues.

5. If this be too long continued, or if there be deficient reactionary power, its effect will be the same as extended cold applications (3).

6. If the application be tepid only, 70° to 85°, it relaxes the skin and extremities of the nerves, and thus becomes soothing, in accordance with the law of relaxation, namely: An impression made upon the nerves of a part by warmth, moisture or deficient vitality, temporarily abstracting the tonicity of the structures and thus loosening their fiber, is relaxation, which favors both secretion and excretion, but may vitiate the quality of the secretions.

7. If the application be hot, 95° to 100° F., it stimulates, because it brings an abnormal degree of heat in contact with the surface, and also accumulates internal heat that cannot escape. The heat production of the body is 1° C. every 30 minutes, enough were there no loss to raise the body to the boiling point of water in 36 hours. Three to 6 per cent. is lost in the urine and feces, 9 to 20 in heating the air that is inspired and vaporizing the water eliminated by the lungs, while 77 to 85 per cent. is lost by radiation, conduction and the evaporation of perspiration, all of which are stopped by the hot bath. This bath is not advisable when the skin is cold and clammy, unless the water is used as a vehicle for the strongest stimulants. In other conditions it is an excellent general stimulant.

8. If the application be speedily removed, the effect is only that of a local stimulant generally applied.

9. If the application be continued it astringes, because the nervous stimulation of the abnormal heat and accumulat-

ing internal heat throws the circular fibers of the minute blood vessels into tonic spasm, thus reducing their caliber, condensing the tissues, and hindering both secretion and excretion.

The Law of Astringency.—Astringency being the opposite of flaccidity or relaxation, is the compacting effect upon the fibers of the structures of an impression made upon the nerves by cold, by extreme heat, or by the chemical effect of certain agents. It is, in its nature, the same as tonicity, only the latter indicates a permanent state, while the former is transient, and may also be excessive.

10. If continued over a large extent of surface, the water may induce faintness before the stimulation has given place to astringency, because the rush of blood to the capillaries of the skin partially empties the brain and large blood vessels.

This unbalanced condition of the circulation continued beyond a brief period, becomes prostrating, because the reversal of the natural process of importation of heat by the vital organs interferes with the molecular relations of the nervous centers.

Yet Dr. Baelz asserts that the hot bath of Japan (106° F.) raises the body temperature to 104-105. 8° F., increases the pulsations and dilates the blood vessels, but does not depress or weaken as does the bath at 98° F. No explanation is offered. He recommends pouring hot water on the head on entering a hot bath, to prevent cerebral anæma, and prescribes it three or four times a day in capillary bronchitis, lobular pneumonia, rheumatism, nephritis, and the uterine colic of menstruation.

Air may be borne ten minutes at 269° F., while water at 124.9° cannot be endured a moment. A bath at 113.9° F. may be endured for eight minutes, but it is dangerous.

12. If the application be warm, 85° to 95°, it has, to a modified degree, the effect of the hot application; i. e., there is dilatation of the blood vessels of the skin, softening of integument, copious perspiration, quickened pulse and respiration, but with a slight general decrease of temperature; because, as the heat is retained it soon relaxes the cutaneous tissues, and increases its circulation and expends the heat. In flashes of heat and sweat, this bath gives steadiness to arterial circulation of the surface.

13. This warm application, long continued, engorges the blood vessels of the surface, and by continuous distention ultimately weakens them, so that a state of passive congestion of the capillary circulation may supervene.

14. If the application be lukewarm, 65° to 70° F., its effect is the same as the tepid, to a modified degree (6).

15. The alternation of the hot and cold in quick succession increases circulation, warmth and tonicity, provided the hot applications be as in No. 8, and the cold as in No. 2, and the cold end the series.

16. If the application be tepid, 70° to 85°, at 80° it is a mild yet efficient relaxant to the capillaries, nervous peripheries and sebaceous glands. It reduces the temperature in fevers, cleanses the skin, produces capillary softness and distention, obtains afflux of blood from any congested internal organ, and relieves the nervous system. This may be used three or four times a day in appropriate cases. Not suited to strong local or general congestion, to flaccidity of the structures, a cool surface, a tendency to colliquative perspiration, threatening gangrene, or chronic reduction of vital energy.

(C). *Concerning Impact.*

1. Impact arouses nervous action, and by it calls the blood to the impacted surface.

2. This effect is dependent in degree upon the force of the impact, the temperature of the water, and the reactionary power of the system.

3. This effect is governed by the law of stimulation, which is:

We are organically constructed so that by reason of the alternate, molecular contraction and relaxation of the structures, an impression made upon the nerves of a part,—whether by concussion, temperature or chemical excitation, if *above* the normal average,—immediately calls an increase of circulation to that locality and temporarily exalts its vitality, that is, stimulates it. The distinction should be clearly made between stimulation and tonicity; the last is an increase of the fiber-density, as well as of the vitality of the part, and has a character of permanence instead of being a mere transient condition.

(D.) *Concerning the Solvent Properties of Water.*

1. Hot water possesses it to a greater degree than cold.

2. Pure water has more solvent power than impure.

3. Its solvent power may be increased by the addition of certain other things.

4. Within certain limitations of temperature, the solvent property of water is the index of its utility in the animal organism, i. e.: Pure water can take up and pass out of the system a much greater percentage of the wastes from the physiological processes, than water can that has its solvent capacity nearly satisfied before its ingestion. Hence pure rain water boiled, is preferable to many spring waters.

The Physiological Functions of absorption, secretion and elimination are chiefly governed by the condition of their respective organs as to relaxation, stimulation and tonicity, hence it is easy to see that water applications may be full of potency for good or evil, since they so powerfully affect these conditions.

The Proper Use of Water.—Upon the foregoing facts, and laws must be reared any superstructure of the rational use of water in the treatment of disease, always bearing in mind that all physiological processes are subject to the idiosyncrasies and physical conditions of individuals. Hence a prime factor of successful treatment always must be *careful adaptation to the individual treated.*

3. *The Special Points About the Patient* to be noted are:

1. Special idiosyncrasies, whether aversions, dreads, particular susceptibilities, cravings, or particular unsusceptibilities.

2. Physical condition. *A*, Temperament—the sanguine can bear lower temperature than others. The bilious are hard to effect, hence need decided and even heroic treatment. The nervous temperament (not merely nervous people, for persons of all temperaments may become nervous) require short applications with frequent changes. The lymphatic are slow to react and particularly liable to be injured by the injudicious use of water.

B, Special derangements. These may exist in the organs of circulation, respiration, nutrition, absorption, secretion or elimination, and may consist in a state of relaxation, astringency, stimulation, congestion, inflammation, or suppuration; all of which should be carefully ascertained before the treatment is outlined, else it becomes the merest guess-work.

C, Existing vitality. No point can be more important than this. A temperature that may be full of blessing to one, may be almost death to another. Two questions must be ever-present in the mind of the prescriber of water applications. Is there general vitality enough to secure quick and complete reaction from the cold? Is there local vitality (especially of the brain, heart and blood vessels,) enough to secure against ruptures, faintness and prostration?

3. Intelligence—*i. e.*, sufficient to apply the water treatment with good judgement. A gentleman was denouncing the system because he had tried it and it worked badly. "What did you do?" was asked. "Why, I held my head under the pump and let the ice-cold water pour on it for fifteen minutes." Such stupidity deserves only bad results. Yet the lack of intelligence so often exhibited in the use of water as a curative agent is not altogether the fault of the people, for where can be found a clear statement of the laws governing this subject? Plenty of treatises there are, brimful of methods that by their very multiplicity confuse, but which fail to tell why. And without the knowledge of the why, how can any inexperienced man be expected to show the requisite judgment?

4. Disposition. If everything else is right, has the patient the disposition to use these means? If not, his experiment may be foreseen to be a failure. Better let him dose with drugs that will work when once they are swallowed whether he be persistent or otherwise, and get what good he can from them, than to stigmatise this plan of healing by his failure.

5. Circumstances. These must always be consulted. To order a full-pack of an hour's duration for a poor mother

alone with her babes, obliged to work, 16 hours of every 24 for bread, might be just what she ought to have, but obviously impossible in her case. The efficiency of the system must often be sacrificed to the imperative of circumstances.

6. Diseased conditions. All acute congestions and inflammations show over-stimulation of the parts. Chronic congestions, ulcers, etc., show over-relaxation of the parts. Ordinary fevers are like acute congestions. Typhoid, typhus, malignant scarlatina, diphtheria, malignant dysentery, malignant erysipelas are like chronic congestions. Hence, the condition is the key to the needed treatment. To stimulate an over-stimulated part, or relax a tissue already flabby, is only to increase the difficulty.

It will be well for the reader to study the preceding pages with great care before passing on to the enumeration of the various water applications which constitute our water treatment.

4. *The Applications Used.* BATHS.—Time and temperature as related to the patient are the most important elements in every bath. Therefore, they must be wisely adapted to the disease and the strength of the patient. Every bath may be neutralized by indiscretions immediately after it. Therefore, such should be avoided with the same care that the bath is taken.

Every bath has an immediate local and general, and a remote constitutional effect. To gain one or more of these effects is the object sought by its use.

Constitutional effects are indirect, working toward improved nutrition, equalized circulation, with normal temperature, respiration, secretions, excretions, rest and recuperation, and physiological vim. These are the scale marks on the health-ometer of recovery.

The immediate general effect is dependent upon the immediate local effect and corresponds with it. This local effect is in nervous impression, temperature, circulation, and special functions of the part, and its whole efficiency is measured by the character and degree of these modifications.

Always use pure water, and soft water when possible.

Every bath may be pushed beyond the desired into an objectionable effect. Therefore the object should be kept continually in view, and the bath discontinued as soon as the desired effect is realized. Too little effect is better than too great.

Repetition should be governed by this law: In chronic cases, the second bath should be given before the constitutional effect of the first is lost; in acute cases, it should be given before the local effect of the first is lost.

1. Cold Baths. (See pages 19 & 21.)—From 33° to 55° F. Time, including undressing, bathing and redressing, five minutes.

Always dress without drying, followed by smart exercise at least fifteen minutes and until warm. This is called *undry* bathing, whatever the temperature or name of the bath may be, and was introduced by Trosseau in fevers.

The body must be entirely warm before the cold plunge or swim, the warmer the better. One may even be perspiring, but must not be wet from rain. If perspiring, the time should not exceed one minute; if not, from one to three.

Reaction. The glow should set in within five minutes after all cold baths, and should be maintained with no after-chill. In the cold bath, the recession of the circulation from the surface stimulates the heart and large arteries to a more vigorous effort to return it. This effort is an expenditure of just so much vitality. When the heart is feeble, or the large blood vessels weak, or the capillary circulation feeble, there is danger of congestion in thus driving the blood from the surface.

Cold increases heat production, the consumption of oxygen, and the elimination of carbonic acid. Hence the cold bath is powerfully promotive of tissue change.

The Whole Bath: The whole body is immersed at once, from ½ to 3 minutes. Purifies and strengthens the skin, invigorates the whole system, prevents colds. In winter, not more than two a week. Always as an undry.

Avoid Cold Baths in the treatment of old people, very young children; in dilation of the heart or valvular disease; with the convalescent, especially from acute nephritis and intermittent hematuria. Open wounds should not have cold dressings.

2. Cool Baths, 55° to 65° F.—Pure soft water. The cool bath is lower than the accustomed temperature of the skin surface, which is from 80° to 85°.

3. Luke Warm Baths, from 65° to 70° F.—Pure soft water may operate as a cool or cold bath in cases of high fever and great debility. Frequency and duration governed by the condition of the patient. Also as a cold bath for feeble children and aged people.

4. Tepid Baths, from 70° to 85° F.—Neutral; neither stimulating nor depressant, have a slightly relaxing effect upon the skin. Not of special value, except when used in cases of great feebleness and high fever as a cooling agent. Time according to effect desired.

5. Warm Baths, 85° to 95° F., or solutions, infusions or vapor. Usual time, 20 to 30 minutes, always followed with cold sponge. Depletion by the skin is as prostrating as depletion by the bowels; hence care should be exercised not to crowd them too far.

The Warm Bath is useful in dermatitis, ecthyma, eczema, hygroma, ichthyosis, lupus vulgaris, syphilis, business anxiety and depression, spasm, strangulated hernia, uterine and ovarian diseases and gonorrhea of females, melancholia and insanity, measles, scarlatina, small pox, croupus pneumonia, jaundice and chronic lead poisoning. One a month for aged people. Two a month for gout, podagra and the like.

6. Hot Baths, 95° to 100° F. Solutions, infusions or their vapors.—Full hot baths should be always followed by cold sponge. The impression of heat transmitted to the brain from the surface, excites a reflex nervous influence from those centers which preside over the heart, lungs and the caliber of the blood vessels. Hence, increase of respiration and perspiration, and dilatation of the blood vessels.

A hot bath should not be taken if the heart and circulation are weak. The hot and Turkish are dangerous where there is fatty or dilated heart or atheroma of the great vessels.

In typhoid fever, when the temperature is high, but the surface cool, give warm, not cold baths.

Hot baths are excellent in renal and biliary colic. Useful in hyperidrasis, bromidrosis and chromodrosis. Also in dermertalgia and paraesthesia. Also in psoriasis, pityriasis, scabies and frost bites. Especially valuable in recovery from freezing.

Avoid Heat in hemorrhage from vessels not accessible, and in great weakness of the blood vessels where added impulse to the heart might cause rupture of an artery. It should not be applied to the head in apoplexy. Aneurism should also avoid great heat. Old people should be treated with a high degree of heat very cautiously, lest apoplexy or heart failure be induced.

Head Bath. The top of the head dipped in a basin of water one minute if cold, five to seven if warm. Hair to be thoroughly dried. Good for scalp diseases.

Eye Bath. Forehead and eyes dipped in either cold or warm water one-half to one minute. Eyes open. Repeat four or five times.

If warm is used, follow with cold wash. A half spoonful of ground fennel should always be added to the water. The cold strengthens weak eyes, the warm extracts impurities.

PART BATHS are baths applied to any part of the body or limbs and may be designated by the name of the part concerned, as head bath, foot bath, eye bath, etc.

Hot immersion of wounded and contused parts favors healing.

Cold Foot Bath—Duration one to three minutes, hardens the healthy, brings rest and sleep to the weary. Leads blood down from head and chest.

Warm Foot Bath, 100° to 105° F. with a handful of salt and two of wood ashes. Duration twelve to fifteen minutes. Suitable for weak, nervous people, those who have poor blood, very weak and very old people. Relieves congestion and cramps of the neck and head. Corrects the circulation. Not good for sweating feet. Never to be followed with cold bath.

Warm Foot Bath Medicated—Three to five handfuls of hay flower seeds, leaves and the like, with boiling water poured over them, and cooled to 105°. They dissolve, strengthen and eliminate. Good for sweating feet, tumors, wounds, gout in the feet, whitlow and the like.

Hot Foot Bath breaks up cold, stops bleeding at the nose, gives relief in urticaria. Always of decoctions, or ashes and salt solution.

he Spray Bath of Preyer and Flasher is a part bath. Covers laid aside, bed protected, and a finely divided spray directed against the body for thirty or forty minutes. Repeat as often as necessary. Is cooling to the surface, lowering the temperature, without the shock and revulsion of a cold bath. Excellent for feeble folks and timid children in fevered conditions.

PACKS (See Page 21). 3. **Whole Packs.**—Across the bed lay three or four woolen blankets, and on them spread a sheet wrung out of water. The patient lies on his back on the sheet, one end of which is carried over and tucked under him, then the other end is brought over in the same way, after which each blanket is separately treated in the same way, and over all other blankets or a light feather bed is piled. The feet must be snugly tucked in, and no crevice for air to enter should be left about the neck. Let him lie until perspiration is quite profuse upon the face, then remove wraps and give a quick, cold, undry sponge.

The whole pack may be made a *whole compress* by sprinkling it frequently with cold water and reducing the wraps.

In packs the temperature may range from warm to cold, but the envelopment must be perfect, and the temperature then left to be

regulated by the heat of the body within its wraps. It expels gas from the stomach, and the body must be warm when taken.

The Wraps or Part Packs.—The same method as whole packs applied to a single limb or surface. The effect is dependent upon the gradual accumulation of body heat in the part, and its confinement at that locality, added to the normal effect of water at that temperature. Duration from one-half to two hours.

The Spinal Pack, 45 minutes. Strengthens the spine, relieves lumbago, reduces the heat of fever, and removes congestion.

Abdominal Part Packs, forty-five to one-hundred and twenty minutes. If over an hour, must be re-wetted. Useful in indigestion and cramps and to draw the blood away from the heart.

Nightshirt Wrap, (see Fig. 41).—Wring a long nightshirt out of water, and put it on, and lie down upon two or more blankets, which must be closely wrapped around and tucked under. One to two hours. Promotes perspiration, removes congestions and spasms, soothes the nerves, imparts health to the skin; relieves Saint Vitus' dance; valuable in general catarrh, gout, articular rheumatism, small pox, typhus, and to prevent paralysis.

To bring out eruptions, dip in salt water, or water and vinegar.

The Three-fourths Pack (Fig. 42), is the same as the full pack except that the arms are not included.

FIG. 41. NIGHTSHIRT WRAP.

The Sitz Bath.—This is likewise indicated in the cut. Temperature and time are the main elements, as it should always come nearly to the navel.

Cold Sitz.—For the healthy, strengthens the bowels, relieves hemorrhoids, chlorosis, wind colic, hypochondria, hysteria, diseases of the generative organs, and prevents colds. Time from two to three minutes. May be taken any hour of the night as undry bath, and will cure sleeplessness. Excellent for tired feeling in the morning. Only two or three times a week.

Warm Sitz.—Duration from two to fifteen minutes. Two or three times a week. Should be made of hay flower decoction, oat straw, mullen or smartweed tea. May be medicated and allowed not more

than two or three times a week. Medicated with oat straw is good for gout; with hay flowers, good for constipation, hemorrhoids, spasms, exterior swellings, wounds and colic; duration fifteen minutes.

Hot Sitz excellent in cystitis, dysmenorrhea, amenorrhœa, suppres-

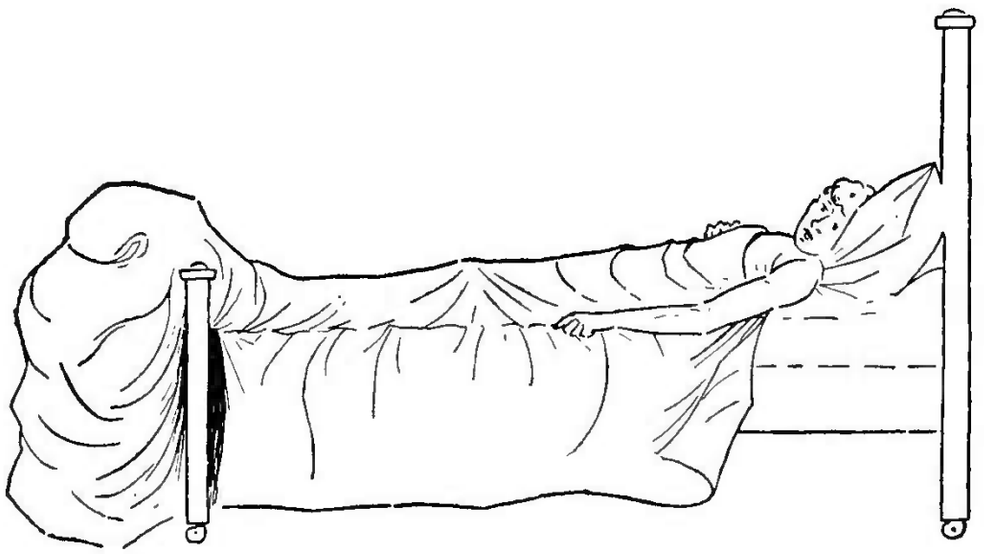

FIG. 42. THREE-FOURTHS PACK.

sion of menses, chronic metritis, endometritis, spermatorrhea. Used only medicated and as an intense form of warm sitz; duration five to ten minutes. Cover in bed afterward.

4. COMPRESSES.

The compress is a linen or cotton cloth folded from one-half to one inch in thickness and of a suitable size for the use intended. The flannel cover is four to six thicknesses of flannel made the shape of the wet application to be covered, whether body bandage, shawl, limb bandage or any other, but in all cases three to six inches larger all ways and fitted with tapes, so that, when adjusted, it can be tied by the patient without assistance.

FIG. 43. SITZ BATH.

Wet the compress in water not above 65° and apply it, and keep it below that temperature by dipping frequently into the water, or dripping water on it, or in extreme cases apply ice. The effect is that of a long continued cold local bath. Must be kept on until the object is accomplished, for a compress soon removed has the effect of a short cold bath.

Ice Cold Compress (local). Blunts the sensibility of nerves, powerfully influences reflex nervous functions, therefore has great effect upon the circulation of deep-seated organs. They relieve the pain of cerebro-spinal meningitis, the delirium of fevers, delirium tremens the burning and retching of acute rachitis, are useful for hemorrhage and valuable locally in inflamation.

Cold over the spine dilates the blood vessels of the surface, relieves muscular spasms, lessens muscular sensibility and secretion, raises body heat and favors increased peripheral circulation.

Cold over the lower dorsal and lumbar vertibræ drives the blood to the pelvic organs and the feet, and restores and promotes menstruation.

Sweating Compress—Three or four thicknesses of compress, with the flannel cover bound over it until dry. Has the effect of a mild poultice. Renew as often as necessary.

Neck Compress.—Is the last fitted to the neck so as to just meet, not lap over. Should be three inches thick and come out even with the chin. A double woolen blanket, to absorb the moisture, should be thrown around the shoulders.

The Chest Compress may be made like a jacket, with arm holes. Useful in bronchial and chest congestions, rheumatism of the chest.

Body Wrap (See Fig. 44).—A sheet folded lengthways wrung out of water and wrapped closely about the body followed by a woolen blanket wrapped in the same way, then other blankets sufficient to secure warmth. One to two hours. Follow with undry sponge.

FIG. 44. BODY WRAP.

Shawl Wrap (Fig. 45). A piece of coarse linen, one to one and a half yards square folded into a triangle, wrung out of water and wrapped closely about the shoulders and chest, and covered with woolen blankets folded in the same way. From thirty to ninety minutes. For congestions of head, throat and chest, melancholia, etc. Especially good with appropriate foot applications to draw the blood from the head. Should be re-dipped every thirty to forty minutes, if it becomes very warm.

Fomentations are hot applications kept on a part at a temperature not below 99°, and must be kept at that temperature by frequent

dipping or by the application of the hot water bag or bottle. They have the local effect of the hot bath.

The wet cloth should be of four to six thicknesses of flannel covered with six to eight more dry and warm, and extending three inches beyond the wet on all sides, the whole should be bound on. Should be continued until the desired effect is decidedly seen.

A brief fomentation is a local stimulant; a long continued, very hot fomentation is a local astringent; a long continued, not very hot fomentation is a relaxant. In applying hot vinegar, flannel should be

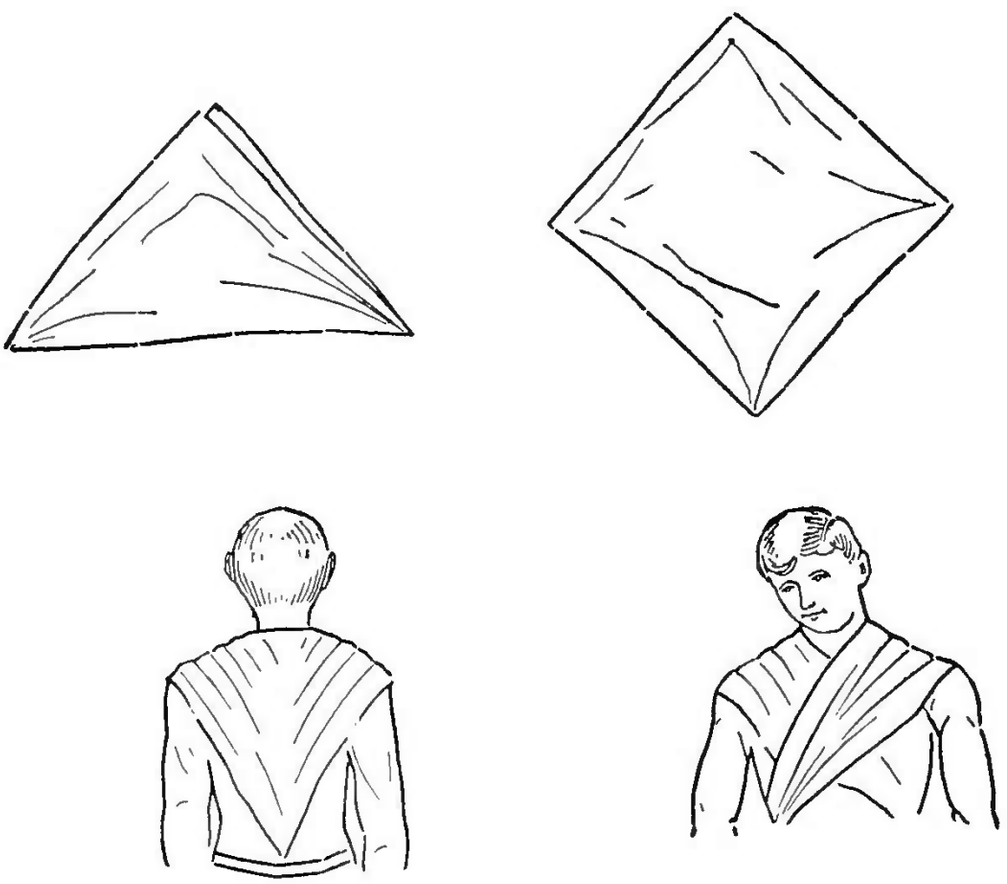

FIG 45. SHAWL WRAP.

used but only two thicknesses of it, covering it the same as the water applications. Whenever the pad becomes cool it must be renewed or removed, but the covering must remain until perfectly dry.

Hot water over the spine, contracts the peripheral blood vessels, checks hemorrhage from the nose and lungs when applied over the cervical and upper dorsal vertebræ, and of the uterus when applied over the lower dorsal and lumbar vertebræ.

Dry Fomentations. When dry heat is desired, put a quantity of hot sand, hot salt, hot bran or hot corn meal into a flannel or a muslin bag. A hot plate wrapped in a cloth is good, a rubber bag filled with hot water is perfect. Put acetate of soda into a tin can tightly closed,

set this in boiling water for thirty minutes, then remove it and wrap up in flannel and apply to the painful part. It will give out heat for many hours.

Medicated Baths and Packs.—*Hay Flowers, i. e.*, the seeds and flowers that scatter on the barn-floor, boiled fifteen minutes in a bag, and the decoction added to the bath. Opens the pores and favors elimination.

Oat Straw, boiled half an hour and the decoction used for the bath or added to it, stronger than the hay flower, and good for kidney and bladder diseases and rheumatism.

Mustard Bath.—Two teaspoonfuls to two tablespoons of mustard flour to hot water, two to four gallons. Stimulating to the skin and

FIG. 46. HEAD VAPOR.

capillary circulation. Draws the blood to the part to which it is applied.

Mullein.—Relaxing, soothing, antispasmodic. Promotes absorption.

Sassafras Tea.—Aromatic, relaxant, stimulant to capillary circulation and absorbents. Must not be boiled.

Smartweed Tea.—A diffusible stimulant with some relaxant power. Excites cutaneous action, relieves internal congestion.

Pine Needle and Cones.—Promote the action of the skin, thus purify the blood and relieve deep-seated congestions.

Fennel Seed.—Aromatic, antispasmodic, carminative, soothing.

Catnip.—Diffusive relaxant, mildy diarphoretic and antispasmodic.

Tansey.—Stimulating, diffusive and moderately relaxing. Externally, stimulating, with a slight tonic after-effect.

Wormwood.—Stimulating and relaxing tonic.

Red Pepper.—Pure stimulant, persistent and intense.

Lobelia.—A pure relaxant. Relieves pain without narcotizing. Should not be used in putrid tendencies, as diphtheria, scarlet fever,

malignant scarlatina, etc. Not proper for extensive external use unless followed by cold stimulating tonic sponge.

Bran Bath.—Four pounds of bran boiled in one gallon of water. Strain and add water enough for bath. Allays irritability of the skin and softens it.

Salt.—Rock salt or sea salt, one pound to four gallons of water. Very invigorating. Taken hot, a quick and reliable stimulant.

Soda.—One teaspoonful of soda bicarbonate, warm water four gallons. Useful chiefly as an ant-acid.

Sulphur Bath.—Twenty grains of sulphuret of potassium, to a gallon of water. For skin diseases and rheumatism.

Vapor, Both Clear and Medicated.—*Head Vapor.* A small tub or a water pail, is filled two-thirds full of boiling water, instantly tightly covered with a thick wet cloth, and placed upon a chair beside which is a higher chair. Patient stripped to the waist and clothing protected by a towel, sits upon the high chair leaning forward over the pail. An attendant throws a large blanket over his head and both chairs, so as to make a tight tent, then uncovers the pail. Eyes and mouth should be opened to take in the vapor. The water should be flavored with a teaspoonful of ground fennel, sage or mint. Duration twenty to twenty-five minutes. They open the pores, aid elimination, relieve humming in the ears, rheumatic and spasmodic complaints of neck and shoulders, asthma and catarrh.

Should patient not perspire freely in ten minutes drop a piece of brick or stone well heated into the pail. Cold sponge at close, and if weather is cold or raw, remain in warm room several hours. One or two a week. For inflammation of eyes, etc., the same evening a hot foot bath with wood ashes and salt for fifteen minutes.

FIG. 47. FOOT VAPOR.

Foot Vapor.—A wide thick blanket is placed lengthwise across a chair upon which patient sits naked to the waist. A pail half full of boiling water, with a narrow board fastened across the top to prevent slipping, is placed before him. Feet rest on the cross board. Blanket then brought around so as to completely envelop the lower limbs of the patient. A hot stone or iron may be dropped in every ten minutes. Duration fifteen to thirty minutes, followed with quick cold sponge, as far as perspiration has been abundant. Valuable for foul odor from the feet, swollen or cold feet, ingrowing nails, determination of blood to the head. One to three times a week. The latter but seldom.

Stool Vapor.—An ordinary chamber vessel one-third full of boiling water or the desired decoction. Patient sits on the vessel fifteen to twenty minutes, followed with cold sponging as far as the perspiration has been abundant. Useful in diseases of the bladder.

Bed Vapor Bath.—The bed clothing may be raised by chairs placed beside the patient or by barrel hoops, then proceed as for croup. Cover crib with a blanket, supported tent-like by the crib posts or by barrel hoops or chairs. Nurse sits with head under cover with the child. Then connect the spout of a teakettle by a pipe with the interior, the kettle resting on a gas or kerosene stove, or hot stones or pieces of brick are dropped into the kettle from time to time. Of course there should not be so much water in the kettle as to prevent the escape of the steam by the spout.

Alcohol Vapor Bath.—Place patient with clothing removed in a large cane-seated chair, and surround both completely with blankets,

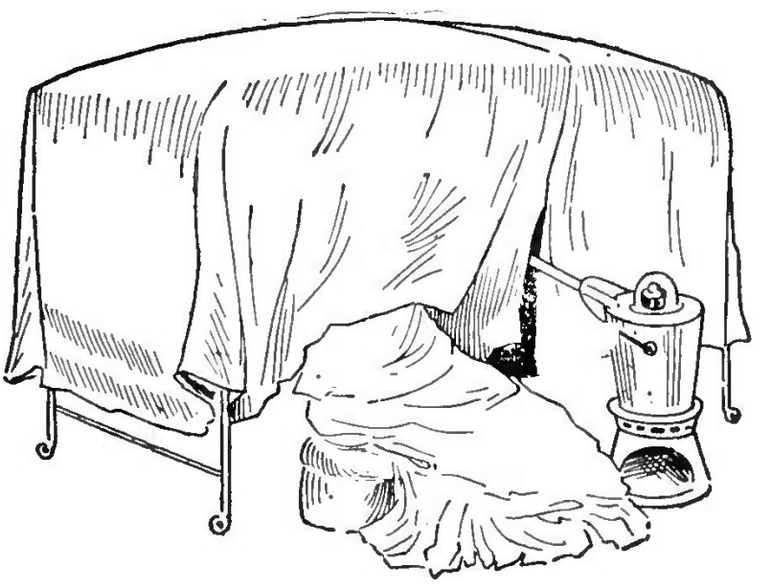

FIG. 48. CROUP KETTLE.

letting them extend to the floor and to be secured about the patient's neck; under the chair place a basin of hot water with an alcohol lamp beneath it, bring water to a boil, and patient will soon be brought into a state of perspiration which may be carried to any desired extent. Use in uræmia, Bright's disease, and whenever diaphoresis is required.

Domestic Turkish Bath.—Pin two large woolen blankets closely together lengthwise. Fasten one corner to the top of a pole about eight feet long. With two screws fasten this to the base-board in one corner of the room. The corner of the blanket will then be the peak of a tent roof. Weight two chairs so that they will not slip and draw the blankets over them in such a way that they will constitute a tent covering.

Close in the corner, set a basin of water in which stand a teacup one-third to one-half full of alcohol. Now heat the room from 95° to 100°. Patient drinks a cup of hot water and sits naked on a blanket-covered chair in the room from fifteen to twenty minutes, wetting the

head occasionally if desired, and drinking more water if thirsty. Then lighting a match in the room he steps inside the tent, drops the open curtain, leaving a very small space at the bottom for ventilation. Then drops the lighted match into the alcohol and seats himself upon a stool.

If the heat becomes too oppressive, he should have at hand a towel wrung out of cold water with which to give himself a hasty ablution, and if necessary to avoid faintness, may stick his head outside the tent, but should keep his body in until perspiration is abundant. Then he should step out of the tent into a washtub, and hastily rub himself all over with some first-class soap; then with a flesh brush rub into a lather all over very thoroughly, rub it off with his hands and pour, at two or three dashes, six quarts of water over his head and shoulders; then wipe lightly and rapidly, wrap in one or two woolen blankets and lie or sit down to cool off gradually, which should take

FIG. 49. SHOULDER SPRINKLE.

one-half to one hour. The temperature of the room meantime having been gradually reduced to about 75°, or an adjacent room at that temperature being used for cooling. Then dress and avoid immediate exposure to chills and cramps. One or two a week.

Turkish baths are excellent in melancholia, insanity from lead, gout, alcohol, rheumatism or syphilis. Valuable in chronic rheumatism, rheumatic arthritis, lumbago, sciatica, eczema, psoriasis, Bright's disease, uraemia, constitutional syphilis, obesity, quinsy, bronchitis, winter cough, early state of phthisis and bronchial asthma.

The Sprinkle.—Provide a garden watering pot that will hold six to twelve quarts, and if no bath tub is in the house, a large washtub.

Shoulder Sprinkle.—Patient bare to waist; leans forward over tub; attendant pours one to five cans on and between the shoulders, and one

on each arm. See Fig. 49. Strengthens the spine and aids the circulation of the blood. Follow with quick ablution of chest, and abdomen and dress quickly.

Loin Sprinkle.—Patient stands in tub and attendant pours one to three cans on the hollow of the back and the hips. See Fig. 50. One to five cans on the lower back, each loin and abdomen, should follow the foot vapor unless the water tread be preferred. Strengthens the spine and aids the circulation of the blood.

FIG. 50. LOIN SPRINKLE.

Knee Sprinkle.—Patient sits on stool, feet in tub and pours two to ten cans on knees, calves, ankles and feet, making the last can a pour by emptying it from the top. Begin with two cans and increase one or two cans each application. Useful for poor feet, poor blood, to harden in convalescence, and as a counterpoise to the shoulder sprinkle. Fig. 51.

The Pour.—Pours are large streams as from the spout of a teakettle falling upon the patient. It powerfully arouses the capillary circulation and absorbent vessels. Also promotes innervation of the deeper parts, should never be long continued—one to three minutes.

The Sponge.—The sponge is a large sponge filled with water, or a towel dripping and applied rapidly to the whole surface, beginning at the back of the neck unless specially directed otherwise. When cold, should be undry, and done within a minute or two. In sickness, may be given under the bed clothes as often as the fever becomes high.

Hot sponge checks hemorrhage, relieves pain and swelling of sprain, diminishes sweating in phthisis, and good for *acne indurata.*

Warm sponge relieves headache of acute catarrh, and aids the granulation of ulcers.

The Tread.—The method is sufficiently evident from Fig. 52 p. 336, but the temperature, time, and depth of water all graduate its effects. Feeble patients should begin with one inch of cool water one minute. The robust can have fifteen inches of cold water three to eighteen minutes. Hardening to the system and draws the blood to the extremities.

The Dash.—Patient stands in nightshirt or sheet; a bucket of

water is dashed over him downward, then he is vigorously rubbed until reaction sets in. The double dash repeats the dash as soon as reaction occurs. The triple dash adds the dash to the double dash. May be undry also. Powerfully arouses the energies of the whole system.

FIG. 51. KNEE SPRINKLE.

The Plunge.—Patient dives into the water head first, or jumps in so that he is completely submerged. Body must be warm all over, may be perspiring to any extent. Cooling, refreshing. Out instantly.

The Swim.—Patient is completely immersed except the head, and engaged in the vigorous exercise of swimming. Must not be protracted until chill is felt. Body must be warm but not perspiring. Should be followed by rest.

The Alternating is quickly changing from one temperature to another, and is single, double or triple, and according to the number of changes made. For example, the alternating double is ten minutes in warm or hot, and one in cold. Ten minutes more in warm or hot, and one in cold, always ending with cold.

Injections.—These may be of any temperature needed and medicated or otherwise, and may be rectal, vaginal, urethral, bladder, nasal, ear or eye.

See Our Colon Flush for particulars of application of bowel injections.

Hot colon flush stimulates the small intestines, liver and pancreas, and is useful in extreme flatulence, strangury, prostatitis, phthisis, and urethral diseases; cold rectal flush, in the collapse of diarrhœa and enterocolitis of young children. Hot vaginal injections or bath excellent sedative in chronic pelvic, uterine and ovarian ailments.

FIG. 52. WATER TREAD.

Rules For Bathing.—Page 23–24 should be read carefully before beginning water treatment, to which we add this important fact: The power of vital reaction in a patient, is a changeable quantity and should always be determined at the

time of the treatment, otherwise that which is ordered for one condition will be applied at another, possibly to the serious detriment of the patient.

Remember. — That temperature in its relation to water treatment is a relative thing, depending on the vitality of the patient; that is, a cool or even lukewarm application to a very feeble patient, may be fully equivalent to a cold one for a vigorous person.

Remember, also, that both age and childhood may be like feebleness as related to temperature.

Remember, further, that nervous dreads may disqualify for cold applications almost as much as feebleness.

Also, that great weariness, especially if long continued, stands related to temperature as feebleness.

Spare patients, with skin in good order, do not need much sweating.

The Special Uses of the Several Applications will be noted in the part on treatment of diseases.

Prof. Winternits declares that after cold-water applications the leucocytes in the blood increase to two, or even three times their original number. Hence the great value of these applications, especially in all infectious diseases, because the leucocytes are the natural defenders of the blood against microbial assailants.

PART VII.

CARE OF THE SICK.

HINTS ON NURSING.

1. Hints on Nursing—2. The Sick Room—3. Bed and Clothing—4. Water Supply—5. Giving Medicines—6. Bedsores—7. Food—8. Treatment of Patient—9. Useful Facts—10. Medication—11. Respiration, Pulse and Weight—12. Landmarks of Diagnosis—13. Questions Concerning Remedies—14. States and Indications—15. Landmarks for Prescription—16. Diet as a Remedy—17. Walking as a Remedy.

The Nurse.—One person only should have the care of the sick if practicable, receive directions from the physician, and report to him. That person should be collected, cheerful, sweet tempered, low voiced, not fussy, quiet but firm. Dr. Warren declares that many lives have been sacrificed to the peevishness of nurses. Should not permit the patient to help himself; should turn the pillows, and sponge the face and hands as often as may conduce to his comfort. Should see that his mouth is cleansed with a soft linen rag, and rinsed occasionally with water with a few drops of tincture of myrrh in it. Hair should be gently brushed daily. Should walk quietly and talk in a low tone, but not whisper. Should speak so that the patient can hear it if he wishes to and not let him feel that there is conspiracy to keep him in ignorance. On entering the room, open the door quickly and firmly, but silently. If sleepy, should lie down at once in sight of the patient and have a nap, for his sake; a dozing nurse is neither soothing nor reassuring to the sufferer.

The Sick Room.—Should be the pleasantest one in the house.

Should never be disfigured by an array of medicine bottles, or the sight of bed pans, urinal or slop-jars.

Should be thoroughly ventilated all the time, and especially *aired* twice a day. Pure air must come from outside. Once a day cover patient with sheet and throw the window open several minutes, or fill an adjoining room with outside air, then admit it.

Should be adequately disinfected during the progress of, and after all contagious diseases, and in all sicknesses should be clarified as follows: Pure oil of turpentine mixed with about one per cent. of oil of lavender flowers, used in the form of a spray from an atomizer. It is surprising how refreshing this is for the occupants, the action being due to the ozone formed, and at the same time perfumed with fragrant lavender.

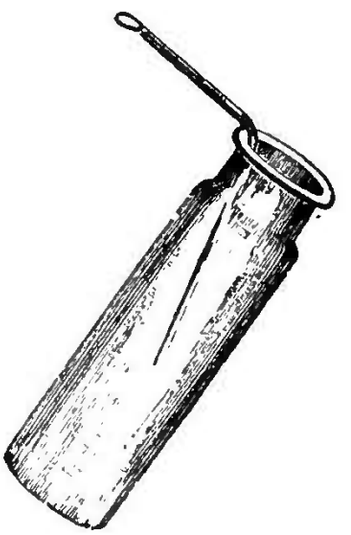

FIG. 53. FOR DROPPING MEDICINE.

Should never be entered (except as patients) by long-faced sympathizers who have a story to tell about somebody "handled just like you are."

Should be provided with a Japanese hot box for night use when it is inconvenient to procure hot water, and hot water bags, family syringe, medicine dropper,—a little vial with a bent strip of soft paper as seen in Fig. 53 if a bulb dropper is not at hand; and for invalids not confined to the bed, in homes where there are no sanitary closets, a corner commode as seen in Fig. 54, with homemade upholstery is desirable, of course with deodorizers and disinfectants.

Should never be "spread up a bit" before the doctor can enter. If it is in too much disorder for him to see, it is for the patient.

It should be kept at a temperature suitable to the disease, usually about 70° days and 60° nights.

Should be quiet and restful.

Should be beautified with flowers and pictures.

The colors of paint and paper (if there is any; better have whitewashed walls,) should be of a quiet, cheerful tone.

Should be swept only when the patient can be taken to another room, or with a broom wrapped in a damp cloth to keep down dust, or with a quiet carpet sweeper.

Should never be opened to general visitors except by the direction of the physician.

Bed, Bedding and Clothing.—The bed-linen, change frequently. Hair or husk mattresses better than feather beds. Keep under-sheet smooth as possible. The covering warm, without being heavy. Light blankets and sheets. No sick person should sleep with the head under the bedclothes, for in doing so he will be constantly breathing air poisoned by exhalations from his body. Blankets allow these emanations from the body to pass through them, while heavy cotton counterpanes do not; besides, they distress the patient by their weight. If possible, the bed should be made once or twice daily. Keep the covering evenly and smoothly placed over the patient. Soiled sheets and every offensive thing should at once be removed from the bed and room. Do not air clothing in the sick room. If the condition of the patient will permit, have two nightgowns,—one for day and the other for night. Hang the one not in use by an open window, and warm it before using it again. If possible, have two sets of blankets—one set in the open air, while the other is in use.

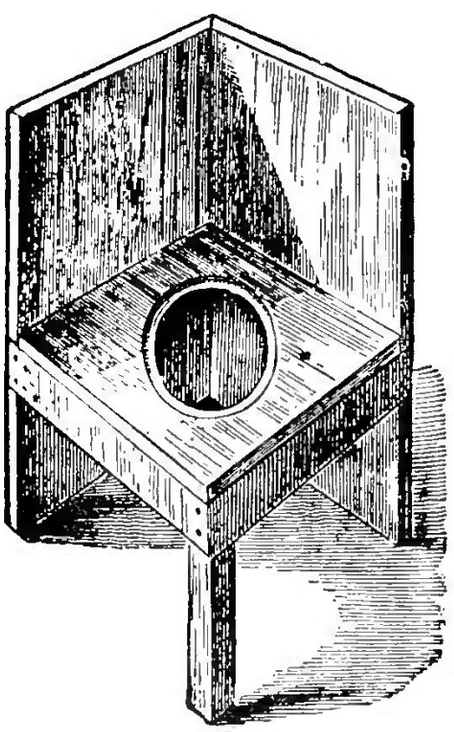

FIG. 54

The Water Supply.—The addition of one per one-thousand of hydrogen peroxide to ordinary drinking water, to drinking water containing sewage, or to water containing typhoid bacillus or cholera bacillus, is quite sufficient to destroy the various saprophytic and pathogenic organisms contained under these conditions, if it is obtained perfectly fresh and

kept in good condition, and if it is allowed to act for a period of twenty-four hours. It is specially valuable for the disinfection of drinking water because it does not affect the taste, does not alter the color, and in the proportion mentioned is perfectly innocuous. Should always be used.

Giving Medicine.—Follow directions. Never guess at size of dose. Write directions on bottle label. Write down the hours of giving and cross them off each time. Wash spoons and glasses after use. Note down on paper every change, chill, bowel movement, etc., and report to the doctor. Disguise nauseous medicines as much as possible; if very bitter, rinse mouth before and after with wintergreen water. If castor oil, thoroughly mix with four times as much hot milk by shaking in a bottle which they do not more than half fill.

Bedsores.—Keep under-sheet smooth. Sponge spots where they are likely to occur, three or four times a day with alcohol, or witch hazel extract. If redness becomes constant, report it to the physician. Provide air cushions if necessary.

Food.—Do not serve a large quantity; the amount may produce aversion. If more is desired, serve it on a clean plate and freshly warmed, and in the daintiest manner possible. If any remains, remove it from the room immediately. Give as much variety as the disease will allow. Give a little the last thing before sleep at night. Give something warm on waking in the morning. Do not ask what he will have, but bring what is best. If able to help himself, provide a bed-tray as in Fig. 55. To feed insensible and delirious persons, attract the attention as much as possible, then glide the spoon back and forth upon the lip, and when they instinctively part, pass it well into the mouth and empty slowly. Never hurry the sick while eating. Consult special foods and how to make them for

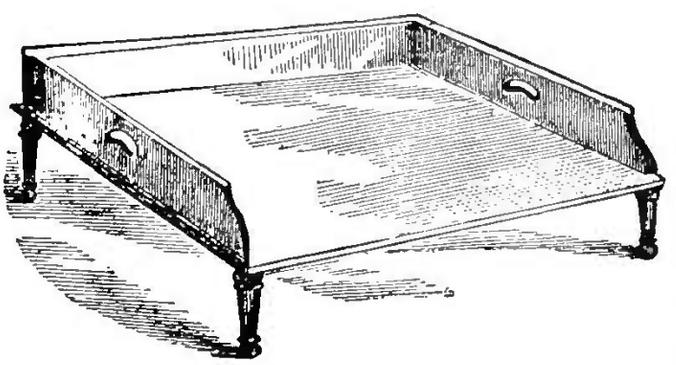

FIG. 55.

appropriate foods. If food must be given before there is any relish for it, do not try to make it appetizing with flavors, but as near neutral as possible, and give it as medicine.

The Patient.—Should be protected from uncongenial visitors and nurses.

Should receive food and medicines regularly, except when asleep, and never be aroused from sleep except by direction of physician.

Should be humored in unimportant whims and fancies, and gently but firmly *controlled* in all essential matters.

Should be made as *comfortable* as the circumstances admit, without fussiness and often being asked if he "will have anything," or disturbed by unnecessary arranging of bed clothing, etc.

Should have the physician of his choice, if practicable.

Should not be deceived, either by physician, nurse, or friends. The whole case need not always be told, unless explicitly asked. Even then, it may be best sometimes to say, "It is not best to tell you all," but never misrepresent facts. There are higher interests than those of health, and they are often sacrificed by the deliberate prevarication of those who mean well, but make a fatal mistake.

Should be gently and sweetly (not sanctimoniously) assured of God's interest in his individual case, and encouraged to trust in Him, not for the soul's welfare only, but for the sake of the healing influence of such sustaining confidence.

If religious ministrations are desired they should be discreetly afforded, even though the case be so serious as to exclude all other calls.

Mr. M. N. Adler read before the Oriental Congress, a paper illustrating the power of religious habits by comparing the death rate of the Jews and of the general American population from phthisis, diabetes, and diseases of the spinal cord, and also of the number of the insane amongst people similarly classified. The figures are as follows: From phthisis the mortality amongst the Jews per 1000 was—males 36.57, females 34.02; while amongst the general population it reached—males 108.79, females 146.12. From diabetes—Jews per 1000—males 19.85, females 19.59; and the general population—males 2.74, females 1.21. From diseases of the spinal cord—Jews per 1000—males 9.40, females

6.18; general population—males 3.73, females 3.32. Although these diseases, spinal complaints and diabetes, have such an important influence on the mortality of the Jews, and are supposed to arise principally from nervous and mental strain (to which the exhausting business pursuits and headwork of the Jews are supposed to subject them), the number of insane amongst them is only 44.5 per 100,000 of population, while amongst the general population of the United States it is 183. If such is the influence of special religious culture upon health, its effect in disease ought not to be overlooked.

Useful Things Learned by Personal Sickness.—*To Relieve a Hot Aching Back in Bed.*—Lie on one side and lift the cover just at the back so as to give it a cool air bath.

To Rise From Bed Easily.—When suffering from lame back or weakness, turn on side facing the front of bed. Extend the under arm so that the elbow will be on the bed near the edge. Lift that fore-arm vertically with thumb and fingers forming a crotch. Now raise the other upper arm and, its hand crotched within the other crotch, pry down with the upper hand and roll the body forward at the same instant, and it will be gently but firmly lifted to almost the perpendicular with a very slight effort.

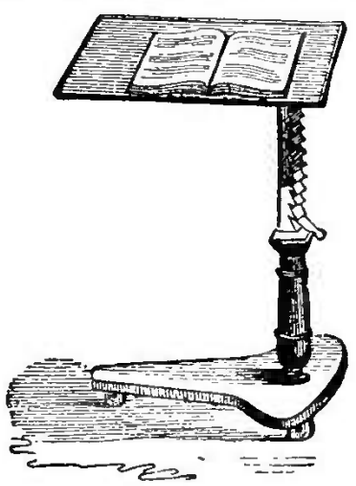

FIG. 56.

To Walk up Stairs Without Needless Strain.—Keep the body perpendicular, and plant the heel as well as the ball of the foot upon the stair.

To Relieve Uneasiness From Surface Heat.—Take the upper end of the bed clothes in both hands and shake them up and down so as to make a billow motion toward the foot. If that is not sufficient, wring a towel out of cold water and hastily rub over the surface under the underclothing, and lie down without drying.

To Enjoy a Meal When Too Much Fatigued, or Stomach Too Feeble to Eat.—A glass of hot milk a few minutes before the meal; or, stale bread crumbled into a cup of weak black tea.

Reconstruction Must Be Upon the Principle of Construction; i. e., what will build a baby into a healthy man, will re-build an invalid into health.

To Relieve the Monotony of Beginning Convalescence.—Have a reading stand something like that in Fig. 56, on which to have a book of pictures, some illustrated papers, etc.

MEDICATION.

Health consists in an exact equipoise between the chemical forces which seek to dissolve the physical structure of animal life back to its primal gaseous and mineral constituents, and the vital force which perpetuates that complex existence. Our condition varies from that medium normal line of exact equipoise, up to the most robust and exuberant vitality on the one hand when vital force is in excess, and down through derangements of vital functions, degradation of molecular structure, disease in all its multiform aspects, and death when the chemical forces prevail. *De-vitalization* then, means—in the hands of the enemy—disintegration already begun. It is always serious, very often fatal in its consequence. The instinct of self-preservation, as well as the warnings of experience, prompt men to seek a remedy. Too often they attempt to find it in drug-medication, by which is meant, the employment of drugs of unknown properties, or in mistaken ways by physicians, and the haphazard use of patent and proprietary nostrums by self-prescription of people who know neither their own condition nor the nature of the compound that they purchase. The people of the United States spend eighty million dollars annually for such nostrums, a very large proportion of which adds to the torrent of disease that rages through civilized life. Drug-properties misapplied are always injurious, and usually in direct ratio with their good effects when rightly applied.

The Value of Medicines.—The microscope, the spectroscope and chemical analysis give clearer information now concerning the true condition of a patient than was possible in former years, when they are applied by experts. But not one case in 10,000 is thus scientifically investigated, so that the vast majority of cases must still be exposed to all the mischances of their condition. We could add whole chapters similar to those on Pages 42-44 regarding the evils of drug

dosing and the uncertainties of medicine. But we protest that these statements should only be regarded as expressing the disappointment that their authors (however eminent) met in their own practice, or the fact that they failed to get beneath the prescribed formulas of their times to the reasons *why*.

Medicine is not an exact science; nor can the same certainty reasonably be expected in its practice that is found in

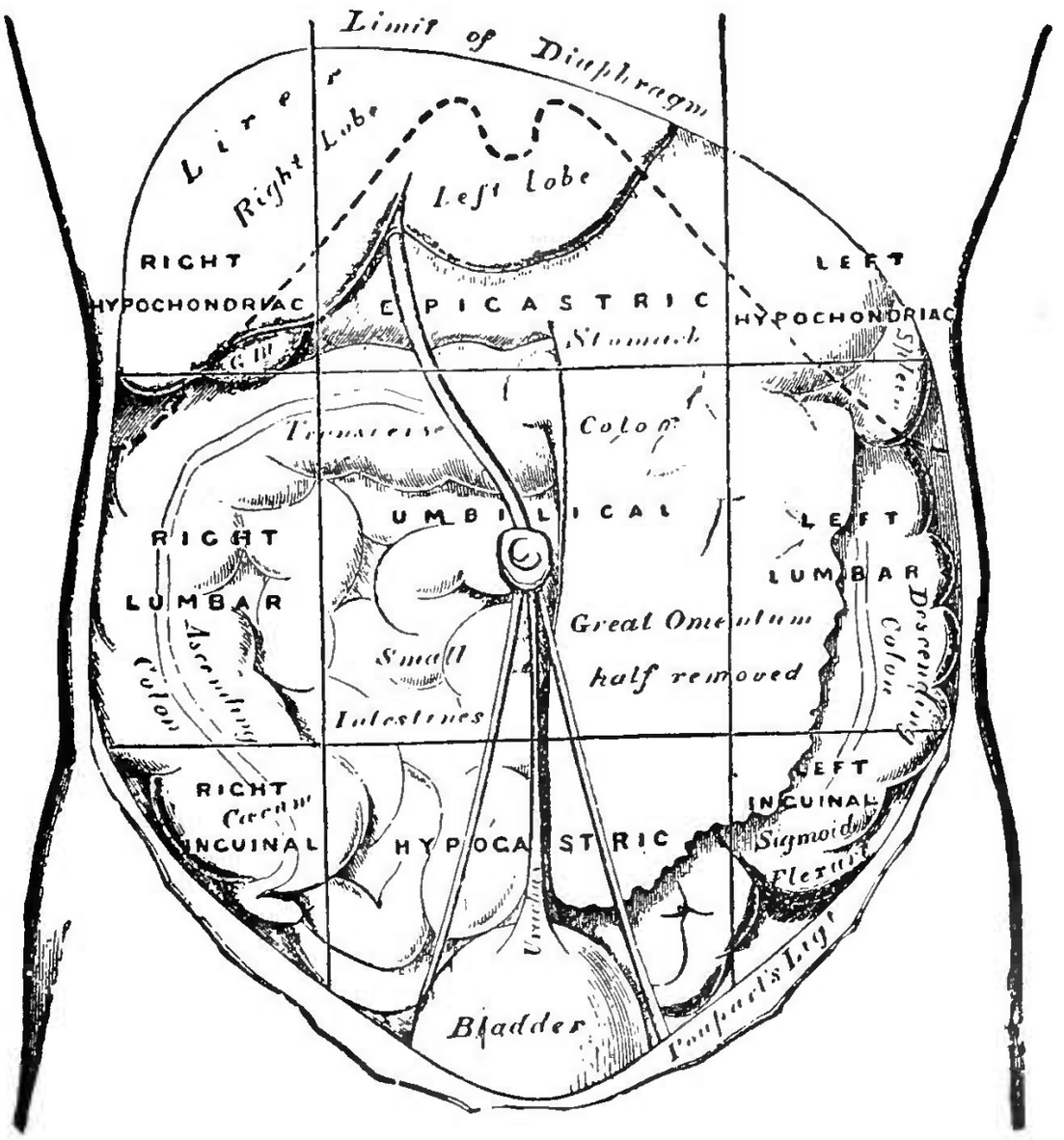

FIG. 57. REGIONS OF THE BODY OFTEN REFERRED TO IN TREATING OF DISEASE.

the applied sciences, yet, notwithstanding this, there is enough of known cause and effect in it to entitle it to the confidence of the world in its time of direst need. Hence, in the following pages in addition to the treatment without drugs, for the

various diseases, in deference to the convenience of the many whose circumstances compel them to choose medicines, and our own conviction of the real value of correct medication, we shall add such prescriptions as may be required.

Breathing, Pulse and Weight.—The weight of the body at birth is from 2 to 12 pounds, or an average of 7½ pounds, while the average weight of a grown man 5 feet 1 inch high is 120 pounds, increasing gradually to about 178 pounds, for 6 feet in stature. When the weight increases more than 7 per cent. above the average, respiration becomes diminished. Clothes average about 1-18 of the weight of the body in autumn and early spring. The pulse and respirations per minute vary as follows:

The Pulse and Respirations Per Minute.

		Respirations.
At birth	130	33
At puberty	90 to 80	22–20
From puberty to 45 or 50	80 to 75	20–18
From 50 up to old age, a gradual decrease	75 to 65	18–16

Some Landmarks of Diagnosis.—In the United States there are 18 deaths to every 1000 population, and 25 sicknesses to every death each year. This, at 60,000,000 population, gives 1,080,000 deaths, and 27,000,000 sicknesses each year. Counting 12,000,000 families, there are two and one-fourth disabling sicknesses in every family every year, that is, one sickness about every five months. If the periods of disability average two weeks, that will be about one week of every two and one-half months. Hence it is a matter of great importance to know how to shorten those sicknesses as much as possible. All sicknesses are either functional or organic derangements, or both.

Functions, when not normal, are either excessive, diminished or suppressed.

Organs, when diseased, are in a condition of super-vitalization or de-vitalization.

Functional: The functional states may be learned from their appropriate secretions, excretions and other products, such as sensibility in a nerve, thought in a brain, etc., which are excessive, diminished or suppressed according to the activity of the function.

Organic: Organic super-vitalization is indicated by augmented circulation and temperature, and corresponding increase of functional activity. Organic de-vitalization is known (1), by diminished circulation and temperature, with corresponding decrease of functional activity as in local paralysis, or (2), by increased temperature, with sluggish, plethoric circulation and partial or entire suspension of functional activity, as in abscesses, or (3), by reduced temperature, stasis of circulation, suspension of nutrition, and disposition to slough, as in old ulcers.

Systemic: When there is excess in one region there is usually corresponding deficiency elsewhere.

Remedies: Therefore remedies for any of these conditions should be—(1). At the point of the disturbance, in order to correct the excess or deficiency agents, the effect of which is opposite to the condition to be changed. (2). Remote from the locality, in order to reinforce the local agent, means that will tend to restore the balance of circulation and temperature, e. g. a congestion about the chest should not only have a local relaxant, but a foot stimulant to act together toward the same object.

Questions to be Asked in Selecting a Remedy:

1. Does the disease exhibit over-stimulation? If so, seek a relaxant.

2. Does the disease exhibit over-relaxation? If so, seek a stimulant.

3. Does the disease exhibit deficient secretions? If so, seek a secernent.

Secernents are remedies that excite the secretions, such as saliva, gastric juice, bile, intestinal fluid.

Excernents are remedies that increase the excretions, perspiration, fæces, urine.

4. Does the disease exhibit retained excretions? If so, seek an excernent.

5. Does the disease exhibit both over-relaxation and over-stimulation? Then combine relaxants and stimulants.

6. Does one exist in large measure and the other in small? Then adjust the combination accordingly.

Nature can only be helped by giving the opposite of any surplus condition.

States and Indications Classified.—*States of Functional Excess:* (1). Excess of secretions, ear-wax, tears, saliva, gastric fluid, bile, intestinal fluids, pancreatic fluid, mucus, spermatozoa and ovules, known by comparison with normal average. (2). Excess of excretions. Perspiration, carbonic acid and water of expiration, urine, fæces, bile, and menses, known by comparison with the normal average. (3). Excess of sensibility and thought, unless extreme, difficult to ascertain.

Indications in Such Excess: Rule. The average normal quantity per day of any secretion or excretion, corrected by the peculiarities of the individual as learned from his experience, is a true guide as to his physical condition in those respects, e. g. the average secretion of urine is about forty ounces per day, but during a long period of health, Mr. A. has uniformly secreted but thirty-four ounces, therefore, the latter is his normal standard, and if at any time it be found to run for several days together at forty-four ounces while no change in diet or habits can account for it, he is justified in concluding that an abnormal excess of action of the kidneys is present. So of any excretion or secretion that is open to observation.

States of Deficient or Suppressed Secretions, etc., are the opposite of the foregoing, and of course require opposite treatment.

Merely functional disturbances of whatever nature, are easily and safely curable by water applications alone, or reinforced by simple teas, extracts, embrocations, etc.

States and Indications of Organic Diseases.—These, particularly the de-vitalized conditions, are far more serious than the functional, because the more complete the devitalization the more do they approximate death. The first stage of congestion is one of supervitalization; it is nature concentrating her energies for the expulsion of some foe or the repair of some lesion. Therefore, when the heat and pain are felt, they are nature's call for relaxants if there be obstruction or irritating foreign matters present, and for rest and invigora-

tion if there be repair to carry forward. Hence the tepid bath, or the lobelia for relaxation, and the cool compress for the healing. But when the foe has become too strong and is safely entrenched as in a chronic ulcer, relaxation will only extend the area of his conquest.

Super-vitalization must be restored by antiseptics and stimulants until the subjugated tissue shall be sloughed off, and new be formed in its place.

These illustrations are designed to convey to the common mind the fundamental principles that underlie all arts of cure by whatever means effected. Organic change from disease to health, when not accomplished in the manner named, is wrought by the analagous process of metamorphosis of tissue ; in both cases the principle is the same.

Landmarks for Prescription.—The reader should not be troubled about names of diseases, but should seek to know the condition requiring treatment, and should constantly bear in mind the fact that treatment must be opposite to condition. As a guide to treatment, he may act upon the assurance that substances and power act upon the body in four general ways, namely: (1). Physically, as by blows, pressure, the expansion of heat, contraction by cold and the like; (2), chemically, as in the corrosion of acids and alkalies; (3), supportively, as in the nourishment of food, invigoration of air and sunlight, etc.; (4), depressively, as in the prostration of grief, narcosis, etc.

Vitality is measured by the degree to which the life-power can appropriate the friendly and react against the hostile effects of all these operations. Remedies are instruments in the hands of vital force. Therefore the vitality of the patient should be as accurately estimated as his condition should be correctly observed, and the means of treatment carefully studied. These three vantage points being gained, any person can be a successful home doctor. And these not being assured, no man can be a successful physician, though his walls be adorned with medical diplomas, and medical societies make haste to do him honor. Dr. Cook gives three tests of true remedies, which it would be well for the non-professional

reader to heed: (1). Their action is definite, and the vital response is definite; (2), can be given persistently and indefinitely until they accomplish their work; (3), after their work is accomplished, the parts are stronger than they were before.

Innervation is a word that expresses the degree of vitality of any part, because vitality is dependent upon the integrity of the nerve functions. Most remedies also act by direct impression upon the nervous system, although some neutralize morbific elements and others supply needed constituents. Diseases are marked by, even if they do not originate in, derangements of innervation. These derangements affect the caliber of the blood vessels, thus modifying the circulation, temperature and functional activity of the organs and tissues. Normal innervation keeps up the alternate action which seems essential to life, as in the contraction and relaxation of the muscles, the alternate contraction of the longitudinal and circular fibers as in peristalsis, etc., and likewise maintains a similar alternate equipoise between the two systems of nerves, namely the cerebro-spinal and the sympathetic (or ganglionic).

Important Facts: (1). Whenever a spinal nerve is excited, all the blood vessels supplied by that nerve will dilate, the blood pressure will increase, and the secretions augment. If the excitement be excessive, it overcomes the opposing action, and congestion results. In excessive spinal innervation, the flesh will be soft, full; pulse full, low and soft; secretions abundant and bland, tending to become alkaline and purulent, and predisposed to fevers, congestion, catarrhal affections, glandular enlargements, and sluggish capillary circulation. Such will not bear opiates or sedatives, but require ganglionic stimulants. Bitter medicines energize the whole nervous system but particularly the cerebro-spinal.

(2). If a ganglionic nerve be excited, the circular fibers of the blood vessels connected with it will contract and anæmia set in. If the excitement be excessive, fainting will result. Contraction of the circular fiber produces flexion and tends to atrophy. Excessive ganglionic innervation gives quick, wiry pulse; hard, fine-grained tissues; activity of mind

and body; great sensitiveness, inclining toward nervous affections, neuralgia, anæmia of brain and cord, mental diseases, insufficient assimilation, scanty, acrid secretions and emaciation. Such bear sedatives and bitter tonics well; because sedatives relieve ganglionic tension and the tonics increase cerebro-spinal nerve energy. Acids, acrid vegetable remedies and many of the alteratives and tonics excite the ganglionic system.

These illustrations show the extremes of antagonistic innervation. A careful observation of the patient will show whether functional disturbance is of the congestive or anæmic type, and indicate the appropriate treatment as above suggested. The foregoing facts should be borne in mind in the application of all remedial systems. Had Dr. A. B. Woodward had these in mind he would not have written:

> The practice of giving alterative medicine is perfect guesswork. I have always been taught by my teachers that it (the word alterative) was a kind of dark horse to be drawn in occasionally, without having, perhaps, a very definite idea of its meaning."

Diet as a Remedy for Disease.—Bouchard's discoveries of the poisonous properties of the excretions of the body, especially that the greater part of the toxic ptomaines, upon which those poisonous properties depend, are generated by microbes in the alimentary canal, the existence of which may be very largely regulated by the diet of the patient, shows the special importance of diet in sickness, and his term, "Intestinal Asepsis," presents the object to be aimed at, namely—to clear the alimentary canal of germs and thus rid it of their toxic ptomaines, which are the cause of many maladies remote from the digestive tract as well as those within it. A re-reading of pages 284–287 will sufficiently emphasize this point.

Walking as a Remedy: "If we could persuade every person who sees this journal to make a firm and solemn resolution, and to adhere thereto, that he would hereafter, rain or shine, hot or cold, walk five miles per day, we would feel that we had accomplished a task that would entitle us to a place among those individuals whom we would esteem as great. We would ask for no further epitaph than to have it truthfully engraved on our editorial tombstone: Here lies the body of the man who succeeded in persuading his fellow creatures to walk five miles every day."

Thus writes the editor of "The Annals of Hygiene." Some get it in their daily work; multitudes die prematurely for lack of it. The heat-producing function in full play within, and sensible clothing without, may safely defy weather, and the invalid should be taught to avail himself of this means of help in chronic ailments.

PART VIII.

PARTICULAR METHODS AND SPECIAL DIETS.

Fifteen Methods of Treating Various Forms of Disease Without Too Much Drug Dosing Fully Described, and Directions Given for the Application of these Methods—Numerous Special Diets Prescribed for use Under Certain Circumstances.

In harmony with the plan of this volume to teach the intelligent use of healing methods, rather than reliance upon a particular drug-formula, the following graded methods have been elaborated and are commended to the careful study of the reader. The selection embraces a wide variety in order to suit the convenience of readers scattered all over this, and perhaps some foreign lands.

The outlines are drawn for adults only; therefore if children are to be treated, the same modifications are requisite as in drug dosing. (See Index). Particular reference should constantly be made to Our Water Treatment, Page 316, and Our Colon Flush, Pages 283–298.

It is advisable never to employ strong methods when the average, mild, or very mild, will do as well. The brief notes that preface or are appended to the several methods, are of great importance, and should be attentively considered.

In the succeeding part, the treatment of diseases, reference will often be made to these methods, and should be always considered as an essential part of the prescriptions in which they occur.

1. Rapid Blood-Making Method.—For exhaustion from hemorrhage, anæmic prostration, and similar cases, use the following treatment, graded as the case seems to require.

Very Mild: Milk warm from the cow, every hour or two; Bovinine in small doses added to the milk.

Mild: Bovinine added to the warm milk in larger doses, or Mosquera's beef cacao.

Average: Rose's or Rudisches' beef peptonoids, with milk and dyspepsia crackers.

Strong: Salted raw egg retained enema every four hours, Mosquera's beef meal every two to four hours. If stimulants be indicated, egg coffee by enema or stomach, also may be used. Secernent methods, No. 10, mild; excernent method, No. 8, very mild; calcium lacto phosphate three times a day, one and one-half grains, or Hensel's Tonicum one to two teaspoonfuls a day.

Very Strong: Nutritive retained enema, No. 3, page 224, every three or four hours, and Mosquera's beef meal every two hours. Oxygen inhalations, or Thermo-ozone battery. If stimulants be indicated, our milk punch, page 222, or wine whey, page 231, or liquid peptonoids. Inunctions of warm olive oil. Secernent method, No. 10, mild; excernent method, No. 8, mild; calcium lacto phosphate one and one-half grains six times a day, or Hensel's Tonicum two to four teaspoonfuls a day, or both the calc. lacto. and the Tonicum as in strong.

2. Nutritive Method.—In each case, colon flush as necessary to secure full regular movements of the bowels. See pages 284–286. Regular cool or cold baths adapted to the condition. See pages 19–20. Sun bath twice a week; page 8. Exercise in the open air according to strength. Expend less vitality each day than is gained. In particular diseases see Special Diets. Always remember that a merely mild nutritive diet in one condition may be a very strong or even a prohibited diet in another condition. Therefore study condition as well as nutrition.

Very Mild: Selections from corn meal gruel, our toast, unleavened wafers, egg and milk, dyspepsia crackers, Boston crackers, bovinine in small doses, mutton chops or side, beef flank, gluten gems or gluten bread.

Mild: Gluten gems or gluten bread; beef neck or sirloin; goose, mutton leg or shoulder; tongue. Oatmeal with our malt extract; sea bass, perch, porgy; canned salmon with our digestive salt; walnuts, hazelnuts; chicken, chicken panada; gluten cake.

Average: Gluten bread, beef round; nut and fruit pudding; ox heart, smoked tongue, smoked herring, pigeon, wild duck, pike, beans, lentils; liver, roach, hare; sardines, almonds; dried peas; Mosquera's beef cacao, coffee, cream.

Strong: Codfish creamed; Rose's, Rudisches' or the Arlington Co.'s beef peptonoids, small doses; cottage cheese, beef smoked; anti-anæmic diet; Spanish mackerel, sausage; peanuts, date pudding, peach pie deep, gluten gems. If stimulant is needed, eggnog, No.1. Our malt extract with sweets and starches, our digestant with meats, and our digestive salt with fish and nuts.

Very Strong: Beef tea nutritive, Mosquera's beef meal, cottage cheese, No. 2, rapid blood-making method very strong, skimmed cheese, nut and fruit pudding, dyspepsia crackers, strawberry pudding, raspberry shortcake, fig pudding. If stimulant is needed, eggnog, No. 2. Digestants as in strong.

3. Tonic Method.—In order to be permanently beneficial, the following points are to be gained, namely: (*a*) There must be consumption of oxygen beyond the habitual measure, page 107. (*b*) The amount of food taken must be graduated to the intake of oxygen. Pages 104–111. (*c*) The various food elements must be adjusted to the need as determined by the nature of the disease, the age and sex, the amount of exercise, the degree of exposure, and the activity of the secreting and excreting organs, pages 117–121. (*d*) Cool or cold baths must be adjusted to the reactionary power so as to secure a free and somewhat rapid metamorphosis of tissue. (*e*) If tonics are employed they must be such agents as will moderately constringe the tissues without depressing the nerves or over-stimulating the glands, and must contain the cell constituents that are most disturbed, e. g., phosphorus for depleted nerve-cells, iron for anæmic blood-cells, etc.

Very Mild: For the skin, partial cool ablution. For the nerves extra sleep and recreation. For the blood, nutritive method, No. 2, very mild. Secernent method, No. 10, very mild. For the muscles, extra outdoor exercise adapted to condition; or if confined to the house, massage.

Mild: Skin, whole cold ablutions. Nerves, kali phos. three times a day, or mag. phos. three grains three times a day. Blood, nutritive method, No. 2, mild. Secernent method, No. 10, mild. Excernent method, No. 8, as needed. Muscles, gentle muscle beating. By stomach or retained enema, hops, a mild infusion three times a day, or dandelion two ounces to the pint; dose two to three ounces, three times a day.

Average: Skin, partial cold showers. Nerves, scutellarin resin one-half to two grains every three hours, or caffeine (alk). one grain three or more times a day. Blood, nutritive method, No. 2, average. Secernent method, No. 10, mild, excer nent method, No. 8, as needed. Muscles, massage. By stomach or retained enema fl. ext. gentian or berberine (alk.) one-sixth to three grains before meals, or cascarilla powder twenty to thirty grains, or hydrastine (alk.) one-sixth to one-half grain twice a day.

Strong: Skin, whole cold showers. Nerves, cypripedin (con.) one-fourth to two grains every two hours; or assoffœtida ten to fifteen grains every four hours; or valerianate of zinc one grain three times a day; or oil of valerian four or five drops every four hours. Blood, nutritive method, No. 2, strong. Secernent method, No. 10, as needed. Excernent method, No. 8, as needed. Muscles, systematic exercises adapted to condition; outdoor athletic games; by stomach or retained enema, quassin (neut.) one-twelfth to one-sixth grain in water before meals; or cinchonine two grains three times a day; or quinine sulphate two grains twice a day.

Very Strong: Skin, cold whole baths. Nerves, phosphorus one-one-hundred and thirty-fourth grain three times a day for one week only; or strychnine sulphate (alk.) one-sixty-seventh to one-twenty-fourth grain every four hours; should be used but two or three weeks. Blood, nutritive method, No. 2, very strong; secernent method, No. 10, and excer-

nent method, No. 8, as needed. Muscles, thorough gymnastic course for harmonious development; by stomach or retained enema—nitric acid five to fifteen drops in four ounces of water, the whole given in divided doses during the day when there is looseness of bowels; or nitro-hydrochloric acid three to six drops in plenty of water after meals, with teeth protected in both cases.

4. Blood-Cleansing Method.—The process is the same for both acute and chronic cases, except that it must be pushed so much more rapidly in the first that it is here given separate consideration, and is designed to meet conditions of acute blood poison, malignant erysipelas, cancer, diphtheria, etc. The outline only indicates what should be aimed at as far as the circumstances allow. Of course not the whole of all the treatments here suggested are to be used in any case, but such features of each as seem best adapted, or are at command. Much discretion should be exercised.

Average: Head or foot vapor alternated with shawl wrap or nightshirt wrap. Excernent method, No. 8, average. Rapid blood-making method, No. 1, mild to average. One to four quarts of pure soft water drank daily.

Strong: Excernent method, No. 8, strong; if necessary aid with diaphoretic method, No. 9, strong, or with stimulating method, No. 6, strong, and nutritive method, No. 1, strong. Peroxide of hydrogen thirty drops three times a day in water, or calcium sulphide one-twelfth grain six to twelve times a day.

Very Strong: Excernent method, No. 8, very strong, reinforced if necessary by diaphoretic method, No. 9, very strong. Also stimulating method, No. 6, very strong if needed, and nutritive method, No. 1, very strong. Baptisin (glu.) one to three grains for typhoid, putrescent tendencies. Hensel's Iron Tonicum, large doses when the red blood corpuscles need to be increased; potass. permanganate to burn out the impurities, one to two grains after meals. Resorcin one-half to one and one-half grains every two to four hours till stools are odorless, when intestinal symptoms are grave.

5. Alterative Method.—This very vague word, as generally used, is considered in this treatment to embrace

excernent, secernent, and nutritive processes, and to be equivalent to a slow blood-cleansing.

Very Mild: Excernent method, No. 8, very mild, except for the skin, which should be mild. Secernent method, No. 10, very mild. Nutritive method, No. 2, mild.

Mild: Excernent method, No. 8, mild, except skin, average. Secernent method, No. 10, mild. Nutritive method, No. 2, mild.

Average: Excernent method, No. 8, average. Secernent method, No. 10, average. Nutritive method, No. 2, average.

Strong: Excernent method, No. 8, strong, modified to suit anæmia and neurasthenic conditions. Secernent method, No. 10, strong, modified to suit plethoric conditions. Nutritive method, No. 2, strong, modified to suit plethoric conditions.

Very Strong: Excernent method, No. 8, very strong, modified like strong. Secernent method, No. 10, very strong, modified like strong. Nutritive method, No. 2, very strong, modified like strong.

When substantially the same thing occurs in Nos. 8 and 10, as adopted in the above gradations, the one most appropriate should be employed—not both.

6. Stimulating Method.—Designed to temporarily quicken the action of the vital force without any permanent augmentation of its power.

Very Mild: Coffee weak, one-half strength of our coffee, No. 1, or beef tea, or mutton broth. Warm bath every other day.

Mild: Wine whey, beef essence, ginger tea, our coffee, No. 1, warm bath every day.

Average: Coffee, double or treble our coffee, No. 1; hot bath every third day; retained enema every day of beef essence; Virginia snakeroot, three drams to one pint steeped in covered vessel an hour, much below boiling point, one tablespoonful an hour. Hot, dry applications often renewed.

Strong: Milk punch, or eggnog, No. 1. Hot bath every day, very short, and only for a few days. Retained enema night and morning of black coffee or Virginia snakeroot, tincture one-half to one teaspoonful; or tea of smartweed, or myrrh ten to thirty grains every four hours. Extensive mustard plasters. Carbonate of ammonia, five grains every two hours; fomentations, poultices, etc.

Very Strong: Whisky drink, or eggnog, No. 2. Hot salt or mustard bath two or three times a day, very short, only for two or three days, and retained enema every two to four hours of brandy or capsicum. Capsicum one to four grains often as necessary. This may alternate with prickly ash bark, ten to thirty grains three or four times a day. Hot and stimulating local applications—smartweed or pepper tea. Hypodermic injections of brandy. When the secretions are locked up, stimulants can be useful only to aid their ejection after relaxants have opened the sluiceways. When the pulse is hard and fevered, stimulants will increase the difficulty. In these conditions, therefore, first use excernent and relaxing treatments until these symptoms disappear.

7. Relaxing Method.—Large quantities of relaxants should not be used in dropsy, peritoneal effusion, congestive chill, delirium tremens, or any congestion with decided prostration. Relaxants are only useful in states of tension, and are always injurious if used when the tissues are already lax. Tepid is practically a relative term, and while 80° may be such for the average, 85° will be no more than tepid to others.

Very Mild: Tepid sponge 80° once a day, warm clothing, warm, moist atmosphere, and warm water as a drink; tepid rectal flush.

Mild: Tepid sponge 80°, two to four times a day, or vapor bath 110° to 115°, once a day. Tepid shirt wrap once a day 15 to 25 minutes; catnip tea, balm tea. Tepid sigmoid flush.

Average: Tepid full bath, or vapor 115° to 125° once a day; tea of black cohosh for irritable nerves, irritations of serous membranes, rheumatism, uterine congestions, etc. Tea of valerian for nervousness, restlessness, hysteria, etc. Tea of boneset for inward muscular structures, stomach, gall ducts, bowels, uterus, etc., given cold. Tepid cæcal flush.

Strong: Body pack—tepid, once a day. Tea of plurisy root for febrile and inflammatory conditions. Tea of lady's slipper for hysteria, headache, sleeplessness, and spasmodic action.

Very Strong: Full tepid pack, forty to eighty minutes.

Tea of lobelia, or retained enema Nos. 7 and 23 mixed. If necessary, pack, tea and enema.

8. Excernent Method.—Increasing the products of excretion; i. e., the elimination of matter no longer needed in the constructive vital processes, and that must be expelled to prevent the deleterious effects of their chemical or mechanical action, if retained.

The excernent remedy should be selected with particular reference to the need, not goad all the functions for the relief of a single organ unless the danger be imminent. Sweet and starchy food should be avoided when uric acid is to be expelled to an unusual degree. When the formation of urea is to be hastened, alcohol, colchicum, opium, morphine, iodide of potassium and quinine are to be avoided.

Very Mild: For the skin, catnip or balm tea; kidneys, tepid compress thirty to sixty minutes daily, cleavers tea; ureants, light exercise; uric acid, drink freely of soft water; for the liver and gall ducts, exercise 19 a. b., page 34; for the bowels, rectal flush, or figs, prunes, honey, olive oil or treacle.

Mild: For the skin, extra clothing, very warm room, yellow dock tea, warm sponge baths; kidneys, tea of agrimony, or tag alder, or princes pine, or pumpkin seeds, or dandelion root; ureants, average exercise; uric acid, drink freely of soft water and take a cold sponge bath daily; liver and gall ducts, chionanthus fl. ext. ten to thirty drops three times daily, exercise 11 a., page 32. Bowels, rectal flush and fruit diet, or barberry five to ten grains three times daily, or ten to fifteen grains of rhubarb, or thirty to sixty grains of magnesia, or one to two teaspoonfuls of sulphur, or thirty to sixty grains of cream of tartar.

Average: Skin, sunflower seeds—boil one ounce of seeds and husks in a quart of water to a pint, drink freely; warm full bath, or quite warm sitz; sulphur one-half teaspoonful three times a day. Kidneys, peach leaf tea one dram to water four ounces, two ounces every three hours; or burdock root two ounces in one quart of water boiled to one pint. Dose one to four ounces three times a day. Or sweet birch leaves two ounces to one pint of water. Dose two ounces every two hours.

Or juniper berries one ounce to one pint of water; steep an hour. Dose two ounces every two hours. Ureants, vigorous exercise and the mild diuretics named for kidneys; uric acid, soft water freely, cold sponge five times and cold plunge twice a week. Liver and gall ducts, beef gall three to five grains three times a day; or butternut ten to thirty drops of fl. ext. one to four times a day; or retained enema No. 37. Bowels, sigmoid flush; or thirty to sixty drops of butternut extract; or four to six grains of aloes; or phosphate of soda one teaspoonful every two hours; or sulphate of magnesia one teaspoonful every hour; or cascara sagrada ext. two to five grains; or fl. ext. ten to twenty drops.

Strong: For the skin, whole pack or hot sitz; composition tea one teaspoonful to three-fourths pint of hot milk and water. Kidneys, Virginia snakeroot fl. ext. one-fourth to one-eighth teaspoonful; or false bittersweet—digest at low heat two ounces in a quart of water two hours; strain. Dose two to three ounces three times a day; or fl. ext. gravel weed one to three teaspoonfuls; or corn silk fl. ext. one-half to one teaspoonful three times daily. Ureants, Hensel's Iron Tonicum two to three teaspoonfuls a day; or vigorous exercise and strong diuretics; or five to ten grains every two hours of ammonium chloride. Uric acid, gravel root one-half to one teaspoonful fl. ext., and as much cold bathing as can be endured. Liver and gall ducts, leptandrin one-half to two grains; or phytolaccin, crushed berries one pint, whisky one-half pint. Dose one to two fl. ounces; or sanguinarine nit. (alk.) one-eighth to one-twelfth grain every two to four hours. For the bowels, leptandrin; or euonymus thirty to forty drops three times a day; or caster oil one ounce; or iridin one-half to three grains; or colocynth fl. ext. fifteen to twenty-five drops; cæcal flush plain but hot.

Very Strong: For the skin, alcohol vapor bath; or domestic Turkish; or hot bath alternated with full packs; pilocarpine hyd. (alk.) one-twentieth to one-sixth grain in hot water every hour. Kidneys, tea of dwarf elder, infusion of root three to four ounces three times a day; or queen of the meadow infusion four ounces three times a day; or citrate of

potash fifteen to sixty grains several times a day. Ureants, phosphoric acid five to ten drops three times a day, largely diluted; or phosphate of soda three-fourths to one teaspoonful in water three or four times a day, and vigorous exercise. Uric acid, gravel root tea of two to three teaspoonfuls fl. ext. in hot water; inhalations of oxygen and cold bathing as in strong. Liver and gall ducts, bitter root fl. ext. one-half to one teaspoonful; or euonymus forty to sixty drops; or iridin one to four grains; or podophyllin (resin) one-twelfth grain two to four times a day. Retained enema Nos. 5 and 2 mixed. Bowels, podophyllin one-half grain; or blue flag two to four grains; or jalapin (con.) one-half grain or more; or gamboge one to two grains of the powder; or elaterine (alk.) one-sixty-seventh to one-twentieth grain, not for old or feeble; cæcal flush, hot and salt, or with one-half cup of molasses.

9. Diaphoretic (Sweating) Method.—Use relaxing diaphoretics when the skin is warm and dry and the heart excited. Use stimulating diaphoretics when skin is cold and heart feeble. Use stimulating and astringent diaphoretics when skin is cold and tissues lax.

Very Mild: Warm sponge bath in very warm room. Warm tea of catnip or balm, or hoarhound (stimulo-relaxant) infusion one ounce to one quart of warm water. Dose one to three ounces every hour or two.

Mild: Warm vapor bath or warm shawl wrap. Warm tea of feverfew (wild chamomile)—one-half ounce to one quart water, covered—two ounces every hour (stimulo-relaxant); or warm infusion of rosemary (stimulo-relaxant); or bayberry (myrica cerifera) warm infusion, twenty grains of powder to one pint. Dose four ounces every four hours (stimulo-astringent).

Average: Warm nightshirt wrap; hot foot bath; quite warm tea of garden chamomile, one-half ounce to one pint boiling water steeped ten minutes. Dose two to three ounces every one or two hours (relaxo-stimulant); or catnip one-half ounce in one pint of hot, much below boiling, water; use very freely (diffusive relaxant); or pennyroyal (relaxo-stimulant), two drams to the pint, two ounces every hour; or spearmint

(relaxant), two drams to the pint, often; or boneset—warm infusion one ounce of powder to one quart of boiling water. Dose one to three ounces, frequently as needed; a nearly pure relaxant; or sassafras (stimulating), warm tea of bark used freely; or bayberry (stimulo-astringent), warm infusion twenty grains to pint, four to six ounces every two to four hours.

Strong: Warm body pack. Hot tea of Virginia snakeroot, two tablespoonfuls every forty minutes; steep crushed root three drams one hour covered in one pint of water (stimulo-relaxant); must not boil; or pleurisy root, (relaxing), an ounce to the quart of boiling water. Half a cupful every two hours.

Very Strong: Quite warm full pack, with hot teas of Virginia snakeroot, three tablespoonfuls every twenty to thirty minutes; or pleurisy root six ounces every hour of warm infusion; or pilocarpus pinnatifolius (jaborandi), solid ext. three grains; or fl. ext. twenty to sixty drops. The jarborandi causes profuse perspiration and salivation. Sustain, if necessary, with stimulants. Do not give in low conditions of vital depression. Saliva should not be swallowed. A dose every two hours until effect is gained.

10. Secernent Method.—Increasing the secretions of the salivary, gastric and intestinal glands, liver and pancreas, *i. e.* those fluids that have some physiological function that is needed constructively in the vital processes. It is difficult to classify remedies with much accuracy as regards their excernent and secernent effect, for both properties are usually found in the same agent. Most secernents become excernents by increasing the dose. When a secernent effect is desired chloride of potassa, or atropine should not be given.

Very Mild: For salivary and gastric glands, appetizing flavors; gentle exercise in open air while fasting or abstaining. dill, fennel, caraway; balmony five grains three times a day, For intestinal glands, beef gall three grains three times a day; liver, sour fruit, lemonade, barberry, three grains three times a day; pancreas, berberine (alk.) one-sixth grain before meals.

Mild: For salivary and gastric glands, ginger, allspice, nutmeg, balmony seven grains three times a day; intestinal

glands, beef gall five grains three times a day; liver, retained enema No. 16 or 37; dandelion steep four ounces of bruised roots in one and one-half pints of hot water one hour, then boil five minutes. Strain, dose two ounces three times a day, or Wahoo fl. extract thirty drops three times a day, or Rochelle salts small doses. Pancreas, berberine (alk.) one-third grain before meals.

Average: For salivary and gastric glands, pepper, cinnamon, balmony ten grains three times a day (relaxant). Intestinal glands, ipecac (relaxant), one-fourth to one grain three times a day; or yellow parilla (stimulo-relaxant) fl. extract thirty drops three times a day. Liver, retained enema No. 1 or 7. Sanguinarin one to three grains every four hours, (stimulo-relaxant). Pancreas, berberine two-thirds grain before meals.

Strong: For salivary and gastric glands, horseradish, Worcestershire sauce, Our Digestive Sauce (the best), Leicestershire sauce. Intestinal glands, berberis aquifolium fl. extract ten to twenty drops three times a day; or capsicum (pure stimulant) one to three grains daily. Liver, retained enema No. 2 or 5; blue flag (stimulo-relaxant) two to three grains three times a day. Pancreas, berberine (alk.) one and one-half grains before meals.

Very Strong: For salivary and gastric glands, horseradish and mustard. Intestinal glands, blue flag three to five grains three times a day; or pilocarpine hydrochlorate one-twentieth every hour; not to be given in fatty heart, impeded circulation in lungs from heart disease, emphysema and pleurisy. Liver, retained enema, podophyllum (acrid stimulant) one-tenth to one-half grain—not to be given in irritated conditions of stomach and bowels. Pancreas, berberine (alk.) one and one-half to three grains before meals.

11. Emetic Method.—Always indicated when the stomach contains poison, or indigestible food, and whenever, as in croup and bronchitis, the mechanical effects of vomiting are desirable. Give with caution in hernia; avoid in extreme age, and with tendency to hemorrhage of lungs. When emetics are called for, but arterial and nervous centers seem relaxed, known by cold skin, soft, sluggish pulse, and, if extreme, by

sighing respiration, give stimulants by stomach and emetic by retained enema. See also head note to relaxant treatment.

Mild: Mustard water, or table salt, four teaspoonfuls in two ounces of water.

Average: Ipecac for hot, dry conditions. May need a stimulant afterward if it leaves skin cold and pallid, and with inability to throw off secretions. Bloodroot for very sluggish conditions, twenty-five to thirty grains aided with lukewarm water and tickling the throat.

Strong: Lobelia forty to sixty grains in eight ounces of water; unless haste is essential, give in one to two ounce doses, five to ten minutes apart. Too rapid relaxation may cause crampy pains, which will disappear as soon as the relaxation becomes equally distributed.

Very Strong: Lobelia sixty grains in four ounces of water. A large teaspoonful infused in covered vessel twenty minutes (not boiled). A teaspoonful of composition infused in six ounces of water covered twenty minutes, then add three ounces of milk. If patient is feverish give first one ounce of the lobelia, wait ten minutes and give two ounces of the composition. Wait eight minutes and give another ounce of lobelia; wait eight minutes and give two ounces of composition. Wait five minutes and give another ounce of lobelia, and five minutes later two ounces more composition. Five minutes later the rest of the lobelia, and in five minutes more two ounces composition. If still there is not full emesis, follow with copious draught of lukewarm water, and tickle the throat with a feather. But if at any stage vomiting has been sufficient, discontinue the teas. If the final effect desired is relaxing, follow the emetic action by dessert or tablespoonful doses of lobelia tea as often as necessary. But if the final effect desired is stimulant or tonic, follow in the same way with composition instead of lobelia. If the patient is relaxed at the outset, the emetic dosing should begin with the composition. Much better effect will be had by giving twenty to thirty grains of bicarbonate of soda in warm or tepid water before the emetic.

12. Cooling (Antiphlogistic) Method. — *Very*

Mild: Cool air baths, amount of exposure and degree of temperature suited to the case.

Mild: Sponge baths, tepid to cool. Tepid or cool rectal flush. Quinine sulphate two grains every four hours; or cinchonine two and one-half grains every four hours. Local applications of bay rum and borax, puff powders.

Average: Diet deficient in fat and force elements; frequent sponging without drying; tepid sigmoid flush; aconite, seven drops tinct. in four ounces water, teaspoonful every thirty minutes; or salicin, two to eight grains every hour; or quinine, three grains every three hours.

Strong: Diet exclusively of buttermilk; tepid cæcel flush; nitrous ether. Ether spray, see index; salicin six to twelve grains every hour, or quinine four grains every two hours.

Very Strong: Diet of cold water or lemon and water only; cold bath until the temperature is reduced; tepid cæcel flush of cream of tartar water, one to two teaspoonfuls to the pint; pilocarpus hydrochlorate (alk.) one-sixth in hot water, hourly.

13. Revulsive Method.—*Very Mild:* Surface stimulation at a little distance from the affected point by hot fomentations, mustard, etc.

Mild: Gentle rubbing away from the place affected, beginning at a distance and working closer until it is included, but always rubbing away from it as a center. While rubbing, dip the hands frequently in cold water.

Average: Cool compress on part affected, heat at some distant extremity.

Strong: Cold compress on part affected. Heat on all distant extremities, with No. 7 relaxing method, strong if needed in tense fevered conditions; or No. 6 stimulating, strong in prostrate conditions tending to gangrene or collapse.

Very Strong: Cold dripping compress on part affected, heat on all distant extremities. Mustard on intervening surfaces with very strong relaxing treatment, No. 7, if needed in tense fevered conditions; or very strong stimulating, No. 6, in prostrate conditions tending to gangrene or collapse.

14. Hardening Method.—*Very Mild:* Barefoot in the house one-half hour to two hours daily. Exposure of the whole skin (naked) to the air of the room at 70° to 95° F. fifteen to thirty minutes. Cool sponge bath daily in room 70° to 80° F. A brisk walk in the open air in clothing insufficient for comfortable warmth without the exercise; must add more clothing instantly upon stopping; or sectional ablution in room 60° to 70° F. as follows: 1. Plunge one foot into cold water on rising from the bed, wipe and dress it quickly as possible. Shawl over shoulders. 2. The other foot the same. 3. Wash head and neck, and dry hair thoroughly. 4. One arm. 5. The other. 6. Stripped to waist, wash chest and abdomen. 7. Take towel stringway, one end in each hand, throw the middle over one shoulder, one hand up, the other down, and saw the upper back into a glow, then saw across the back down to waist. Then, leaning forward, throw one handful of water over on the spine, having the towel around the body at the waist to protect the clothing, then saw it dry and dress. 8. Drop the clothing off one limb to the foot and wash and dry. 9. Then the other. 10. The whole process should not take over five minutes, unless the person is very feeble, in which case he should lie down a few minutes, well covered, as soon as he is dressed.

Mild: Barefoot outdoors one-half minute to five minutes. Air bath at 60° to 65° F. ten to twenty minutes, keeping in constant motion. Cold sponge bath daily in room at 60° to 65° F. Cold daily head ablution, drying thoroughly. Or, sectional ablution in room 50° to 60° F., same as very mild sectional, except both limbs are exposed at once, the water is dashed on with the hand, and no part is dried except the head, and three or more dashes are made on each place.

Average: Cold water tread one to ten minutes daily. Cold arm plunge one-fourth to one minute twice a week. Cold ablution in cold room and dress without drying, and exercise till warm. Cold daily head ablution.

Strong: The cold water tread, the arm plunge and head ablution as in average. Cold hip and thigh shower twice a week. Cold ablution on the days when the arm plunge and shower do not occur.

Very Strong: Water tread and head ablution as in strong Shoulder and back shower twice a week, and cold ablution on all other days. None of these should be carried so far as to reduce vital heat, or cause congestions anywhere. If not sensibly improving every week, fall back to the less vigorous treatment.

15. Astringent Method.—Should not be employed when inflammation or acute irritation is present.

Very Mild: Internally or externally. Tea of chestnut leaves, or eyebright herb, or strawberry, red raspberry, or huckleberry bark, false wintergreen, life everlasting, sweet fern, yellow dock, or stone root.

Mild: Tea of either agrimony herb, beech bark, sweet birch, bark and leaves, cinchona, dogwood, witch hazel, bugleweed, rhubarb three to five grains every three or four hours, white willow, golden rod, queen of the meadow, solomon's seal, tag alder, water or white pond lily.

Average: Tea of either horse-chestnut rind, ambrosia leaves, uva ursi, shagbark hickory,—middle bark three to eight grains three times a day,—cranesbill, sumac, fireweed, bayberry fl. ext., five to ten drops, or rose willow.

Strong: Tea or solution of either yarrow, gallic acid five to fifteen grains, tannic acid two to five grains every six hours, alum five to fifteen grains every three or four hours, rhatany, hardhack, myrrh two to five grains three or four times a day, marsh rosemary, or pomegranate rind. Externally, hemlock bark, white oak bark, catechu, or tannic acid (five grains per ounce).

Very Strong: Monsel's solution, five to ten drops to ounce atomized, or three to six drops by stomach; or alum root, or Heuchera Amer. (for external use), or kino five to fifteen grains every two to six hours, or stinging nettle five to ten grains.

PARTICULAR DIETS.

The whole medical world is aroused upon the subject of the proper feeding of the sick, so much so that the medical journals are teeming with articles discussing the theme. Not

less than three medical journals have been named expressly to be regarded as exponents of the subject: *The Journal of Balneology and Dietary; Food, a Journal of Hygiene and Nutrition*, each in its fifth volume, and *The Dietetic and Hygienic Gazette*, now in its ninth volume, all give particular prominence to the question. Yet the author has searched in vain through many hundred pages of these journals, and thousands upon thousands of others, to find a single article of practical value as a standard, scientific expression of the physiological and therapeutic results of modern research in this direction.

Dr. W. H. Porter, editor of the *American Medico-Surgical Bulletin* (formerly Merck's Bulletin), has done very valuable service in a series of articles running through seventeen numbers on the "food values" of different foods, each considered as an entire dietary in itself; and Dr. James Wood, in the same journal, has emphasized the importance of avoiding the excessive use of sweets and starches in the feeding of the young. But beyond these contributions, the whole wilderness of matter published is the sheerest empiricism, as contradictory as can be imagined. Even the forty-seven large, double column pages of *Food's* last issue contain but a single page (and that copied from "A Hand Book of Invalid Cooking") giving anything practical, and that is so unpractical that it merely enumerates certain articles as suggestive of what may be used on successive days—of precisely as much real value as the bill of fare of a restaurant. All writers express and reiterate the importance of correct feeding, but not one tells HOW TO DO IT.

How To Do It.—This universally felt need, the author proposes to meet in this section (in addition to Part III, on Diet) as far as in the nature of things it is possible for him to do this without personal investigation of each patient.

Certain things must be premised.

1. The Standard of Construction in all the dietaries is that of a man in full health, but doing no work.

2. For Women.—About one-fourth should be deducted for a woman in the same circumstances.

3. For Children.—Deduction must be made according to Prof. Atwater's table on page 371.

4. For the Sick.—Further modification must be made ACCORDING TO THE CASE. In brief sickness, embracing reductions in fiber, fat and force foods at pleasure; but in lingering cases, holding the fiber foods up to the normal standard, while changing the fat and force elements to suit the exigencies as they arise.

5. The Quantities named in each dietary constitute the rations for twenty-four hours, to be divided into the three or more meals at the discretion of the nurse, or pleasure of the patient.

6. Changing the Dietary.—Should an article of an approved diet be distasteful or otherwise unsuited to the patient, another may be substituted of the same elemental constituents as found in the working table; but the necessary transposition must be made from the pounds and grams of the table, into the ounces of the dietaries.

7. When a Reduction is Made in a dietary, it should not be by dropping out one or more of the articles entirely, but should be by a proportionate reduction of all the articles composing it, so as not to change the proportion of its elements.

8. Variety of Food.—In these dietaries, constant reference is had to the importance of variety and of keeping the food value up to the full demands of the reparative processes, both of which are practically ignored in the ordinary provisions for the sick.

9. Avoiding Errors.—Should the objection be made that in the necessary adaptations of these dietaries to individual cases, there is likely to be the same empiric guesswork that now dominates the whole field of invalid food-supply, the answer is: The difference is very great. In one case, there is no conception of what is needed, and no standard by which to rule the judgment. In the other, the exact need (in health) is specified in so many ounces of each food element, so many calories of energy and so many pints of oxygen, and that need is the standard of judgment with a sliding scale of adaptation equally exact for women and children, and capable of being applied to the sick with corresponding exactness whenever the

observer is competent to detect in the condition of the sufferer *nutritive states analagous to those of infancy*, childhood, youth or womanhood. Mistakes unquestionably will occur, but the standard is an ever present corrective, and the chances of serious mishap from them are a thousand fold less than under the haphazard custom now prevailing.

10. The Standard Required.—A man of average height and weight, at no work, requires in each day of twenty-four hours, food that shall furnish in digestible form, of the fiber element 3.5 ounces, fat 3.5 ounces and of the force elements (see definition on Page 100) 8.4 ounces, a total of 15.4 ounces of the actual nutritive elements of food. This furnishes 2,324 calories of energy, and for its proper assimilation requires capacity of inhalation sufficient to furnish 1312 pints of pure oxygen. Adding for women and children, we get this comparison:

STANDARD OF ACTUAL FOOD ELEMENTS REQUIRED EVERY TWENTY-FOUR HOURS, STATED IN OUNCES.

	Fiber.	Fat.	Force.	Calories.	Oxygen.
Man	3.5	3.5	8.4	2,324	1,312
Woman	2.8	2.8	6.3	1,743	1,036
Child 6 to 14 yrs.	2.6	1.5	11.4	2,041	1,367
Child 2 to 6 yrs	1.9	1.4	7.0	1,418	871
Child 1½ yrs.	1.0	1.3	2.6	767	371

These standards for children are for normal play conditions. "No work" with them would be no play. No estimates have been made for that.

11. Oxygen Needed.—On pages 94, 104-112, the necessity of lung capacity, including both size and use, to digestive possibilities, has been shown and is recalled here because in these particulars mainly sickness may bring the adult to the state of childhood or even infancy.

For example, a man with pneumonia may have his lungs so occluded by the disease that his real respiratory capacity is no more than that of a three-year-old child. Aside from the debilitating effects of his disease, his digestive capacity, from the mere lack of oxygen, must be reduced in the same ratio. Now add the debility and the poisonous accumulations of a suboxidized blood current, and the digestive capacity may be

cut down to the assimilation of a very small amount of predigested liquid pabulum only.

On the other hand, the patient sometimes needs nourishment far beyond his seeming ability to dispose of it. For example: In the third stage of consumption, the nervous restlessness, coughing and uncompensating rapid breathing are all *work done* requiring sustainment. The breathing is called uncompensating, because it yields no proportionate oxygen intake. Besides that work done, there may be the albuminous waste of a half-pint of pus matter from discharging abscesses, which calls for a corresponding supply of fiber element. Hence the food should be rich in predigested proteids and in those fat and force foods that require the least oxygen for their complete digestion. Hence the importance of a dietary exactly adjusted to the conditions of the case.

12. Interchange of Diets.—Except in diabetes, fevers, and some other extreme cases, the diets are largely interchangeable, thus materially multiplying the commissary resources of the sick; but when made, the change should consist in the substitution of one entire dietary for another, not parts of one for parts of another, except as noted in No. 6.

13. Digestants.—Pepsin to aid stomach digestion. Pancreatin to assist pancreatic digestion. Oxgall to aid bile digestion. Papoid to supplement all the digestive processes. Peptenzyme is also claimed to have the same effect.

Our Digestant has the same effect as papoid, together with peculiar appetizing and stimulant properties. *Our Digestive Salt* is similar to Our Digestant, but in a dry form.

14. Rating of Foods.—Diets are rightly proportioned for no work when they contain of fiber one part, fat one part, and force 2.4 parts, but much latitude is allowable if the fiber and calories be sufficient. Diets are fiber when they consist of more than one part of proteids to 4.6 parts of fat and force elements combined. Diets are fat when they contain 1.5 parts of fat to one of fiber, and 3.6 of force constituents. Diets are force or starchy when their calories are more than 700 to each one part of fiber.

Protein diet is appropriate whenever the fibrous tissues re wasted by disease or abstinence, or the system suffers an nusual drain of albuminous material, as in the third stage of onsumption, in abscess, some of the catarrhs, or in the heal- ng of extensive wounds.

Fat diet is needed in excessive emaciation, nervous pros- ration, when fat is needed for fuel without the intermediate rocess of digestion which the force foods must undergo, and hen exposed to a low degree of temperature.

Force diet should be resorted to when the energies of the ystem are greatly taxed by severe labor, great grief or anxiety, nsufficient ferments to digest the fiber and fat elements, and tates of prostration where the bodily heat must be maintained n the absence of ability to take other nourishment. Its xtreme forms are only fit for emergencies when an extra strain s placed upon the vital powers.

Liquid diets are designed for those conditions of inactivity nd disease in which the digestive functions are too feeble to educe solids, and in which the intake of oxygen is small. Useful in typhoid fever, dysentery, extreme nervous prostra- ion, collapse from shock, etc.

Semi-fluid diets have the same purpose as liquid to a more imited degree.

Solid diets are appropriate in those cases where liquids ncrease fermentation, and in those where bulk is to be avoided, r where an excess of hydrochloric acid is to be employed in he work of digestion.

Mixed diets approximate the normal, and are to be used specially in convalescence.

Consumption is the only disease in which sufficiently umerous measurements have been taken to afford a basis for pretty accurate general average of respiratory capacity, and consequent digestive possibilities. The first stage has been found to have but 67 per cent., the second but 57, and the third ut 46 per cent of the normal. Hence one who, in health with- ut work, with 222 cubic inches of lung capacity, requires daily ood in the proportions and quantity of fiber 3.5 ounces, fats .5, force 8.4 ounces, yielding 2324 calories of energy and

requiring 1312 pints of oxygen, would, in the several stages, need but the following. (These calculations assume that respiration and digestion are equal.)

	Fiber.	Fat.	Force.	Calories.	Oxygen.
First stage.....	3.5	2.3	4.5	1559.	879.
Second stage.....	3.5	2.0	3.3	1329.	748.
Third stage.....	3.5	1.6	1.9	1088.	603.

Obviously, therefore, the patient's diet should be adjusted to these facts. The fiber constituent should be kept as near the normal requirement as possible, because the waste of nitrogenous substance is so excessive, both from innutrition and pus-expectoration.

The fats should be mainly animal because they are absorbed directly into the system, while the vegetable fats combine with soda salts in the duodenum into hard soap and are thus chiefly lubricants of the intestines, and the fuel value of the first is vastly in excess of the lubricant value of the last.

The force element should be selected so as to yield the greatest number of calories of energy with the least expenditure of oxygen.

With these principles in mind we proceed to construct some illustrative dietaries as suggestive of what should always be done for these sufferers.

[*The Figures* in all these diets represent ounces or decimal parts of ounces. They are not per cents, or parts in 100. The analyses of foods have all been calculated over into ounces, because common people can estimate food more readily by weight, and they have not the time to figure out the weight of each food necessary to furnish the required elements. In these diets for consumption, we give the details of the calculation, but only the summaries are given in succeeding diets.]

The First Stage of Consumption requires a daily ration that will supply of fiber or nitrogenous elements 3.5 ounces, of fat 2.3 ounces, of force elements 4.5 ounces, yielding 1559 calories of energy and requiring only 879 pints of oxygen for its proper assimilation. Such a ration may be thus composed:

Diet No. 1.	Food. Fiber. *Ounces.*	Fat. *Ounces.*	Force. *Ounces.*	Calories. *Units.*	Oxygen. *Pints.*
Beef.....	10 ozs. = 1.500	1.400	.....	550.	230.
Fish.....	10 ozs. = 1.310	.300	.....	230.	100.
Gl. Bread ..	3 ozs. = .204	.111	.738	162.	48. (p. 218)
Fruit.....	12 ozs. = .046	.....	1.548	186.	60.
Milk.....	12 ozs. = .444	.408	.588	228.	84.
Butter.....	1 oz. = .010	.850	.005	226.	87.
Sugar.....	1 oz. = .003	.....	.967	112.	36.
Total.....	49 ozs. = 3.517	3.069	3.846	1694.	645.

It will be seen that in this sample the fats are slightly in excess, while the force element seems deficient; but it should be remembered that the fat and force constituents are in their physiological results interchangeable; thus the calories show an excess by reason of the surplus fats. But this overplus of the calories is all right, so long as there is a good margin of oxygen intake above its necessary expenditure in the transformation of these food elements. In this case 234 pints of oxygen are to spare.

The Second Stage of the disease having been reached, calling for a daily supply of fiber 3.5 ounces, fat 2, and force elements 3.3, yielding 1329 calories, and requiring 748 pints of oxygen—the following would be appropriate:

Diet No. 2.	Food. Fiber.	Fats.	Force.	Calories.	Oxygen.
Egg coffee.....	9¼ ozs. = 0.192	.170	.162	86.	34. (p. 214)
P. barley.....	1 oz. = .116	.021	.655	95.	33.
Bovinine.....	3 ozs. = .417	.042	.....	48.	27.
Mosq. B. meal....	1 oz. = .772	.136	.....	127.	27.
Creamed codfish.	4 ozs. = .252	.260	.104	112.	44. (p. 212)
Chops.....	8 ozs. = 1.200	1.496	.....	536.	216.
Fruit.....	3 ozs. = .011	.....	.387	46.	15.
Gl. gems.....	2 ozs. = .160	.228	.712	158.	58. (p. 218)
Peach foam.....	4 ozs. = .006	.....	1.500	180.	56. (p. 226)
B'f tea, nutritive.	5 ozs. = .375	.350	.....	135.	57. (p. 208)
Total.....	40¼ ozs. = 3.501	2.703	3.520	1523.	567.

In this illustration the fat and force elements and calories are all in excess, but as there are still 181 pints of surplus oxygen, it may be considered a safe ration, and is purposely constructed with these deviations in order to show the latitude that may be allowed.

The Third Stage is marked not only by greatly diminished respiratory capacity, but by a general breakup of all the vital forces. Hence the food must be adjusted, not only elementally and in quantity to the case, but in its form as well. The

following diet may be regarded as an example, to furnish the needed fiber 3.5 ounces, fats 1.6, force 1.9, calories 1088, oxygen 603:

Diet No. 3.	Food.	Fiber.	Fat.	Force.	Calo.	Oxygen.
Liquid peptonoids....	2 ozs. =	1.400	.188	.206	236.	96.
Mosquera's beef meal	1 oz. =	.772	.136	.....	127.	27.
Oyster stew.....	4 ozs. =	.252	.008	.025	8.	4.
Eggs.....	2 ozs. =	.236	.204	.008	82.	36.
Fruit.....	6 ozs. =	.023	.....	.774	93.	30.
Chicken panada.....	4 ozs. =	.498	.048	.126	45.	18. (p. 211)
Dyspepsia crackers...	2 ozs. =	.180	.060	1.180	226.	60. (p. 214)
Butter.....	½ oz. =	.005	.470	.002	113.	43.
Cream.....	2 ozs. =	.054	.534	.056	153.	60.
Total.....	23½ ozs. =	3.420	1.648	2.377	1083.	374.

The greater the prostration, the more should the food supply fall within the oxygenating capacity in order to compensate for less vigorous elimination, and probable deficient ventilation. Hence 229 pints of oxygen are allowed in excess in this example.

The greater the disturbance in the nutritive functions, the more carefully should both the average and the individual digestibility of the food be considered. See working table, page 133, for the average, and ascertain the experience of the patient for the individual, giving special emphasis to the fact that foods which are poorly digestible in health, will be much less so in disease. This diet has a high average digestibility.

Another Example.—As it may be difficult in some parts of the country to obtain liquid peptonoids, Mosquera's beef meal and oysters, a substitute is added for the diet No. 3, as follows:

Diet No. 4.	Food.	Fiber.	Fats.	Force.	Calories.	Oxygen
Beef tea nutritive.	8 ozs. =	.400	.376	.....	144.	56.
Whites of eggs....	6 ozs. =	.756	.012	.....	84.	42.
Fruit..... ...	6 ozs. =	.023	.....	.774	93.	30.
Cream	2 ozs. =	.054	.535	.056	153.	60.
Butter	¼ oz. =	.002	.235	.001	56.	21.
Chicken panada..	4 ozs. =	.498	.048	.126	45.	18.
Dressed game.....	4 ozs. =	1.000	.040	.....	116.	52.
Dried beef stew...	6 ozs. =	.696	.426	.282	222.	90.
Whisky.....	2 ozs. =	....	.....	.492	217.	73.
Total.....	38¼ ozs. =	3.429	1.672	1.731	1130.	442.

Oxygen surplus in this case 203.

It may be thought impossible for the patient to consume this quantity in twenty-four hours. So it has been thought impossible for any to recover from this stage, yet many have.

It will doubtless require appetizers and perhaps digestants, with much outdoor air to enable one to digest this supply, but the nearer it can be approximated, the greater will be the chance of recovery.

Having given these illustrations at length, the remaining diets will be formulated more briefly, but all are worked out with equal care.

For the composition of the particular articles named in these diets, see index in each case.

PARTICULAR DIETS GROUPED BY CONSISTENCY.

Fluid Diets.—Of the following rations, Nos. 5 to 11 inclusive, are only fit for inactive conditions, because of their deficiency in energy, but their small oxygen requirement specially adapts them to states of extreme sub-oxidation, and as their full fiber constituents amply sustains the constructive processes, they are the best for extreme cases. The two last diets of this group, Nos. 12 and 13, have the same general characteristics as their predecessors, with the advantage of being appropriate in more active conditions; hence may be relied upon sometimes in "about-the-house" ailments, instead of being confined to bed sicknesses.

Five.—Kumys, 125 ozs. This furnishes of fiber 3.5 ozs or the correct amount, of fat 1.1 ozs and of force 8.8 ozs. It yields 1,750 calories of energy, a deficiency of 574, and requires for its assimilation sufficient air to furnish 625 pints of oxygen. Our standard of respiration being 1,312 pints in the twenty-four hours, gives a surplus of 687 pints of oxygen.

Six.—Kefir, 93 ozs: Fiber 3.5 ozs, fat 1.8, force 1.8, calories 1,162, oxygen 465. Fiber enough; energy deficient, 1,162 calories; oxygen surplus, 847 pints.

Seven.—American Kumys, 127 ozs: Fiber 3.5 ozs, fat 1.1, force 8.8, calories 1,778, oxygen 635. Fiber sufficient; energy deficient 546 calories; oxygen surplus 677 pints.

Eight.—Milk, 95 ozs: Fiber 3.5 ozs, fat 3.2, force 4.6, calories 1,805, oxygen 665. Deficient in force 519 calories; oxygen surplus 647 pints; fiber sufficient.

Nine.—Skimmed milk 88 ozs: Fiber 3.5 ozs, fat 1.5, force 4.7, calories 1,232, oxygen 528. Deficient in force, 1,092 calories; oxygen surplus, 598 pints; fiber sufficient. For temporary use in bed when pancreatic and biliary functions are mostly suspended.

Ten.—Buttermilk 88 ozs: Fiber 3.5 ozs, fat 0.6, force 5.6, calories 1,232, oxygen 440. Fiber just enough; calories deficient, 1,092; surplus oxygen 872 pints. This has the same characteristic as No. 9, to a greater degree, and is preferable to that when fats cannot be tolerated and very little energy is required.

Eleven.—Matzoon, 90 ozs: Fiber 3.5 ozs, fat 4.4, force 4.5, calories 1,620, oxygen 630. Fiber correct; energy deficient, 704 calories; oxygen surplus 692 pints.

Twelve.—Homemade Kumys, 103 ozs: Fiber 3.5 ozs, fat 3.1, force 6.7, calories 2,060, oxygen 721. Fiber correct; deficiency in energy 264 calories; surplus oxygen 591 pints.

Thirteen.—Homemade Kumys, 115 ozs. This supplies of fiber elements 3.9 ozs, fat 3.6 and of force elements 7.8 ozs, yielding 2,300 calories of energy and requiring 805 pints of oxygen. The fiber is present to a slight excess, calories are about right, and the oxygen surplus is 507 pints.

Semi-Fluid Diets.—The rations No. 14 and 15 are appropriate in early convalescence from acute gastritis, in chronic gastritis, some stomach derangements of pregnancy, some cases of ulcer or cancer in stomach, etc. Nutritive enemas or bowel injections are added, No. 17. In order to give their food value and show to what extent they may be depended upon to support life, assuming that they are entirely absorbed, while in reality only from one-fourth to three-fourths are assimilated. No. 4 D is absorbed to a greater extent than the others.

Fourteen.—Clabbered milk 16 ozs, iced milk with limewater 16 ozs, whites of eggs 4 ozs, beef tea nutritive 24 ozs, pure ice cream 6 ozs, oatmeal mush 12 ozs, grape juice, No. 2, 5 ozs. This yields of fiber 3.5 ozs, fat 3.7, force 6.2, calories 2,338, oxygen 855. The fiber and calories are right, oxygen surplus 457.

Fifteen.—Egg and milk 10 ozs, malt infusion 1 oz, cracker gruel 8 ozs, blanc-mange 8 ozs, Rudishe's beef peptones 2 ozs, rice milk, No. 2, 12 ozs, oatmeal mush 16 ozs, hot milk 8 ozs, corn meal gruel 8 ozs. This gives of fiber 3.5 ozs, fats 2.6, force 10.4, calories 2,341, oxygen 852. The fiber is correct, with a deficiency of only 17 calories and surplus of 460 pints of oxygen.

Sixteen.—Boiled milk 32 ozs, beef scraped 8 ozs, blackberry cordial 5 ozs, thickened milk 10 ozs, astringent food 6 ozs, creamed codfish 8 ozs, butter ½ oz. This yields of fiber 3.6 ozs, fat 3.8, force 9.2, calories 2,319, oxygen 821. The *astringent food* is thus made: Pure pow-

dered chocolate 8 ozs, rice flour 8 ozs, sugar 8 ozs, tannin 120 grains; cook 30 minutes.

Seventeen. Nutritive Enemas.—A: Beef 6 ozs, papoid 1 grain, water 2 ozs; divide into three portions. Thirty-two ounces of this food would contain of fiber 3.5 ozs, fat 3.2, force 0.0, yielding 1,312 calories and requiring 544 pints of oxygen.

B: Milk gruel 2 ozs, beef tea stimulating 2 ozs, pancreatin 5 grains. Fifty ounces of this would supply of fiber 3.5 ozs, fat 1, force 2, calories 1,500, oxygen 550.

C: Beef pulp 2 ozs, coffee syrup 1 oz, pancreatin 5 grains. Thirty-five ounces would supply of fiber 3.5 ozs, fat 3.2, force 8.1, calories 2,240, oxygen 770.

D: Whites of eggs 2 ozs, salt one-half teaspoonful, pancreatin 5 grains. Twenty-eight ounces of this would furnish of fiber 3.5 ozs, fat .05, force 0, calories 392, oxygen 196.

E: Milk gruel 1 oz, beef tea nutritive 2 ozs, pancreatin 5 grains. Forty ounces of it would yield of fiber 3.5 ozs, fat 2.8, force 0.1, calories 1,260, oxygen 520.

F: Grated oysters 3 ozs, cream 1 oz, papoid ½ grain: Twenty-four ozs; gives of fiber 1.2 oz, fat 1.8, force .7, calories 714, oxygen 288 pints.

Nutrient Suppositories: Beef tea nutritive one pint evaporated in a double boiler to the consistence of molasses, add as much cacao butter as there is of the concentration, melt together, and cool in a shallow dish. Cut with a warm knife, and shape into cones. Use in place of nutritive enema.

In all cases, the bowels should first be cleansed by an injection of warm water or castile soap water, then slowly inject two to four ounces as far up as possible at blood warmth, every two hours. After the first cleansing, if the bowels are empty of fœcal matter, it should not be repeated oftener than once in a day or two.

Solid Diets.—An exclusive meat diet has been largely relied upon by Drs. Saulisbury and Cutter and their admirers, with gratifying results in many instances, but the almost irresistible craving for something else which this food causes, renders it extremely difficult to hold patients to it, and suggests the query whether there is not a sound physiological reason for that longing, aside from mere taste. Recent experiments have proved that a diet of nitrogenous substance exclusively is assimilated only to the extent of about one-fifth, while one

with carbohydrates added, is absorbed to the extent of sixty per cent.

Assuming for the moment entire absorption, **Diet No. 18**—chopped steak 23½ ozs, butter 1 oz—gives of fiber 3.5, fat 4, force 0, calories 1518, and requires 627 pints of oxygen. This is so defective in energy that it is unfit for active conditions, and may thus answer the above question. If the quantity be increased to the normal demand for force, still supposing complete absorption, it will become a strong protein diet as in No. 33. It is impossible to make both fiber and force elements right, when but one or two articles constitute the diet. Making due allowance for want of absorption, No. 18 should be raised to,—steak 280 ozs, which would yield nearly the right increment of force, but is obviously an impracticable amount to ingest.

Nineteen.—Chopped steak 23 ozs, butter 1½ ozs, fruit 26 ozs: Fiber 3.5, fat 4.4, force 3.3, calories 2006, oxygen 789. Deficient in force 300; oxygen surplus 523.

Twenty.—Chopped steak 13 ozs, butter 1½ ozs, mutton 7½ ozs, bread 6 ozs, fruit 19 ozs: Fiber 3.6, fat 4.6, force 3.7, calories 2342, oxygen 895 pints. Calories right; oxygen surplus 417.

Twenty-one.—Chopped steak 7 ozs, butter 1½ ozs, mutton 8 ozs, chicken 3½ ozs, bread 4 ozs, grapes 27 ozs, Boston crackers 3 ozs: Fiber 3.7, fat 4.1, force 6.7, calories 2333, oxygen 882 pints. Fiber and force substantially correct; oxygen surplus 430 pints.

Convalescent Diets.—When a person has sufficiently recovered to no longer require a sick-bed diet, a ration is needed that will please the appetite and strengthen the patient, without over-taxing the digestive functions. After a sickness in which an *all-fluid* diet has been used, employ a selection from Nos. 22 to 30. Where a *meat diet* has been used in sickness, the convalescent may be given No. 30, 31, or 32. When the patient has had no exclusive diet, any of the rations from Nos. 33 to 64 may be employed, except that No. 36 to 42 inclusive, 47, 55, 58, 61–2–3, are hardly appropriate for convalescent conditions, unless prescribed by the physician.

Twenty-two.—No. **13,** 97 ozs, our toast 4 ozs. This yields of fiber 3.5 ozs, fat 3.7, force 6.5, 2372 calories, and 839 pints of oxygen. Fiber right, energy very slightly in excess; oxygen surplus 473.

Twenty-three.—Our toast 6 ozs, fruit 4 ozs, bovinine 2 ozs, No. 13 81 ozs: Yields of fiber 3.5 ozs, fat 3.7, force 6.1, calories 2362, with oxygen requirement 845. Fiber right, calories very slightly in excess, oxygen surplus 479. This small excess of calories is an advantage in cases of

recovery from sickness when there is no fever, so long as there is a surplus of oxygen.

Twenty-four.—Entire wheat bread 6 ozs, chopped steak 4 ozs, fruit 6 ozs, butter 1 oz, No. 13, 65 ozs. Yields fiber 3.5, fats 3.5, force 8.3, calories 2319, oxygen 832. Fiber and calories right; oxygen surplus 480 pints.

Twenty-five.—Poultry 6 ozs, fruit 8 ozs, egg coffee 9¼ ozs, creamed oysters 6 ozs, entire wheat bread 4 ozs, butter 1¼ ozs, No. 13, 55 ozs: Gives of fiber 3.5, fat 4, force 7.3, calories 2338, oxygen 857. Fiber and calories right; oxygen excess 455 pints.

Twenty-six.—Our toast 4 ozs, whisky drink 2 ozs, No. 12, 83 ozs: Yields of fiber 3.6, fat 1.3, force 6.4, calories 1810, oxygen 647. Fiber sufficient, calories short 514, oxygen surplus 665. Should there be much muscular emaciation, No. 34 may be better, if the digestive functions are competent. This is only for inactive conditions where stimulation is necessary, and is compatable with still further stimulation on account of its defective calories, although that defect may be a merit in some fevered conditions of short duration.

Twenty-seven.—Our toast 6 ozs, fruit 8 ozs, pure ice cream 4½ ozs, sugar 1 oz, No. 12, 73 ozs: Yields of fiber 3.4, fat 2.5, force 8.3, calories 2330, oxygen 829. Fiber and calories right; oxygen surplus 483 pints.

Twenty-eight.—Entire wheat bread 6 ozs, chopped steak 4 ozs, fruit 12, butter ½ oz, sugar 1½ ozs, cream 4 ozs, No. 12, 52 ozs: Gives of fiber 3.6, fat 2.5, force 10.6, calories 2344, oxygen 846. Energy and fiber correct; oxygen surplus 466 pints.

Twenty-nine.—No. 12, 46 ozs, sherry wine 8 ozs, poultry 6 ozs, egg coffee 9¼ ozs, creamed oysters 6 ozs, fruit 15 ozs, butter 1 oz, wheat bread 4 ozs: Fiber 3.5, fat 3.7, force 7.8, calories 2324, oxygen 867. Fiber and energy right; oxygen surplus 445 pints.

Thirty.—*Convalescence;* after meat diet during the sickness. For one or two weeks—lean meat 20 ozs, our toast 2 ozs, milk 12 ozs: Yields of fiber 3.5, fat 3.5, force 6, calories 1444, oxygen 624. Fiber right, calories too deficient for any active exertion, or for a long time; oxygen surplus 688 pints.

Thirty-one.—For the next two weeks. Lean meat 16 ozs, our toast 4 ozs, milk 16 ozs, Boston crackers 3 ozs, chicken salad 2 ozs, butter 1¾ ozs: Fiber 3.7, fat 5, force 3, calories 2326, oxygen required 858. Very slight excess of fiber, calories right; oxygen surplus 454 pints.

Thirty-two.—Our toast 6 ozs, milk 16 ozs, chicken salad 2 ozs, garden vegetables 6 ozs, steak 8 ozs, chops 8 ozs: Yields of fiber 3.5, fats 5.7, force 1.2, calories 2386, requiring 876 pints of oxygen. Fiber right; calories properly in slight excess, and oxygen surplus 436.

GROUPED BY CONSTITUENTS.

Fiber Diets.—

Thirty-three.—Chopped steak 38 ozs, butter 1 oz: Yields of fiber 5.7 ozs, fats 6.1 ozs, force 0 ozs, 2316 calories and 911 pints of oxygen. The calories are about right, but the fiber is largely in excess. This with some fruits added to secure the absorption of the nitrogen, makes a suitable diet for great albuminous losses, as from abscesses, etc., with not much fever.

Thirty-four.—Chopped steak 8 ozs, kumysgen 16 ozs, celery toast 3 ozs, creamed codfish 8 ozs, chicken 6 ozs, buttermilk 8 ozs, berries 6 ozs, canned tomatoes 4 ozs, butter 1 oz, sugar 1 oz, graham crackers 3 ozs, whole wheat crisps 2 ozs, creamed potatoes 3 ozs: This comprises of fiber 4.3, fat 2.7 and force 7.4 ozs, and 2346 calories, requiring 1035 pints of oxygen, which still leaves a surplus of 277 pints, with a slight excess of energy and fiber element.

Thirty-five.—Buttermilk 8 ozs, beans 4 ozs, eggs 3 ozs, apples 14 ozs, wheat bread 6 ozs, butter 1 oz, beef 8 ozs, fish 6 ozs: This has of fiber 4.3 ozs, fat 2.7 ozs, force .8 ozs, 2336 calories, and requires 884 pints of oxygen. The fiber is mildly in excess, the calories are right, and the oxygen surplus 428 pints.

Fat Diets.—

Thirty-six.—Fat pork 4 ozs, potatoes 3 ozs, gluten gems 4 ozs, butter 1 oz, sugar 1 oz, pie 4 ozs, mutton chops fat 6 ozs, boiled ham 6 ozs, cheese 1 oz, our coffee 10 ozs, milk 12 ozs, bread 2 ozs: This gives 3.6 ozs of protein, 10.6 ozs of fat, 5.9 of carbohydrates, 3907 calories and 1493 pints of oxygen. The fiber is correct, energy 583 in excess, requiring 181 pints of oxygen more than our standard, for no work; therefore only fit to be used with considerable exertion temporarily, or to supply great waste of fat tissue.

Thirty-seven.—Nuts 6 ozs, butter 1½ ozs, cheese 1 oz, whole wheat crisps 6 ozs, pure ice cream 8 ozs, dressed game 6 ozs, and nutritive beef tea 5 ozs: This gives of fiber 3.5 ozs, fat 7.6, force 5.7, 3,114 calories and 1,235 pints of oxygen. The same characteristics as No. 36, except that the oxygen supply a little exceeds the demand.

Thirty-eight.—Our toast 4 ozs, fat mutton chops 6 ozs, chicken milk creamed 8 ozs, oysters creamed 8 ozs, cheese creamed 1 oz, egg toast 3⅓ ozs, fig pudding 4 ozs, game (dressed) 5 ozs: Fiber 3.5 ozs, fat 7, force 2.2, calories 2,756, oxygen 1,081. The fiber is right, the oxygen surplus 243 pints.

Thirty-nine.—Egg toast 3½ ozs, fat pork 4 ozs, lean veal 5 ozs, apples 4 ozs, coffee creamed 9¼ ozs, chicken salad 2 ozs, butter 1 oz, steak 8 ozs, dried peas 3 ozs: This gives of protein 3.6 ozs, fat 8.3, force

2.7, calories 3,033, oxygen 1,143 pints. Oxygen surplus is 169 pints; same characteristics as No. 36.

Force-Foods.—

Forty.—Bread and milk 16 ozs, fruit minute pudding 6 ozs, boiled rice 8 ozs, potatoes creamed 8 ozs, oatmeal mush 6 ozs, gluten bread 6 ozs, butter 1 oz, sugar ½ oz, cream 3 ozs, steak 7 ozs: This gives of fiber 3.4 ozs, fat 4.37, force 11, calories 2,877 and 1,033 pints of oxygen. The fiber is about right, calories 553 in excess, making a good force diet in view of the surplus of 279 pints of oxygen.

Forty-one.—*Stimulating.*—Beef tea nutritive 24 ozs, oyster stew 8 ozs, bread and milk 16 ozs, egg and brandy 4 ozs, graham gems 4 ozs, butter 1 oz, coffee creamed 11 ozs, mutton chops 4 ozs: This gives of fiber 3.5 ozs, fat 5.7, force 7.9, and calories 2,890, requiring 1,075 pints of oxygen. The oxygen surplus is 249 pints, making not only a safe force ration, but adding a strong stimulating quality.

Forty-two.—Hominy 4 ozs, dried beans 4 ozs, oatmeal mush 8 ozs, rye bread 4 ozs, fat pork two ozs, round steak 5 ozs, simple pudding 2 ozs, macaroni 2 ozs, snow drift sauce 1 oz, our coffee 8 ozs: This gives of fiber 3.6 ozs, fat 2.4, force 13.1 and calories 2,709, with oxygen demand of 984 pints. The fiber is practically correct, calories in excess 385, same characteristics as No. 38. Oxygen surplus 328 pints.

Forty-three.—Mosquera's beef meal 2 ozs, pure ice cream 8 ozs, buttermilk 20 ozs, smoked beef broth 8 ozs, fruit 10 ozs, our toast 3 ozs, dyspepsia crackers 4 ozs: The constituents of this are fiber 3.6 ozs, fat 2.7, force 7.7, calories 2,329, oxygen required 764 pints. The fiber and calories are about right, the oxygen surplus 548 pints.

Forty-four.—Egg milk 8 ozs, cracker gruel 8 ozs, blanc-mange 8 ozs, rice milk No. 2, 12 ozs, French custard with jam 4 ozs, baked potatoes 4⅝ ozs, dyspepsia crackers 4 ozs, dressed game 5 ozs, butter 1 oz: This yields of fiber 3.5 ozs, fat 3.2, force 8.3, calories 2,359, oxygen needed 827 pints: The fiber and calories are substantially correct, the oxygen 485 pints in excess.

Forty-five.—Apples 6 ozs, bovinine 3 ozs, milk 60 ozs, bread 9½ ozs, cream 2 ozs: This contains of fiber 3.6 ozs, fat 3.3, force 9, calories 2,349, oxygen required 863 pints. The fiber and calories are practically right, the oxygen surplus 449 pints.

Forty-six.—Sweet potatoes 4 ozs, malt and milk 18 ozs, creamed codfish 8⅛ ozs, beef steak 8 ozs, fruit 8 ozs, our coffee No. 2, 9¼ ozs, scrambled egg and our toast 9 ozs, oat meal porridge thick 6 ozs, cream 2 ozs, sugar ¼ oz: This contains of fiber 3.5 ozs, fat 4.3, force 5.3, calories 2,372, oxygen required 908 pints. Calories a little high but amply provided for by the excess of 404 pints of oxygen.

Forty-seven.—Chopped steak 16 ozs, our toast 6 ozs, apples 12 ozs, simple pudding 8 ozs: This yields of fiber 3.4 ozs, fat 4.04, force 6.05 calories 2,466, oxygen required 940. Same general characteristics as No. 45.

Forty-eight.—Steak 10 ozs, milk 12 ozs, bread 6 ozs, fruit 12 ozs, oatmeal 2 ozs, butter ½ oz, fat mutton chops 6 ozs, sugar 1 oz: Comprising of fiber element 3.5 ozs, fat 3.7, force 4.7, calories 2,326. Oxygen required 704. Energy and fiber element are correct, oxygen surplus 608 pints.

Forty-nine.—Bread 4 ozs, beef cacao ¼ oz, cream 4 ozs, pears 3 ozs, eggs 2 ozs, green vegetables 4 ozs, steak 4 ozs, grapes 4, peaches 4 ozs, crackers 2 ozs, butter 1 oz, sugar ½ oz, milk 4 ozs, chops 6 ozs, dressed game 4 ozs: This gives of fiber 3.6 ozs, fat 4.3, force 3.3, calories 2,339 and requires 903 pints of oxygen. Oxygen surplus 409 pints.

Fifty.—Mosquera's beef meal 1½ ozs, entire wheat bread 3 ozs, lamb chops 12 ozs, gluten gems 2 ozs, whole wheat crisps 2 ozs, French custard 5 ozs, butter 1½ ozs: This gives of fiber 3.5 ozs, fat 4.5, force 3.6, calories 2,335, and requires 855 pints of oxygen. Surplus of oxygen 457 pints.

Fifty-one.—Mosquera's beef meal 1½ ozs, entire wheat bread 3 ozs, lamb chops 12 ozs, gluten gems 3 ozs, whole wheat crisps 3 ozs, French custard 2 ozs, butter 1 oz: The constituents of this are fiber 3.5 ozs, fat 5.4, force 4.2, calories 2,321. Oxygen required 847. Fiber and calories correct, oxygen surplus 465 pints.

Fifty-two.—Oatmeal pudding 8 ozs, butter 1 oz, fish 7 ozs, fruit 12 ozs, eggs 4 ozs, fat mutton chops 6 ozs, sugar 1 oz, gluten bread 6 ozs, milk 12 ozs, cream sauce 2 ozs: This contains of fiber 3.4 ozs, fat 4,8, force 4.8, calories 2,347, and requires 705 pints of oxygen. Fiber and calories practically correct, oxygen surplus 607 pints.

Fifty-three.—Porter's beef tea 16 ozs, smoked beef broth 8 ozs, eggs 4 ozs, cream 1 oz, butter 1 oz, oysters creamed 8 ozs, oatmeal and fruit 8 ozs, beef scraped 8 ozs, graham crackers 4 ozs: This gives of fiber 3.5 ozs, fat 5.1, force 4.9, calories 2,318, oxygen requirement 905 pints. Energy and fiber constituents correct, oxygen surplus 407 pints.

Fifty-four.—Mutton chops 4 ozs, chopped steak 6 ozs, roast meat 4 ozs, unfermented bread 4 ozs, Boston crackers 3 ozs, limed milk 8 ozs, butter ¾ oz, oatmeal mush 8 ozs, creamed codfish 5 ozs: This consists of fiber food 3.5 oz, fat 4.6, force 4.4, calories 2338, and demands 894 pints of oxygen. Oxygen surplus 418 pints, energy and fiber right.

Fifty-five.—Hot lemonade 9½ ozs, tomato soup 8 ozs, green vegetables 16 ozs, apples 12 ozs, rye bread 6 ozs, graham crackers 2 ozs, stewed rhubarb 8 ozs, beans 4 ozs, scraped beef 8 ozs, butter ½ oz: This gives of fiber 3.5 ozs, fat 2.4, force 10.5, calories 2332, and requires 866 pints of oxygen. Right in fiber and calories, with an oxygen excess of 446 pints.

Fifty-six.—Meat 8 ozs, fish 7 ozs, onions 2 ozs, butter 2 ozs, wheat bread 2 ozs, buttermilk 16 ozs, apples 12 ozs, hominy 4 ozs, graham crackers 2 ozs: This gives of fiber 3.5, fat 3.4, force 8.6, calories 2349, oxygen 872 pints. Fiber and energy correct, surplus of oxygen 440 pints.

Fifty-seven.—Fish 12 ozs, eggs 4 ozs, peaches 8 ozs, green vegetables 8 ozs, unfermented wafers 4 ozs, butter 1¾ ozs, sugar 1¾ ozs, macaroni 2 ozs, entire wheat bread 4 ozs, baked Indian pudding 4 ozs: This gives of fiber 3.5 ozs, fat 2.8, force 10.3, calories 2326, oxygen 890 pints. Calories and fiber are correct, oxygen excess 422 pints.

Fifty-eight.—Bovinine 1½ ozs, fruit 6 ozs, eggs 2 ozs, sugar 1 oz, butter 1 oz, Boston crackers 4 ozs, milk 12 ozs, Mosquera's beef meal 1 oz, dried beans or peas 4 ozs, hominy 4 ozs, cream 3 ozs: This contains of fiber food 3.4 ozs, fat 2.9, force 7.9, calories 2326, oxygen 828. Energy and fiber are right, oxygen surplus 484 pints.

Fifty-nine.—Chops 3 ozs, eggs 4 ozs, milk 8 ozs, butter ½ oz, sugar 1 oz, baked apples and bread and milk 16 ozs, chicken 8 ozs, gluten gems 3 ozs, vegetables 4 ozs, cream 2 ozs: This yields of fiber 3.6 ozs, fat 3.3, force 8.9, calories 2344, and requires of oxygen 866 pints. Strong in energy and fiber and with an oxygen surplus of 446 pints.

Sixty.—6 a. m.; our coffee 8 ozs, with 2 ozs raw white of eggs: breakfast; smoked beef broth 8 ozs, cream 1½ ozs, Boston crackers 2 ozs: 11 a. m.; grape juice 2 ozs: Dinner; raw beef pulp 8 ozs, grape juice 2 ozs, rice milk 8 ozs: 3 p. m.; restorative jelly 5 ozs: Supper; Raw oysters grated 4 ozs, Boston crackers 2 ozs, cream 2 ozs; bedtime: Thickened milk 5 ozs. This is a diet for appropriate conditions in typhoid fever, and other exhausting diseases. It gives of fiber elements 3.5 ozs, fat 3.9, force 4.9, calories 2328, and requires 831 pints of oxygen. Energy and fiber are right, and oxygen surplus is 451 pints.

This seems like a formidable ration for the conditions named, but when three-fourths have been deducted to adapt it to the digestive childhood state of the patient (as in many cases must be done) it leaves but 15 ounces for 24 hours.

Sixty-one.—Gluten gems 6 ozs, beans 9 ozs, nuts 4 ozs, apple and Indian meal pudding 4 ozs: This gives of fiber 3.5 ozs, fat 3, force 9.5, calories 2439, oxygen required 866. The fiber is right, force 115 calories in excess, with oxygen surplus 446 pints, which renders the excess of force favorable for exposures, cold states, etc.

Sixty-two.—Beans 4 ozs, peas 3 ozs, nuts 4 ozs, oatmeal 2 ozs, entire wheat bread 4 ozs, gluten gems, No. 1, 4 ozs: This gives of fiber 3.5 ozs, fat 3, force 9.4, calories 2366, oxygen required 871. The fiber is right, force only 42 calories in excess, with oxygen surplus 441 pints.

Sixty-three.—Gluten gems 4 ozs, butter 1 oz, dates 2 ozs, beans (dried) 2 ozs, bread 2 ozs, hominy 3 ozs, rice 2 ozs, graham crackers

ozs, suger ¼ oz, milk 8 ozs, fruit 6 ozs: This ration is inserted in order to show how defective is the nutrition ordinarily given to the feeble. Very many invalids would deem themselves incompetent to ingest these 32¼ ounces, yet they afford but ⅓ the necessary amount of fiber food, and are defective nearly 1-7 in force. The only merit of the diet is the small oxygen requirement,—but little over one-half the normal supply, i. e. 699 pints.

Sixty-four.—Beef 8 ozs, mutton 4 ozs, skimmed milk 24 ozs, green vegetables 28 ozs, bread 4 ozs, apples 12 ozs, butter 1 oz, horse-radish freely: This gives of fiber 3.8 ozs, fat 3.7, force 6.5, calories 2316, oxygen 907. The oxygen surplus is 405 pints. Designed for rheumatic tendencies, and made strong in fiber element in order to sustain the tissues under the use of the baths that are often necessary.

Mixed Diets will be found among all the foregoing classes, excepting the fluid.

SPECIAL NOTE.

On page 371 it is stated that 1312 pints of oxygen capacity, are required to effect the complete assimilation of the quantity of food adopted as the standard for a man at no work; yet the reader can not have failed to notice that most of the diets made require less than 900 pints, the average of the whole forty-seven, not including the four for consumption, nor the thirteen fluid and semi-fluid bed diets, being but 865, while the average of the first sixteen is only 629 pints. The explanation of this seeming incongruity, is that the oxygen capacity noted on page 106, reaching even to 1642 pints, is Nature's provision for the larger oxygen requirement of the increased rations which work, and hard work make necessary. Should the objection be urged that this excess of oxygenating capacity over the nutritive oxygen requirement practically nullifies the point so strenuously urged on pages 111–112 and 129, the answer is:

(1) The rations in ordinary use require much more oxygen for their assimilation than do these specially prepared diets, as is practically illustrated in the rich dinner on page 125, which requires 568 pints, and that is often matched in the dinners of the middle class by reason of the large proportion of fat and sweet compounds which they consume; e. g. pud-

dings with their sauces and pies demand from 36 to near 50 pints per oz, while beef needs but 23 and lean chicken but 9 per oz.

(2) On page 121 it is stated that every 100 pints of oxygen required for the reduction of food, calls for 17½ cubic inches of lung capacity. Of course it is assumed that this capacity is used. If, then, a man at no work uses 222 cubic inches in health, it is far from improbable that in diseased, bed conditions he will approach dangerously near to the 90 cubic inches absolutely necessary to prevent suboxidation of even these carefully prepared diets requiring only 629 pints. Therefore as wide a margin of oxygen surplus as practicable, is always to be sought in these circumstances, with due regard to the evolution of sufficient force to sustain animal heat and the various vital processes of the system.

PART IX.

DISEASES AND THEIR TREATMENT.

All the Principal Diseases and Most Common Ailments Described so that They May be Recognized—The Cause Pointed Out—The Best Treatment in Each Case Given in Detail, Including Full Directions as to Diet, Hygiene, Exercise, Baths and Similar Common Sense Methods, as well as Proper Medicines when Physic is Needed.

Important Notes.—In order to save space and avoid numerous duplications, the particular methods and special diets of Part 8, are often referred to in the treatment of diseases, and should always be carefully consulted in such cases. These methods and diets are a new departure of vast utility to all who would be guided by principles, instead of going blindly by mere directions; because the last always must have a certain combination of conditions to be appropriate, which in practice is found as often absent as present.

In grading the remedies in these particular treatments, their position is not always fixed by their real relative potency, but often according to their appropriate use in different strengths.

When homeopathic remedies are named, the usual strength as put up in family cases is indicated.

Dosimetric remedies are occasionally prescribed and can be readily procured of any druggist.

Biochemic remedies are often prescribed because perfectly safe, and can be procured of any wholesale homeopathic pharmacy; six x is the usual strength, and three tablets two or

three times a day in chronic cases, and three to six times a day in acute cases is the *ordinary* dose, but may be given every half hour if necessary.

Botanic agents are often prescribed, and can be gathered from the fields or procured of any good druggist.

☞When a number of remedies are named for the same condition, it is not intended that all of them shall be used in one case, but the one most readily procurable or best adapted.

When reference is made to any matter, as of diet, hygiene, etc., but no page named, see index for page on which that topic is treated.

Remedies that are to be taken in *alternation*, or *rotation* are to be used one at one period, the other at the next, and so on. Two remedies may be alternated, three or more may be rotated.

When remedies are named for stomach use, and others by retained enema for the same disease, either may be employed, but not both at the same hour unless one proves ineffective.

Objections. Some may object that this arrangement requires too much careful study. Our answer is, no person is fit to use a home doctor book who is not willing to study it; for if he does, as much harm as good is likely to result.

Diets for sickness can only be accurately constructed upon the basis of the average for a man in health at no work. Deduction can then be made for women and children as stated on page 371. Then, the further modifications of quantity necessary to adapt them to disease, must be left to the skill of the physicians or the common sense and experience of the nurse, because the same quantity of a given food that at one stage of a disease would be beneficial, at another might be very harmful.

Abortion.—The loss of the fœtus before the sixth month of pregnancy; most common between third and fourth months. *Symptoms:* Hemorrhage, labor pains. If in fourth month or later, chills, lassitude, paleness, palpitation, flaccid breasts, sinking abdomen, bloody discharge. *Cause:* Predisposition from weakness or chronic disease, acute diseases, accidents, mental excitement, over-fatigue, drugs such as ergot, savin, etc. Sometimes diseases of the fœtus.

Treatment: Unload the bowels with an injection of starch water and ginger. If able to sit, take tepid hip bath fifteen minutes, and vaginal injection of tepid beth-root, geranium, or witch-hazel tea every three hours. Patient must keep in bed. If hemorrhage occurs, get the blood to the surface. Bathe limbs and feet in strong pepper tea; heated bricks at feet and hips. Internally a tea of black or red pepper, or strong, warm composition tea every one-half hour. If restless, add scullcap or ladies' slipper. If lips get blue, cheeks and fingers cold, inclination to faint,—strong or very strong stimulating method. If hemorrhage continues, give strong or very strong emetic method until nausea is decided, then continue the composition alone until free vomiting occurs. Repeat if necessary; the danger is in not using it. Or, three to five drops of fluid extract of false unicorn (helonias dioica), in water Repeat, if necessary, once or twice. Or, teaspoonful doses of black haw (viburnum prunefolium) fl. extract, or the same of high cranberry (viburnum opulis), every hour. Or a bowel injection of forty drops of laudanum in starch water.

Abscess.—A cavity or tumor containing pus. *Symptoms:* Heat, swelling, pain, redness, pointing (*i. e.*, special prominence on the swollen area where the pus seeks exit).

Cause: Lymph that has been effused as the result of inflammation, into a natural or unnatural cavity, breaking down into pus. A product of microbial action, the streptococus pyogenes.

Treatment: Abort by revulsive method, No. 13, average to very strong. Sigmoid or cæcal flush every night. In severe cases, diet as for fever until suppuration, then nutritive, No. 2, mild, and change the water application to hot fomentations of hay or catnip tea, or poultices of carrots, flaxseed, bread and milk, etc.

Biochemic: Ferrum phos. every two hours. If swelling continues, three grains kali mur every two or three hours. If suppuration is inevitable, three grains silicea, every two to four hours, and poultice.

Germicide.—When it points, open and inject with peroxide of hydrogen, until the pus is destroyed; take twenty to thirty drops internally three or four times a day. Or sprinkle powdered papoid upon open surfaces and inject a solution of papoid into the cavity. Give three grains calcaria sulph. every three hours to promote healing.

Allopathic: Twenty drops tincture of chloride of iron, every four hours. In chronic abscess, foment with tea of wild indigo.

Massage.—Revulsive method, No. 13, mild.

Acarus Follicularum.—See skin diseases.

Acarus Hominis (itch).—See skin diseases.

Acne (all forms).—See skin diseases.

Actinomycosis. — Probably a micro-organic disease, consisting first of a tumor in the jaw. Later abscess and fistula. May occur in the respiratory tract or intestinal canal and in liver, spleen, and muscles; may be contracted from cattle or men. Treatment should be blood cleansing, No. 4, average to very strong, and blood making, No. 1, mild to strong. Peroxide of hydrogen, No. 15, vol. solution, every three or four hours for the mouth, resorcin (pure) two to five grains for the intestines every three hours.

Addison's Disease. — A disease of the supra-renal cap-

sules. *Symptoms:* Bronze skin, anæmia, general debility, breathlessness on exercise, dim vision, dyspepsia, loss of memory, albuminous urine, convulsions, delirium or coma. *Cause:* The tubercular bacilli. *Treatment:* No cure. Alleviative—germicidal remedies and tonics, and generally as in consumption.

Adenitis (bubo).—The function of the entire lymphatic system is to raise the blood from elementary molecules to leucocytes, thence to red discs. Leucocytes are protoplasmic units, whose function is to unite in forming structures with vital endowments in a particular direction. The cells from which all organic structures are made are leucocytes. Sometimes this functional power is impaired and sometimes the cell structure may be inflamed. This is adenitis.

Forms of the Disease: (1) *Simple Adenitis*, may result from a blow, walking or the absorption of some irritating poison. (2) *Tubercular Adenitis* consists of enlargement of the glands of the neck with inflammation and suppuration, or the mesentary may show a similar condition. (3) *Syphilitic Adenitis* accompanies soft chancre and gonorrhea in the form of virulent bubo, indurated chancre of the lip, indurated submaxillary and axillary glands. (4) *Cancerous Adenitis:* As in enlarged sub-maxillary and axillary in cancer of the tongue, lip and breast. (5) *Adenia or Hodgekin's* disease (*Leucocythemia*): Enlargement of the lymphatic glands of the entire body; anæmia, greatly diminished red blood corpuscles, enlargement of the spleen and supra-renal capsules. No increase of white corpuscles. (6) *Poison Adenitis:* In plague, relapsing fever, anthrax, glanders, farcy, malignant erysipelas, dissection wounds, phlebitis, malaria, bites of angry men, etc. There may be general enlargement of the lymphatic glands with hypertrophy of the spleen and an increase of white corpuscles.

Treatment: Must be heroic in all forms. Alterative, No. 5, strong or very strong. Tonic, No. 3, strong. Special remedies to sterilize the microbes. Locally plantain leaves, iodoform, resorcin, peroxide of hydrogen. For syphilitic bubo, soft in the center, throbbing pain, poultices of slippery elm and bicarbonate of soda days, and linseed nights. If it does not open itself must be cut to the bottom in four directions so as to destroy its sac. If it does open, inject with solution of iodine two to four grains and iodine of potassa four to eight grains to the pint, to destroy its secreting power. A strong decoction of hemlock. See ulcers, chronic.

Aesthenia.—Exhaustion, the heart ceasing to beat while other organs may continue their functions. *Cause:* Prussic acid, stroke of lightning, violent effort or excessive fatigue, extreme terror or violent grief in those of weak hearts. *Symptoms:* Face pallid, eyes dilate, gasping, pulse feeble or suspended, unconsciousness, falling. *Treatment:* Lay on back, head lower than heart. Loosen clothing about neck, chest and waist; dash cold water into the face. Ammonia to the nostrils, abundance of fresh air. Smartly slap the side of the chest over the heart. If persistent, four tablespoons of whisky or

brandy in water or milk thrown into the bowel; or hot enema containing one to four grains of capsicum.

Ague (chills, chills and fever, intermittent fever, malarial fever).—Rigor, fever and sweat at certain times with intervals of apparently good health. The spore or germ of decaying vegetable matter acted upon by solar heat above about 78° enters the blood through the air breathed, or the water imbibed, and evolves the bacillus of malaria, which periodically emits spores, and the chills are at the time of the greatest activity of the bacilli just preceding the sporulation. If this occurs every other day with an interval of twenty-four hours it is quotidian; with forty-eight hours interval, tertian; with seventy-two hours interval, quartian. The first occurs usually in the morning, the second at noon, the third in the afternoon. Any form may occur twice during its specified time. There are also forms that occur once a week, once a month, etc. When the bacilli enter the blood-stream they either coalesce with and destroy the red blood corpuscles, or cause their destructive metamorphosis and change the blood clotty and dark colored, causing it to adhere to the walls of the arteries; from which comes embolism.

Symptoms: The cold stage, dullness, lassitude, headache, sick-stomach, pain in back and limbs, a cold feeling though the skin may not be cold to the touch, shivering, skin shriveled, papillia prominent (goose skin), pale face, lips and finger ends blue, exhaustion, sometimes urgent thirst, features contracted, eyes dull and sunken, pulse feeble, respiration hurried or oppressed. Irritability. May continue from a few minutes to several hours. *Fever Stage*—Skin warmer, flushed face, headache severe, quick respiration, pulse hard and rapid, temperature hot, mouth dry, great restlessness, irritability and delirium. May last from two to twelve hours. *Sweating Stage*—Slight moisture on forehead, skin moist and cool, all the distress subsides, may be copious discharge of urine depositing a brick dust sediment, and the patient falls into a quiet sleep from which he may awake in his usual state of health until the next paroxysm occurs. Sometimes one or two of the three stages are absent.

The Geographical Limits of the disease are 63° latitude north, and 57° south. Hertz says that even in an elevated and dry region, loose soil overlaying any impermeable soil that retains percolating vegetable matter may induce malaria.

Conditions tending to ague are anger, fear, sleeplessness, hunger, fatigue, exposure to night air, sleeping in damp beds, or on the lower floor of a house, or in rooms too densely shaded, sudden cooling and exposure to the direct rays of the sun. The morbid conditions resulting from frequent attacks are irritation of the brain, morbid condition of liver, kidneys and spleen, and finally leucocythema or white-cell state of the blood.

Treatment: Diet nutritive, No. 2, mild to strong. In *Cold Stage*, hot cæcal flush No. 40 (or No. 13, if not an habitual user of coffee), prepare blankets as for a pack, wring the upper blanket out of water as hot as can be borne and proceed as for pack. Give as much hot lemonade as patient desires. If there are no signs of faintness, keep the patient in until the hot stage comes ; but if it is over three-fourths of an hour, remove all wraps except wet one and apply as soon as possible another blanket wrung out of hot water and re-cover. Should there be faintness, remove quickly, wrap in a warm, dry blanket and give stimulants freely. In *Hot Stage*—All the cold water or lemonade desired, frequent sponging under the bedclothes with cold or tepid water. If this stage be protracted, a full tepid cæcal flush of salt water. In *Sweating Stage*—Frequent gentle rubbings with a dry towel.

Intermediate Treatment: Full pack every other day, cæcal flush daily of No. 9, general ablution daily. Drink three to six quarts of water, hot or cold, or as lemonade every day. Wear flannels, have an open fire in the room night and morning, and avoid conditions predisposing to fresh attacks. Side exercise (a) page 32, three times a day. Just before the next chill is expected give an emetic of lobelia and capsicum ; or a spirit vapor bath with sweating teas so as to have it in full operation when the chill is expected. Abstain from milk diet, buttermilk, fats and fish. Forenoon chill, great thirst, violent headache—natrum mur., three grains every hour; with vomiting of food, ferrum phos., three grains every two hours; with vomiting acid, natrum phos., three grains every two hours; with cramps in calves, magnesium phos., three grains every hour.

Dr. Hill's Homeopathic Treatment is, on first sign of chill, aconite and baptisia alternately, first three doses every ten minutes, next three every fifteen, then every thirty until patient sweats freely. Then substitute arsenicum and cimicifuga alternately every hour during intermission. If chill returns repeat aconite and baptisia as before and follow with arsenicum and nux vomica every two hours. Also cinchona, one grain every one-half hour from the beginning of the chill until time for the next. Pulsatilla and cimicifuga in alternation for chronic, much drugged cases. Arsenicum every hour to end of fever and every three hours of intermission in irregular cases with thirst during chill, face pale and bloated. French authorities claim that a decoction of green, unroasted coffee, taken freely a few hours before the chill, will prevent it. Whatever treatment may be selected the bowels should be freely opened with extract of butternut bark; or with cæcal flush. Dr. Challones names as a specific in dumb ague, a decoc-

tion of the inner bark of the sugar maple, two ounces steeped in a quart of water twenty-four hours. Dose, a wineglassful, four or five times a day.

Albuminuria.—The presence in the urine of an albuminous body which is coagulated by heat or precipitated by neutralization. *Cause:* Acute congestion of the kidneys; acute or chronic inflammation of the kidneys; or degeneration of the kidneys. *Treatment:* Anti-albuminous diet and treat kidney diseases. Calc. phos. in alternation with kali phos. Strontium lactate, an ounce and a half; distilled water, eight ounces. Dose one teaspoonful morning and night, and diet of vegetables, milk and eggs, has been highly recommended.

Alcoholism (*delirium tremens*), Mania à potu.—Delirium with trembling, sleeplessness, disagreeable hallucinations, profuse perspiration, loss of appetite, thirst and nausea. *Cause:* (1) Excessive use of alcoholic stimulants. (2) Sudden withdrawal of the stimulant, causing an attack in from two to seven days. The first is over-excitement. The second is prostration, to be treated by stimulants, tonics and restoratives.

Diet: Vegetables and fruits give a distaste for alcoholics because they retard each other's combustion in the system.

"Those who take much fat, butter, or oil, cannot take wine, and feel no desire for it."—Professor Gregory's *Organic Chemistry*. 1852.

For acute cases, bovinine in hot milk every two or three hours; or Rose's Beef Peptones half to one dram, with hot milk every two hours. *Baths:* First day shoulder sprinkle and knee sprinkle; second, loin sprinkle and arm plunge; third, body pack and water tread. So repeat every three days until cured, temperature carefully adapted so as not to give a depressing shock. *Exercises:* Very light and not continued to fatigue. Tranquilizing, page 35. *Vital Cleansing:* Sigmoid flush, capsicum, one to four grains in elm or starch water as frequently as strength will bear, i. e. daily if practicable, and retained enema No. 18 every four to six hours, or No. 34 every two to three hours. Rest and sleep all that is possible (see page 26). Ventilation free, temperature comfortable. *Medicine:* Erythroxylon coca fl. ext. one to four teaspoonfuls in water often enough to steady the nerves. Capsicum in full doses. For sleeplessness whenever exhausted, sulfonal in fifteen to thirty grain doses every one to two hours until sleep is induced. After four to six days, drop the coca and take tinct. of oats one-half to two teaspoonfuls in hot water every three hours, or oftener if the desire becomes vehement. For delirium tremens and as a substitute for alcohol lupulin (con.) one to two and one-half grains up, until the nerves are steadied. To rid the body quickly of alcohol, a Turkish bath, meat food with papayotin one to four grains after meals. Complications must be treated as they occur.

Alcoholism, Chronic (dipsomania, methomania oinomia):—Morbid, uncontrollable craving for intoxicating drinks. *Cause:* The great excess of hydrogen introduced into the system by the use of intoxicants. *Treatment:* Remedies that carry into the circulation an excess of oxygen—chest exercise. Depth. page 31.

The following medicine is said to have helped many to reform, as it did Captain John Vine Hall of the Great Eastern steamship: "Sulphate of iron, twenty grains; magnesia, forty grains; peppermint, forty-four drams; spirits of nutmeg, four drams. Dose, one tablespoonful twice a day." Dr. S. R. Beckwith pronounces the following as the best remedy that chemistry has produced, and advises its use with the Thermo-Ozone battery: "Chloride of sodium and gold one dram, chloride of soda two drams, (liq.) sol. chloride of calcium mur. two drams, sol. chloride of barium one dram, sol. chloride of aq. pura. two ounces. Dose one-third teaspoonful in a teaspoonful of water, administered by the mouth, or twenty drops hypodermically, or fifteen drops placed on the positive disc when the battery is used; to be used in either case twice a day."

Alopecia (loss of hair).—*Treatment:* Head vapor once a week. Head ablution daily. Nutritive treatment, No. 2, average. If one prefers the usual stimulant and unguent plan, the following germicide may be used: Bay rum, one pint; boroglyceride, one ounce; tinct. lobelia, one-half ounce; tinct. cantharides, one ounce. Wash the head daily with a lotion of boroglyceride, and dress the hair with the above. In scrofulous and syphilitic cases apply daily to the scalp an ointment as follows: Liquid vaseline, one ounce; boroglyceride, three drams; resorcin, one dram; chrysophanic acid, ten grains; mix.

Amaurosis.—Blindness from disease of the retina, optic nerve or brain, the eye being in a normal condition. *Symptoms:* Impairment of vision, uncertain walk, unmeaning look. *Cause:* Use of tobacco (see pages 39–40) etc., straining the optic nerve and affections of the brain.

Treatment: If anemic, nutritive treatment strong; if congestive, cæcal flush, No. 7, bowel fomentation, foot vapor, each once a day. If reflex, treat the source of irritation. If poisonous, remove the poisons and give tonic treatment, No. 3, strong or very strong. If organic, stimulant treatment average or strong; massage one to two hours daily. Nutritive treatment strong, fomentation of neck daily.

Amenorrhea. — Absent or defective menstruation. Cause: Congenital absence of the organs, lack of development of the organs, unnatural toughness of hymen, anæmic constitutional diseases, colds. Symptoms of acute cases are feverishness, pain, weight in lower back and pelvis, headache, dizziness, swelling of abdomen and breasts, nausea, palpitation, lassitude, flushed face, dry skin.

Treatment: Hot cæcal flush, No. 22, or No. 34. Hot mustard foot bath to knees one-half hour. Then in bed with heat to feet; drink freely of hot lemonade with one-half teaspoonful of essence of ginger to cup, every hour or two until perspiration. Mustard fomentations on lower abdomen and plasters of mustard on inside of thighs. A tea of thyme, summer savory, garden feverfew or garden angelica may also be used. Case obstinate: Sit fifteen minutes every two hours over a vessel containing steaming tansy or hemlock leaves, and drink tea of hemlock

leaves, smartweed and camomile every one-half hour. Hot fomentation of tansy and smartweed on lower abdomen, preceded by hot colon flush containing ginger and lady's slipper.

Chronic cases are usually attended with undeveloped breasts, narrow chests and hips, and in cases of congenital deficiency by a masculine appearance. Be sure to distinguish from pregnancy. In serious cases, seek the removal of the disease causing it. In mild cases, bathe lower abdomen with smartweed or pepper tea night and morning; also the feet, if cold. Hot colon flush two to five times a week. A few days before time for menses, hot foot bath each night and warm pennyroyal or hemlock leaf tea. Tea of camomile and black-cohosh, cold, every two hours, or if patient is well nourished and has no other prostrating disease, thirty drops fl. ext. of polygonum punctatum (smartweed), in hot water four times a day for a week before the time of menses. If the case is obstinate, use stimulating emetic once or twice a week, the stimulating wash over spine and limbs as well as abdomen, and the emmenagogue tonic: Four ounces each of motherwort and camomile, one each of blue-cohosh and red flowering smartweed. Tincture a week in two quarts malaga wine, strain and add one pound of sugar. One-half to one tablespoonful three times a day. For lymphatic women, vapor bath once a week. When menses appear, suspend vigorous measures. A few days before the next period, use the emmenagogue tonic and the warm foot baths and drinks as may be necessary.

Schoolgirl's Amenorrhea: No study either at home or school. Open air several hours daily, warmly clad but with no chest protectors, with deep breathing with mouth closed. Sponge bath on rising, water of the temperature of the room, with plenty of towel or hand friction. Strong nutritive diet.

Homo: Acon. and puls. every fifteen or twenty minutes, less frequent as pain diminishes, feet in hot water. If nausea, vomit with lukewarm water. Rub loins and back downward with naked hands. Head hot and face red, bell. with puls., lungs oppressed, bryonia, much pain after flow begins, caulophyl. Suppression of weeks duration apis. mel. In young women—pod. at night, cim. in morning three weeks; then puls. also in rotation every six hours.

Ammonæmia.—Blood poisoning from the absorption of a fungus and carbonate of ammonia by the retention of the urine in the bladder. *Cause:* Stricture, enlarged prostate, atony or paralysis of bladder, cystitis, kidney disease, etc. *Symptoms:* Breath and skin ammoniacal. If not relieved, rigors, vomiting, fever, dry, brown, shining tongue, dingy brown skin, headache, insomnia, restlessness, lethargy, muttering delirium.

Treatment: For immediate relief, drain off urine with a catheter, then flush the bladder with hot water two or three times, then with a solution of six to ten drops of peroxide of hydrogen to a pint of water; thus empty and wash daily. About nine p. m. wash out rectum with one-half to three-fourths pint of tepid solution of boracic acid, thirty to forty grains to the pint. Pass off. Then inject one tablespoonful of the following: Distillation of hamamelis, four ounces; papoid, thirty-two grains; mix; retain. Average or strong nutritive and tonic methods as far as they can be employed in connection with very strong blood-cleansing method.

Amyloid Degeneration.—*Cause:* A disease germ, the bacillus pyocyaneus, which evolves starch molecules that are carried by the blood and deposited in weakened parts and increased by aggregation. The heart, liver, spleen and kidneys

most frequently affected. *Symptoms:* Progressive debility, waxy complexion, abundant urine, enlarged liver, spleen and kidneys. *Treatment:* Remove cause. General alterative and tonic treatment. Exercises, 3, p. 30; 9, p. 31; 9 d., p. 32; 12 b., p. 32; 13 g., p. 33; 24, p. 35 as needed. Calca. fluor. three grains four times a day. If the heart is affected fl. ext. of cactus grand five to twenty drops every four hours. If the liver be affected, vegetable tonics such as hydrastis, black willow or cinchona cal.

Anæmia.—A deficiency of blood as a whole, or of some of its constituents, usually of red blood corpuscles, diminishing sometimes to 40 parts in 1,000, instead of the normal 130 parts. The symptoms are debility, bloodlessness, cold extremities, palpitation, spots before the eyes, noises in ears, vertigo.

Treatment: Rapid blood-making treatment according to degree of debility; or nutritive treatment strong or very strong. Beef blood has had much reputation, but Gheradini has shown that it is difficult of digestion, the hæmoglobin being changed in the stomach into hæmatin, which is not absorbed but passes unchanged into the fæces, and therefore the peptonoids resulting from the digestion of blood contain but little iron. *Baths:* Head ablution daily and carefully dry the hair, which should be short. Water tread daily one-half to five minutes. Body wrap twice a week thirty to fifty minutes, must not chill; sun bath three times a week twenty to thirty minutes (see p. 8). Cold sponge daily. *Exercises:* Selected according to need from 3, p. 30, 9 depth, 9 breadth (a), p. 31; apex fulness, p. 32; e., p. 33; 18 a, p. 34; 19 a, p. 34; 24, p. 35. After considerable improvement substitute for above water applications, sitz bath three times a week, shoulder shower and knee shower each twice a week, and later once a week. Cæcal flush No. 31, often enough to keep bowels free, with stimulating drinks if necessary. Retained enema of No. 22, as often as condition of nerves requires. Rest and sleep to be encouraged to the utmost; see pp. 25–28. Clothing, see pp. 24, 25. Diversion, very important, p. 28. Air and temperature, open and genial but bracing; see p. 5.

Medicine: The following saline and chalybeate tonic may be used, as it supplies in about the relative proportion in which they exist in the blood, most of the important inorganic salts of the blood, with an excess of sodium chloride and a small quantity of reduced iron:

SALINE AND CHALYBEATE TONIC.

R	Sodii chloridi (C. P)		iij; drams
	Potassii chloridi (C. P.)	gr.	ix;
	Potassii sulph. (C. P.)	gr.	vj;
	Potassii carb. (Squibb)	gr.	iij;
	Sodii carb. (C. P.)	gr.	xxxvj;
	Magnes. carb	gr.	iij;
	Calc. phos. præcip		ss; ½ dram
	Calc. carb	gr.	iij;
	Ferri redacti (Merck)	gr.	xxvij;
	Ferri carb	gr.	iij;

M. In capsules, No. 60.
Sig.: Two capsules three times daily after eating.

The animal, or beef extracts deserve careful consideration as specially efficient remedies. The oxygen treatment may be used to awaken all the processes of life. Give thirty drops of tinct. of oats and a generous diet, to furnish the material out of which new tissues are to be

nade. Tinct. of the chloride of iron fifteen drops in water three times , day is deemed a specific. A tablespoonful three or four times a day f liquor mangano-ferri peptonatus "Gude," is a recent but effective cientific treatment.

Anæsthesia.—Loss of consciousness, or sensation, or oth, by the inhalation or application, or subcutaneous injec- ion of various drugs. By chloroform, one death in 2413 ases, none by ether. Treatment for excessive narcoses, see ccidents. Safe local anæsthetic—spray on rapidly for one inute, then slowly from two to six minutes, menthol one part, ther fifteen parts, chloroform ten parts. Dr. Sleich of Berlin, ays that subcutaneous injections of distilled water render the arts insensible as long as the wheal remains.

Anasarca.—See Dropsy.

Anchylosis.—The union of ends of broken bones into a oint by the effusion of lymph and its organization into liga- nent or bone. *Treatment:* Ozonized clay applied daily as a oultice to cause the absorption of the lymph. Should not be ept on long enough to cause redness of skin. Nutritive nethod, No. 2, average to very strong. Liquor auri et arsenii ive drops three times a day in water has cured some cases.

Aneuria (or coma).—Extreme oppression of the brain or xhaustion of the energy of the great nerve centers, causing eep sleep from which patient can not be aroused. *Treatment:* Belladonna five to ten drops, water four ounces. One teaspoon- ul hourly. With signs of apoplexy, treat as for apoplexy. With indications of opium poisoning, treat for opium poison- ng. In fracture of the skull, treat as for shock and secure urgical aid. In dead drunkenness, full colon flush of hot tarch or elm water containing one to four grains of capsicum. n uræmia, inhalations of oxygen, frequent and protracted, nd such treatment for kidneys as the case requires.

Aneurism.—The dilatation of the coats of an artery nto a swelling or sack. *Cause:* Morbid state of the blood, eakness of organization, disease of the walls of the blood ves- els. *Symptoms:* A swelling, pulsating with the action of the eart, and located over an artery.

Treatment: If small, it may be obliterated by painting it with a amel's hair brush, with the best quality of collodion, adding coat to oat with finger pressure if necessary also. Paint one-fourth of an nch beyond it on all sides. As soon as the edges begin to loosen,

remove and repaint until it disappears. Calc. fluor. three grains in alternation with same of ferr. phos. every two hours. Pressure when it can be applied. Electricity by needles inserted into the aneurism when available.

Angina Pectoris (neuralgia of the heart).—*Cause:* Diseases of the brain or blood, stimulants, passional excitement, loss of sleep, etc. *Symptoms:* Sudden, excruciating pain shooting through the heart, from breast to back, producing faintness, depressed pulsation, pale, anxious expression, and coldness or cold, clammy sweat.

Treatment: If caused by wind in stomach, give hot pepper or anise seed tea, or ten to twenty drops of ether, or inhale a tablespoonful of ether from a handkerchief, or take a teaspoonful of whisky in a tablespoonful of hot water, repeated in ten minutes. If stomach is acid, a teaspoonful of soda in a glass of water. If full of undigested food, an emetic. During the attack, secure complete relaxation with cæcal flush, No. 23, or with thirty to sixty drops of tincture of lobelia, repeated as often as necessary. Nitrite of amyl, three to eight drops in a hermetically sealed capsule, broken on a piece of lint or linen and inhaled, gives instant relief. Use cautiously; if not procurable, use nitro-glycerine, one drop of a one per cent solution in water; or inhale a few drops of chlorform, and, just as it begins to narcotize, hypodermically inject one quarter of a grain of sulphate of morphia. To prevent recurrance, R. tinct. lobelia, one ounce; tinct. macrotys, one-half ounce; tinct. gelsemium one-half ounce; aconite, ten drops; water four ounces; mix. Teaspoonful three or four times a day. During the interval improve general health, avoid cold, damp, violent exercise, walking after meals, frequent sexual intercourse, and all mental excitement, and cure any condition predisposing to other attacks.

Angina Tonsillario.—See quinsy.

Angina Gangrenosa, malignant quinsy, putrid sore throat.—See quinsy.

Anosmia (loss of the sense of smell).—May be from injury to the nerves leading from the brain to the nose; or from disease of the nasal membrane. Treat the cause.

Anorexia (loss of appetite).—Common in all acute, and many chronic diseases. *Treatment:* Improve conditions of light, air, cheerfulness, and the like, and increase the secretion of the gastric fluid. Exercise 19, p. 34; 9, p. 33; 3, p. 30. Active exercise in the open air; if vigorous, cold sponge bath twice a day, or shower bath once a day; if weakly, cool or cold sponge once a day, half pint of hot water drank four times a day. In all cases, bowels kept active with cæcal flush. If any cause is known, treat that. Camomile tea, gentian, wild cherry, or aromatic sulphuric acid, ten to thirty drops two or three times a day; or, before meals give quassin (neut.) one-thirty-third to one-sixth of a grain in water. First regulate the bowels, and cure gastric catarrh if present.

Anthrax (wool sorter's disease). — A micro-organism peculiar to cattle. Both contagious and infectious. May attack man as malignant pustules, anthrax-œdema, or internal anthrax. Produces symptoms of a malignant poison, rigors, high fever, vomiting, nausea, prostration, sleeplessness, labored breathing, exhaustion and delirium. *Treatment:* Ten to thirty drops of peroxide of hydrogen, in alternation with fifteen grain doses of resorcin, one dose every three hours. Also rapid blood-cleansing method, No. 4.

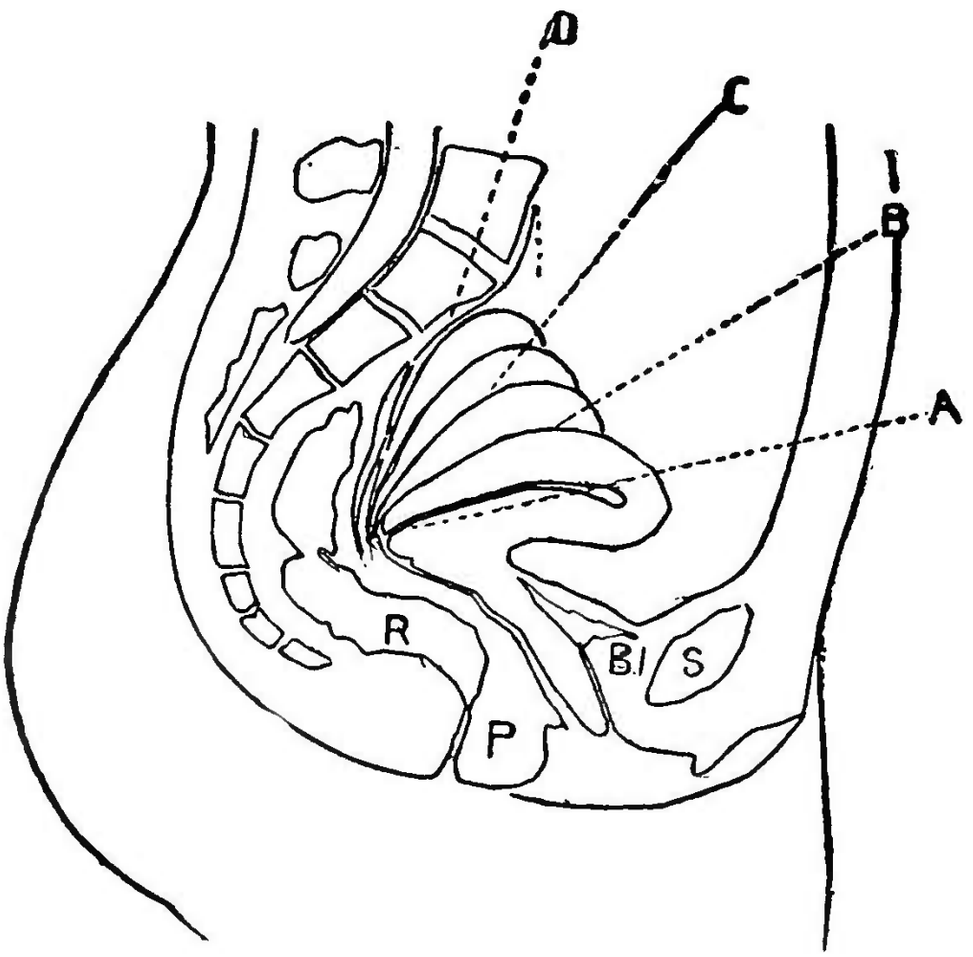

FIG. 58. POSITIONS OF THE WOMB.

Antipyrinism.—Disease resulting from the poisonous effects of antipyrin. *Symptoms:* Face and lips red and swollen, scarlet rash, inflamed and ulcerous mucous membrane, extremities swollen and itching, tongue swollen and dirty. Stop giving the drug, and treat symptoms as they arise.

Anteflexion.—The fundus of the womb drops down at an angle as in *C* or *B*, Fig. 58, and is rigid in that position.

Anteversion.—The fundus drops down upon the bladder, while the os points directly back toward the sacrum. The different normal positions of the womb are shown in Fig. 58, but these differ from the normal in the rigidity of the structures, causing feeling of weight, pelvic pain, and frequent, but vain desire to pass water. If not relieved, chronic inflammation of bladder will result. See *A*, Fig. 58.

Sleep on back, with foot of bed elevated eight to ten inches. Remove all weight and pressure from clothing, by supporting from the shoulders. Once a day for an hour, lie on the bed in the position represented in Fig. 59, the chair being covered with blankets, hips on the back of the chair, knees supported over the rounds. Breathe deeply,

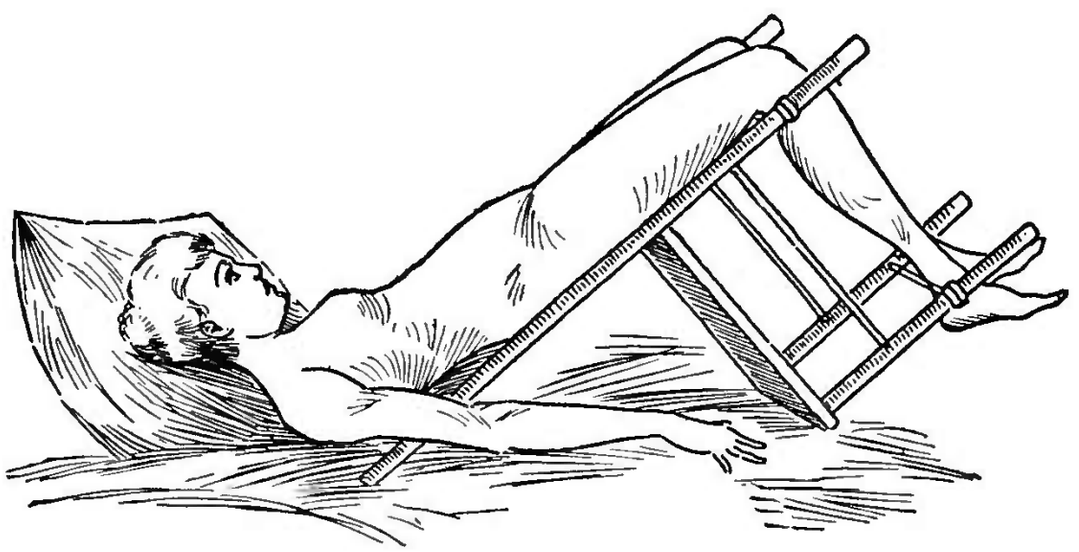

FIG. 59. CHAIR PELVIC TREATMENT.

read or sew at pleasure; when tired turn a little on one side, and then on the other. This position loosens adhesions, and strengthens the natural supports of the pelvic organs. Cæcal flush two or three times a week. Rest and sleep on back a few minutes at intervals of two hours all day. At every rest, take three deep, long inspirations. Be much in the open air, and live in a temperature as cool as possible, without chills. Medicine is of doubtful utility beyond a tonic like berberis or false unicorn (helonias dioica.), in non-irritative states. If irritation be present, remove with sitz baths, tri-weekly. In either case, the water tread daily, with arm plunge twice a week.

Anus (Fissure of).—A painful crack at the edge of the anus. *Symptoms:* Smarting, and sometimes throbbing in the part, increased by coughing, sneezing and the like.

Treatment: Colon flush three times a week, tepid sitz bath three times a week; shirt wrap once a week; bowel pack, thirty minutes, twice a week, of hayseed tea. Daily cold ablution; or, keep bowels soft with butternut, and wear on the fissure a soft sponge, saturated with equal parts of fl. extract of mullein and white pinus canadensis. Wash sponge and renew three times a day. Keep in place by a "T" bandage.

Anus, Fistula.—A tubuler ulcer with an outer opening near the anus, and an inner opening into the rectum. *Symptoms:* Itching pain when bowels are moved; moisture, soiling the clothing, with offensive

odor sometimes. Treatment same as fissure of anus, or solid ext. Bugle weed trituated with lard, into a strong ointment, and applied constantly.

Aphonia (loss of voice).—Organic, when the vocal cords have been distroyed by diphtheria, cancer, etc. Functional, when the cords are stiff by inflammation, or lose their power of motion from paralysis, or from hysterical causes, syphilis or tubercle eating the tissue of larynx; or by lack of cohesion of nerve, or nerve distress, or cold. Most cases are reflex from teething, worms, masturbation, uterine or genital irritation.

Treatment: If organic, local and constitutional to suit cause; if functional and reflex. treat the organ implicated; if nervous, antispasmodics and tonics; cold or heat to larynx externally, according to condition of congestion or relaxation, in each case. *Electric* faradic current, mild, positive at base of spine, negative on throat, ten to twenty minutes once or twice a day, for relaxed conditions. For same use exercise, No. 2; p. 30. General tonic, water method, or cinchonidia, three to ten grains, in twenty-four hours; and nutritive diet, average or strong. Be careful to have rooms well ventilated (see p. 2-4).

Appendicitis (perityphlitis). — Inflammation of the cæcum, may produce ulceration of the mucous membrane, or inflammation of the entire wall and surrounding tissues. *Cause:* Cold and wet; traumatism; irritation of fæces containing seeds, or other hard substances.

Symptoms: When slow—constipation, pain in right groin, increased by pressure, then same as if sudden, namely—pain in the cæcum, may be vomiting, loss of appetite, fever; abdomen swollen and tympanitic, and prominence over the seat of the attack. If then, masses of foul-smelling feces are discharged, recovery ensues. If the peritoneum becomes involved, tenderness and swelling increase, the right leg is drawn up, and later collapse. If abscess forms—septic fever, fluctuation; if it breaks into the colon—probable recovery; if into the peritoneum, peritonitis and death.

Treatment: Cæcal flush, No. 28, repeated if necessary, until the colon is entirely empty; only hot milk and bovinine for food. Compress on right groin, renewed as often as it warms. Two tepid sitz baths a day, up to the navel, if able. Hot foot bath with ashes and salt every day, or, if not able, heat to the feet. Fomentation of whole left arm; lie chiefly on left side, and with hips elevated. Crowd the treatment; if pain becomes severe, or abdomen tympanitic, give the elm flush, as directed for diarrhœa, dysentery, etc. If necessary, give retained enemas of No. 23, or of sweet oil, when the disease begins to yield, then treat less vigorously. Should ulceration have set in, or abscess formed before treatment is begun, and no surgical aid at hand, then fomentation on the part, of hay flower tea, the shirt wrap daily, whole ablutions as often as comfort requires. Should peritonitis supervene, treat as for that.

Appetite, Unnatural. — *Cause:* Irritation of the mucous lining of the stomach or small intestines, diseases of the nervous system, chlorosis and pregnancy. Treat the cause.

Apoplexy, (1) cerebral, (2) spinal, (3) pulmonary, etc. —An engorgement of blood, with or without extravasation

of blood, in or upon an organ. *Symptoms:* (1) unconsciousness, pulse small and slow, respiration slow, embarrassed or stertorious, froth at mouth, clammy sweat, face livid and congested, or very pale, eyes dull, glassy, insensible, teeth clenched. (2) Sudden pain, convulsions, difficult breathing if high, depressed pulse, pale, cold skin; not high, spasms confined to limbs, paralysis in all parts supplied with nerves radiating

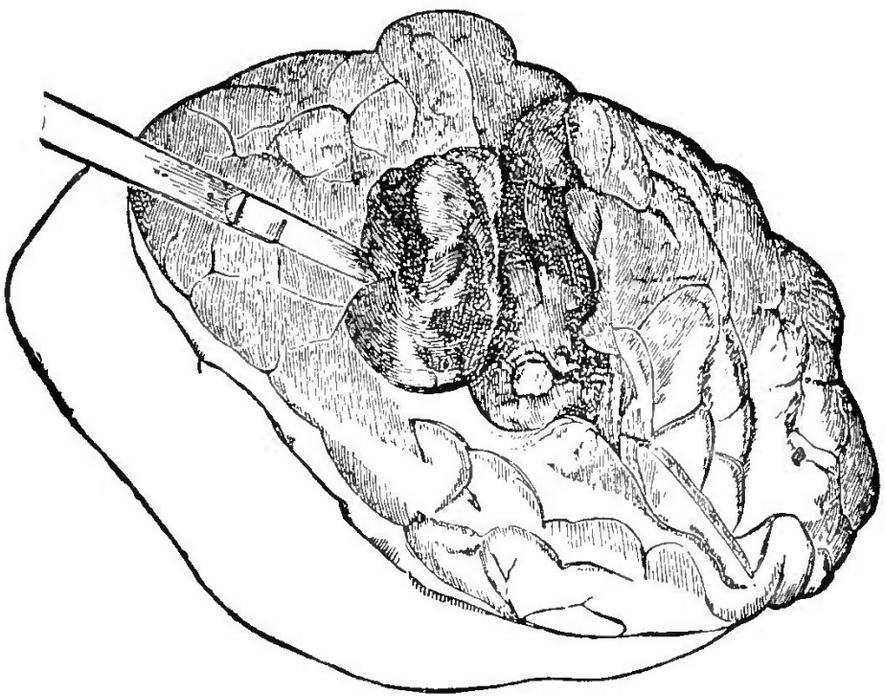

FIG. 60. APOPLECTIC CLOT IN BRAIN.

from below the point of disease. (3) Profound collapse, profuse hemorrhage, extreme difficulty of breathing, lividity. *Cause:* Anything that exhausts the vitality of the organ.

Treatment: In cases 1, 2, and 3, avoid violent mental or physical exertions, straining at stool, and strong emotions or passions; also, tea, coffee, tobacco, alcohol, stimulants or sexual indulgence, heavy meals, much animal food, stooping, tight bands about the neck, hot baths, and great extremes of temperature. Sleep with head high, and wear hair short. If anæmic, give anti-anæmic diet, and tonic treatment as required. (1) *In Attacks;* with face turgid—cæcal flush, No. 22, head high, lie on right side, fomentations of mustard to feet and limbs. Back, chest and abdomen, vigorously washed three or four times a day with vinegar and water, as quickly as possible. A warm foot bath every six hours, vigorous ablution of limbs and arms twice a day. (1) With pale face—cæcal flush, capsicum one to four grains in elm tea; hot sponge bath, two or three times a day. Massage. (2) Absolute rest; cold compress to part, fomentations of mustard to the feet, abdomen and wrists. (3) Absolute rest; general applications as for hemorrhage of the lungs. Support the heart with cactus grand, and liquid nutritive diet.

Apthe (small, white ulcers in the mouth; most frequently in young children. The oidium albicans. Contagi-

ous and infectious).—*Cause:* Anything that can degrade the living matter of nutrition into microbial forms. *Symptoms:* Irritation, restlessness, fever, debility, cough, vomiting, diarrhœa innutrition. Blisters changing to ulcers.

Treatment: One ounce each of Lloyd's Hydrastis and fl. extract pinus canadensis, applied locally with a camel's hair brush or swab, or wash with saturated solution of boroglyceride, or peroxide of hydrogen, one-half teaspoonful to the ounce of water. For red and hot mouth—ferrum phos. White ulcers of nursing babes—kali mur; ashy grey ulcers, fetid breath, gums bleed easily, red line on edges, watery canker—kali phos., a dose every three hours. Attend to ventilation, disinfection of nursing bottles, if used, and keep skin clean and warm, and improve the general health.

Asthma.—A spasmodic, nervous disease, consisting of an irritation of the nerves that supply the circular muscular fibers of the bronchi, causing spasmodic contraction, obstructing the passage of air both ways. Comes when electrical condition of the atmosphere is low. *Symptoms:* Lassitude, debility, headache, drowsiness, may be indigestion, smothering, difficult breathing, chest distended, pulse feeble, eyes protrude, lips purple, temperature falls to near 80° F., profuse sweat, cough, expectoration.

Treatment: If patient is vigorous, first day, shoulder shower, knee shower and water tread. Second day, back and loin shower and water tread; third day, sitz bath, shoulder shower and water tread; fourth day, back and loin shower, arm plunge and water tread; fifth day, sitz bath, shoulder shower and water tread; sixth day, whole pack and water tread; seventh day, loin shower and water tread. The showers from one to three minutes, sitz baths from fifteen to twenty minutes, water treads from three to fifteen minutes, water cold. The second week, shoulder shower three times, back and loin shower three times, sitz once, and water tread seven times. If weakly, substitute the shawl wrap for the shoulder shower, lower back and abdomen ablution for the loin shower, tepid sitz in place of the cold sitz, and foot shower or very short water tread in place of the longer water tread. Water only as cool as can be reacted against within three minutes.

Syrup or wine of ipecac one-half teaspoonful, or tincture of lobelia one-fourth teaspoonful, every half hour, until relieved; same time hot mustard foot bath, and mustard between the shoulders. Strong, clear coffee sometimes gives relief; two or three cups before meals. If the paroxysm arises from indigestion or overloaded stomach, give a teaspoonful of mustard in a half pint of water; if from constipation, cæcal flush of hot water, and retained enema (flush), No. 6. Smoking paper dipped in a saturated solution of saltpeter, and dried until the fumes fill the room, is often efficacious. Caffeine in two grain doses every half hour is good. Smoking stramonium leaves sometimes relieves. Inhale the vapor of a mixture, from a wide mouthed bottle, of ether one ounce, spirits of turpentine one-half ounce, benzoic acid one-half ounce, balsam of tolu two drams.

To prevent paroxysms upon first symptoms, anemonine (alk.) one-sixty-seventh to one-twenty-seventh of a grain every ten minutes, less frequently in chronic cases, or hyoscyamine sulph. (alk.) one-two-hundred-fiftieth, increased if necessary to one-fifth of a grain every hour until the effect is gained, or sulphide of calcium, one-twelfth of a

grain three to twelve times a day. Fluid extracts of yerba santa and grindelia robusta, of each half a teaspoonful each hour, for three hours, then every two or three hours, has cured many cases.

Homeopathic Method: Asthma from sudden cold—aconite and ipecac every hour for a day, then if not cured, copaiva, arsenicum, phosphoric acid and ipecac in rotation, one dose every hour. Asthma, chronic—the last four remedies, one every two hours, upon the occurrence of any symptom.

"A mixture of oxygen and nitrogen monoxide gases invariably gives instant relief, and their continued use, variously modified, has never failed in my hands to work a perfect cure."—Dr. S. S. Wallian.

Ascites (abdominal dropsy).—Effusion of serum into the cavity of the abdomen. Usually caused by peritonitis or liver disease. *Symptoms:* If from liver—sallow or yellow skin, congested conjunctiva, brown tongue, cough, dullness of upper lobe of right lung, pain in shoulder, drowsiness, urine loaded with bile. If from chronic peritonitis—none of the above, but upper body emaciated, features pinched, anxious, shining skin, veins dilated, abdomen enlarged.

Treatment for the last is encouraging; the first will probably return unless persistent water treatment thoroughly changes the condition of the liver. Dwarf elder (Sambucus Ebulus L.) root tea three times a day. Cold body wrap daily one hour, for a week, then every second day for ten days, then every third day for two weeks. Nutritious diet, average or strong. The thermo-ozone battery one hour morning and night. Apocynum canadensis, one ounce, water four ounces; one teaspoonful every four hours; or sambucus, two to ten drops every three hours; or aralia hispida two drams, water four ounces; a teaspoonful every four hours.

If this be not successful, strengthen the blood with tonic method, average or strong. Leave the dropsical accumulation as long as possible so that its pressure may check further effusion and give calcium lacto phosphate. Then to remove the effusion jalapin (con.) one-half grain or more as required. To act on the kidneys, apocynum (conc.) one-twelfth of a grain every one-half hour for acute; every two hours for chronic cases.

Atelectasis (pulmonary collapse).—*Cause:* Anything that weakens the power of inspiration. *Symptoms:* Difficult, quick, shallow breathing, pallor, face and ends of fingers bluish, prostration, rapid, feeble pulse, cold extremities, weak voice, feeble cough, slight expansion of chest. *Treatment:* Fomentations of mustard water on chest and limbs, stimulants, lobelia emetic if bad; later, tonic and alterative treatment. In the new-born, the hot bath followed by dashes of cold water on back of neck, roll in warm flannel, friction, repeat the bath, tonics, stimulants and generous feeding.

Atheroma.—A degeneration of the inner and middle coats of the arteries, usually in patches. *Symptoms:* Obscure;

heart failure, rigidity of affected parts, pulse indistinct, cold extremities, debility, dry gangrene; apoplexy, epilepsy, dementia, petrification. *Cause:* Violence, tension and any morbid matter in blood, as tubercles, syphilis, rheumatism, etc. Deemed incurable, but might be retarded in early stage by keeping blood charged with hydrogen peroxide, or try iodine one-sixty-seventh to one-twelfth grain three to five times a day, and calcium lacto phosphate one and one-half grains three to six times daily.

Atrophy.—A want of nourishment and waste of substance of any organ, gland or tissue.

Atrophy of the Brain may be congenital or from old age, from cerebral hemorrhage, chronic inflammation, masturbation, sexual excesses, or the use of alcohol, opium or tobacco. *Symptoms:* General failure of mind and senses, tremor, incomplete paralysis, irritability, vertigo, thick speech, outbursts of rage, sleeps nearly all the time, complete imbecility. *Treatment:* Improve the general health. Gentle exercise, sponge bath daily, and warm sulphur baths. Massage and faradization of the whole body. General alterative and tonic treatment. Nutritive or blood-making diet, as strong as can be borne. Liquor auri et arsenii bromidi, five to fifteen drops three times a day. Compound oxygen as constitutional remedy to be long continued. Beef extracts.

Atrophy of the Heart.—*Cause:* Impoverished brain, exhausting disease, defective nutrition, germs of syphilis, cancer and the like; old age, morbid growths, aneurisms. May be congenital. *Symptoms:* Decreased area of dullness over the heart, diminished heart action, lowered temperature. *Treatment:* Rapid blood-making, average or strong; physical exercise and mental excitement to be avoided. Cinchona fluid extract, ten to thirty drops in water every three hours, or sparteine sulphate (common broom), one-half to one grain three times a day; or cactus grandiflorus, ten to thirty drops of the fl. ext. three times a day.

Atrophy of the Lungs.—*Causes:* Senile changes, emphyzema, marasmas, hydrothorax, tumors. *Symptoms:* Difficult breathing, dropsy of extremities, cyanosis, pigeon breast thorax. No treatment very promising, but try liquor auri et arsenii bromidi (Barclay) as for senile atrophy.

Atrophy of the Muscles.—*Cause:* Non-use, injury of their nerves, the germs of disease, shocks, concussions, etc. *Symptoms:* Wasting, lowered temperature, impaired sensation, numbness. *Treatment:* Remove cause. Hot baths, pours or fomentations alternated with cold, one-sixth as long time, changing from hot to cold two or three times, the whole application to continue twenty-five to thirty minutes once daily. Massage. Exercise as can be borne. General tonic treatment, cinchona as for atrophy of heart, fomentations (stimulating) for five to ten minutes every three hours.

Backache.—When symptomatic only of a want of tone, give tonic treatment, No. 3, suited to the case, or arnicin (glu.) one-sixth grain every one-half to two hours. When it is a symptom of disease, treat the disease which causes it.

Baldness.—See alopecia.

Bedsores.—Caused by long continued lying in one position, excoriation of the skin from matter, bread-crumbs, wrinkles in the sheet; occur on the back, heel, shoulders and elbow. Remove the pressure by a ring cushion stuffed with muslin, cotton, or curled hair, or better still a rubber water cushion. If actually open, cover with soap plaster spread on thick buckskin, or with two layers of adhesive plaster very smoothly applied, which must be removed if suppuration sets in, and treat as for ulcers, which see. If not open, apply one part of alcohol to three parts of water as a wash two or three times a day, or a wash of tannic acid five to ten grains, and glycerine one to two drams, or anoint with lanolin and protect with wool. To prevent their formation, use alum and common salt, of each half an ounce, and water and alcohol of each one pint; for local use twice daily.

Biliousness.—A word in general use, applied indiscriminately to five different conditions: 1. Deficient secretion of the liver, when the materials which ought to be removed from the blood are left in it. 2. Obstruction of the bile ducts, preventing the escape of the bile from the liver, and causing its re-absorption into the blood. 3. Abnormal condition of the bile itself. 4. The pouring back of the bile from the duodenum into the stomach. 5. Overproduction of bile.

Causes. 1. Anything that will repress the functional aetivity of the organ. 2. Inflammation, viscid condition of the bile itself, colds, semi-paralysis from eonstipation, sedentary habits, etc. 3. Overwork of the liver by excess of sugar and starehy foods, excess of poisonous substanees in the blood, deficient food elements. 4. May be sea-siekness, reverse peristaltie action in consequenee of eonstipation. 5. Usually the same as No. 3.

Symptoms: 1. Dullness, blotched skin, probably headache, sometimes deranged appetite and digestion. May be overwork of the kidneys, bowels or skin in the effort to throw off the noxious material; stools clay colored, or dark. 2. Sickness of stomaeh, headache, dizziness, eonstipation, slate colored stools, yellow eyes, bitter taste, pain in right side or under right shoulder blade. 3. Much like No. 1. 4. Eructations of bile or vomiting of bilious matter. May be sickness at stomaeh and headaehe. 5. Morning dizziness, may be headache and fever, nausea, vomiting, tongue yellowish white, breath offensive, bit-

ter taste. The repetition of the acute attacks is apt to induce chronic biliousness with muddy skin, yellowish eyes, headache, etc., more or less constant.

Treatments: Avoid the cause if practicable; if not, treat it. For No. 1, much exercise in the open air, exercise, Nos. 11 and 12 b; cæcal flush three times a week with retained enema No. 37 and 7; daily compress of one hour, of vinegar one part to water three parts; daily sponge bath, full pack twice a week; diet of meat, fish, green vegetables and acid fruits. Avoid sugars, starches and alcoholic and malt liquors. Anti-bilious diet: Leptandrin extract two grains as often as necessary; or euonymus extract softened with essence of peppermint and stiffened into a pill mass with equal parts of powdered bitter root and golden seal, and one-tenth part capsicum.

No. 2: Full pack once a week; cæcal flush with retained enema No. 2, or a fomentation daily for one hour over the gall bladder of No. 23 one day, and No. 26 every alternate day; exercise No. 12 b; daily sponge bath and one-half pint of hot water sipped slowly before meals and on retiring. Apocynim (when piles, feverishness and hard pulse are absent) one-third to three grains as often as necessary. When these are present, treat fever and give ext. of butternut eight to twelve grains or fl. ext. thirty to sixty drops with a little ginger.

No. 3: Treat as for No. 1 if abstinence from food for twenty-four hours and then a diet of skimmed milk, buttermilk, beef, poultry, and raw or stewed fruits is not effective.

No. 4: Secure a normal peristaltic movement of the bowels by hot cæcal flushes as often as needful. Knead the colon beginning low in the left groin by a downward, pushing movement of the knuckles, repeat three times; then two inches higher, carrying the downward movement as low as possible, three times; then two inches higher, and so follow the tract of the colon all the way round to the right groin, always making the motions in the direction of the space already passed over. Then from the right groin, with a digging, pushing, forward motion, retrace the steps to the left groin; then knead and shake the central bowels for five minutes. Do this daily, but not until all impacted foeces are removed by flushing.

No. 5: Tepid compress on liver one-half hour daily. Bowels kept active with colon flush, even if loose, but with baking soda one teaspoonful to the pint in it. Much outdoor air. In chronic biliousness apply the same methods with a vigor proportioned to the severity of the disease and the strength of the patient.

Bites.—See accidents, etc.

Bladder, Inflammation of.—See cystitis.

Bladder, Irritation of.—Caused by intense prolonged erotic excitement, especially if unrelieved. Contracted meatus, strictures, congestion of the deep urethra left by inflammation.

Symptoms: Desire to urinate frequently, with smarting during the act, especially towards its close. Pain in the urethra and back. The expulsive power is generally weakened at first, later increased into spasmodic, painful, crampy action. *Treatment:* When due to phosphatic deposits in the urine—R. Acid benzoic, two drams; soda borate, three drams; water, 12 ounces. Mix; tablespoonful three times a day. In other cases treat as a mild chronic cystitis, which see.

Bladder, Paralysis of.—In spinal disease with retention of urine, cannabin (alk.) one-sixth to one grain every two hours. For sphincter-palsy, distention-palsy and paretic dysuria (impeded and painful urination), ergotine (Bonjean's), one-

half to two and one-half grains hypodermically. For palsy of detrusor (expulsive) muscular fibers, arnicin (glu.), one-sixth grain every one-half to two hours, or Brucine (alk.) one-sixty-seventh to one-twelfth grain as required. For atonic paresis (lack of power without paralysis), cantharidin one-five-hundredth of a grain every three hours.

Blood Diseases need not to be enumerated, nor their symptoms given, since the following treatment is effective for all, except anæmic and poisoned conditions (for first see anæmia). For poisoned see blood poison.

Treatment: Nutritive method average or strong, or blood-cleansing method as needed; daily ablution the first week, head vapor once, foot vapor once, whole pack once, hot water one-half hour before each meal. Second week—Shirt wrap three times, sitz bath twice, whole shower twice. Third week and later—Shawl wrap once, loin shower twice, arm plunge twice, whole ablution daily, cæcal flush two to five times from the beginning, No. 42. Rest and sleep abundantly. Air and temperature should be fresh, abundant and comfortable, no chills; diversion, as active as circumstances permit. Make free use of comp. oxygen or the Thermo-ozone battery; with sufficient oxygen in the system the blood becomes so saturated that bacteria cannot propagate in it, which is called sterilizing it.

Blood Poisoning.—Wrap the injured part in a hot fomentation of hay flowers, to be renewed as often as the pain increases. If there are other than local symptoms, treat with wraps, packs, ablutions, etc., according to the symptoms.

The usual general symptoms are chills or chilly sensations, fever which may run very high, sweating, face pale, pinched, delirium, diarrhœa, vomiting, red spots over the skin. *Treatment:* Rapid blood-cleansing and tonic methods, control excessive exhausting sweating by quinine, one to two grains every hour or two, or hyoscyamus fl. ext. five to fifteen drops. Treat other complications as they arise.

Boils, Furuncles and Carbuncles.—An oil gland of the skin filled with lymph interspersed with the straphylococcus or streptococcus pyogenus aureus.

Cause: Anything that depresses the stomach and produces malnutrition. Change of habit. Too exclusive meat diet, diabetes, albuminuria cachectic conditions. Exciting cause may be friction.

Treatment: To abort boils before suppuration, camphor one part, chloroform two parts, applied with the tip of the finger hourly for a day and take calcium sulphide one-twelfth three to twelve times a day. Or, calcium sulph. three grains every two hours. If in crops silecia same dosage. Bowels kept open by cæcal flush, No. 42; nutritive method average or strong. As a special tonic, comp. tinct. of cinchona and simple syrup each two ounces, nitro-muriatic acid two drams; mix. Dose one teaspoonful every four hours. One-half wineglass of fresh yeast taken night and morning is effective. Compound oxygen to vitalize the system and sterilize the blood; a good lobelia emetic followed by alcohol sweat and dose of salts if the system is plethoric.

Brain, Concussion of.—See brain shock.

Brain, Inflammation of.—May be of the fibrous dura mater membrane, or of the serous arachnoid membrane, or of the vascular pia mater membrane, or of one or more of these (cerebral meningitis), and of the substance of the brain (phrenitis). Inflammation of the dura mater rarely occurs except from injuries or from otitis. The symptoms of congestion following either, should be vigorously treated as for congestion.

Arachnitis is inflammation of the arachnoid and pia mater membranes—almost always associated. The irritation stage has the symptoms of congestion of the brain. The inflammatory stage has transient pains in the head alternated with others in the bowels, quick, tense pulse, greater irritability, eyebrows knit and frowning, eyelids half closed, retching and vomiting, deep sighing and torpid bowels. The depressing stage is characterized by delirium, surprised yet stupid look, pupils contracted or dilated, red eyeballs, pupils rolled up during sleep, sleepiness, inattention, mental torpidity, coma.

Encephalitis, phrenitis, inflammation of brain and membranes. The stage of excitement is marked by intense and deep-seated pain in the head, tightness across forehead, throbbing of temporal arteries, flushed face, wild, brilliant and injected eyes, with contraction of pupils, great shrinking from light and sound, violent delirium, want of sleep, general convulsions, parched and dry skin, hard pulse, white tongue, thirst, nausea, vomiting, constipation. The stage of collapse is marked by indistinct mutterings, dull and perverted hearing and vision, double vision, twitching of the muscles, tremors and palsy of some of the limbs, ghastly and cadaverous countenance, cold sweats, profound coma and death. The disease will not show all these symptoms in any one case. It runs a rapid course, causing death sometimes in twelve or twenty-four hours; it may run two or three weeks.

Treatment: First stage, treat as congestion. Second stage—Bandage feet and legs to the knees, and hands and arms to the elbows, in cloths dipped in hot water, one-fourth vinegar. Re-dip in cold water when the extremities become thoroughly warm, then renew every one-half hour to one hour. Put under the patient folded wet sheets, and a folded wet towel laid on abdomen (both to be re-wet in three-fourths of an hour). Bathe the head often with warm water; tie a wet cloth around the neck and renew every one-half hour; cover all wet applications so as to give them a fomenting, not a cold-compress effect. The object is to draw the blood away from the brain. Give pure water to drink often, but in small quantities. To abort—Jalapin,(con.) one-half grain or more as required as a revulsive. Pilocarpine one-sixth grain in hot water every hour until free perspiration is induced. (Contra indicated in emphysema, plurisy and heart disease). Veratrine (alk.) one-twelfth grain every two to four hours in most acute cases. Nickel bromide one grain three or more times a day for convulsions. Eregotin (Bonjean's) one to two and one-half grains hypodermically to lessen blood in brain and subdue excitement (Waugh).

Homeopathic Treatment: Aconite for high fever, sleeplessness, etc.

Bell.: For throbbing in head, boring head into pillow, furious delirium, aversion to light and noise, starting during sleep.

Bry.: For pain as if skull were pressed asunder, night delirium, lips dry and parched, worse by least motion, sitting up in bed causes nausea and faintness, dry, hard stools, great irritability.

Cicuta.: After concussion, pupils dilated, face bluish and puffed, grinding teeth, thirst with inability to swallow, spasmodic drawing of head backward.

Glonoine: After sunstroke, throbbing in whole head, sore eyeballs.

Verat. Vir.: Dim vision with dilated pupils, red streak down center of tongue, congestion from high living or abuse of stimulants.

Opium: Lethargy, stertorious breathing, eyes half closed, delirious talking with eyes wide open, acuteness of hearing, stools round, hard, black balls; after grief, fright or violent mental emotions.

Hyoscyamus: Drowsiness and loss of consciousness, rolling the head, delirium with wild, staring look, jerking limbs and throbbing carotids, white tongue, frothing mouth, muttering, picking bed clothes, involuntary stools and urine.

Stramonium: Stupefaction of senses, loquacious delirium, shrinking look on waking, talks, sings, makes verses, teeth grind with shuddering, lips sore and cracked, sordes on teeth, glistening, staring look.

Helleborus: Face pale and puffed, soporous sleep, screams, starts, head rolls constantly, lower jaw sinks, chewing motion, squinting, pupils dilated, one arm and one leg move. "Keep room quiet; warm fomentations to head; keep feet warm, and for restlessness give warm baths and wrap in dry sheets without rubbing." (Johnson).

Brain Fag.—Caused by overwork, the tire of worry and anxiety, sleeplessness, etc. Symptoms are morning tire, lack of ambition, easily wearied by mental work, may be headache. *Treatment*: Nutritive diet, average or strong, rest from business, pleasant recreation, abundant sleep, general tonic method, outdoor life, kephaline.

Brain, Congestion of (hyperæmia).—*Symptoms:* Constipation, feverishness, severe headache, shrinking from light, noise or sudden motion, face flushed, noises in ears, pressure behind eyeballs, irritability and restlessness. *Cause*, active: Caused by two great pressure of blood in capillaries of brain. Passive: Blood flows slowly, but in excess, poisons in blood, blows on head, excessive fatigue or excitement, teething, whooping cough paroxysms, mental over-exertion.

Treatment: First week—Foot vapor twice, shawl wrap twice, water tread six times, shoulder shower once, hip and knee shower once, as equally distributed as practicable. Abstain from all mental work and excitement. Second week—if necessary, foot vapor once, shawl wrap once, water tread six times, knee shower once; cold ablution once. After that, if chronic, the same, modified according to violence of symptoms; cæcal flush from the first, to keep bowels free.

Or, aconite for the fever, belladonna for the congestion. Or veratrum, five to twenty drops in water four ounces. Dose a teaspoonful every hour, if the pulse is full or aconite five to ten drops in water 4 ozs. Dose, a teaspoonful every hour, if the pulse is small. Warm bath. If complicated with irritation of bowels, give enema of elm mucilage as for diarrhœa. Sponge face and head with warm water. Tongue broad, pallid and dirty—sulphite of soda ten to thirty grains, every two or three hours. Broad, expressionless tongue, with fullness of veins and tissues—podophyllin, one-tenth grain, two or three times a day, for one to three days. Pulse small and sharp, contraction about the eyes, sudden cry in sleep, or starting from sleep.—Rhus five drops in water four ounces. Dose one teaspoonful every hour or two. Should proper treatment not have checked the disease, there may be (1) a congestive apoplectic attack (see apoplexy); or (2) a maniacal attack (see mania); or (3) an epileptic seizure (see epilepsy).

Brain Starvation.—A condition in which the vital elements of the brain are worked off or drained out by

excesses, and not adequately supplied by the foods. In such cases, chemistry has shown that the dificient substances are identical with the composition of testicular juice; hence that would seem to be the remedy, which has been abundantly proved by experience. Treatment the same as for brain fag, but more prolonged.

Brain Shock.—With signs of congestion, see brain congestion; with collapse, see collapse; with dilated pupils, depression—kali phos., fever, ferrum phos., optical illusions, magnesium phos., numb sensations, calcarea phos., chronic effects, natrum sulph.

Brain Tubercular consists in a deposit of the bacilli tubercle, from the blood in or on the surface of the brain or its membrane, usually an affection of childhood; most prominent in summer months. *Cause:* Reflex irritation from teething, worms, diarrhœa, cholera infantum and the like.

Symptoms: Great irritability and peevishness, crying, screaming, rolling the head, eyes partially open during sleep, emaciation, paleness, listlessness, cough, disorders of stomach and bowels, stools green or chopped spinach appearance, vomiting, diarrhœa or constipation, headache, fever, pulse very rapid, high temperature. Later, the pulse slow, respiration irregular, stupor, delirium, pupils dilated, senses impaired, spasms or convulsions, clinching of the jaws, contortion of features, partial or complete paralysis.

FIG. 61. SUPPORTING THE BREAST BY STRAP.

Treatment: Dry mustard to the feet and legs, placed in the socks. Open the bowels freely with cæcal flush, No. 8 and 10, mixed, warm bath daily fifteen to twenty minutes, general treatment as for fever. Diet should be nutritive. After the fever, tonic method as fast as can be borne. Watch symptoms and control them. Any spasm or convulsion to be checked by the administration of lobelia, passiflora to control restlessness. Hydrocephalus liable to follow if it continues long.

Breasts, Acute Inflammation of (mastitis).—Symptoms are swelling, tenderness, rigors, fever. Caused by infection from fissures, exposure, too much milk, pressure of stays, irritation of sore nipples.

Treatment: Remove the cause. Compress (cool) on breasts, hot foot bath, fomentation on bowels, hot cæcal flush. If excessive milk secretion, the Columbia hospital prescription is—camphor one ounce,

turpentine oil three ounces. Rub the breasts freely, or use rosin ointment spread on piece of soft leather or kid, or oil of spearmint one dram, olive oil two ounces, apply a teaspoonful hot, three times a day with friction. Or keep bowels open with cæcal or sigmoid flushes, foment the breast with fl. extract of phytolacca decandra four drams, and hot water four ounces.

Dr. Waugh recommends as a specific, fl. extract of phytolacca five drops every hour and solid extract of phytolacca with an equal quantity of lanoline, applied as a plaster. Keep the breasts well strapped up with strips of adhesive plaster or bandages as in Fig. No. 61. If from cracked nipples, paint the nipple with compound tincture of benzoin or apply an ointment of ichthyol four parts, almond or olive oil one part, lanoline and glycerine each five parts. If abscess forms, poultices of carrots, bread and milk or slippery elm; if it points, open in most depending part with edge of knife pointing toward nipple, and apply elm poultices.

Breath, Fetid.—Zinc sulphocarbolate, potassa permanganate, menthol, thymol or eucalyptol a few granules of either dissolved in the mouth and swallowed as needed.

Bronchitis, Acute.—Inflammation of the lining membrane of the bronchial tubes. Tubes shown in Fig. 62.

Symptoms: Chilliness, pain in back and extremities, headache, coryza, sore throat, hoarseness, tightness of chest, soreness under sternum, furred tongue, constipation, harsh cough, frothy expectoration after one or two days, light fever, difficult breathing.

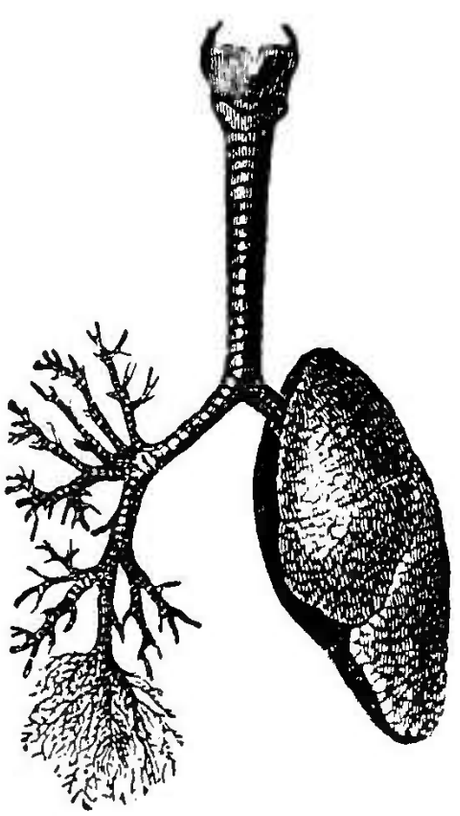

FIG. 62. TRACHEA, LUNG, BRONCHIAL TUBE AND SMALL BRONCHI.

Cause: Early or old age, debilitating diseases or habits, insufficient clothing, heart diseases, cold, damp climate; sudden cold, irritants inhaled, morbid growths, disappearance or suppression of skin diseases, various diseases such as measles, whooping cough, gout, rheumatism, syphilis, typhoid fever.

Treatment: Full cæcal flush No. 7. Shawl pack one hour, hot foot bath twenty minutes, dry heat between shoulders and on spine. Inhalation of comp. oxygen four to six times a day through warm water; or jug inhalation a few minutes every hour or two, as follows, using water made sweet with brown sugar or molasses, or the drugs named: A quart stone jug, heated and containing a pint of boiling water and a teaspoonful of tar, creosote, oil of turpentine, carbolic acid, tincture of iodine, or oil of eucalyptus. Then the patient envelopes his head and the jug, with his mouth to the orifice, and inhales the escaping steam.

Heat to feet and wrists. Retained enema, No. 35. Adapt the treatment to strength of patient and violence of disease. Diet, nutritive, mild; all foods and drinks warm; ferrum phos. in alternation with the remedy indicated by the expectoration. Kali mur in second stage with white, thick phlegm. Kali sulph. with yellow, watery, profuse, greenish or slimy phlegm, three tablets every two to four hours. Natrum mur. with frothy, clear, loose, rattling phlegm. Calcaria phos. with phlegm like the white of an egg in anæmic persons. Calcaria sulph. with yellowish or green phlegm, mixed with blood, third stage. Natrum sulph. Patient holds his chest in coughing. Silicea, cough worse from cold and better from warm drinks; pus-like expectoration.

Or, warm bath at bed time followed by eight or ten grains Dovers' powders; next morning a dose of epsom salts, or castor oil. If there is cough with tightness of upper chest, give a sweat, apply mustard, follow with a saline cathartic, such as epsom or rochelle salts, or citrate of magnesia. For the cough—syrup of ipecac one-half teaspoonful every three or four hours; after first day syrup of wild cherry bark a teaspoonful with the ipecac. When the cough is soft and loose, reduce the ipecac; expectoration free, discontinue the ipecac and substitute one-half teaspoonful syrup of squills three or four times daily. Or, make flannel jacket for the chest, back and front, saturate with turpentine, cover with wadding, re-wet two or three times a day; give aconite as for fever through the day and syrup of codeine at bedtime. For a child one or two years old—R. Tincture veratri viridi fifteen drops, syrup ipecacuanha and spirits of nitrous ether, each half an ounce; mix. Dose fifteen drops every three hours.

Bronchitis, Acute Capillary.—The extension of the inflammation from the larger to the smaller bronchial tubes. *Symptoms:* Frequent and labored respiration, face flushed and anxious, pulse 130 to 140 a minute; temperature may rise to 103 F. Short, hacking cough at the beginning, with scanty, then thick expectoration, with rattling sound in severe cases. Later, lips and tips of the fingers blue, veins of neck turgid, breathing more labored, signs of exhaustion, often a profuse frothy expectoration, clammy sweat, pulse small, respiration more and more feeble, cough and expectoration cease, suffocation. In some cases at the beginning, temperature may be below normal, pulse very rapid and feeble. Extremely dangerous.

Treatment must be sustaining, temperature of room at 70°, air kept moist by steam, wrap in a flannel blanket wet in hot water covered with dry until face sweats if there be no indication of faintness. If face be blue and pulse feeble, give stimulants freely, both by stomach and retained enæma. Call physician as soon as possible. Chloride of ammonium as an expectorant. If a stimulating expectorant be needed, carbonate of ammonia in wild cherry syrup. Quinine as a tonic. Cactus grand to sustain the heart.

Bronchitis, Chronic.—Catarrhal inflammation of bronchical tubes. Cough, with expectoration of viscid mucopurulent matter, often greenish, great tightness of chest, emaciation, debility, lungs clear from top to bottom, whistling rhonci over chest, walls of bronchi thicken and caliber decreases.

Cause: Repeated acute attacks, rheumatic and gouty diathesis, old age, heart disease.

Treatment: Climate warm with dry air, moderately high altitude protected from cold winds. Drinks warm and nourishing; cup of hot tea or milk before rising; germicidal ointment on chest; even temperature, sleeping and living room the same; alkaline poultice over chest at night; inhalations of steam medicated with terebene, or tincture of iodine. Daily baths, inunction daily of three ounces of warm olive oil. Anti-dyspepsic diet, No. 50, or 48, or 46.

Inhale for ten minutes every four hours, eucalyptus five drops in boiling water one-half ounce; or one teaspoonful comp. tinct. of benzoin in a pint of hot water; keep in same atmosphere thirty minutes after inhaling. If the expectoration is tough and cough hard, use tinct. of lobelia one-half ounce in one-half pint simple syrup; one teaspoonful often enough to loosen. If cough is loose and expectoration profuse, use capsicum or red pepper freely internally and oil of turpentine inhalation one teaspoonful to a pint of hot water; calcium lacto phosphate as a tissue builder. For profuse, purulent sputa aristol seven to ten grains with phosphite of sodium. For sticky mucus hard to raise. Scillitoxin (glu.) one-sixty-seventh grain several times a day.

Bronchitis, Membranous.—A membranous exudation on the lining membrane of the bronchial tubes. Cause, uncertain. *Symptoms:* Those of ordinary bronchitis and the expectoration of the exudation. *Treatment:* During the attack, same as for acute bronchitis. In the intervals avoid all sources of bronchial irritation and build up the general health.

Bronchitis, Old Folks'.—Half an hour before rising drink a cup of equal parts of hot milk and seltzers water. Inhalations of menthol twenty per cent. in olive oil. Antiseptic atmosphere. Pulverized ipecac six grains, pulv. myrrh twelve grains, potassa nitrate thirty grains; mix and make into six powders. One every fourth hour. Nutritive and tonic methods as needed. Chest compress in aggravations.

Bronchocele (goitre, enlargement of the thyroid gland).—May occur as a simple, puffy swelling, or crystic degeneration, or effusion of fibrous tissue, or the colonization of the bacillus of tubercle and cancer and infiltration of the entire gland with calcareous particles. One or both lobes may be affected. *Causes:* Irritation reflected from the genito-urinary organs, masturbation, perversion of the sexual act, testicular and ovarian irritation, drinking snow or ice water, water impregnated with lime or magnesia, or anæmia. *Treat-*

ment: Remove cause. Alterative treatment, mild; tonic treatment, mild. The thermo-galvanic battery, or general galvanism. Tinct. of iris versicolor, ten to sixty drops in four ounces water. Dose a teaspoonful every three hours; or phytolacca tincture five to twenty drops in water four ounces. Dose, a teaspoonful every three or four hours.

Bronchorrhœa.—An excessive discharge of mucus from the bronchi. *Treatment:* Secernent method, mild to strong. Astringent inhalations of hemlock. Myrtol four grains repeated as needed. Chest compress thirty minutes twice a week. Cold ablution and water tread daily.

Bruises.—See accidents.

Burns.—See accidents.

Bunions.—Irritation of the bursæ sack, and the overlying skin; caused by pressure of the shoe deflecting the toes from their normal position. *Treatment:* Protect by mechanical means and treat as corns.

Cachexias.—Bad conditions of the body indicating the presence of certain diseases, as the cancer cachexia, etc. In all, tonic, alterative (excernent) and nutritive methods, to be patiently continued for a long time; also calcium lacto phosphate. One to one and one-half grains three to six times a day.

In cancerous, malarial, splenic, and phthisical cachexias—for the anæmia, give iron valerianate one grain before each meal, and manganese phosphate one to three grains before meals, on alternate days. In the mercurial, saturnine, arsenical, scrofulous and syphilitic, give iodine one-sixty-seventh to one-twelfth grain, three or four times a day. For scorbutic, give citric acid one and one-half to seven and one-half grains as needed.

Calculi, Biliary.—*Symptoms:* Paroxysmal pain over gall duct, vertigo, nausea, bilious, coated tongue, constipation. Surface cold, clammy sweat, pulsation feeble. *Cause:* Gallstones from deranged bile in consequence of deficient oxygenation of the blood, producing a diminished proportion of soda and an increased amount of lime.

Treatment: During attack, empty stomach by emetic of lobelia, then take six or eight ounces of olive oil, and after twenty minutes recline on left side with hips elevated higher than the shoulders. Fomentations of lobelia tea to the side, hot colon flush, No. 23, as a strong relaxant. If available, electricity, faradic current, positive pole on seat of pain, negative on opposite side, with slight inhalations of chloroform or ether, followed by warm bath. Dioscorea villosa ten to sixty drops in four ounces of water. Dose, one teaspoonful every twenty minutes to three hours is useful. Drink one to two gallons of filtered rain water every twenty-four hours.

To prevent: Avoid sugars, fats, fried foods, pastry, potatoes, spices, sweet fruits, malt liquors, wines and alcoholic spirits. Cæcal flush three times a week, No. 16, shirt pack twice a week, half pint of hot water four times a day, sodium phosphate, one dram before meals for several weeks may be taken by those who object to the flush. Trituration of podophyllin, one to a hundred, three grains every bedtime as a substitute for the sodium phos.; or fl. ext. of fringe tree and peroxide of hydrogen, ten to thirty drops of each three times a day. Diet No. 52.

Calculi, Renal.—Concretions formed by the precipitation of substances from the urine. *Cause:* Heredity, sedentary habits, highly nitrogenous food.

Calculi, Phosphatic (Phosphate of magnesia).—Remedy: Cæcal flush, No. 23, warm bath, fomentations afterward, lobelia emetic; all to be repeated, if necessary. Between the attacks, outdoor exercise.

Calculi, Oxalic.—Oxalate if lime mixed with brown or mahogany colored granules. Inhalations of oxygen. Give ammonium benzoate one-sixth to three grains every two hours, for many months. Treat the attacks as for phosphatic, and in the intervals, anti-oxalic diet and alterative and tonic methods.

Calculi, Uric Acid.—Deposits of reddish sediment or crystals of uric acid. Cause, the gouty or rheumatic diathesis; nineteen-twentieths of the cases are of this kind. Treatment of the attacks as for phosphatic; or internally ten to thirty drops of chloroform, every hour or half hour in glycerine, with some preparation of opium; if necessary, althæa or hair cap moss with potash for a drink. In the intervals diet, No. 61, and oil of sassafras on sugar four times a day. Or, half to one teaspoonful of hydrangea, two or three times a day.

Cancer (*Carcinoma Lupus*). (Malignant tumor).—*Symptoms:* Debility, indigestion, clay colored stools, dry, husky, sallow skin; peculiar fetor of breath, pearly conjunctiva, great impoverishment of nerve force, enlargement of glands near the seat of the disease.

Cause. This malignant blood disease is caused by the microbe carcinoma locating at some point of irritation, or of special devitalization, and assuming some particular form which gives a name to the disease—as scirrhous (stone), medullary (brain), melanotic (brown or black), etc. Both imfectious and contagious; but the germs may

remain in the system latent for many years, until some state of low vitality gives an opportunity to localize and multiply.

Treatment: Fortify existing vitality by all possible conditions of health. Increase the store by studiously expending less nervous energy than is made day by day by a most generous diet of beef, game, milk, cream, raw eggs, etc. Nutritive diet, strong or very strong; and such regulated exercise and baths as will secure the utmost possible assimilation. See blood-making treatment strong. Much outdoor air, deep breathing, the hot colon flush three times a week, full pack once or twice a week, avoidance of all causes of depression, and all unnecessary drains upon the vital force. Try to kill the germs in the blood by the use of ozonized chian turpentine, one teaspoonful before meals, gradually increased to three for two weeks, then change to phytolcca berries, ozoned fluid extract five to ten drops in water before meals, three times a day, for two weeks more, and in urgent cases after meals also, then the turpentine again, and so on. If the tumor is very small, apply an ointment of stramonium during the day, and an ointment of phytolæca at night. These failing to arrest the growth, services of a competent physician must be secured without delay.

Particular care should be taken to protect the growth from all irritation, as there is reason to believe that many benign tumors have been made malignant by injudicious irritation. Too much importance cannot be attached to a strictly animal diet, which should be reinforced by the other hygienic agents named with heroic persistence. Whenever there is discharge, an ounce of listerine to a quart of water, as a dressing to kill the odor, or Platt's chlorides diluted with an equal part of water on absorbent cotton as near the sore as possible, and towels wet with the chlorides (one to four of water) wafted about the room; solution of eucalyptus is also good.

Cancer, Gastric.—Cause unknown. Rare under forty, tumor in three-fourths of cases, duration two years and under. *Symptoms:* Hemorrhage frequent, vomiting, free hydrochloric acid absent, secondary cancer in liver, peritoneum or lymphatic glands, loss of blood and strength, cancer cachexia marked, pain anterior and posterior and more continuous, less dependent upon food, less localized and less relieved by vomiting than in ulcer. Cancer germs in vomit. Only temporary improvement if any generally, but it is claimed that it is sometimes cured by recent methods.

Treatment: Liquid animal diet, ozonized clay applied locally to the stomach, and removed as often as it reddens the surface, and re-applied as soon as it disappears. Europhen one-half grain, three or four times a day. Papoid two to five grains, or papoyotin one to four grains, after meals.

Carbuncle.—A hard and circumscribed inflammatory tubercle, like a boil, on the cheek, neck or back, and in a few days becomes highly gangrenous. The anthrax of medical books, *not* anthrax the sheep disease.

Treatment: A poultice of rye flour and old fashioned soft soap; or electricity positive on the sore, negative at a distant point, one-half to one hour twice a day, galvanic current; and take internally ferrum

phos. and kali mur in alternation, one dose every hour; or, calcium sulphide one-twelfth grain three to six times a day. This for the early stage. If pus forms, inject the cavities with per oxygen of hydrogen, take silicea three grains every two hours internally, and apply to the sore a cloth wet in a fifty per cent. solution of carbolic acid, diminishing the strength after the first three to six applications. Renew as often as it dries. For the fever, quinine in one to two grain doses three to six times a day; or, cooling method, No. 12, as needed.

Cardialgia.—Pain in the stomach existing independent of any group of symptoms.

Treatment: For a hard, painful pressure after a meal—belladonna, pulsatilla. For contractive pains—bryonia. For violent spasms or cramps of the stomach with frequent eructations, and tasting the food—calc. carb. or mag. phos. For spasm in the stomach with a sense of pressure—carbo. veg. or mag. phos. For painful distension of the stomach, or a bloatedness in region of stomach,—cham. or rhus tox. For fine, stinging pain in the stomach—ignatia; intense pain in stomach, lycopidium; aching, drawing pain increased by motion, pulsatilla; cramping, burning pain in stomach, sepia; violent pressure in pit of stomach with severe sharp, cutting, piercing pain, veratrum.

Carditis (Inflammation of the heart).—Does not frequently occur; very dangerous; runs a rapid course. *Cause:* Taking cold; cold applications to the chest when heated and perspiring freely; large potations of ice water when the body is heated by exercise, or exposed to extreme heat; falls, contusions, and metastasis of rheumatism.

Symptoms: Fever; pains around the heart, with palpitation, at times most violent and irregular, anxious and oppressive breathing; pulse small, tense, irregular and tremulous; difficulty in swallowing, fainting, and sudden starting in sleep. *Treatment:*—Ferrum phos. three tablets every hour, or aconite tinct. ten drops in four ozs of water, one teaspoonful every one-half hour or hour until some relief; then once in two, four or six hours, revulsive methods, average to very strong. Diet as in other serious inflammations of the trunk.

Caries (Fever sores) and **Necrosis.**—The former consists of ulceration of bone tissues, characterized by molecular death and loss of substance; the latter of the death *en masse* of bone and tissue-like gangrene in soft tissues. The bacillus of saprogenes is the microbe.

Cause. Of caries—injury, debilitated condition of the system, but most commonly from tubercle, struma or syphilis; of necrosis—cutting off of blood supply by injury or inflammation, certain poisons as from specific fevers, scarlet fever, and mercurial and phosphorous poison.

Treatment: Remove the cause. *Diet:* An exclusive meat diet. Colon flush often enough to secure complete emptying of the colon, two or three times a week. Full pack once a week. Wrap the diseased part several times a day in bandages dipped in oat straw decoction; syringe out all openings with peroxide of hydrogen once a day, and

apply constantly to their outlets absorbent cotton saturated with glycozone. Build up vital force in every possible way, especially by the nutritive and tonic methods, average to very strong.

Catalepsy.—*Symptoms:* Peculiar rigidity of muscles, often taken for death; partial or complete loss of consciousness. Attacks are usually preceded by premonitory symptoms as yawning, eructations, palpitation of the heart, sense of pressure in head, vertigo and change in disposition. One limb or whole body may be affected. Patient can swallow. Sensitiveness of skin is diminished. Attacks vary from several hours to two to four days. *Cause:* Mental depressions, exhausting intellectual labor, violent passions, domestic afflictions, pregnancy, hysteria, chorea, fevers, suppressed menses, etc. Cases of trance are usually cataleptic.

Treatment: Remove the cause if practicable; mild, alterative and tonic treatment to correct the tendency; hot colon flush, No. 46, repeated if necessary until the colon is emptied, then retained sigmoid flush, No. 23.

Soldier Martin in hospital in Havana, after fifteen days' treatment in vain, was cured almost immediately by a bagpipe played near his bed.—Dr. J. R. Buchanan.

In a young, nervous, irritable, plethoric girl—aconite; cold extremities, eyes half closed, pupils dilated and lusterless—chamomile. Patient lies as if dead, countenance sunken, after depression, yawning and drowsiness—laurocerasus. Preceded by jerking of fingers, with deadly paleness—cicutae. Diet must be suited to the condition, and nutritive, tonic, secernent or excernent methods as required.

Cataract.—Opacity of the crystalline lens or its capsule, from defective nutrition. *Cause:* Injuries, strains, deep-seated inflammations of the eyes, heredity, more frequently without any assignable cause.

Treatment: Calc. phos. and kali. sulph. 3 tablets of each once a day. Massage of forehead, head and eye, with building up of general health. With dry coryza, itching nose, a web or mist before the eye—causticum, silex, baryta carb. Sight obscured in open air, or clouds, motes or specks before eye—pulsatilla, conium-mac. lachesis. Eyes sore and scrofulous, sight imperfect with black spots or luminous vibrations—phosphorus. Vision indistinct, black spots, itching lids, dry, burning sensation—hepar-sulph, sulphur, calc. carb. From injury, 1st, arnica, 2nd, conium. With syphilis, mercurius, nitric acid. Two drops three times a day in the eye, of the juice of the cinerariæ maritimæ plant of Venezuela has cured cases of great obstinacy.

Catarrh.—Inflammation of the follicles of a mucous membrane with excessive discharge of mucus. The vital processes become degraded into the formation of disease germs, the amœba, the lowest and simplest form of microscopic life instead of renewal of healthy tissue. *Cause:* Diminution of

nerve force either local or general, or both. May be occasioned by rapid alternations of temperature, long continued chill, mechanical or chemical irritation, indigestion, constipation, etc.

Treatment: There are certain general principles that should govern the treatment of all catarrhs, and that may be comprehensively stated here to avoid repetition under the treatments for its various forms.

1. The special causes must be removed.
2. The general health must be improved to the greatest possible degree.
3. All causes of nerve depression must be avoided.
4. Local treatment must be adapted to the amount of inflammation present, the degree of devitalization or destruction already experienced, and the recuperative energies of the patient.
5. The immediate aim should be to destroy the disease germs and vitalize the membrane above the point of germ-production.
6. A membrane once devitalized, remains for a long time more subject to fresh attacks than is one that has remained healthy. Hence one catarrh may be cured, but another may soon be developed. Therefore special care should be taken not to expose a recently weakened membrane to unnecessary danger, and to cure it as quickly as possible should another attack occur.

Catarrh, Aural.—The irritation of the eustachian tube by the amœba of nasal catarrh. Spray several times a day with ozonized distillation of witchhazel. (Dist. witch-hazel three parts, peroxide of hydrogen one part). Head vapor once or twice a week; throat compress thirty minutes every day, followed by cold ablution of the part; knee shower twice a week, not on the same days as the head vapor. Build up general health by nutritive and hardening methods, which see. Open the tube several times a day by holding the nostrils and mouth tightly closed and blowing quickly. A snapping and sense of fulness in the ear will indicate success.

Catarrh of the Bile Ducts.—A relaxed, devitalized condition of the mucous membrane of the bile ducts. *Cause:* Duodenal catarrh, gouty and rheumatic state of blood, calculi, and disease germs.

Symptoms: Loss of appetite, coated tongue, nausea, vomiting, pain, constipation except when there is intestinal catarrh, then diarrhœa; clay colored feces, urine dark green, tendency to jaundice, liver enlarged and tender, headache, vertigo and debility.

Treatment: Bathe the region every morning with water made just stinging acid with nitro-muriatic acid. Every evening a tepid compress thirty to fifty minutes wet in water one-third cider vinegar. Colon flush daily containing one-half teaspoonful of peroxide of hydrogen thrown in first in a syringe of cool water, afterwards the full flush. Retained enema of a teaspoonful of phosphate of soda to liquify the bile every night.

If these are impractieable, give ehloride of ammoninm five to ten grains every two to four hours, and fluid extract of fringe tree (eollinsonia) fifteen drops, two or three doses each day. Diet of vegetables and fruits nntil relieved, avoiding starchy vegetables and sweet fruits. Any vegetable may be considered starchy if by the working table, pages 133–137, it be found to contain over fifteen per eent. of starch, and any fruit may be deemed sweet that contains over twelve per cent. of sugar. These elements being given in the table at so many per 100 grains of carbohydrates, is the same as the same per cent. of either or both starch and sugar.

Catarrh of the Bladder.—See cystitis.

Catarrh, Bronchial.—The devitalized condition of the membrane of the bronchial tubes which develops the amœba instead of the conferva, bacillus of tubercle, etc., which mark bronchitis. *Symptoms:* Same as chronic bronchitis, which see.

Treatment: Make the blood so healthy that no micro-organism ean live in it; this not practicable, then saturate the blood with harmless germicides with the same object.

Peroxide of hydrogen one-half teaspoonful two or three times a day. Distillation of pine needles one to two dessert spoonfnls every four hours. Omit every seventh day. Glycozone sprayed into the nostrils three times a day. Daily compress on chest wet in tea of pine needles. The odor of turpentine constantly in the room; may be made fragrant with lavender or cinnamon. Nutritive treatment average or strong. Nightshirt wrap wet in pine needle tea twice a week. Cold ablution five times a week. Water tread daily, each suited in temperature and length of application to the case so that benefit, not harm shall be seen very soon.

Catarrh, Cervix.—A catarrhal condition of the large gland cervix uteri. *Cause:* Any source of irritation.

Treatment: Remove the cause; rest; pack the vagina every other night with boroglyceride paste, or daily use a saturated solution with a fountain syringe. Blood treatment as for bronchial catarrh; hot hip shower twice a week followed by a rapid cold ablution of the showered parts. Avoid chills, damps, all eanses of nervous depression, and harden the system with water treads, cold sponge baths and cool or cold shawl wraps according to the vigor of the patient.

Catarrh, Duodenal.—See intestinal catarrh.

Catarrh, Gastric.—A weak condition of the mucous membrane of the stomach with excessive secretion in which the sarcinæ ventriculi and yeast plant (criptococcus cerevisia) propagate in enormous quantities; constitutes two-thirds of all cases of dyspepsia.

Cause: Defective mastication, drinking at meals, espeeially eold drinks; beer, tobacco, ice cream, sugar and starch foods, alcohol, alkalies and other drugs; also anything that will irritate the stomaeh, as chills and diseases of adjacent organs. *Symptoms:* Prostration, faintness, goneness, general dyspeptic symptoms, flatulence, aeid eructations, heartburn, water brash, cold extremities, white, slimy tongue, sour breath, head, heart and liver trouble, craving, eapricious appetite, fulness, usually spells of vomiting or diarrhœa.

Treatment: The sarcinæ must be washed out, starved out or destroyed. To wash out.—Insert a flexible stomach tube, three to five feet long, about four or five hours after the last meal, twenty to twenty-five inches into the fauces and stomach; hold the upper end above the mouth, and through a tunnel adjusted to that end, pour a solution of sodium or potassium carbonate, thirty grains to the pint; or sodium salicylate, one per cent.; or resorcin, two per cent.; or thymol, one per cent.; or sodium silico-fluoride one per cent., until the stomach is full; then the patient, leaning forward, lower the end over a receptacle and the contents of the stomach will run out as from a syphon. Repeat the charge until the return is free from mucus; repeat the washing from two to six times a week. The tube should be well oiled with olive oil or cacao butter, and the patient should attempt to swallow as the tube glides down.

To starve out.—Diminish the secretion of mucus by the use of an emetic of lobelia leaves, one ounce to eight ounces of boiling water every four days, preceding each by copious draughts of bicarbonate of potassa water, thirty grains to the pint. After the emetic drink freely of kaki tea one ounce to the pint, with two to four grains of capsicum added. Also avoid fluids at or near meal times; all easily fermentable food, such as sugars, starches, beers, wines, etc., and eating when much worried or wearied, or until the previous meal has digested.

To destroy the germs.—Peroxide of hydrogen ten to thirty drops in water one-half hour before meals, and papoid two to three grains after meals. The cæcal flush should be crowded as far as the strength will bear in order to free the system from the fungoid mass that may pass downward devitalizing the whole intestinal tract. Blood-cleansing method as in bronchial catarrh; general tonic method as needed, and hardening method as far as can be borne.

Catarrh, Gastric, in Children.—The same disease as the gastric catarrh of adults, with the special aggravations of generally easily fermentable food, and less vigor.

Cause: Hand feeding, sweet and starchy diet, irregularity of meals, over-stimulated brain and nerves. *Symptoms:* Same as in adults, with greater irritability and other nervous symptoms, and more rapid physical waste.

Treatment: Blood and tonic treatments as far as they are appropriate, as in adults. Peroxide of hydrogen and glycerine equal parts; fifteen drops in an ounce of water after meals. Before meals some mild, bitter tonic as sulphate of cinchona. Diet of milk, bovinine, toast. Soon as tongue cleans, boiled fish, white of chicken, lean broiled mutton. Flannel bandage from armpits to groin. Hand massage often; as near a cold bath daily as the strength of the child will permit.

Catarrh, Laryngeal.—The irritation of the fauces and larynx by the amœba of nasal catarrh. *Cause:* The natural tendency of all irritations of the mucous membranes to work downward; sleeping with mouth open; sudden and excessive change of temperature after vocal exercises; irritants.

Symptoms: Fauces red, follicles swollen, covered with mucus, hawking, spitting, frequent efforts to clear the throat of some clinging obstruction.

Treatment: Same as for aural catarrh, except that the opening of the eustachian tube should be omitted provided it is clear of the catarrhal irritation.

Catarrh, Intestinal (including duodenal).—This is the sarcina of the stomach, but of smaller size, located in the duodenum and intestines.

Cause: Catarrh of the stomach, cold, mechanical irritation of undigested food, or of the gases generated by fermentation of food, degenerated intestinal secretions, mental depression. *Symptoms:* Constipation, gaseous distention, pain, loss of flesh and strength, stomach usually complicated, with dyspeptic symptoms.

Treatment: Daily full colon flush of No. 31 (in bad cases may be nearly double strength), followed by retained enema of fluid extract of Virginia stone crop, thirty drops, or fluid extract of bayberry sixty to eighty drops in two ounces of water. Salol five to ten grains three times a day by the stomach. It passes through unchanged and is dissolved in the duodenum by the pancreatic secretion and kills the germs. Diet of meat and non-starchy vegetables exclusively, or dyspepsia diet, apeptic; no tea, coffee, tobacco or fermented drinks. Blood-making and tonic methods as far as appropriate with the diet restrictions named.

Catarrh, Acute Nasal (coryza).—*Symptoms:* Patient feels indisposed, chilly, slight headache, sneezing. May have pains in back and limbs, and slight fever; pulse quick, skin dry, mucous membrane of nose swollen. There is a thin, clear irritating secretion which in a day or so becomes muco-purulent. Eyes are "weepy," slight sore throat, sense of smell and taste somewhat lost. *Cause:* Cold and exposure, also irritating fumes as of iodine or ammonia.

Treatment: Hot colon flush, followed by foot vapor bath preferably, or by hot foot bath. Temperature of the room should be kept above the point where the inspired air irritates the nasal passages. Ferrum phos. every hour until relieved, or aconite six to ten drops in four ounces of water. Dose one teaspoonful every hour for fever with small pulse. For fever with strong pulse, veratrum viride five to twenty drops in water four ounces. Dose one teaspoonful every hour; revulsive method mild to strong.

Rest in bed without food until the inflammation subsides; or should it prove very obstinate, only a koumyss, or buttermilk, or skimmed milk diet. This for well-conditioned patients. The very aged and anæmic, and puny children, should have rapid blood-making method, which see, with rest in bed, and other treatment as above. Warm local douches of pinus canadensis one to two teaspoonfuls to the pint, two or three times a day; warm tea of balm or hot lemonade. A spray of potass. iodide one dram to one ounce of rose water has been found useful, so has a snuff of lobelia powdered with one-tenth borax. Sometimes it is well to keep the whole head covered. Anoint the nose of nurslings with lobelia ointment. Quinine one to two grains every hour or two will generally abort an attack. Eupatorin (con.) one-fourth grain every hour in hot water until free perspiration, will break up an attack. Bryonin (con.) one-half grain every one-half hour till it purges, relieves burning in eyes and nose and acrid discharge.

Catarrh, Nasal, Chronic (disease-germ amœba).—*Symptoms:* Inflammation of mucous membrane of nose and upper and back part of throat; tightness across forehead, closure of nostrils, lack of appetite, may create a diathesis marked by debility, lassitude, pasty skin, pains in limbs, muco-purulent discharges, etc. Contagious and infectious.

Cause: Repeated attacks of acute catarrh, or an acute attack prolonged by neglect and bad conditions; exposure to cold and damp after being closely confined in hot and badly ventilated rooms; inclines to descend to lungs, when pulmonary disease may follow.

Dr. T. V. Gifford contends that all chronic nasal catarrhs are mainly caused by the urea which should be eliminated through the kidneys, remaining too long in the system, and being expelled by the lungs, their exhalations poison the membranes wherever they touch.

Treatment: Cleanse the blood of excessive waste by excernent method average or strong. Restore the functions of the kidneys. If the excernent should fail to do this, add excernent method very strong for kidneys. Locally, glycozone sprayed upon the membranes several times a day. When the discharge is rapidly oxidized, hard scabs are formed. Cleanse well two or three times a day with a solution of bicarbonate of soda one to ten grains to the ounce of warm water, then syringe with one ounce each of fl. ext. of eucalyptus and listerine, two ounces of glycerine, and twelve ounces of soft water; or pinus canadensis one ounce, glycerine half an ounce, soft water ten ounces; or apply oil eucalyptus one part and petrolatum sixteen parts; or for cleansing, use a warm spray of soda bicarbonate and soda biborate, of each half an ounce, glycerine two ounces, listerine one ounce and water five ounces, and follow with a snuff of aristol, pulverized boric acid, and subnitrate of bismuth of each nine grams, pulv. elm bark one and one-half ounces; or, in advanced cases, a spray of flu. ext. hydrastis and oil of eucalyptus of each one dram; or, Lloyd's hydrastis and listerine of each one dram and water two ounces. In very severe cases a spray of balsam of copaiva one dram, sulphuric ether one-half dram, carbolic acid two drams may occasionally be required. The cleansing solution should never produce pain beyond a few seconds.

It is often necessary to change from one preparation to another to find the one best adapted to the case, hence others that have proved efficacious are appended:—Soda bicarbonate and soda biborate each one dram, carbolic acid one scruple, glycerine and rose water each one ounce, water one pint; use as a spray.

Wash. Table salt five to twelve grains to the ounce of tepid water. Begin with the least; or potassa bicarbonate one to eight grains to the ounce. Nostrils sensitive and discharge profuse—use snuff of borax three drams, cypripedium and hamamelis, each one dram. Omit the hamamelis if discharge becomes too dry.

Another: Borax nine parts, lobelia one part, for cases that require relaxation. Pure lanoline used as an ointment is excellent in some cases.

For strumous or cachectic cases, and for youths who inherit phthisis or have overgrown their strength calcium lacto phosphate. For cases with suppuration calcium sulphide. For fetid discharges, eucalyptol one to five grains every two to four hours; or menthol one grain or more as needed; or thymol one to two grains as needed.

For *Catarrh of Nose and Throat.*—Vaseline spray. White fluid vaseline one ounce, eucalyptol or menthol one-half drachm, oil sandal wood pure one-half dram; use warm morning and night in a sprayer. Gargle throat with cold salt water and eject through nose by putting tip of tongue against upper front teeth and tipping head forward quickly.

Catarrh of the Prostate Gland.—*Cause:* Debility, relaxation, the sequel of gonorrhea, masturbation, sexual perversion or excess.

Symptoms: Seminal weakness, discharge of a ropy viscid fluid from the urethra after urination or stool, and sometimes during the day with nocturnal involuntary losses of spermatic fluid. May involve the sphincter muscle of the bladder and cause stoppage in the act of urinating, dribbling after with more or less pain.

Treatment: Absolute avoidance of sexual excitement; keep blood free from the lactic acid of rheumatism and the lithiate of soda of gout; no horseback or bicycle riding or any other mechanical irritation of the perineum. Blood, hardening, revulsive and tonic methods as far as they can be applied to the case, and fluid extract of black willow thirty drops in water three times a day; or, if there be atrophy of the gland, sixty to ninety drops of fluid extract of saw palmetto three times a day in water. Diet, anti-rheumatic.

Catarrh of the Rectum.—Catarrhal irritation of the membrane of the rectum, with a great variety of disease germs and their ptomaines; very common and dangerous because the germs and their ptomaines so easily enter the blood.

Cause:—Torpid liver, alcoholic drinks, malaria, sedentary habits, some drugs, cold, damp, tight lacing, pregnancy. *Symptoms:* Diarrhœa or dysentery or constipation with itching, heat, burning, soreness—muco-purulent discharges, rectum relaxed, blood and nerve derangement proportioned to the extent of the absorption of the poison.

Treatment: Remove the cause if possible. A rectal retained enema of distillation of hamamelis 6 ozs, fluid extract of hydrastis 2 ozs, tincture of calendula 2 ozs, a tablespoonful in three or four of thin starch water, three times a day; or, fluid extracts of butternut, Virginia stone crop and stone root equal parts, a teaspoonful to one-half cup of slippery elm water three times a day. And three times a week 20 drops of oil eucalyptus 2 drams, phenol sodique 4 drams, and glycerine 3 drams in thin starch water. If there be intestinal catarrh, treat that; if not, the general regimen suitable for all catarrhal conditions.

Catarrh, Uterine (*endometritis*).—Catarrhal irritation of the lining membrane of the uterus. *Acute: Cause:* Ovarian disease, abortions, instrumental irritation, retention of placenta, bromides, aloes, savin and some other drugs, sudden suppression, masturbation, torpid liver, tight lacing, gout, rheumatism, marriage incompatability.

Symptoms: Fever, high temperature, rapid pulse and respirations, general irritation, sallow complexion, loss of appetite, headache,

pain in the loins and lower part of the abdomen, sacrum, groin and inside of the thighs; a sense of great heat and fullness about the pelvis, and bearing-down; bladder very irritable; desire to pass water every few minutes, which is loaded with uric acid; diarrhœa and tenesmus, and subsequently constipation; tenderness on pressure over ovaries and uterus; after a day or two, thick, ropy, tenacious discharge, which, after a while, becomes muco-purulent, tinged with blood, and imparts a greenish-yellow or greenish-red stain to clothing; often attended by piles.

Treatment: Rest in bed; foot vapor bath followed by sponging the limbs with cool or cold water every two to four hours in bed; shawl wrap the second day, wet in tepid or warm hay tea; cæcal flush, No. 7, daily. Excernent method, mild to strong according to violence of symptoms; nutritive mild, revulsive method mild to strong as needed. When acute stage has passed, give tonic method average or strong, with nightly retained enema of a tea, two drams to the pint of aletris farinosa (unicorn root, ague root,) or the fl. extract, ten to thirty drops in starch water.

Chronic: *Symptoms:* Headache, languor, lassitude, debility, great mental depression, obstinate dyspepsia, flatulence and constipation; sense of weariness, if not pain, about loins, sacrum, groin, inside of the thighs, and bearing-down; thick, ropy, tenacious, very abundant, glairy (like white of egg) discharge; discharge most abundant in the morning accumulating in uterus over night, or after lying down awhile; as debility increases, hysteria, convulsive affections, nausea, vomiting, tympanitis, tenderness of breasts, and menorrhagia if the lining covering the fundus is involved.

Treatment: General regimen as for other catarrhal conditions. Insert into the uterine cavity once a week for three weeks, a soluble gelatinized bougie of papoid; repeat for two more months if there is a vestige of the disease remaining; bowels kept open with sigmoid or cæcal flush; retained enema every other night of the aletris as in acute cases, and on each intervening day thirty drops of the fluid extract of black willow in water by the stomach. Diet nutritive, average or strong.

Catarrh, Vaginal (leucorrhea).—Catarrhal irritation of this cavity is extremely frequent and attended with the deleterious effects of various disease germs, the amœba, sarcina and different streptococcus.

Cause: Much the same as catarrh uterine. *Symptoms:* Discharge of a mucus or muco-purulent character, with constitutional symptoms proportioned to its virulence.

Treatment: Diet and general regimen, as in other catarrhal states. Three tablets three to six times a day as follows, viz.: If discharge be milk-white, non-irritating mucus kali mur; if scalding and acrid, kali phos.; if yellow greenish, shiny or watery, kali sulph.; if watery,

scalding, greenish after walking, with headache, colic, and bearing-down, natrum mur; if creamy or honey-colored, or acid and watery, natrum phos.; if in an over sensitive, imperfectly nourished condition, silicea; as a constitutional tonic, once a day with the chief remedy, calcaria phos.; vaginal injections of one to two pints of hot water twice a day, with a syringe having a stem so constructed that its use will open all the interior folds of the passage; or, the hot water once a day, and once a day a bactericide solution of boroglyceride (saturated), or resorcin one per cent., or iodine tincture thirty drops to the pint, or napthaline thirty grains to the pint, or permanganate of potash five grains to the quart. Many times a simple tonic or astringent solution will suffice. White pinus canadensis, or red gum fl. extract, or sumach fl. extract, or hydrastis fl. extract, or witch-hazel fl. extract, one to two teaspoonfuls to the pint or quart; or oak bark one-half oz to the quart; or tannin one dram to the quart; or a strong tea of raspberry, witch-hazel or white pond lily; the thermo-galvanic battery. For fat, flabby patients, hydrastine (alk.) one-sixth to one-half grain, one to three times daily. For relaxed, anemic, sterile patients, sanguinarine (alk.) one-eighth to one-twelfth grain every two to four hours.

Cerebro-spinal Meningitis.—Inflammation of membrane covering brain and spinal cord. Epidemic and slightly contagious, often fatal. *Cause:* Supposed to be a germ, not yet isolated.

Symptoms: Fever, chill followed in children by convulsions, stupidity or delirium, vomiting, headache, pain in neck and spine so severe that it often produces an arched position of the body (opisthotonos) also in pit of stomach great weakness, and sometimes delusions. During first and second weeks, skin exhibits purplish spots which are distributed all over body. When symptoms are slowly developed the disease is likely to be mild.

Treatment: Revulsive method, according to the severity of the attack and blood-making as needed, with natrum sulph. every one to two hours; or, veratrum viride five to twenty drops in four ozs. of water, a teaspoonful every hour. Absolute quiet, and treat attending symptoms as they occur. For sleeplessness, warm baths and dry sheet without rubbing. Tonic method, average to strong after acute symptoms subside.

Chafing of Young Children.—*Treatment:* Subnitrate of bismuth, one dram; pulverized gum acaciæ, seven drams; mix, and apply dry, after washing the parts with castile soap, or anoint with lanoline.

Chicken Pox (*varicella*).—*Symptoms:* Fever followed by rose-red spots on second day scattered irregularly over body, usually over back first, elevated above skin and rapidly change from pimples to minute blisters filled with watery fluid. Every day a fresh crop of spots appear, converted in time to blebs of milky appearance, with great irritation. These fall off entire as crusts; last about two weeks, and often leave child debilitated. *Treatment:* Colon flush, or a gentle cathartic if

needed. Treat fever with cooling method mild to strong, c ferrum phos., or aconite. Diet light and easily digested.

Chilblains.—Sub-acute inflammatory swelling cause by cold and rapid restoration of the circulation by externa heat instead of gradually from within. It is a sort of chroni burn.

Treatment: Avoid mechanical irritation, cold and damp; revu sive treatment three times a day proportioned to the severity of th case; also apply locally two or three times a day, zinc sulphate thirt grains, tannic acid thirty grains, rose ointment one dram; or, tanni acid two parts, alcohol five parts, collodion twenty parts, tinctu benzoin two parts. Apply with brush. If itching is troublesom apply ichthyol and spirits of turpentine equal parts. Camphorate oil is sometimes beneficial.

Chloasma.—See skin diseases.

Chlorosis (green sickness).—A form of anæmia in th young of both sexes, occuring about puberty, and consisting i excess of blood serum, and red corpurcles dwarfed and dimi ished in number; nervous bankruptcy. *Causes:* Deleterio trades, indoor life, solitude, masturbation, undue precocit *Symptoms:* Wax-like face, yellow pallor of skin, poor appetit fetor of breath, coated tongue, dry skin, constipation, abunda urine, weak, quick pulse, hysteria. *Treatment:* Same a anæmia.

Cholera (Asiatic).—*Cause:* The evolution of th microbe comma-bacillus in the intestines which excretes deadly tetanizing ptomaine, much like the alkaloid strychnin It is a filth disease born amid the sensualities and unhygien customs of oriental life, and propagated by the specific ger gaining access to the stomach and bowels of those who a already predisposed to it by a bad physical condition. Health gastric juice instantly destroys it. It cannot be induced b inoculation or contact.

Treatment: 1. Preventive.—Dwellings, outhouses and surroun ings must be kept clean and disinfected, decaying organic matte burned, drinking and cooking water boiled; daily bath and moveme of bowels; flannel clothing changed night and morning and well air and sunned; good ventilation, proper food, no excesses; a clear co science and trust in God.

First Case: Keep calm and use the right means and it will probably be the only case. *First Stage:* Premonitory, sometimes absent in severe cases. Symptoms: Irritability, languor, sleepiness, confusion, paleness, nausea, diarrhœa. Prepare the following disinfectants, namely:

No. 1. Five pounds of copperas and three ounces of strong sulphuric acid in four gallons of water. Stir with a stick.

No. 2. One ounce of strong sulphuric acid, to one gallon of water.

No. 3. Sulphuric acid half ounce to a gallon of water.

No. 4. Strong cider vinegar.

From the very beginning mix all diarrhœa discharges and all vomit with one-fourth their bulk of No. 1, and pour into a distant hole, or into the sewer drain. Wash all soiled clothing in No. 2. Keep two bowls of No. 3 in the room, one for bathing the hands of nurses and the other the body of patient. No. 4 may be used until No. 3 can be procured. Remember that the ptomaines cause so much irritation in the intestines as to prevent reaction, and end in collapse, therefore two definite things must be arrived at, namely: (1) Neutralize or expel the ptomaines and sterilize or kill the germs; this is accomplished by one or two full, hot cæcal flushes of strong coffee, two to four quarts, through a flexible pipe inserted into the sigmoid flexure, *i. e.* eight to twelve inches long, and after the colon is emptied inject a gallon of warm water containing four per cent. of peroxide of hydrogen (5⅓ ozs to the gallon of boiled water). Repeat if necessary. Also give by stomach 2 ozs in 8 ozs of boiled water, a cupful every two hours. If the peroxide of hydrogen is not at hand, give the coffee injection, and by stomach one-half teaspoonful of dilute sulphuric acid in plenty of water every ten to twenty minutes. (2) Promote reaction. As soon as the injections have cleansed the bowels, wrap in two sheets wrung out of hot water, with an extra cloth dipped in hot vinegar, all over the abdomen, and cover with a feather bed; rewet the sheets in thirty minutes, and keep in until the cramps cease, then give one-half cup of hot milk. Repeat the wet sheets one hour a day until well, but gradually cooler.

Second Stage: Profuse, odorless, serum-like diarrhœa with white flakes, called rice-water discharges, watery vomiting, cramps, intense thirst, sunken abdomen cheeks and eyes, nose pointed and cold, voice whispering, hands pale, dry, wrinkled, icy, nails blue, extremities covered with dark patches, icy, pulse imperceptible, temperature sinks even to 12° below normal. The blood thickens by loss of its serum, and there is total absence of urine.

If this treatment in the preparatory stage has failed, repeat it with the sheets wet in strong red pepper or capsicum water, blister from behind each ear to the angle of the jaw to cause inhibition of the sympathetic nerve, and in place of the peroxide of hydrogen or carbolic acid, give salol, five to fifteen grains every hour, diminishing as rapidly as improvement goes on. If this is not at hand, give equal parts of tinctures of lobelia, capsicum and American valerian (lady's slipper) a teaspoonful every fifteen to thirty minutes, until temperature, pulse and respiration become normal, then give tablespoonful doses every thirty to forty-five minutes of table salt one tablespoonful, black pepper one teaspoonful, cider vinegar one-third tumblerful, water two-thirds tumblerful.

Third Stage: Skin cold, clammy, bluish, pulse and voice gone, intense thirst, breathing shallow and difficult, breath icy. Add to the blisters behind the ears, mustard paste from the roots of the hair down to between the shoulders; keep up the packs and the administration of the tinctures, and add every hour a mixture of tinct. of capsicum one-half ounce, oil of cajeput twelve drops, tinct. of camphor one dram, chloroform twenty drops and ether one-half ounce. Shake. Dose one-half to one teaspoonful; or, give atropine, hypodermatically one-two-hundredths to one-sixtieth of a grain. The administration of oxygen has sometimes cured when all other means have failed.

Patient must keep his bed for a day or more after the last symptom disappears, and diet in convalescence should be hot milk, liquid beef foods, kumyss, semi-liquid diets, and return with great caution to ordinary food.

Cholera Infantum.—*Symptoms:* Frequent stools, vomiting, elevation of temperature, rapid emaciation and loss of strength. Usually under two years. May begin abruptly or be preceded by diarrhœa. Stools are watery and like chopped spinach after the first few; have musty odor. Stomach is very irritable rejecting all drinks, abdomen swollen. Appetite lost and thirst intense, pulse accelerated, urine scanty and high colored, skin lies in folds. If eyes become sunken and hollow and mouth remains partly open from feeble contractile power, death is pretty certain to result.

Cause: Neglect or ill treatment of simple diarrhœa, indiscretion in diet, or digestive disturbance of the mother; sudden changes arresting perspiration. A temperature of ninety or over favors its occurrence and increases its fatality. May be caused by retrocession of rash, also the germs of decaying organic matter in the atmosphere.

Treatment: Preventive: Pure air, proper diet at regular intervals if bottle fed, a clean bottle at every meal, absolute cleanliness in person and surroundings. Give cool water before each nursing. If fresh cow's milk is used, have as many bottles as the child takes meals in twelve hours, each holding just one meal. Strain while warm directly into the bottles; cork and put in a cool place; shake, warm, dilute and sweeten as necessary and give through a plain nipple without any tube. Precautions: Select the coolest place in the hottest part of the day; wear light clothing with woolen belly bandage; give one or more cooling baths each day; give freely, but a little at a time, water that has been boiled and kept in bottles on ice; protect from draughts at night.

Curative: Must have three objects—(1), to restore the blood to the surface; (2), stop the vomiting; (3), regulate and tone the bowels. But as every case has fermentive matter, undigested matter and septic matter in which the germs of the disease propagate, it is necessary to expel them all. Give neutralizing cordial one to two teaspoonfuls every hour, until the bowels move freely from it, then follow if necessary with listerine, elixir of lacto peptine and cinnamon water equal parts; a teaspoonful every one, two, or three hours. This failing, give a hot bath five to ten minutes and wrap in warm, dry flannels, but not to cause free perspiration. 2. Tinct. of ipecac five to ten drops in four ounces water. One teaspoonful every twenty to sixty minutes. 3. If with green discharges, a dessert spoonful of a two per cent. solution of lactic acid after each nursing; not green, hot bath of dilute alcohol and then warm mattress in the open air. Ointment of dilute alcohol quinine and lard to be rubbed in the armpits and over the body every two hours; colon flush as warm as can be borne, given through soft rubber catheter eight to twelve inches long, one-half to a gallon at a time, allowing it to return as injected; then a retained enema, tepid water one pint, sub. nit. bismuth four drams, boracic acid one dram and listerine two drams. If necessary compress rectum to prevent return.

This failing withdraw all milk, and feed bovinine or essence of beef or mutton broth well salted, given cold if preferred. For pain, listerine and paregoric each two drams; simple syrup twelve drams; teaspoonful every two to four hours. If the fermentation is putrid give carbohydrate diet exclusively; if acid, give albumens only. Stimulants and antiseptics must be continued. Both are combined in listerine and brandy equal parts. Dose twelve to thirty drops every two to six hours.

If stools are lumpy and offensive, give full injection of hot water with a grain of bicarbonate of soda to the ounce, or castor oil and pure glycerine each one ounce, cinnamon water one-half ounce with enough bicarbonate of soda or potash to emulsify: A teaspoonful every one or two hours. Keep warm applications to extremities. If stools be watery and but little tenderness to abdomen give enemas of dark pinus canadensis one teaspoonful to the one-half pint. Keep down fever with tepid spongings. If discharges are bloody, euphorbia hyperi. fl. ext. in five drop doses every two hours. If possible give oxygen twice a day by means of a paper funnel over the mouth and nose. If necessary retained enema, listerine one dram and starch water two ounces. Should there still be unexpelled fermented matter, give every one to three hours, the following: Dilute alcohol three drops, listerine twenty drops, hot castor oil one teaspoonful; or one teaspoonful of hot castor oil with one-fourth drop of carbolic acid in fifteen drops listerine every two hours until it operates; follow with listerine, glycerine, simple syrup, cinnamon water each one ounce; mix. Dose, teaspoonful every one, two or three hours. Or, glycerine five ounces, borax one ounce; twenty drops every one to three hours; or, tinct. of nux vom. one or two drops in two ounces of water; a teaspoonful every one to three hours; or tinct. belladonna, three to five drops in four ounces of water; a teaspoonful every two to four hours. The elm mucilage colon flush as for diarrhœa and dysentery is specially recommended.

Cholera Morbus.—*Symptoms:* Extreme nervous prostration, cold skin, feeble pulse, cold breath, interrupted respiration, cadaverous face, blue extremities, nausea, vomiting, diarrhœa, cramp and cholera germ in stools. *Cause*: Depression of great sympathetic, eighth pair of nerves and brain.

Treatment: Emetic of equal parts of lobelia and capsicum repeated until vomiting is very thorough. Bowel injections of the same. Heat to abdomen, feet and limbs. If procurable, comp. oxygen fully and repeated until perfect quiet is secured. Call physician if necessary.

Electrical—positive pole between shoulders; negative over stomach and bowels twenty to thirty minutes. Repeat as necessary. If case is severe, treat as for cholera.

Chordee.—An erect and rigid condition of the penis, during which it is curved in the form of a bow or arch; exceedingly painful; a complication of gonorrhea.

Treatment: Rectal retained enema of lobelia, repeated often enough to relax the system. Hot colon flush, No. 41, at bedtime, hard mattress, cool bedroom, avoidance of sexual thoughts. Hot genital baths of lobelia water; or, if necessary, camphor water four ounces, bromide of potassa one-half ounce, nitrate potassa two drams, tincture gelsemium one ounce. Dose one teaspoonful in water afternoon, after supper and at bedtime.

Chorea (St. Vitus dance).—*Symptoms:* Irregular involuntary contractions of more or less of the voluntary muscles.

Cause: Anything that so shocks the nerves as to cause want of harmony between gray and white matter of the spinal cord, such as over education, passion, blood diseases, skin diseases, etc. *Treatment:* Complete change of habits and occupation, fresh air, abundant exercise, daily stimulants each side spinal cord, free and persistent use of oxygen to enable system to appropriate foods; nutritive diet, average to strong; massage if practicable. A tincture of the green (or recently dried) root of gelsemium five drops every four hours, diminished to one drop at a dose, is regarded by some as a specific. The thermo-galvanic battery.

Chyluria.—The urine loaded with chyle. Syrup of iodide of iron fifteen to forty drops an hour before meals has been successful.

Climacteric Disorders.—Those which precede the last monthly sickness and end with the re-establishment of health on a basis somewhat similar to that previous to puberty. Three million women in the United States are constantly passing through them, called "change of life," "turn of life," "critical period," etc. Usually thirty-two years after puberty, at the age of forty-five or forty-six.

Cause: The periodicity of nature causing a failure of the reproductive center in the brain; hence lack of nerve stimulus to the ovaries, which wither, causing structural changes in all the related organs.

Symptoms: Nervous debility, flushes of heat, perspiration, leucorrhea, hemorrhage, headache, drowsiness, giddiness, hypochondriasis, melancholia, hysteria, epilepsy, apathy, peevishness, neuralgia—may be apoplexy and paralysis. More or less of these in connection with gradual diminution of the menses after forty and a gradual extension of the intervening time, especially if the skin loses its softness and elasticity, may be considered decisive.

Treatment: Preparatory: special hygienic course to free the system from existing ailments. Alterative (No. 5) and tonic (No. 3) methods suited to the case.

Nutritive method (No. 2) mild or average with abundance of ripe fruits; flannel clothing next the skin; alcohol vapor bath twice a week; warm alkaline bath on all other days; all the open air exercise that can be taken without fatigue; well ventilated rooms; abundance of sleep, change of scenery, and recreations that rest, not irritate.

For the nervous debility, if caused by excess of blood: Fast, and take cold sponge baths. If by too little, more nutritive, even rapid blood-making method (No. 1) and rest.

For heat-flushes: Avoid emotions and external heats. Cooling method (No. 12) mild. Macrotin (con.) one to two and one-half grains three times a day.

Sweats (passive permeability of skin from loss of nerve-power): Tonic method (No. 3) average or strong. Aromatic sulphuric acid ten to thirty drops and quinine one to three grains three times a day.

For leucorrhea: Vaginal injections three times daily of tea of white pond lily, witch-hazel or strawberry leaves.

For hemorrhages: Unless excessive, should not be entirely checked, except in the anæmic. If vaginal, local vinegar pledgets changed every three hours, head low, feet elevated. Tinct. of ipecac one to three drops alternated with distillation of witch-hazel five to ten drops; a dose every ten to twenty minutes.

For headache, see headache. For sleeplessness, see sleeplessness. For giddiness, see giddiness. For neuralgia, see neuralgia. For flatulence and fluttering in epigastrium: Cajeput oil, five to twenty drops three times a day. For hysteria, zinc valerianate one grain three times a day. For muscular debility, brucine (alk.) one-sixty-seventh to one-twelfth grain, or berberine (alk.) one-sixth to three grains before meals.

Coccyodynia (painful coccyx).—Cause: Blow, injury during childbirth, or sitting on hard, cold seats. Treatment: When caused by a blow or strain, treat as for contusion or strain. When caused by cold, give revulsive method as needed.

Colds.—A vapor bath of hemlock leaves, with rest in bed, fasting a whole day and night will cure nearly all cases within forty-eight hours. Free inhalations of comp. oxygen immediately after the cold is contracted is usually effective. Diaphoretic treatment strong is a certain cure if taken in time. Ferrum phos. every hour or two aborts a cold in a few hours if used as soon as the cold is felt.

In Head: Put a pint of vinegar into an old teapot on an oil stove, and add a teaspoonful of spirits of camphor, and replenish as it evaporates. Inhale the steam until the head is clear. Or, sodium salicylate and syrup of orange peel each one-half ounce, peppermint water four ounces. Dose a dessert spoonful every three hours until the ears ring.

In Throat: Treat as for cold in head. Also compress on throat, and if it continues steep a dram of bloodroot in half a pint of good cider vinegar sweetened into a syrup; a teaspoonful frequently.

Cold in Head, Acute Rhinitis (child): Warm bath ten to twenty minutes. If nostrils are irritated, cosmolene warmed and sprayed up the nose; nostrils dry and filled, apply frequently a warm, weak solution of baking soda and follow with cosmolene; "snuffles" (nasal catarrh), cosmolene spray, following an alkaline solution, or listerine reduced with from four to seven parts of soft warm water; body pack daily until cured.

Colic.—Cramp or spasm of the bowels. Numerous varieties, some due to indigestion, flatulence, worms; others to acrid states of the bile, with nausea, vomiting, yellow skin; others to gout or rheumatism; to obstruction; to neuralgia.

Treatment: Cover patient warmly in bed, then give a pint of water as hot as can be taken; place patient on left side with hips raised and give copious injections of warm water with one-half cup of molasses in each; hot fomentations of hops to abdomen. **These**

failing, give dose after dose of lobelia in warm soda water, then hot drinks, and add lobelia enemas if necessary.

Colic, Bilious: Full cæcal flush, large quantities of hot water drank, colocynth and podophyllin in alternation every thirty minutes. If with fever, full pack, or frequent spongings under bed clothing.

Colic, Obstructive: Place patient in knee-chest position, or lying with hips elevated as high as possible, and give an injection of a pint or more of warm sweet oil; retain as long as possible.

Colic, Pictonum (lead colic): Emetics and injections of lobelia and opium if necessary to relieve the pain, if warm body packs, or hot fomentations of hops fail.

In enema treatment, use hot annis seed, peppermint, spearmint, caraway, fennel, or catnip tea as the fluid instead of hot water. Or put a dessert spoonful of table salt into the hot water

Colitis (inflammation of mucous membrane of colon).—See dysentery.

Colitis, Chronic.—See chronic dysentery.

Coma.—Lethargy or sleep deeper than stupor. *Cause:* Fracture of skull, effusion, softening with paralysis, microbes, gases, acro-narcotics, urea.

Treatment: Remove the cause. Rouse the vital force by rubbing, electricity, oxygen, injections of glycerine and peroxide of hydrogen, or of two to four grains of capsicum in elm or starch water. In uremic coma give long continued inhalations of oxygen.

Condyloma (a hard tumor about the anus or pudenda).—Thuja thirty drops internally in water three times a day and apply locally thuja and sweet oil.

Congestions.—Revulsive method according to locality and severity.

Conjunctivitis (inflammation of the conjunctiva).—Hot water fomentations to back of neck, and two drams of boric acid to a pint of warm water used freely on the eyes; or, Lloyd's hydrastis four drams, Lloyd's belladonna twenty drops, boiled water three and one-half ounces applied on absorbent cotton. General revulsive method.

Consumption, Pulmonary (pulmonary tuberculosis, phthisis).—*Nature:* Digestion having prepared the elements of food, they are poured into the blood and there raised by vitality to the condition of cell growth suitable to supply the wastes of the tissues. If the vitality be deficient, the food elements, too little vitalized to make animal tissue, yet vitalized too much to perish, produce specific vegetable parasites, the bacilli-tuberculosis. These germs proceed to consume all the

vital elements of animal life for their own nutrition; and secrete a "cadaveric alkaloid," the poisonous effects of which are seen in fever, hectic, night sweats, etc. Some weakened patch having offered opportunity for the transudation of some of the bacilli from the blood into a lymph space or air cell, there they nest and the epithelial cells harden about them. If vitality be sufficient, these germs may be encysted (cased in) with walls of fibrillated network and thus be made harmless.

Failing in this, the bacilli or germs multiply with enormous rapidity and their poisonous ptomaines or excretions kill the tissue in immediate contact with them and inflame that which lies just beyond, thus producing consolidation. By chemical action, this dead tissue becomes pus, and the inflamed tissue soon degenerates into the same product. Nature now makes an effort by expectoration to clear the system of the rottenness. If successful, she may then heal the cavity by a scar; if unsuccessful, the cavity remains a pool of purulent matter. This matter may be absorbed into the circulation and cause blood poisoning. The imprisoned pus constantly eats away the walls of its cavity, thus enlarging its area. Sometimes cavities work by extension into each other; these processes waste the serum of the blood to the point where the lymph canals and pink morrow fail to produce it in normal condition. Nutrition becomes less and less able to supply material for the repair of these destructive wastes, and hence emaciation and decline go steadily on.

Causes of Consumption: (1) The direct transmission of its predisposing causes from a diseased parent. (2) The production of its predisposing causes by incompatibility of temperament of parents; (3) their production by the union of physiologically adverse peoples, as Indians and whites; (4) their production by waste of vitality; (5) their production by unfavorable physical conditions; (6) contraction by infection, or (7) contraction by contagion. The statistics of this disease justify the following average statement: In the whole world one is destined to die with it out of every family of seven; and of every family of four, three will be smitten with a predisposition to it, and one must die from some form of tubercle.

Symptoms; first stage.—Breathing hurried on exertion, inspira tion harsh, expiration prolonged; cough dry, hacking in the morning expectoration not relieved by ordinary remedies; wanting at first then colorless, frothy, glairy or sticky mucus; spirometer measur about one-third less than normal, *i. e.* the capacity of the lungs i reduced to that extent.

Weight slightly diminished; appetite and digestion somewha impaired; aversion to fats; pulsations slightly accelerated; extremi ties cold; palpitation upon slight exertion; constipated; urine dimin ished; irregularity or suppression; skin sluggish, clogged and pallid.

Second Stage.—Breathing more hurried on exertion, cough some what wearing; expectoration yellow and more or less watery; some times mucous. Spirometer measure about three-sevenths less tha normal.

Weight decreasing; appetite poor or variable; digestion slow an imperfect; strong dyspeptic symptoms; pulsation still more rapid with a marked difference between night and morning; cheeks flushe when fever is on; chills, not malarial; bowels constipated, sometime alternating with diarrhœa; urine diminished and frequently turbid night sweats; suppression.

Third Stage.—Breathing rapid and abdominal, fœtid; cough severe and exhausting; expectoration thick and if with little mucous sinks in water; is sometimes pellet, or coin-shaped, yellow and puru lent; sometimes green and offensive; later copious and sticky; ina bility to retain a forced inspiration; spirometer measure about seven twelfths less than normal; emaciation; frequent vomiting from th cough; appetite very poor; pulsations one-hundred to one-hundred sixty per minute and very weak; regular afternoon increase, an later preceeded by dumb chill; hectic glow; diarrhœa; night sweats kidneys variable; usually complete suppression.

Treatment must be carried on with two cardinal principle in view: Nutrition must be restored, and respiration must b ample to oxidize the nutrient material or food consumed Nature requires an average food consumption of sixty ounce every twenty-four hours for an average weight of one hundre and forty-eight pounds. The oxidation of that food impera tively demands the intake of the tidal air of two hundred an twenty-two cubic inches of lung capacity, eighteen times ever minute, in order to work that food into its ultimate excre mentitious products.

Statisties show the respiratory eapaeity of eonsumptives in different stages of disease to be as in the following table:

Capaeity in Health.		Capacity in Consumption.		
Height.	*Cubic inches.*	*First stage.*	*Second stage.*	*Third stage.*
5 feet 1 inch	174	117	99	82
5 " 2 "	182	122	102	86
5 " 3 "	190	127	108	89
5 " 4 "	196	133	113	93
5 " 5 "	206	138	117	97
5 " 6	214	143	122	100
5 " 7 "	222	149	127	104
5 " 8 "	230	154	131	108
5 9 "	238	159	136	112
5 " 10 "	246	165	140	116
5 " 11	254	170	145	119
6 "	262	176	149	126

This demonstrates the absolute ineapaeity of the eonsumptive to make use of the normal quantity of food, even if it eould be eonsumed.

The Diet in Consumption is therefore of the utmost importance, and thousands upon thousands every year forfeit their lives because of ignorance of the essentials of a helpful dietary. One set of doctors make appetite the only umpire, "eat when and what you crave," forgetful that the appetite is as much diseased as the lung. Another class stuff with enormous quantities of fats, ignoring the fact that fats can neither make good blood, renew wasted tissue, nor replenish exhausted digestive ferments. Another class feed green vegetables, blind to the fact that these require far more labor of the debilitated digestive organs than do the animal foods. The real problems are:

1. To give nearly a normal average of the fiber element, upon the assumption that, although the work done may not be as much as the average of the healthy, the wastes already suffered will fully average the neeessity for these elements.

2. To supply as nearly the normal quantity of fats as the diminished respiratory power will oxidize; beeause, although they have the disadvantage of loeally raising the temperature in the lungs, they also possess the vastly preponderating advantage (when not in great excess) of yielding heat and energy without digestion, thus saving a heavy drain just where the organism is weakest.

But that eod-liver oil is not an appropriate fat is apparent for these reasons, summarized from Wood, Porter and others: (*a*) The oil eontains the excretive nitrogenous products of the liver, designed for expulsion as unfit for further use in the animal economy. (*b*) Its emulsification inereases the danger of exhausting the oxygen supply, because of its rapid absorption. (*c*) Its rapid transformation in the lungs into carbon dioxide and water, tends to inerease the loeal eon-

gestions there. (*d*) Its alterative action is in the direction of depression, because it decreases the urea in the urine, and increases the deleterious products of deficient oxidation.

3. To use the force element only as appetizing and supplementary —to fill up the calories of heat and energy to the measure of the full oxidizing capacity of the system and enable it to appropriate more of the fiber-element and no further.

4. To make actual increase in respiratory capacity the standard of a corresponding increase in food supply

5. To make no account of the increased number of respirations, because they are fully balanced by the diminished area of oxygen absorption, and by the augmented impurity of the blood.

It will thus be seen that the adjustment of the diet must have a constant relation to the respiratory power, and should be specific as to kind and quantity in each several phase of the disease. TO INCREASE THE RESPIRATORY CAPACITY IS THE FIRST NEED, THEN TO FEED UP TO ITS LARGEST MEASURE IS THE SECOND.

The kind of food is also of utmost importance. An excess of fats overtaxes the emulsifying functions, and their point of oxidation being in the lung-tissue, their transformation increases the heat where it is already too high, by reason of the inflammatory processes already described.

The physiological nutritive demand is for nitrogenous substances to supply the wastes of tissues and the digestive ferments, and carbohydrates to give requisite heat, but not in such excess as to cause the imperfect oxidation of the nitrogen into its proper excrementitious products.

The nitrogenous substances should be in the most easily digested forms, and such carbohydrates selected as are capable of yielding the necessary amount of heat without a bad effect upon the organs.

These rules are plain, scientific, and practical, and should be rigorously enforced so long as there is hope of recovery. When that is abandoned, the old guesswork or whimsical system may be readopted.

On pp. 373–376 some dietaries may be found constructed in accordance with these rules.

The Hygienic Measures necessary have reference to: First, the danger to the patient of reinoculation by himself; second, the peril of infection; third, the possibility of cure.

The first two may be summarized thus: All expectorations should be immediately distroyed by fire, or by disinfectants. All dishes or utensils that have been used by the patient should be disinfected.

Bedding, clothing and room should have a sulphur fume every few days. The cuspidor should constantly contain a solution of carbolic acid, one ounce to one and one-half pints of water, and should be washed twice a day with boiling water. When away from this receptacle, the patient should carry little squares of cloth to receive the sputa, and each should be wrapped immediately in paraffined paper and burned on the first opportunity.

The urine and fæces should be disinfected by mixing with each discharge one ounce of powdered chloride of lime, or one quart of a solution of four ounces of chloride of lime to one gallon of soft water. Let stand an hour before emptying anywhere. Rooms should be disinfected by exposure for twenty-four hours to the fumes of burning sulphur, (three pounds for every ten feet square size of room) then to currents of fresh air several hours, then the walls should be rubbed with bread crumbs, which should be burned.

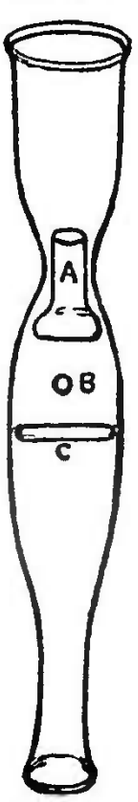

FIG. 63. FIG. 64.

BREATHING TUBES.

FIG. 63. *A*, valve; *B*, side orifice; *C*, bar to stop the valve.
FIG. 64. *A*, side orifice.

The Inhaling Tube.—From what has already been said concerning the relation of lung capacity to nutrition, it follows that lung expansion lies at the root of possible cure in all cases. Therefore the inhaling tube, or more properly the respirator systematically used, is the supreme hygienic measure, never to be omitted. The construction of the inhaling tube is such that when held between the lips, and the breath is drawn through it very deeply; it enters by an orifice large enough for comfortable inspiration, but when expelled, by the operation of an interior valve, it is diverted through an aperture so much smaller that the rebound of the air from the effort to force it through rapidly, dilates all the air cells, and thus accomplishes three very important purposes namely: 1, Breaks up the tendency to mat or consolidate like a hard dry sponge, which is the first step towards ulceration. 2, Gives the cells a gymnastic exercise by which they are greatly strengthened and made more hardy. 3, The slow expiration

affords ample time for the complete absorption of all the oxygen of the inspired air. The tube should always be used in the open air or by an open window, from two to many times a day. The patient should stand erect if able, with shoulders thrown well back, and breathe as deeply as possible from one to twenty minutes at a time. Should any dizziness be felt, rest a minute. If predisposed to hemorrhage, it should be used if at all with great caution.

There are many forms of the tube, most of which are needlessly expensive. One of the simplest is illustrated in Fig. 64, and consists of a glass tube with a side orifice for expiration, the tongue being placed against the interior and acting in place of a valve. Another also of glass with a valve is represented in Fig. 63. One can be made by boring a three-sixteenth inch hole through the length of any piece of hard wood three inches long, then about one-half of an inch from one end, bore a one-sixteenth hole through one side into the lengthwise hole. Place the end with the side-hole in the mouth, so that the hole shall be between the throat and the front teeth, and draw the breath through it. To expel, clap the tongue against the end, and at no cost whatever one can have practically as good an inhaler as any that costs two dollars, so far as the lungs are concerned, but it should be carefully cleansed every day with menthymos solution, or some other disinfectant, and care must be used to have the end smooth lest the tongue become sore.

Habitual Outdoor Air, with as much of the right kind of physical exercise as can be taken without exhausting the vital force, are imperative co-requisites. But how to secure that exercise is the perplexing problem.

The following objections hold *against horse locomotion:* The exercise is too passive for the most curable stage, when its benefit is most required; the expense and care are prohibitive in the majority of cases. The following objections hold against *bicycles:* They do not admit of enough companionship; they afford no shelter from the sun; they tax the heart and large blood vessels too much; they can be used comfortably only in favored localities, and in the most pleasant season of the year.

Summer Camping parties, which should extend from June to October in the Northern States, moving southward as the season advances, and passing the winter in California, Texas or New Mexico, are the best form of life and exercise. Expensive? Yes, but what is human life worth? The day is not distant when such parties or something equivalent will come to be recognized as the reasonable thing for the cure of this dire malady.

But what shall the poor victim do who cannot go camping? Do as the author did forty-seven years ago, when physicians and friends despaired of his life, because consumption had fastened upon him (early second stage). Keep up a running fight with Death—a desperate purpose to live to do good in the mind, trust in God in the heart, and with the inhaling tube as the chief reliance, FIGHT TO WIN! Then if you fall, it will be because God has a better place for you.

Medical Treatment.—Its first aim should be to heal suppurations if they exist. Its second should be alterative and

tonic as far as the system will respond favorably to such agents. In all cases medicines should be germicidal, only such drugs being used as have power to kill or sterilize the germs, or neutralize their ptomaines, or both, and at the same time not prove devitalizing.

Guiacol, creasote, calomel, chlorides of gold, antimony, arsenic, turpentine, cinnamon—these and many others have been used with success in different cases. Our judgment is that the particular remedy employed is not of so much consequence as its careful adjustment to the vital force and the use of the hygienic means previously named. Without them, all medication is useless; with them, medicine rightly selected and administered may play a subordinate role, but must never be allowed the chief place.

The simple fact that in spite of all the varied medication of the past, the disease still holds sway is proof that drugs cannot cure it. On the other hand, a strictly scientific diet has had no chance to try, because until very recently its elements have not been sufficiently understood. But it is fair to assume that since a certain percentage of cases recover in spite of positively wrong diet, if that be corrected and added to the other means named, a much larger proportion will cast off the disease.

Tonic and alterative treatment according to the case. Some preparation of tar for the cough, when needed, and creosote carbonate as a germicide is probably the best treatment that can be given. Ozone or oxygen inhalations in all cases.

Constipation (diminished peristaltic action of the bowels).—*Cause:* Lack of bile, stricture of large intestines, or growths from its surface; more commonly sedentary habits, neglect of the calls of nature, certain diseases—anæmia, hysteria, etc., and acute diseases. It is normal; (1) after free evacuations from diarrhœa, enemas or cathartics; (2) during protracted fasting; (3) from three to ten days after child-birth; (4) in serious sickness when nature uses all her energies in saving. The stool consists of waste matters secreted from the blood by the glands of the colon. For the effects of the undue retention and resorption of such matters, see our colon flush. Dr. Turner, of Washington, examined the colons of three hundred persons and found two hundred and ten of them constipated, and containing disease germs that were being absorbed into the system.

Treatment: 1. Knead the abdomen with a deep, shoving movement, in the direction of the intestinal peristalsis, i. e., beginning in

the right groin and moving around over the colon, five to ten minutes every day. Should this prove ineffective, anti-constipation diet and avoid tea, gin, beer, cheese, milk, salt and smoked meat, pickles, pastry, fresh bread, beans, peas, nuts, rolls, waffles, and all milk compounds with farina.

Or, eat one or two oranges on rising, followed by one-half pint of water, cold or hot. For breakfast, eggs or fish, and oatmeal mush or hominy; no bread, rolls, griddlecakes or gems, unless they are oatmeal and take the place of oatmeal mush.

Two hours before dinner, one or two apples followed by one-half pint hot water. For dinner, meat, poultry or game, green vegetables, such as greens, cresses, squash, turnips, spinach, cabbage, tomatoes, asparagus, cauliflower; no desserts, no bread.

Every one-half hour from dinner to supper take a teaspoonful of cold water and drink whenever thirsty.

For supper, stewed fruit, or figs, pears, prunes, peaches, apples, oranges, melons, grapes, cherries, berries, toast, cold meat; no cake nor sweetmeats. Can use brown bread, corn meal mush, or hominy in place of toast.

At bedtime, one-half pint of hot water. The only drink allowed at meals is buttermilk at the end.

2. Make the effort to stool at a regular hour after breakfast. 3. Stool whenever the desire occurs. 4. Cæcal flush every night as long as there are dark, hard or mucus covered discharges and until they are yellow. Then, two or three times a week until cured. 5. Massage. (a) Rub the whole abdomen with a compound of lanoline two ounces, sweet oil four ounces, oil of sassafras two ounces, gently pinching the skin for ten minutes. (b) Gently tap with the ends of the fingers all over the stomach and bowels, four or five minutes. (c) Standing, clasp the bowels in both hands and shake up and down and from side to side four or five minutes. (d) Knead as first directed, but this process should never be employed vigorously if the colon is packed with hard fæcal matter. First unload it with flushes. 6. The colon flush.

When the cause is inactivity of the liver, ox-gall pills will supply the deficiency until the liver can be set right. With dry stools, easeara cordial four ounces, fl. ext. of lobelia two drams; one to two teaspoonfuls.

Constipation, Habitual: Podophyllin one grain, malaga wine two ounces; one teaspoonful at bedtime.

Constipation of Children: Nux at night, bryonia in the morning. A tablespoonful of fine bran night and morning in a cup of warm milk, poured on bread.

In all cases with heat in lower bowels, or red line in center of tongue, ferrum phos. With clear slimy tongue, bubbles on edges, involuntary tears or other watery discharges, or frothy saliva, natrum. mur. With white tongue, light stools, fat and pastry disagree, kali mur. With yellow, slimy tongue, sticky, thin, yellow secretions of watery matter, any attendant symptoms worse in evening and in a warm room, or with retrocession of eruptions, or itching pimples, or peeling skin—kali sulph. Three grains of either, three to six times a day.

Contortions (chronic, from rheumatism).—*Treatment:* Give lobelia until complete relaxation is produced, then straighten. Repeat every week.

Contusions.—When of the flesh, see bruises. When of the bone, see peritonitis.

Convulsions, Infantile.—*Symptoms:* Spasms of muscles, general or partial. May come suddenly, but usually preceded by restlessness with twitching and grinding of teeth. Spasm usually begins with hands, eyes fixed and rolled upward, body stiff and breathing suspended for a moment, face congested.

Cause: Peculiar excitability of nervous system; reflexly from gastro-intestinal disturbances, especially with debility; seldom from dentition alone; rickets, fever, congestion of brain as in whooping cough. May be due to irritation of the brain, or at a distance, as a worm in the bowels, or a burn on the hand or foot, or to fright.

Treatment. Remove the cause. Hot baths ten to twenty minutes. Sponge the spine with cold water. Mustard to the extremities. Warm water on head, allowed to evaporate freely. Enema of lobelia and skull cap tea. Give passiflora incarnata five to twenty drops, or catnip extract one teaspoonful. Or, calc. phos. and mag. phos. in alternation, one dose every hour. Or, if from worms, salt and water, and as soon as the paroxysm is over, a dose of belladonna and santonine as for worms. If at the beginning of ague, give aconite and belladonna, a dose every thirty minutes, four times, then give baptisia in place of the belladonna. If from diarrhœa, belladonna and camomilla. If from whooping cough, belladonna.

Convulsions, Puerperal (occuring during childbirth).—*Symptoms:* Convulsive movements of the limbs, muscles of the face, dilated pupils, red or livid countenance, fixed or convulsive eyes, foam at the mouth, involuntary escape of urine and fæces.

Treatment: Empty the bladder and rectum, place a piece of rubber between the teeth, give infusion of lobelia freely by mouth and rectum as soon as possible; if the urine is albuminous and scanty, give diuretic teas, then administer peroxide of hydrogen, thirty drops in water; or resorcin, five to fifteen grains every three hours; or, salicylate of soda, fifteen to thirty grains three or four times a day; with passiflora, one teaspoonful every four hours, to neutralize the ptomaines; or, give hypodermic injections of veratrum viride every thirty minutes, five drops of the tincture. Treat other symptoms as they occur with packs, compresses, fomentations, bed sponges, etc.

Corns (indurations of the skin caused by irritation).—*Soft:* Harden by applications of tannin, and treat as hard. *Hard:* Soften by the hot foot bath, or by wrapping in lint soaked in a solution of washing soda, then scrape away; repeat.

Or, salicylic acid thirty parts, extract cannabis indica five parts,

collodion two hundred and forty parts. Apply with small brush; in four days rub off in hot foot bath and repeat until cured. Or, soak in very hot water a few minutes, then protect surrounding parts with iodoform, and apply salicylic acid and lactic acid, each one-half dram, collodion one-half ounce; protect from further irritation.

Cough, Whooping (pertussis).—A contagious and infectious disease chiefly of childhood, caused by the presence in the blood of the micrococci parasite, localizing in and around the cervical spinal cord and giving the nervous symptoms; and upon the membrane of the air passages, giving the catarrhal symptoms. *Symptoms:* Languor, fretfulness, symptoms of a cold, periodic and spasmodic closure of the glottis on deep inspiration, which, if long-continued, causes a sense of suffocation; convulsions, attacks often end in vomiting. Complications are extremely dangerous.

Treatment: Keep quiet, give nutritive diet, daily antiseptic bath. Keep atmosphere of room antiseptic with cresolene vapor constantly. If that cannot be procured, spray glycozone, naphthaline, or eucalyptus about the room every hour, and every third day remove the child and fumigate room and furniture with burning sulphur. See fumigations. Give internally, of syrup of tolu four ounces, resorcin one-half ounce, mix. Dose, one teaspoonful every three hours when awake.

Treat complications as they arise. Mild tonic method, No. 3. Warm, not sweltering clothing; open air in pleasant weather. Sea air is especially beneficial.

Dobell's solution as a spray is of great utility—crystals of carbolic acid three grains, biborate of soda and bicarbonate of soda, of each twenty grains, glycerine one ounce, water five ounces. Or, use in the same way thymol fifteen grains, alcohol three drams, glycerine four drams, water thirty-four ounces. An emetic of one-fourth to one-half teaspoonful of powdered alum in syrup or honey occasionally is helpful. After giving the dose, hold the child on its stomach with head lowered until it operates. At night give an enema of one ounce of lac asafœtida to promote sleep. Listerine one teaspoonful to two ounces of water sprayed into the throat is beneficial.

Coryza.—See catarrh, acute nasal.

Cramp (a spasmodic action of the nerves, causing involuntary muscular contractions).—*Cause:* A disturbance of the molecular motion of the salt magnesia phos. in the tissues.

Treatment: Magnesia phos. three grains every thirty minutes to three hours. Fomentations of smartweed, or a foot bath of a handful of salt and two of wood ashes in warm water. Or, specific aconite ten drops, sanguinaria nitrate one grain, glycerine one ounce; ten drops every ten to twenty minutes as required.

Cross Eyes.—*Treatment:* Cover the eyes with a mask

having an orifice at such a point as will compel the eye to turn straight in order to see out.

Croup.—Under this name three separate diseases occur:

1st. Laryngeal: See laryngitis.

2d. Spasmodic: *Cause:* Reflex irritation, as teething, worms, and derangements of the digestive tract. *Symptoms:* Short, barking cough and difficult, hoarse breathing. *Treatment:* Give enema of No. 4, followed as soon as it is expelled by a warm mustard bath of twenty to thirty minutes, and give lobelin (conc.) one grain in warm alkaline water every ten to twenty minutes, or magnesia phos. three grains every ten to thirty minutes.

3d. Membranous or Diphtheretic Croup: *Symptoms:* Croupy cough by day, slight fever, rapid and wheezy breathing, prolonged jumping inspirations, redness and swelling of tonsils and palate, increased fever, pulse irregular, great thirst, false membrane on tongue, tonsils, palate, larynx and trachea (bacillus indicum).

Fatal Symptoms: Drowsiness, wakes in terror, breathing becomes gasping, congestion of lungs, skin cold and clammy, suffocation, convulsions, death.

Treatment: Temperature eighty degrees, moist with steam of vinegar, or slack lime in bucket and cause vapor to be breathed; make sheet tent and fill with vapor, keeping the child in it. Long flannel wrapper, high neck and long sleeves; nutritive method mild to strong. Immerse in hot water until sweating then rub dry; put cold compresses on throat, of vinegar and water and manipulate the limbs, or put mustard fomentations on them and heat between shoulders. If not soon relieved, alternate fomentations and compresses on throat and chest, and give hot foot baths. (Distinguish from diphtheria, in which never foment). Or, aconite, phosphoric acid and spongia in rotation, every ten, thirty and sixty minutes as improvement continues. If fever subsides, but throat trouble and cough continue, give ipecac in place of aconite. If cough be deep seated, give bryonia instead of spongia, keep in warm room with no draughts, feet warm, head cool, compress on throat. One-half teaspoonful alum and same powdered sugar if suffocation seems at hand, and blow into the throat a little pure powdered alum.

Cyanosis (blue disease).—A condition of the heart or blood vessels that mixes venous and arterial blood. *Congenital:* Keep thoroughly warm and give a drop or two of digitalis twice a day. *Symptomatic:* Treat the original disease. In either case the thermo-galvanic battery two to four times a day.

Cystitis, Acute (inflammation of the the bladder).—*Cause:* Injury from operation; irritation from pieces of crushed calculi; results from certain drugs as cantharidis. In gouty subjects from exposures to cold; from too long retention

of urine; may be due to a stone, foreign body, or growth in the bladder obstructive to the outflow of urine, or to stricture or enlarged prostate.

Symptoms: Burning, piercing and throbbing pain in the region of the bladder extending to the perineum and in some cases to the testicles and thighs, increased by pressure; ineffectual desire to urinate; nausea, vomiting and great anxiety are common; constipation, pulse full, hard and frequent; skin hot and dry, thirst urgent, and patient restless and dejected.

Treatment: Remove the cause. If urine is retained, draw it off with a catheter; sigmoid flush of warm water with thirty drops to the pint of tincture of lobelia; cool compress on bladder. Fomentations of limbs with mustard water, warm hip bath, or body bandage fomentation, two or three times a day. Injections into the bladder of warm, pure milk; revulsive method strong; the pain suppository in the rectum every four hours. Keep urine alkaline with tea of linseed or marsh mallow containing nitrate of potash one-half ounce and cream of tartar one ounce to two pints. Take enough for that purpose; mustard over stomach if there is vomiting. If perfectly pure milk is not at hand for the injection, wash the bladder thoroughly with clear, warm water until the water comes away clean and odorless, then rinse out with a very weak solution of soda bicarbonate, after which inject five grains of papoid dissolved in two to four ounces of warm water. Repeat from once in two days to five or six times in one day according to the severity of the case. Give water freely to drink. Repeat the flush and the bladder injections as often as required to keep down fever and subdue the inflammation, and give tepid spongings as often as may conduce to comfort. (Cooling method.) Absolute rest, diet nutritious, but unstimulating.

Internally the following have been used successfully: Fluid ext. collinsonia canadensis given in fifteen drop doses every four or six hours. Or, tincture of eryngium three drams, tincture of aconite ten drops, and water five ounces. Dose one teaspoonful every one to three hours. Eucalyptus in from twenty to thirty drop doses of the tincture three times a day, well diluted. When the urine is neutral or alkaline one to three bladder injections of resorcin two to fifteen per cent., at intervals of two to three days, usually cures. A No. 1 capsule of ammonium chloride, swallowed, three or four times in twenty-four hours, followed by a glass of cold water, is superior for cystitis arising from stone in the bladder, influenza and uterine diseases. Ten grains of bicarbonate of soda in a half-ounce of an infusion of uva ursi every two hours, is said to relieve immediately. Five grains of carb. of lithia, or six grains of benzoate of lithia in a glass of water, will give relief in most cases. If this fails, give tinct. gelsemium twenty drops, alternated with five grains of benzoate of soda, or lithia, every three hours, in water.

Cystitis, Chronic.—*Cause:* Mechanical and irritating substances in the bladder; retained urine; external injuries, irritating and acrid substances; or by colds, suppressed perspiration, or hæmorrhoidal discharges, or by metastasis of gout and rheumatism.

Symptoms: Violent burning, lancinating, or throbbing pain in the region of bladder. Pain increased by pressure made over the pubes; the perineum and adjacent parts are tender to touch. Frequent efforts to urinate, without success; the little voided passes off in drops,

attended with severe stranguary or dysury; deep red color often tinged with blood; or sometimes depositing a milky, turbid sediment, particularly if the inflammation is of a catarrhal character. Bowels constipated, pulse hard and full, skin hot and dry, urgent thirst, sometimes sickness at stomach and vomiting.

Diet: Generous to a fault; linseed or marsh mallow tea, for drink; flannel clothing, external warmth, bactericides as injections, comp. oxygen to sterilize blood and support nervous strength. Avoid reaching upwards, rapid walks, lifting, damp or chilled feet, and everything that experience proves to be injurious. Keep bowels open with cæcal flushes, No. 41. Retained enema of mullein tea; watermelons eaten freely, if they agree otherwise are beneficial, producing a bland urine. Tepid hip baths two to four times a week; much quiet rest; tepid compress on bladder nightly, or hop fomentation. Hot alkaline sponge baths frequently. Full pack once a week. One to two gallons of water drank daily. One teaspoonful of fluid extract of corn silk in water three or four times a day.

Locally: Empty the bladder with a flexible catheter, then keeping the catheter in position inject through it from a glass syringe two or three ounces of tepid water containing one-half of an even teaspoonful of borax. Let that pass off, and then inject one ounce of warm, soft, white vaseline, pinch the end of the catheter and withdraw it. Repeat once or twice a day, until cured. Or, stool vapor three days; then for three weeks, upper shower and water tread morning and afternoon; then sitz one day and shower alternately; tea of juniper berries and mullein. Or, after the cleansing wash, inject warm water containing a teaspoonful of fl. extract of corn silk, and take one to two teaspoonfuls in water every three or four hours, or take five to eight drops of oil of mullein three times a day. Old men with enlarged prostate will find five to fifteen grains of ammonium benzoate every four to six hours of benefit. If there is much pain, warm and inject and allow to remain twenty or thirty minutes, one ounce of this mixture—sodium benzoate one dram, tincture of gelsemium two and one-half drams, water enough to make six ounces.

The following has been used with much success: Iodoform thirteen drams, glycerine ten drams, distilled water two and one-half drams, gum tragacanth four grains; mix. First wash out the bladder, then inject half a dram in two to four ounces tepid water. Listerine one ounce, water one pint, is also a good remedy as a bladder injection. Also, one-tenth of one per cent solution of permanganate of potassium. Orally, eryngium aquaticum half an ounce, water three and one-half ounces, a teaspoonful four times a day. Correct acidity of urine with one-half to one dram of acetate of potash daily. In mild cases this may be sufficient: Aconite, arsenicum and baptisia in rotation every half hour until better, then less frequently. Drink hot water freely.

Dandruff.—With excess of watery secretions from nose and eyes and white scales, natrum mur, three grains four times a day; with yellow scales, kali sulph. three grains four times a day; with white secretions and tongue, kali mur, three grains four times a day. Wash scalp daily with a solution of menthymos ten grains to one-half pint of water, or use Our Doctor's hair preparation, or a solution of listerine.

Deafness.—*Causes:* Anæmia, congestion or softening of the brain; drugs—quinine, chloral hydrate, opium, belladonna, tobacco; reflex—from teething, worms, etc; microbial—catarrh, tubercle, syphilis, rheumatism, typhoid and

typhus fevers, scarlet fever, etc. *Treatment:* For anæmia, treat as for anæmia; for congestion, treat as for congestion; for softening, treat as for softening; for reflex, remove the cause; for drug, stop its use. If no relief, consult an aurist. For microbes, three or four drops of pure mullein oil dropped in the ear night and morning, and alterative and tonic treatments as needed. This failing, consult an aurist.

Debauch.—Warm bath, rest, diet No. 14. Ten to twenty drops of conc. tincture of oats in hot water every three to six hours. Avoid the cause.

Debility, Sexual.—See sexual diseases.

Deglutition (swallowing) **difficult.**—With impaired innervation, stramonium five drops, water four ounces, teaspoonful every two or three hours; general tonic treatment. Kali phos. three grains every two to four hours.

Delirium Tremens.—See acute alcoholism.

Dengue (break-bone fever, eruptive rheumatic fever, dandy fever).—*Cause:* The same as yellow fever modified by a strong rheumatic diathesis.

Symptoms: Great prostration, pain in bones, excruciating pain in forehead and eyes, delirium, sleeplessness; incubation forty-eight hours, then rigors and fever; about the fourth day of fever temperature declines and rash appears and continues two or three days.

Treatment: Copious lobelia emetic, saline cathartic and alcohol chair bath, or full pack. Diaphoretic and cooling methods as needed; nutritive beef tea; ten drops of peroxide of hydrogen six to eight times a day, and three times a day a teaspoonful of eucalyptol. Antiseptic precautions as in yellow fever. Tonic method in convalescence, with diets No. 13, 22, 26 or 34.

Dermatalgia (neuralgia of skin).—Cocaine one grain to one dram of water applied with camel's-hair brush; general nutritive and tonic treatments.

Diabetes Insipidas (non-saccharine diabetes).—Differs from d. mellituria by the absence of sugar from the urine and its low specific gravity. *Symptoms:* Excessive thirst and copious urine ranging from 1.002 to 1.006.

Treatment: Central galvanism six minutes, then faradism over kidneys twenty minutes daily, or positive at coccyx, negative over kidneys four minutes then positive between shoulders, negative still on kidneys, five to eight minutes daily for three days, then three times a week. Internally rhus aromatica, five to thirty drops every three

hours; or, solid extract of celastrus scan. one ounce, extract hydrastis six drams, soften to consistency of molasses with whisky tincture of columbo and dogwood. One teaspoonful three times a day.

Diabetes, Mellituria.—A disease in which grape sugar exists in all the fluids and solids of the body.

Symptoms: Onset gradual, either persistent thirst or frequent micturition first calls attention. Appetite usually increased with marked and rapid emaciation. Urine varies from six to forty pints according to severity of case, and is pale, with sweetish odor and taste, and acid reaction containing sugar from one and one-half to ten per cent. Thirst greatest about an hour after meals; saliva may be scanty and tongue dry, red and glazed; constipation common; sugar fungus in the blood; urine ferments with yeast; extreme nerve depression; breath is chloroform; often cataract. May run along for years, and usually terminates either in a deposit of tubercle in lower lobe of right lung, or in Bright's disease.

Cause: Heredity; more frequent in men, rarely in the young; injury to nerve centers, brain and cord. More carbohydrates are ingested than can be accomodated by the liver as glycogen.

General Diet for Diabetics: Allowed: All kinds of meats (except liver), poultry, all kinds of game; all kinds of fish, fresh or salt, sardines; oysters and clams; eggs in any style (without addition of flour, starch or sugar); fats and fatty meats, sparingly; butter, cheese, not very old; soup (without flour or the prohibited vegetables); celery, cabbage, cauliflower, string beans, asparagus, lettuce, spinach, mushrooms, radishes, cucumbers (green or pickled), young onions, watercresses, slaw, olives, tomatoes; wheat, gluten, graham and rye bread, acid fruits, such as oranges, lemons, apples, plums, cranberries, currants, cherries, strawberries, gooseberries (sweetened, not with sugar, but with saccharin and sod. bicarb, or with glycerine;) gelatin (without sugar); almonds, walnuts, Brazilnuts, hazelnuts, filberts, pecans, butternuts, cocoanuts; salt, vinegar, pepper. Drinks: Coffee, tea, (without sugar), skim milk, buttermilk, cream, soda water (without syrup); mineral waters of all kinds, but especially vichy; claret, Rhine wine. Prohibited: Liver; sugar, in any form; starch in any form; sauces containing flour, sugar or starch; cakes of all kinds; all cereals such as cracked wheat, oatmeal mush, cerealine, etc.; potatoes (either Irish or sweet), corn, carrots, turnips, hominy, parsnips, beans, peas, beets, rice; white bread, corn bread, white biscuits; pears, peaches, grapes, sweet jellies; chestnuts; malt liquors, beer, ale, spirits. If it can be afforded levulose (diabetin) is the best sweetening.

Treatment: Oxygen in large quantities to burn up the sugar. Pancreatine after each meal to aid the pancreatic secretion to transform the sugar. Colon flush daily to expel the ptomaines; daily cold sponge bath; flannel clothing; long continued alterative and tonic methods. Sodium sulph. (No. 11), as chief remedy. Kali phos. (No. 6), for nervous weakness, voracious hunger, sleeplessness. Ferr. phos. (No. 4), for quickened pulse, pain, heat or congestion. Calc. phos. (No. 1), for thirst, dry mouth and tongue, flabby, sunken abdomen, weakness, polyuria, when bacon and salt are craved, and in glycosuria when the lungs are involved. Kali mur (No. 5), for excessive sugary urine, great weakness and somnolence. Natr. mur (No. 9), for polyuria, unquenchable thirst, emaciation, loss of sleep and appetite, great debility and despondency; give according to indications. Should these fail to cure, sambul seed finely pulverized, five grains in a capsule after each meal, will greatly relieve while its use is continued. Peroxide of hydrogen, teaspoonful dose in water after meals.

Diarrhœa.—Too frequent movements of the bowels with or without pain. *Cause:* Undigested food undergoing chemical fermentation, impure air or water, or irritating drugs.

Treatment: Stop the use of the drugs, get out of the air, drink no more of the water, expel the ferment and perfectly digest additional food. Abstain entirely from food, until the tongue cleans and hunger comes; drink freely of very hot water; take full cæcal flush, warm with ten grains of menthymos to the quart; abdominal compress, with rest in bed. If this does not soon relieve, take neutralizing cordial in tablespoonful doses every hour, until the bowels move freely from the action of the medicine. Then if the movements do not cease at once, give cinnamon or kali tea, or tincture of camphor, opium, rhubarb and capsicum, equal parts; dose twenty-five drops every fifteen to sixty minutes; or dark pinus canadensis, fifteen to thirty drops by stomach or one teaspoonful in retained enema. Saracenia flava, fl. extract after each evacuation; said to be sure. Hom. verratrum alba and phos. acid alternated after each movement. If nausea, vomiting or cramps in the bowels, ipecac alternated with one of the two. If thirst and burning in the stomach, arsenicum alternated with one of the others.

Food: Milk thickened with flour and salted; rice boiled until soft, with salt or butter; rice gruel, or diets No. 16, or 43, or 45, or 51. Mullein root tea simmered to a paste; make into pills and take one; repeat if necessary after next movement of the bowels.

Electricity: Negative pole on back, up and down, positive pole all over abdomen. Treat severe cases four to six times a day, five to ten minutes each time.

Biliary Diarrhœa is indicated by yellow eyes, heavily-coated tongue, excess of bile in stools. Rest in bed, put hot fomentations over liver as well as bowels, hot bowel flushes of salted water. Drink lemon water, preferably hot, and abstain entirely from food. Or, lactic acid three to four drams, simple syrup seven ounces, boiled water ten ounces. Dose four ounces between meals.

Feculent Diarrhœa: Surface cold and the pulse feeble, absolute rest and copious hot colon flushes, the bowels at the same time being swathed in a compress of hot mustard water for an hour, followed by a flannel bandage sprinkled with dry mustard and pinned quite tight.

Mississippi River Fever Diarrhœa: Hom. podophyllum and leptandra in alternation every two hours, and treat with colon flush as in dysentery.

Nervous Diarrhœa: Caused by nervous excitement; treat the nervous debility. General faradization three times a week, with reversed current, five minutes, on any tender spots in the abdomen.

Chronic Diarrhœa: Rest the bowels as much as possible by giving diet Nos. 22, 23 or 24, and three to five grains of papoid after each meal, both to aid digestion and as an antiseptic; a daily colon flush of tepid or cold water, and control pain, if any, with fomentations of hops. Dark pinus canadensis fifteen to thirty drops by stomach, or, temporarily, diet No. 16.

Dr. C. Page once cured himself of a very serious chronic diarrhœa of long standing, contracted in the army, by eating watermelons and nothing else. If change of climate be sought, one of low temperature, equable, dry, with clear sky, porous soil, good scenery and agreeable society should be selected.

Body ablution of vinegar and water daily; sitz baths twenty minutes every other day are beneficial; warm wormwood tea twice a day, is sometimes curative. Aromatic sulphuric acid fifteen drops every two hours, with one tablespoonful of magnesia sulph. every other morning, rarely fails. General faradization fifteen minutes, then negative up and down on spine, positive on abdomen five minutes, daily, excellent. Cockle burr and sage one ounce of each to one pint of water sweetened with honey, a teaspoonful three or four times a day; or epilobium, a teaspoonful every three hours, good. If with full mucus discharges, podophyllum one to one-hundred, one to ten grains twice a day. Or, hom. podophyllum alternated with veratrum.

Diarrhœa, Children's: With flatulence, griping, green discharges, sore stomach—neutralizing cordial every three to six hours. With watery discharges, neutralizing cordial nine drams, tinct. of myrrh one dram, dose according to age every three to six hours. With liver obstruction, neutralizing cordial four drams, fl. extract of leptandrium four drams, dose according to age every four to six hours. With severe flatulence neutralizing cordial four drams, fl. extract of diosc. one dram, dose according to age every two to four hours. With convulsive symptoms, neutralizing cordial four drams, fl. extract of valerian forty drops, essence of anise twenty drops. Dose for age every hour until relieved.

One papoid and soda bicarbonate tablet dissolved in two tablespoonfuls of water. Dose one teaspoonful every fifteen minutes, should not be omitted in any form of the disease; or this may be substituted for a child one year old: Sulphocarbolate of zinc five grains, subnitrate of bismuth fifteen grains, saccharated pepsin thirty grains. Divide into fifteen powders, one every hour until stools become inodorous; then every two to four hours. Stools sour smelling, allow no starchy foods: stools putrid smelling, allow no albuminous foods. When starch must be prohibited, scrape raw beef with a spoon, and season with salt.

Diarrhœa, Children's Chronic: Hom. with greenish, slimy discharge, camomilla and ipecac. Yellowish discharges with distress in

stomach, podophyllum. Preferable to any other treatment in all forms of diarrhœa, is the hot elm mucilage colon flush, No. 50, as in dysentery, with heat to the abdomen and rest. If not effective alone alternate enemas of hot water six parts, peroxide of hydrogen one part.

Diarrhœa of Last Stage of Phthisis: Subnitrate of bismuth twenty to thirty grains after meals, is an old remedy. Much better, see consumption.

Diphtheria.—*Symptoms:* Resemble at first a cold followed by false membrane on tonsils, and in throat and bronchial tubes; profound prostration. Incubation is from four to twelve days. Temperature usually rises to 103 or more. Convulsions may occur at the beginning. By the second day the membrane usually covers the tonsils and pillars of the fauces and sometimes the palate. It is grayish-white at first, and may turn to a dirty yellowish-gray. Membrane is adherent, and when torn off leaves a bleeding surface underneath. New membrane rapidly forms again. If the case ends favorably, about the fourth or fifth day the symptoms subside and convalescence sets in. If this does not occur, there is either an extension of the local trouble or the infection has become systemic. If the former occurs, the posterior nasal passages may be affected, and the ears through the eustachian tubes, and the eyes through the tear ducts. It may also extend into the larynx and trachea. If the latter occurs, the systemic symptoms are in proportion to the local trouble. There is marked prostration, pulse frequent, temperature may be very high or sometimes even subnormal.

Cause: Uncleanliness, lack of nutritious food, exposure to cold, anything that lowers the tone of the system. Hence scrofulous children and those of consumptive parents, children who have partially recovered from measles, whooping cough and scarlatina, and women who have been recently delivered are specially liable to it when exposed to the contagion—the diptheretic bacillus extremely infectious. Use utmost precautions of disinfection.

Treatment: Hot sitz bath, 98° to 110°, until profuse perspiration. May use a washtub with a block under the back side to tip it forward, the feet in a pail of hot water, and a heavy blanket enveloping all but the head, which is wrapped

in a cold, wet towel. Increase the heat by adding hot water if necessary. Follow immediately with cool or cold full pack forty-five to ninety minutes if sleep does not come on, if it does, continue until he wakes. Keep room warm until patient is in pack, then ventilate thoroughly and cool. Warm up again before unpacking, throw off the blankets, etc., and rub off all moisture with dry towels, then rub with dry hand until the entire skin is dry and velvety. Then wrap throat and chest with wet bandages well fitted, and cover with dry ones of the same shape. Then put in bed with a wet cap on head and dry heat to the feet. Perfect quiet; no visitors. The same nurses with as little change as possible, and no unnecessary number. Pure air, oxygen if procurable. Hydrogen peroxide by stomach and rectum, and spray with it and an equal quantity of water often. Then keep the circulation on the surface and at the extremities.

If this treatment cannot be thronghly carried out, or if something more seems needful (which will rarely be the case), give kali mur. (No. 5), and ferr. phos. (No. 4), twenty-four grains of each in separate glasses, eaeh with one oz of water. One teaspoonful in alternation, one dose every fifteen to thirty minutes. Also gargle with kali mur. fifteen grains in a glass of water every thirty to sixty minutes, and if the membranc persists in forming, alternate with borate of soda (borax) gargle, one teaspoonful to the glass of water. If this is not sufficient, wipe off the mucus, and with a camel's-hair pencil paint the patches with papoid two and one-half drams to the ounce of water, or, powder one-half of a papoid and s. bicarbonate tablet (Johnson and Johnson and place dry on the tongne every two hours. If the membranc is in the nostrils, dissolve one tablet in one-half cup of warm water, and holding the child's face downward, throw the solution up the nostrils from a syringe. Give whisky and milk for great exhaustion, and warm oil inunctions. If watery vomiting or diarrhœa, or if face is puffy and pale, drowsiness and much saliva, nat. mur. (No. 7.) If vomit is green with bitter taste, nat. sulph. (No. 11.) For exhaustion or prostration, malignant symptoms, and all after-affects, kali phos. (No. 6.) If the disease is in the trachea, calc. fluor. (No. 3), in alternation with calc. phos. (No. 1.)

Dr. Robert Walter's very successful treatment is: Place an ice bag on the throat, and refill as often as the ice melts, keep the feet warm, empty the bowels by tepid enemas, tepid bath once a day, or tepid body pack one to three hours. No food until appetite craves it, then gruels, fruits and homemade bread. As a substitute for the

whole of the above, twenty to thirty grains every two hours of sulphite of sodium internally, and apply a gargle of chlorate of potassa two drams, hydrochloric acid twenty drops mixed in a well stoppered eight ounce vial, and when decomposed add through a glass funnel two ounces of glycerine and fill with water; apply as often as the membrane forms. Tonic treatment in convalescence.

Dr. A. Murison's method is to give one part of eucalyptus oil and three parts of almond oil, one teaspoonful of the mixture every hour. Before the mixture is given a gargle of pure oil is used if the child is old enough, and if not a spray instead, and both if it can be managed; also saturating the shirt and pillow of the patient with pure oil, and placing plates filled with the oil about the room. The ordinary rules of attending to the bowels, giving as much food as possible, securing plenty of pure air by open doors and windows, and maintaining cheerful surroundings, are to be observed. If signs of intoxication appear, reduce the dose to one-fourth the quantity. This has proved very successful. Diet bovinine, or nutritive beef tea, milk and fruit juice.

To Prevent Diphtheria: Three grains of kali mur (No. 5) three times a day, or a teaspoonful of listerine after each meal for an adult.

False Diphtheria.—Symptoms: Tonsils covered with a yellow, creamy coating, back part of roof of mouth creamy, tongue moist, creamy or gold colored (consult tonsilitis). Cause: Deficiency of alkaline salts in the blood. Treatment: Nat. phos. (No. 10), three grains every hour.

Drowsiness during the day and mental activity at night. Cause: Lack of vascular tone; cold shower on shoulders and back; nutritive method average or strong; tonic treatment as needed. Hensel's tonicum one to two drams in sweetened water in the course of the day.

Drunken Stupor.—Pour cold water on the chest.

Dislocation.—Bend the joint so the muscles will pull the bone in place. If very rigid give lobelia to the point of muscular relaxation, then proceed as above.

Diuresis.—Excessive urinary secretions; urine very limpid, pale, with low specific gravity, less than distilled water; often present in neurasthenia, nervous disease, masturbation, debility, loss of flesh. Remove cause. Tonic and alterative treatments as indicated. Secure free action of the skin. Equalize the circulation.

Dropsy, Cellular (anasarca).—Cause: Bright's disease, intestinal degeneration, debility, heart disease.

Dropsy of Brain (hydrocephalus).—Effusion of cerum into the cavity of the arachnoid, following inflammation. Symptoms: Enlargement of head with violent pain; screaming, impaired senses, uncertain gait.

Dropsy of the Chest (hydrothorax).—Cause: Pleurisy, heart disease, poverty of blood. Symptoms: Livid face, swollen face and feet, dullness of chest.

Dropsy of Scrotum (hydrocele).—Symptoms: Pear shaped, smooth, fluctuating, transparent, without pain.

General Treatment for all Forms: General alterative and tonic treatments according to the case. Apocynum Cannabinum (specific), ten to sixty drops in four ounces of water; a teaspoonful every three hours. Or, three ounces of milk sugar dissolved in two quarts of water, the whole taken in twenty-four hours. Or fl. extract of hair cap moss three ounces, fl. extract apocynum and fl. extract of juniper berries, each one-half ounce. Mix; one-half to one teaspoonful three or four times a day; and enough sulphur and cream of tartar dissolved in Holland gin to keep the bowels freely open. Or, oxydendron aborendum one drop before breakfast, two before dinner, three before supper, and so on until eighteen drops are reached, then reverse the process until one drop is reached, then stop.

Dropsy, Post-scarlatinal.—Treat as for disease of kidneys. Treat the cause. Better than medication is the full pack two or three times a week, knee shower and shoulder shower each twice a week, local wrap daily on the seat of the disease. Excernent treatment as needed.

The following is a broad rule: Dropsy of the feet alone means heart, dropsy of the abdomen alone means liver, and dropsy of all the body means kidneys.

Dysentery.—An epidemic disease due to microbial irritation. *Cause:* Malaria, impure water, especially that containing organic matter. *Symptoms:* The acute catarrhal form is the most frequent. May be dyspepsia or slight abdominal pains, first diarrhœa, with or without pain at first. In about thirty-six hours colicky pain in abdomen and frequent stools with straining. At the beginning fever may be 102°–103°. Tongue furred and moist, and later becomes glazed and red. Sometimes nausea and vomiting; usually great thirst. At first the stools contain mucus mixed with blood and some fœcal matter, later gelatinous and bloody. May be very frequent. In about a week the mucus may become opaque, not so bloody, and may contain shreds. Fœcal matter appears as the disease subsides.

Treatment: Mix four tablespoonfuls of powdered elm bark into a paste in cold water; then add three pints of boiling water, cool with

some cold water and strain through a coarse towel; repeat until a clear mucilage results. First, give a full colon flush of warm water, containing half of an even teaspoonful of menthymos, or a teaspoonful of listerine; after that has been expelled, pass the point of the syringe through a folded cloth, then into the rectum, holding the cloth in position so as to prevent back-flow; then inject two to eight pints or more of the elm mucilage, if an adult, or if a child, one-half of one to three pints according to age; repeat three or four times a day if necessary; fifteen to thirty drops of laudanum may be added for an adult, if needed in bad cases; repeat as often as pain requires, and foment the abdomen with vinegar and water, equal parts. Should the mucilage not be procurable, irrigate the rectum and colon with cold or even ice water as often as the symptoms require, but very gently so as not to excite instant expulsion. Smooth lumps of ice in the rectum often relieve.

Medical: Give a tablespoonful of neutralizing cordial every hour for six hours, unless it operates as a cathartic sooner, then give colon flush No. 50 (the elm flush above) as often as pain requires. If necessary give ten grains of saltpeter (nitrate of potassa) with ten to fifteen drops of laudanum after each flush, or, if the pain is severe add thirty drops of laudanum to the flush. Keep in bed, with foot of bed elevated eight or ten inches; no food but bovinine or nutritive beef tea and milk, until fœcal matter appears, then cautiously go from fluid to semi-solid, then solid diet as strength returns. Great prudence in exercise and diet must be observed, or relapse will occur.

Chronic Dysentery: Daily colon flush of hot, slightly salted water, and follow with melted white vaseline or sweet oil retained as long as possible, the patient lying on face with hips elevated. Tepid sitz bath every other day, fifteen minutes; water tread and arm plunge on alternate days. Diet, as to kinds of food, what experience has proved to be best; as to quantity be guided by the construction of our dietaries.

Dysmenorrhea (painful menstruation). — *Symptoms:* Fainting spells, severe pains in pelvic nerves, sometimes complete scaling off of the thick mucous membrane lining the womb, pain increasing until it is all expelled by labor-like pains. The flow may be scanty, profuse or normal in quantity. Six forms. 1. Neuralgiac, from spinal anæmia. 2. Congestive, from plethora. 3. Mechanical, from cartilaginous thickening of the neck of the uterus. 4. Spasmodic contraction of the neck. 5. Imperforate hymen preventing its escape. *Cause:* The flow is caused by changes in the lining membrane of the uterus, those changes being attended with an influx of blood causing tension of the blood vessels. The pain is caused by the pressure or by the irritating character of the discharge.

Treatment: 1. General nutritive, tonic and alterative treatments, together with special sexual tonics to increase the nutrition of the undeveloped or atrophied genital organs. Saw palmetto three-fourths to one teaspoonful three times a day for a long time; mustard four drams, lobelia two drams, applied as a hot poultice to the lower spine when pain begins. This form of the disease should be suspected if the bust be undeveloped, especially with the absence of amative feelings. 2. Anti-plethoric diet; excernent treatment according to case; revulsive treatment as needed. 3. Surgical, if suppositories or other applications of lobelia fail to relieve. Lobelia suppositories. Three grains lobelia seeds mixed with simple cerate and stiffened with pulverized gum arabic, and made into a cone. Insert one every six to twelve hours into the vagina against the mouth of the uterus, or into the bowel after a colon flush has cleansed it. 4. Mag. phos. three grains four times a day, or nightly retained enema of No. 22, or tinct. cannabis indica twenty to sixty drops to allay pain. 5. Laceration.

Some one of these forms should always be suspected when pain precedes the discharge. In all cases hot colon flush to unload the bowels one or two nights before the flow begins, followed in 1. with a retained enema, No. 6, in 4. with retained enema, No. 22, and in 2. with vaginal injection of hot water. In any case if there is much heat and congestion, ferr. phos. three grains every twenty minutes to two hours. If pain is severe, a retained enema of one-half teaspoonful each of powdered skull cap and lady's slipper in starch water. In bed with heat to feet. Repeat injection every two hours if neuralgia is severe. If there is fever not relieved by ferr. phos., add to the retained enema a fourth of lobelia herb: Hot fomentations of tansy or wormwood over pelvis. Diseased complications treated according to case.

For profuse and exhaustive discharge, treat as for profuse menstruation.

6. Cases where there is no impediment to the flow, produced by diseases of the ovary, gouty, rheumatic tendency, digestive derangements and the like. In the interval between the periods: Pulsatilla, caulophyllum, and podoph; one medicine each night for three weeks, then morning, noon, and night, until time for menses; then if there is pain, caul., puls., and cimicifuga, in alternation every one-half hour. If there is excessive flow ipecac, and the tincture thirty drops to one-half pint of hot water injected into the vagina. If there is constipation, nux. in place of puls. in the intermediate treatment. Treat the complications: See ovaritis, gout, rheumatism, dyspepsia, etc. If pain is very severe, apply extract of belladonna to the neck of the uterus if lobelia is not at hand.

Dyspepsia (chronic defective digestion).—Its several varieties may be appropriately named from the particular organ or function implicated in each case. *Cause:* (1.) Supplying to the digestive organs at a time more food than they have ferments to digest it with. (2.) Furnishing the food in so great variety that the digestive fluids cannot separate them before chemical fermentation begins. (3.) Mingling foods of such varying digestibility that the more readily digestible exhausts the supply of digesting ferments and leaves the others as an

irritating load upon the exhausted organs, and source of chemical fermentation. "Indigestion is charged by God with enforcing morality on the stomach." — Tholemyis. (4.) Defective innervation of the digestive organs preventing the secretion of a proper supply, or deteriorating the quality of the digestive fluids. This innervation may be the result of general exhaustion of nerve vitality, or local because of the blood being habitually drawn elsewhere.

A few General Rules for Dyspeptics.—1. Eat only when the previous meal has digested, and the stomach has been well rested from the muscular labor involved in the process.

2. No severe exercise, strong emotions, bad temper, or great anxiety immediately after a meal, because they divert the circulation and nervous energy into other channels. If these are unavoidable, fast, or if food is required, take a liquid beef preparation or hot milk.

3. Hearty suppers are consistent only with outdoor life and long intervals between meals.

4. The thorough mastication of all food into a soft pulp before it is swallowed is important, with the possible exception of fiber-foods in superpepsia.

5. A wineglassful of ice water will reduce the temperature of the stomach thirty degrees, and it will take from one-half to three-fourths of an hour before it will recover its natural warmth, meantime the progress of digestion will have been seriously impeded, and perhaps fermentation set in. Therefore, no cold drinks with food, but freely, if desired, between meals.

Apeptic Dyspepsia.—A deficiency of the gastric fluid, or of the hydrochloric acid that naturally exists in it. There may be atrophy of the mucous membrane of the stomach, or the deficiency may arise from carcinoma, or cartarrh of the stomach, or from severe nervous depression.

Treatment: If there be atrophy, treat as for atrophy. If the case be simply one of deficient acid, the symptoms are—indigestion; load in the stomach; headache; impaired or deranged appetite. Diet: No. 20 taken at two meals, or No. 13, taking a portion every two hours for a short period only, if at work. Alkalies in contact with acid-secreting membranes stimulate the acid secretion. Therefore a mild alkaline drink or powder taken just before meals is often effectual. Peptonize fiber-foods, because two per cent. of pepsin will digest food in one-third the time that 0.125 per cent. will. Or muriate of hydrastine and pepsin, each one dram, one pint of water, and one of whisky. One tablespoonful in a glass of hot water after meals. No drink with meals. Or nitro-muriate acid, three to six drops in a glass of water after meals. Protect the teeth.

An Acid Form: Apeptic dyspepsia sometimes occurs in which the natural lactic acid stage of digestion is unduly prolonged in consequence of the deficiency of hydrochloric acid; or the lactic acid becomes excessive because of the transformation of the grape sugar into lactic acid. Symptoms: Acid eructations an hour or more after meals, aggravated by milk and sweets.

Treatment: Supply the deficient hydrochloric acid. Dilute hydrochloric acid one ounce, saccharated pepsin two drams, glycerine six ounces, soft water one pint. Dose, one tablespoonful after meals in one-fourth glass of water. Hot water one-half pint slowly sipped half an hour before meals to stimulate the gastric follicles. Diet without milk, No. 51. To neutralize the acidity, make two and one-half grains of magnesia into a lozenge with gum arabic, and let it dissolve in the mouth. Natrum phos. three to six grains, three to six times a day. Forty per cent. of brandy, whisky, or gin, extends the period of stomach digestion three-fold, while fifty per cent. almost entirely prevents it. (Roberts.) Thus favoring the formation of the acids of chemical fermentation.

2. Atonic Dyspepsia.—From partial paresis or over-distention of the walls of the stomach, impairing the muscular tone and debilitating the contractions of the organ. *Symptoms:* Same as Apeptic, with the addition of a lifeless feeling of the stomach; may be sour and contain much gas; tongue pallid, or coated white or yellow.

Treatment: Avoid stretching the stomach by full meals. Eat concentrated foods like Bovinine, Mosquera's beef meal, eggs, etc. Take fluids sparingly. General tonic treatment, hydrastine. A dash of cold water against the stomach twice daily. If there be paresis, use capsicum freely on food, and nutritive treatment as needed. Pepsin to aid digestion until improvement is decided. If this be the only form of dyspepsia suffered, eat starchy foods, and what nitrogenous foods are taken should be in the forms already named. Hot water one-half hour before meals to improve the circulation and nutrition of the stomach. The thermo-galvanic battery thirty to sixty minutes daily. Mountain climbing or sea bathing. Lloyd's hydrastis and water, of each two ounces; Tinct. nux vomica, twenty drops; fl. ext. podophyllum, thirty drops. One teaspoonful before meals. After meals, one teaspoonful of saccharated pepsin sixty-four grains, glycerine three ounces, water five ounces, hydrochloric acid ten drops.

3. Gastric Dyspepsia.—Chronic irritable condition of the stomach with soreness on pressure (chronic gastritis). *Symptoms:* Appetite lost; habitual thirst; burning; dull pain, often a sickish, distressed feeling; may be vomiting; slight feverishness; palms and soles burn; slight hectic; hot, disagreeable breath; emaciation; nervous and melancholy.

Treatment: Revulsive treatment to suit the conditions. Rest, avoid worry, sleeplessness, and unventilated rooms. Alterative and tonic treatments as fast as the revulsive restores the balance of the circulation. In general, eat milk, bovinine, soft boiled eggs, toast, etc., but the solids should be sparingly used, and most of the food such as is digested below the stomach; no more to be eaten at one time than can be retained. As soon as digested and the stomach rested, eat again. Rub the stomach gently with olive oil morning and evening with the hand heated. Keep bowels open with colon flush. Sip a glass of hot water an hour before each meal and at bedtime. In bad cases give nutrient enemas. Ferr. phos., three grains, three to six times a day, or hydrochloric acid, dilute ten to thirty drops in four ounces of water, two teaspoonfuls every two hours. The remedy is indicated whenever the tongue is deep red in color, and is dry and constricted, as these are the

signs of undue alkalinity of the blood. A brownish coated tongue also requires it. Give a tea of the leaves and bark of last year's peach twigs. Diet, Nos. 10 or 14, until very much improved, then Nos. 22, 23, 24 and 25 in order, if necessary.

4. Superpepsia, or excessive hydrochloric acid in the gastric fluid. Above .4 per cent. or below .08 per cent. is abnormal. *Symptoms:* Sour stomach immediately after eating without regard to sweets; burning and soreness of stomach; may be too quick digestion; hungry before meal time, and must eat or the stomach burns; but the digestion of starchy foods is hindered because the excess of acid neutralizes the flow of saliva, and that of fats is deficient because the bile is precipitated.

Treatment: Acids brought in contact with acid-secreting membranes decrease the acid secretion. Therefore an acid before meals, nitro-hydrochloric acid three to six drops in one-half glass of water. Protect the teeth. Alkalies only give temporary relief. Seek to correct all abnormal action by hygienic methods. Eat little salt. If the stomach burns, protect its membranes by diluting the acid with albuminous food or drink rather than by alkalies. Diet: Nos. 20, or 31 or 33, as best suits. Pepsin injurious; easily digested foods to be avoided.

5. Apancreatic Dyspepsia, deficient pancreatic secretion.—*Symptoms:* Not generally constipated; gas in colon increased by eating milk, fats and starchy foods; bloat just below the stomach; may be pain in colon or small intestines, usually an hour or more after eating; may be palpitation or heart pain from gas pressure; headache; irritability, etc.

Treatment: It is doubtful whether this secretion is often deficient except as the result of some general derangement of the system, or as a local effect from the action of poisons resulting from constipation. Therefore, correct the general abnormality, and especially remove inaction of the bowels by full colon flushes of hot water. Berberine (alk.) one-sixth to three grains before meals as a stimulant to the gland, or sulphuric ether for the same purpose, ten drops in water. One to four grains of pancreatin in capsule one-half to one hour after each meal to aid digestion. Diet No. 33, or peroxide of hydrogen (Oakland Chemical Co's.,) one teaspoonful in water after meals. In general reduce the starches, peptonize the proteids and panceatinize the fats. The pancreatic digestion of starch is prohibited by twenty per cent. of alcoholic drink. (Roberts.) Therefore avoid them.

6. Abiliary Dyspepsia, from deficient bile.—*Symptoms:* Constipation from dryness of the membranes of the bowels, and deficient peristaltic stimulation; may be alternated with diarrhœa; flatulence from decomposition because of lack of the anti-septic action of the bile; liver symptoms predominate, sleepy, bad taste mornings, food regurgitates, heartburn, furred tongue, loss of appetite; headache; pain in region of liver; stools clay colored, or hard, and may be lumpy and almost black.

Treatment: Liver pack thirty minutes daily of water, one-fourth cider vinegar. Alterative treatment as needed. Papoid one dram, podophyllum two grains, hydrastine two grains, extract hyosciamus one scruple. Make into twenty pills, and take one before each meal, or purified ox-gall five to ten grains after each meal and keep bowels open with hot colon flush. Extract of butternut bark freely. Discrim-

ination must be made between deficient secretion of bile and sufficient secretion held back by clogged gall ducts. The following medicines increase the secretion: Dandelion, yellow parilla, blue flag and podophyllum in small doses; chionanthus, sanguinarin, *leptandrin*, euonymus.

The followlng open the gall-ducts: Chionanthus, butternut, purified ox-gall, yellow parilla, blue flag and podophyllum in larger doses; phytolaccin, sanguinarin, bitter root, euonymus. With these at hand there is no excuse whatever for the use of the dangerous mercurials in any form in liver troubles. What some of these, in conjunction with the colon flush, cannot safely do, cannot be done by the murderous calomel.

7. Duodenal Dyspepsia (catarrhal).—Both pancreatic and bile secretions defective, and having the symptoms of both probably intensified. *Symptoms:* Tongue coated, bad taste in the morning, may be fetid breath, urine high colored or clouded; sweets and starches cause bloating and pain; palpitation or heart pain from upward pressure of gas. Heartburn from the acrid fumes of butyric acid.

Treatment: Foods that are mainly digested in the stomach—meat, fish, eggs and milk. Two meals a day. See treatment for catarrh. Hydrogen peroxide, one teaspoonful after meals. Wear abdominal compress several hours daily. Asofœtida two grains three times a day for flatulence, or oil of cajeput five to twenty drops on sugar. Papoid after meals, three to five grains; if there is acidity, add soda bicarbonate ten grains.

Or, one to three pancrobilin pills after meals, or five to ten grains of purified ox-gall. Five grains of sub-gallate of bismuth after meals sometimes effective when other remedies fail. One teaspoonful a day of creosote carbonate is very efficient, but medicines must not be expected to take the place of the hygienic measures advised for the general catarrhal condition. With much wind-pain, Lloyd's hydrastis one ounce, tincture dioscorea three drams, tincture podophyllum one dram, water two ounces. A teaspoonful every four hours, or Lloyd's hydrastis four ounces, bismuth subnitrate two drams, lactopeptin four drams, tincture podophyllum two drams, water to make one pint. One teaspoonful before and after meals. If there be bloating, belching and cramps—an emetic of lukewarm water, then three doses of podophyllin one-fiftieth to one-eighth grain one hour apart, then a dose night and morning for a month or more. If the tongue be dirty white, a full dose of phosphate of soda, followed by one-fourth dose every second day for three times, then eat it on food in place of salt.

Diet: No. 19, or 24, or 34 as best may agree. The force foods should be in the form of rice and cooked fruits. When there is flatulence, the use of ale and beer increase it, because of the quantity of fixed air in them, and also because the yeast in them aids the fermentation of the food.

8. Intestinal Dyspepsia.—Deficient intestinal secretion, or catarrhal condition of bowels with diminished normal absorption. *Symptoms:* Lack of nutrition and bowel disturbance of various sorts.

Treatment: Rub the bowels twice a day with a tincture of smartweed and sassafras, made as follows: Mix a strong tea of sassafras bark with an equal part of a tea of smartweed, made by infusing it twenty minutes in a covered vessel of half vinegar and half water; do not boil. Body pack twice a week; water tread daily; colon flush three times a week; catarrhal treatment, alterative and tonic **treat-**

ments as needed. Berberis aquifolium fl. extract fifteen drops in water, or hydrastine (alk.) one-sixth to one-half grain, or cascara sagruda fl. extract ten to thirty drops in water, or emetine (alk.) one-one-hundred-thirty-fourth to one-sixty-seventh grain to increase the intestinal secretions.

Avoid starches and sweets until cured; use glycerine for sweetenings. One to three pancrobilin pills, or ox-gall purified five to ten grains, before meals; boneset and red raspberry-leaf tea, and red pepper freely on food; papoid or peptenzyme, or ingluvin as a digestant. A glass of hot water before rising, retiring and before dinner and supper, followed by the ball rolling over the stomach and bowels for five minutes. Finish five to ten minutes before the meal. Pancreatinize milk and avoid malt preparations and cane sugar. Diet No. 25 or 31.

9. Complete Dyspepsia, stomach, duodenal and intestinal.—*Symptoms:* A combination of all the foregoing dyspepsias excluding the necessary absence of those arising from opposite conditions, *e. g.*, if there is deficient gastric acid, there cannot at the same time, be an excess of it.

Treat as for anæmia as far as its want of assimilation requires. Treat as for catarrh when catarrhal symptoms prevail; as for neurasthenia and nervous debility when their symptoms are prominent; as for the individual dyspepsias, when their symptoms are pronounced. Papoid one-half dram, pancreatin one-half dram, soda-bicarbonate two drams, made into twelve powders; one after each meal, or papoid and soda bicarbonate, one or two tablets after meals, as digestants. The thermo-galvanic battery thirty to sixty minutes daily.

Molecular Dyspepsia, from ulcerous or cancerous affections of the stomach.—Treat the ulcers or cancer. Diets No. 5 to 13 as preferred, or No. 17 if required.

Nervous Dyspepsia, deficient nervous energy to excite the secretion of the digestive fluids.—May manifest itself in any of the forms of dyspepsia named, except superpepsia. Stop all drains upon the nervous system by overwork, anxiety, care, sexual excesses, tobacco, chloral, morphine, etc. Sleep much and once in the daytime, but not after meals. Rest often; live in the open air. Treat for nervous debility and the particular dyspepsia concerned.

Boulimic Dyspepsia.—An unnatural, craving appetite from a perversion of the natural appetite for food.—Differs from the craving of superpepsia in that it does not express a real need, and is a symptom only of some form of dyspepsia. Calc. fleur, three grains three to five times a day. Ascertain the variety to which it belongs and treat that.

Dyspnœa (Difficult breathing).—Symptomatic in asthma, bronchitis, pneumonia, consumption, etc. Fl. extract of quebracho two and one-half drams, mucilage of gum arabic one ounce, soft water five ounces. One to two teaspoonfuls a day regularly. Fifteen to forty drops of fl. extract when the difficulty occurs; or, aspidospermine (alk. from quebracho), one-

twelfth grain every fifteen minutes until relieved; or terebene fifteen drops every four hours; may be increased.

Ear Diseases.—

Earache.—Hot foot bath, and dry heat to the ear. Hop bag wrung out of hot water and applied, or bran bag heated in the oven and applied. The heart of a roasted onion placed hot in the outer ear; tobacco smoke blown from the stem end of a pipe into the ear; should not be used often nor for a long time.

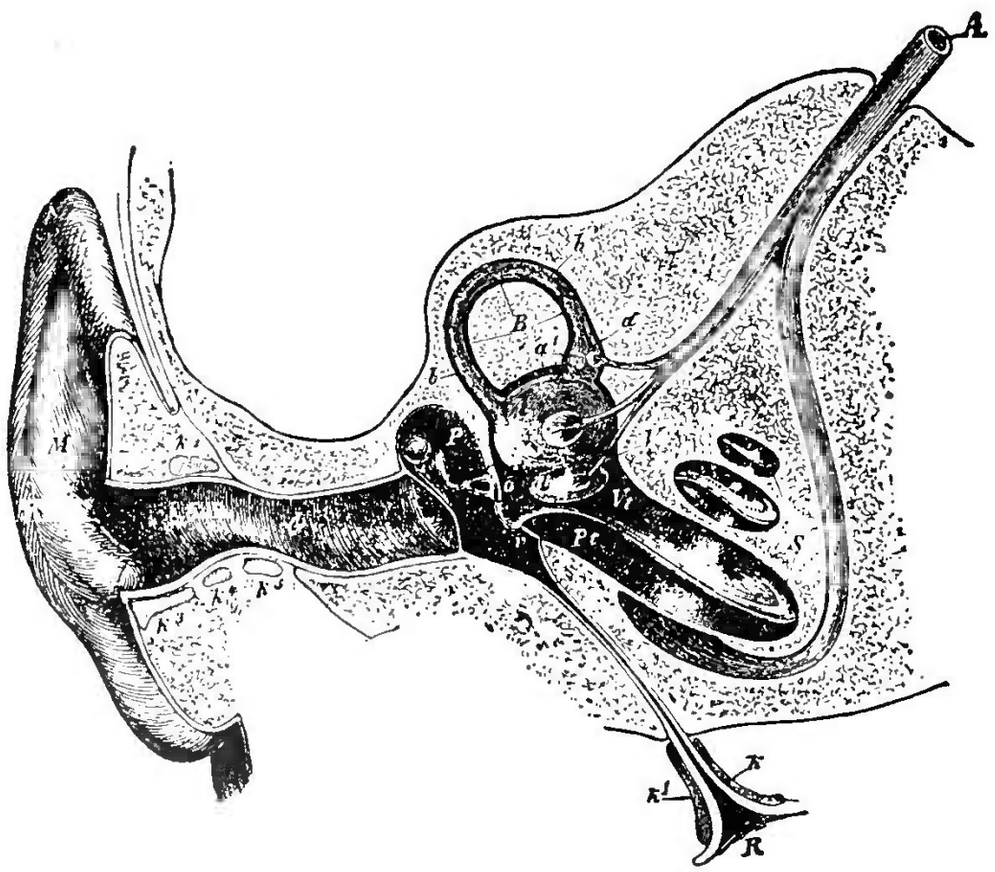

FIG. 65.

M, Concha, outer ear; *G*, External auditory meatus; *T*, Tympanis or drum membrane; *T*, Cavity. From T to *o* is the chain of tympanic bones; *R*, Eustachian tube; *V-B-S*, Bony labyrinth; *V*, Vestibule; *B*, Semicircular canal; *S*, Cochlea; *b*, *s*, *s*, Membraneous semicircular canal and vestibule; *A*, Auditory nerve dividing into branches for vestibule, semicircular canal, and cochlea.

If there are evidences of inflammation, revulsive method average to very strong as needed. Hardening method suited to the case to protect against other attacks. For burning, throbbing pain, ferrum, phos. Purely nervous, mag. phos. Head vapor. One part of menthol in twenty parts of oil of sweet almonds often brings almost instantaneous relief when dropped in the ear.

Homeopathic: If the ear is red or that side of head is hot, bell. and baptisia in alternation, every hour or less, and the head steamed or fomented. If chronic and occurs on change of weather, especially if worse at night in bed, merc. If from shock or blow, arnica.

Deafness: Impairment of the sense of hearing may come from: 1. Stoppage of the eustachian tube, the function of which is to admit the air to the back of the ear drum (see R, Fig. 65), just as the orifice in a military drum admits air to its interior and thus makes the head resonant when it is struck. If that be stopped the sound is dead. So with the ear. See Fig. 65, P.

2. Thickening of the drum diminishes the sharpness of its vibrations, and thus prevents the transfer of the sound to the tiny bones within the tympanic cavity (the inner ear). See T to o Fig. 65.

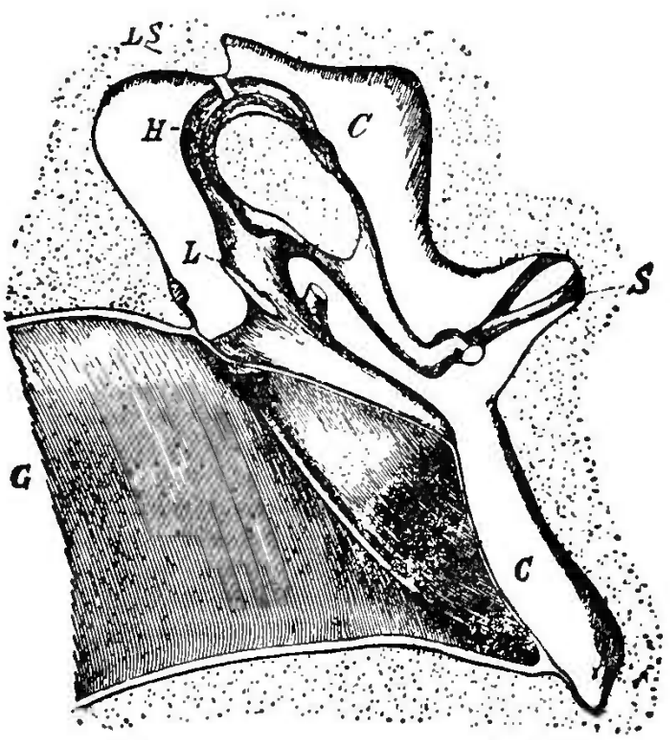

FIG. 66.

Tympanic cavity *C C*, and its bones considerably magnified; *G*, the inner end of the external auditory meatus, closed internally by the conical tympanic membrane; *L*, the malleus or hammer bone; *H*, the incus, or anvil bone; *S*, the stapes or stirrup bone.

3. The mobility of the chain of bones designed to convey the sound to the auditory nerve may be diminished by inflammation, or even the bones themselves destroyed by ulceration. See L, H, S, Fig. 66.

4. The sensibility of the auditory nerve may be impaired by overstrained nervous conditions or extinguished by local paralysis. See A, Fig. 65.

Treatment: 1. Head vapor. Force the air through the tube by holding the nose, closing the mouth and blowing until a crackling noise or sense of pressure in the ear shows that the air has penetrated. Deafness from swollen eustachian tubes, kali. mur. For swollen glands or membranes of the throat or ear, the same.

2. Head vapor once a week. Head ablution daily with very careful drying of the hair. Two or three drops of pure mullein oil dropped upon the drum twice a day.

3. Same as 2, with daily water tread. Mustard back of ears. With swelling of the cavity, kali. sulph. With swollen cavities and watery discharge, natr. mur.

4. Improve nervous condition. If paralysis, treat as such. Deafness from weak auditory nerve, magna. phos. With noise in ear from nervous exhaustion, kali. phos.

Ear, Foreign Substances in.—Place the pipe of a tightly working syringe against the substance and draw back the piston so as to suck the object firmly as the syringe is withdrawn.

To poultice the ear, first fill the external auditory canal (see G, Fig. 65), with lukewarm water, the head resting on the unaffected side upon the pillow. Then a large flaxseed poultice is applied over the ear as hot as can be borne. The column of water is thus kept warm and acts as a conductor of heat between the poultice and the inflamed surface.

Ulceration: Pus, dirty, yellow, offensive, kali phos. With thin yellow, watery matter, kali. sulph. With swollen glands in scrofulous children calc. phos. Discharge of thick and sometimes bloody matter, calc. sul. General remedy: Mullein oil three or four drops twice a day in the ear.

Ear, Wax in.—Pure peroxide of hydrogen warmed in a water bath sprayed into the ear for about five minutes; remove with ear-spoon; cleanse with a little more of the spray; or boric acid fifty-five grains, glycerine one and one-half ounce, distilled water one and one-half ounce. Warm and drop into the ear with a pipette, several times a day. This softens the waxy secretion which can then be removed by syringing with warm water.

Eczema.—See skin diseases.

Elephantiasis.—See skin diseases.

Elevator Dizziness.—Brought on by the stoppage of the elevator car. Place the head and shoulders against the car frame.

Emaciation.—When not due to fatal organic disease, may usually be corrected by a diet of kumys or kaffir. Kaffir ferment for home manufacture may be had of any wholesale druggist.

Embolism; a thick, clotty condition of the blood; *Cause:* malarial or other poisons, non-aëration of the blood, defective action of the liver, skin, congestion of the lungs, and disease of the supra-renal

capsules. *Symptoms:* Blueness of the ears, nose, lips, nails, peculiar sensations about the heart, fainting fits, etc., etc.; the bacillus indican in the blood. *Treatment:* Avoid iron and mineral acids. Carbonate of ammonia five grains with bicarbonate of potassa five to ten grains every two hours. Oxygen freely.

Empyema.—See pleurisy, chronic.

Emphysema.—Dilatation and may be coalescence of the air cells of the lungs. This is vesicular, while inter-lobular is an infiltration of air into the tissues of the lungs. *Cause:* Inter-lobular; violent coughing, or straining, or puncture of the lungs. Vesicular; bronchitis, impaired nutrition, pneumonia, consumption, pleurisy, excessive strains. *Symptoms:* Debility, short and difficult breathing, distress, feeble expectoration of frothy spittle, dusky countenance, weak voice, loss of flesh and strength, temperature eighty-five degrees, pulse fifty to sixty, respiration about twelve, constipation, asthma, barrel-shaped chest, slight movement of the intercostal muscles in breathing.

Treatment: Mainly palliative in the inter-lobular form. No severe muscular efforts, or strained inspiration or expiration; warm flannel clothing; generous proteid diet; open air life; avoid overloading stomach. *Medical:* One grain each of lobelia, quinine, and hyosciamus, three times daily; quebracho for the difficult breathing; Hensel's tonicum as an iron tonic; climate as for chronic bronchitis or asthma.

Endocarditis, Acute (inflammation of the lining membrane of the heart).—*Symptoms:* Palpitation, dyspnœa and pain. Pulse increased and is full and strong. May have fever. Face flushed and looks anxious. Respiration is accelerated. May have anorexia and gastric disturbances. Chronic dyspnœa on exertion, also palpitation. Pain of a piercing character occasionally. Headache, pain in shoulders, and over body. Digestion disturbed. Heart's action irregular. Skin may be bluish; chronic congestion of liver, spleen, and kidneys.

Cause: Acute—Infective from emboli as in rheumatism, tuberculosis, blood poison, etc. Chronic—May follow the acute, or recurrent attacks of rheumatism arthritis deformaus. From repeated irritations, as use of alcohol, nicotine, tobacco in excess, poison of syphilis or immoderate muscular exercise. It may follow chronic inflammation of the kidneys.

Treatment: Perfect rest of mind and body; diet nutritious; ascertain and treat the cause; flannel clothing; avoid all causes of nervous debility and all stimulation; protect surface from cold; passiflora incarnata as a sedative, revulsive treatment as needed.

Enlarged Veins.—See pregnancy.

Enteritis (inflammation of the large intestines).—*Cause:* Uterine disease; nervous states; local irritations. *Symptoms:* Depression, headache, hysteria, colic pains around the navel, worse by pressure, tenderness, nausea, vomiting, rigors, fever, pinched features, buff-coated tongue, and great restlessness and prostration.

Muco-enteritis: Inflammation of the mucous coat alone, with diarrhœa. Treat as for enteritis.

Peritoneal and Muscular Coat Inflamed: Obstinate constipation, patient on back, knees drawn up, delirium, vomiting highly offensive matter.

Treatment: First, a cleansing colon flush followed by the elm bark mucilage, as for dysentery, cool or cold. Repeat as often as fever or pain increases. Cool compress on abdomen; feet wrapped in flannel, wet in vinegar and water, covered warmly, re-wet as often as dry; arms and chest sponged often to keep down fever; cold water as often as desired in small quantities; or

Medical: Turpentine over the abdomen; and water four ounces, tinct. of aconite thirty drops, tinct. of white bryonia one dram. Mix. One teaspoonful every hour until relieved. Warm water enemas with twenty to thirty drops of laudanum in each.

Homeopathic: Aconite, arsenicum and baptisia in rotation every one-half hour until better, then at longer intervals. Drink frequently and copiously of hot water. If vomiting is severe, bowels loose, and pain burning, tart. emetic; cold wet cloths covered with two or three thicknesses of warm, dry flannel over whole abdomen, and heat to feet. After the acute inflammation has subsided, open the bowels with injection, or with nux three times a day.

Chronic Enteritis: Usually located in a single spot, indicated by soreness. Pure mucous stools indicate the sigmoid flexure as the location. Hardened lumps in mucous point to the colon as the seat of the disease.

Treatment: Sitz bath every other night; chest and abdomen ablution with water and vinegar twice a day; the elm bark mucilage enema two or three times a week. Medical: Virginia stone crop in alternation with aromatic sulphuric acid and compound tincture of chinchona.

Enteralgia (neuralgia of the intestines).—*Cause:* Irritants, improper food, hardened fœces, foreign bodies, flatulence, cold, cathartics, reflex irritation, lead, copper, etc. *Symptoms:* Griping about umbilicus, hands on abdomen, vomiting, eructations of gas, pulse small and weak, surface cool, abdomen hard or retracted, rarely tender, urine abundant and pale. *Treatment:* Remove cause; cæcal flush of valerian or scullcap tea; bowel fomentation of hops, and see neuralgia.

Enteric Fever.—See fevers.

Entozoa.—See worms.

Epilepsy (falling sickness).—Paroxysmal convulsions, usually preceded by nervousness, confusion, drowsiness, coldness, griping, flash of light or some other disorder. *Cause:* Intemperance of parents, anything that can cause a weakened patch of brain structure; immediate cause may be a reflex irritation from worms, piles, masturbation, uterine derangement, or a direct irritation from a germ in the blood.

Symptoms: Epileptic cry, head thrown back, hands clinched, first pallor, then a dusky look caused by contraction of the chest muscles obstructing respiration, then intermittent twitching and contractions, especially of the face, eyes roll, tongue may be bitten, mouth froths, breathing is noisy, then follows a deep sleep that may last for hours. *Treatment:* Loosen clothing; protect the tongue by placing a cork between the teeth; hot lobelia enema; remove the cause; general alterative and tonic methods; sambul in alternation with large doses of passiflora incarnata to keep off the fits; tinct. of oats and aromatic phosphates to repair the brain lesion; compound oxygen to keep nerves unexcitable; diet suited to the constitutional requirements.

Enuresis: *Incontinence of Urine* may be first, from nervous weakness of the sphincter muscle; second, irritation of the lining membrane of the bladder; third, reflex irritation from worms, etc.

Treatment: First, for nerves, kali. phos. Second, irritability of the coat, ferrum phos. Third, reflex irritation, natr. phos. Rhus aromatica five to fifteen drops three or four times a day. Child should empty bladder before retiring. If the trouble persists, notice whether it occurs at about the same hour; if so, arouse him with an alarm clock the hour before for the purpose of urination. Every night set the clock a little later. See that his feet are warm on retiring, and never allow him to get into a very cold bed, nor drink much late in the day. Enuresis-senile: Fluid extract of rhus aromatica twenty drops in water four times a day. Electrical treatment for children: Positive at the feet and treat all over; then positive at the small of the back and negative on the perineum, pubes and genitals three or five minutes, three or four times a week.

Epistaxis (bleeding from the nose).—To prevent—head ablution, and upper shower three times a week. To stop—press a clothespin down astride the nose. Put a cold cloth to the base of the brain. Raise the arms above the head. Spray a solution of perchloride of iron up the nostrils, or pack them with cotton saturated with it. Spray far back with peroxide of hydrogen. With throbbing temples and red face and eyes, bell.

With fever, alternate aconite with the bell. In females and children with habitual nosebleed, puls. and pod. alternated night and morning. To stop the bleeding, arnica every one-half hour, or hamamelis. If caused by over-exertion, rhus. In late stage of fever, rhus. and phos.

Erysipelas (an infectious and contagious inflammation of the skin and cellular tissue beneath).—*Cause:* Damp, dirty, ill-ventilated dwellings, local injury, anything that can throw out of the blood a portion of the organic matters designed to build tissues. These organic matters under such conditions, become non-functional, foreign, irritative, and break down into the microbe streptococcus. *Symptoms:* Chilliness, loss of appetite, muscular pains, restlessness, fever, oppressed respiration. Inflamed skin, usually bright red, sometimes yellowish, or pinkish, and puffy. Body hot and dry, tongue coated, stools often green, small vesicles often on skin.

Acute: With heat, redness, fever and pain, ferrum phos. With vesicles, kali mur. in alternation with ferr. phos. With blisters, kali sulph. With smooth, red, shiny, tingling, or painful swelling, natr. phos.

Homeopathic: For the simple, bell. and aconite in alternation. For the vesicular, rhus tox and bell. in alternation. For phlegmonous (when the cellular tissue is involved), bell., rhus. and apis mel. one hour apart. Cover with dry flour, eat sparingly, keep temperature at sixty-five to seventy degrees.

Germicidal: Keep constantly wet with a saturated solution of boroglyceride covered with oiled silk. Internally, brewer's yeast, resorcin five grains three times a day; or ichthyol one dram to the ounce of soft water, painted on every four hours.

Or, paint over and around the infected area ichthyol, two drams, ether two drams, collodion four drams. Many times fomentations of lobelia, or a poultice of cranberries and powdered elm or flour, or of dried hop yeast will cure. The eruption may be limited by bounding it with tinct. of iodine, nitrate of silver, or a narrow strip of fly blister. Dr. H. Kraell (Therapeutische Monatsch), encircles the head with an elastic band to be retained at the edge of the hair until the swelling and bluish-red color have disappeared from this artificial border, and thus prevents infection of the scalp.

Erythema.—See skin diseases.

Eyes, Diseases of.—For blindness from disease of retina, see amaurosis. For dim, red edged, discharging, a pinch of aloe powder in a cup of hot water; stand till cool and wash eyes within and without three or four times a day.

Granular Lids: Pulverize sixteen Jequirity beans and stand twenty-four hours in eight ounces of water. Then add eight ounces of hot water, cool and filter at once. Brush on inner surface of lids.—De Wecker. This is severe, but effective. A milder way is to drop into the eyes twice a day peroxide of hydrogen in an equal part of distillation

of witch-hazel. Or, tinct. of iodide of potassa five to twenty-five drops to the ounce of clean rain water. Must not be strong enough to inflame.

Ectropion and Entropion: The former is eversion of the eyelids, so that they do not close; the latter a turning in of the lids; both affections are usually the result of effusion of lymph. Apply boroglyceride paste to the lid daily. If this does not relieve consult a surgeon.

Inflammation of the Cornea (Keratitis): Nearly one-half of all eye diseases affect the cornea. Very important because if its transparency or curvature is modified, the vision is impaired. See Fig. 67. Inflammation or ulceration. Symptoms: Dull, deep seated pain in the eye, intolerance of light, abundant tears, minute blood vessels in edge of cornea and in sclerotic coat. See Fig. 67. Treatment: Build up the general

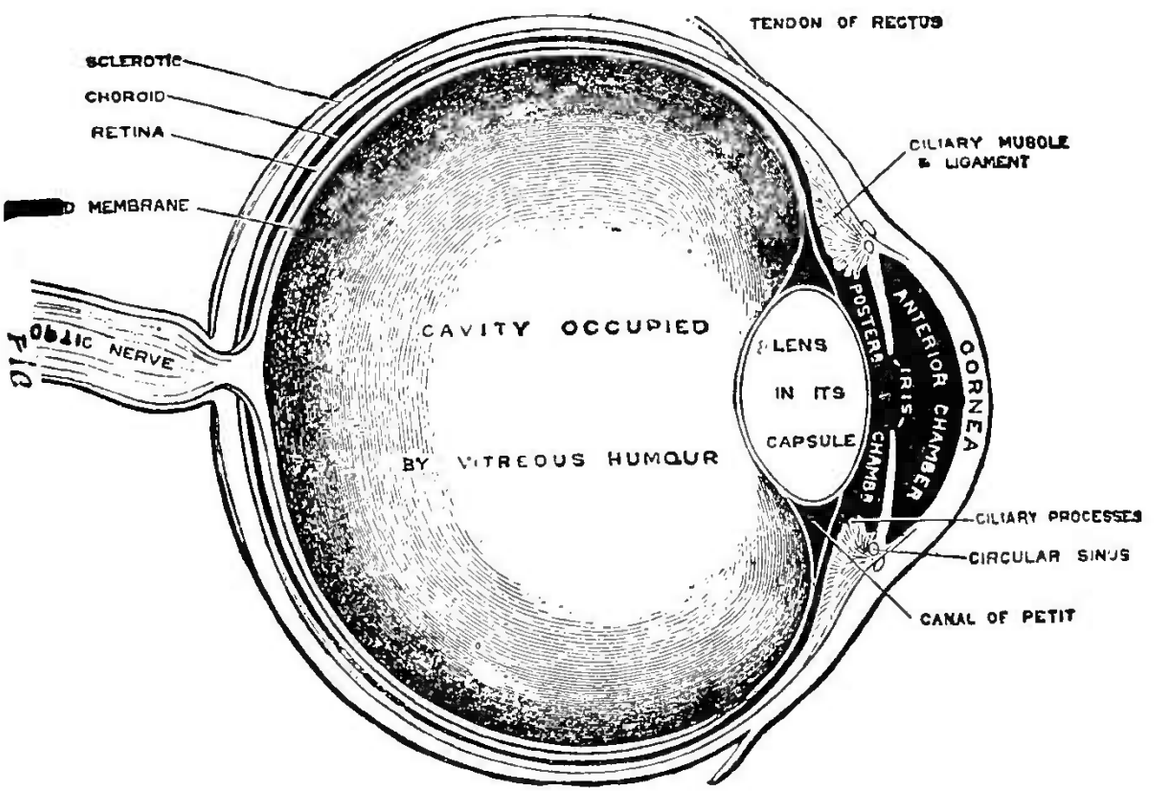

FIG. 67. SECTION OF AN EYEBALL.

health. Protect the eye from all light that pains, dust, wind, tobacco smoke, etc. Desist from use on near-by objects. Revulsive method strong or very strong.

Inflammation of Cornea (Phlyctenular Keratitis): Scrofulous keratitis: Minute bladders on the eyes of poorly fed children. Are soon covered with blood vessels, or change to ulcers with swelling of lids and intolerance of light. The discharge differs from that of ophthalmia (which see) in that it is water, not matter.

Treatment: Same as keratitis, with the addition of alterative and tonic methods strong as case will bear. Keratitis syphilitic: When one or both parents are syphilitic, the children may inherit the disease of the cornea. Treatment: As for syphilis inflammation.

Ophthalmia, inflammation of the mucous membrane of the eye—pink eye, acute conjunctivitis.—Contagious and infectious. Symptoms: Redness, intolerance of light, sensation of sand in the eye, muco or sero-purulent discharge. Cause: Colds, wet, irritating substances, excessive use. Treatment: Rest the eye; protect it from all light that pains or gives uneasy sensations. Cold dripping compress

very thin. Avoid poultices; revulsive treatment average to very strong. At the beginning a head vapor, followed a few hours later by a hot foot bath, will cut short the attack.

Medical: Lloyd's hydrastis four drams, Lloyd's belladonna twenty drops, distilled water three and one-half ounces. Apply on absorbent cotton, and three times a day drop into the eye three drops of Lloyd's hydrastis four drams, Lloyd's ergot one dram, distilled water three and one-half ounces. Clean rain water may be used in place of distilled water. Chronic: Lobelia and golden seal tea, three or four drops in the eye three or four times a day.

Infantile Ophthalmia: Usually begins from two to four days after birth. Cause: Cold, light, irritating soaps or some secretion from the skin. Symptoms: Spasmodic closure of lids, lids stick together, hard crusts on edge of lids and conjuctiva swollen full with transparent, yellowish colored serum and mucous; later muco-purulent matter. Treatment: Great care lest the pus inoculate the other eye; darken the room; open bowels with enemas; control fever with spongings and packs; wash out the eye every hour with a saturated solution of boroglyceride, and keep same applied all the time; drop into the eye three or four drops of a solution of atropia after each washing, two grains to one ounce of water. If improvement does not occur immediately, call physician.

Purulent Ophthalmia: Cause: Overcrowding in workshops, jails, etc. Symptoms: Same as simple ophthalmia, with profuse muco-purulent discharge, prostration, rigors, violent fever, agonizing pain, great swelling, if not arrested, extensive sloughing. Treatment: Bed in well ventilated, dark, disinfected room ; boroglyceride and atropia as for infantile; cooling method, average to very strong; colon flush; diaphoretic method, average to strong; quinine three to five grains every four hours; nutritive treatment strong; sulphonal enough to insure sleep at bedtime; blisters to the nape of the neck; alterative and tonic treatment in convalescence. In purulent ophthalmia: Discharge yellowish green, give kali mur. Golden yellow cream, natr. phos.; white, kali mur; yellow, purulent, kali sul.; thick yellow pus, calc. sul., silica.

Gonorrheal Ophthalmia: Cause: Inoculation. Treatment: Same as for purulent, only more prompt and heroic.

Tubercular Ophthalmia: Common from first to tenth year. Symptoms: No soreness, sensations of sand, nor purulent discharge, but great intolerance of light, spasmodic contractions of lids, secretion of hot tears. Treatment: Protect with green shade; keep applied a wash of salt water strong enough to barely feel it; frequently destroy the cloths; emetic twice a week for six weeks of half teaspoonful of the wine of ipecac every five minutes until thorough vomiting, after drinking freely of tepid bicarbonate of potassa water; flannel clothing; bowels kept open with flushes; nutritive diet; alterative and tonic treatment as needed.

Granular Ophthalmia: Inflamed mucous follicles like grains of sago. Treatment: Alterative and tonic locally; solutions of iodide of potassa five to twenty-five grains to the ounce, brushed over the eye; must not be strong enough to produce irritation; nutritive treatment; warm clothing.

Rheumatic Ophthalmia: The bacillus amylobacta of rheumatism lodging in the sclerotic coat of the eye. Symptoms: Sharp lancinating pains in eye and side of head; fever, white of the eye a pale red, intolerance of light, contracted pupil, dim vision, watery or serous discharge, no sensations of sand, soreness, rawness, nor muco-purulent discharge; always worse at night. Treatment: General as for rheumatism; atropia solution morning and night; warm bag of camomile flowers applied dry to the eye.

Exhaustion.—Recumbent position, warmth. Hot milk, hot coffee, hot beef tea if nutrition is good, if not, hot nutritive beef tea, or beef cacao; or clam broth followed with egg coffee.

Fæces, Impacted.—*Cause:* Old age, paralysis, sedentary habits and neglect of defecation, deficiency of rectal mucus. *Symptoms:* Uneasiness and distention of rectum with inability to expel its contents. *Treatment:* Injections of warm flaxseed tea and oil, or of warm glycerine. Not successful, dilate the sphincter and break up the mass with an iron spoon handle and repeat the enemas. Give them in knee chest position, or with hips elevated.

Fainting (swooning, syncope, sudden overwhelming depression of the hearts action, by reason of which the blood is not sent to the brain, and consciousness is lost).—*Cause:* Anything that arrests the contraction of the heart, lack of blood in hemorrhage, poisons, excess of emotion of any kind, lightning, blows on pit of stomach, even the association of painful ideas, and particular idiosyncrasies, as from the fragrance of the rose, etc. *Treatment:* Lie on back, head lower than heart, loosen dress about the chest, dash cold water into the face, slap chest over heart, apply weak ammonia to nostrils, and if unsuccessful give an enema of four tablespoonfuls of hot whisky or brandy in as much water.

Falling Sickness.—See epilepsy.

Farcy and Glanders. — A malignant, contagious microbial disease called glanders when confined to the nose, and farcy when the lymphatics are infiltrated. (Exists as an epidemic under the name epizooty.) *Cause:* Unsanitary conditions and infection.

Symptoms: Farcy.—A spreading ulcer with a hard base and a crop of smaller ulcers close by, langour, dibility, rigors, fever, glands swell. Glanders.—Secretion of a thin, tough mucus, followed by swelling and redness, then pustules, ulceration of the skin, nasal cartilages and bones. Death occurs from pyæmia and exhaustion.

Treatment: The same for man or horse. Douche the nostrils three times a day with peroxide of hydrogen, full strength or half water, and give teaspoonful doses every four hours to a man. Open enlarged and painful glands, and syringe with the peroxide and dress with glycozone.

Favus.—See skin diseases.

Feet, Blistered.—Rub the blistered spot gently for some time on retiring with spirits mixed with tallow dropped from a candle into the palm of the hand. Or, take common

baking soda, dampen the surface of the blister, and apply frequently during the day. To prevent, bathe the feet a few minutes only every evening, wipe and rub in neat's-foot oil.

Feet, Frosted (see chillblain). — Acid carbolic one dram, tincture iodine two drams, acid tannic one ounce, simple ointment four ounces; mix. Apply twice a day

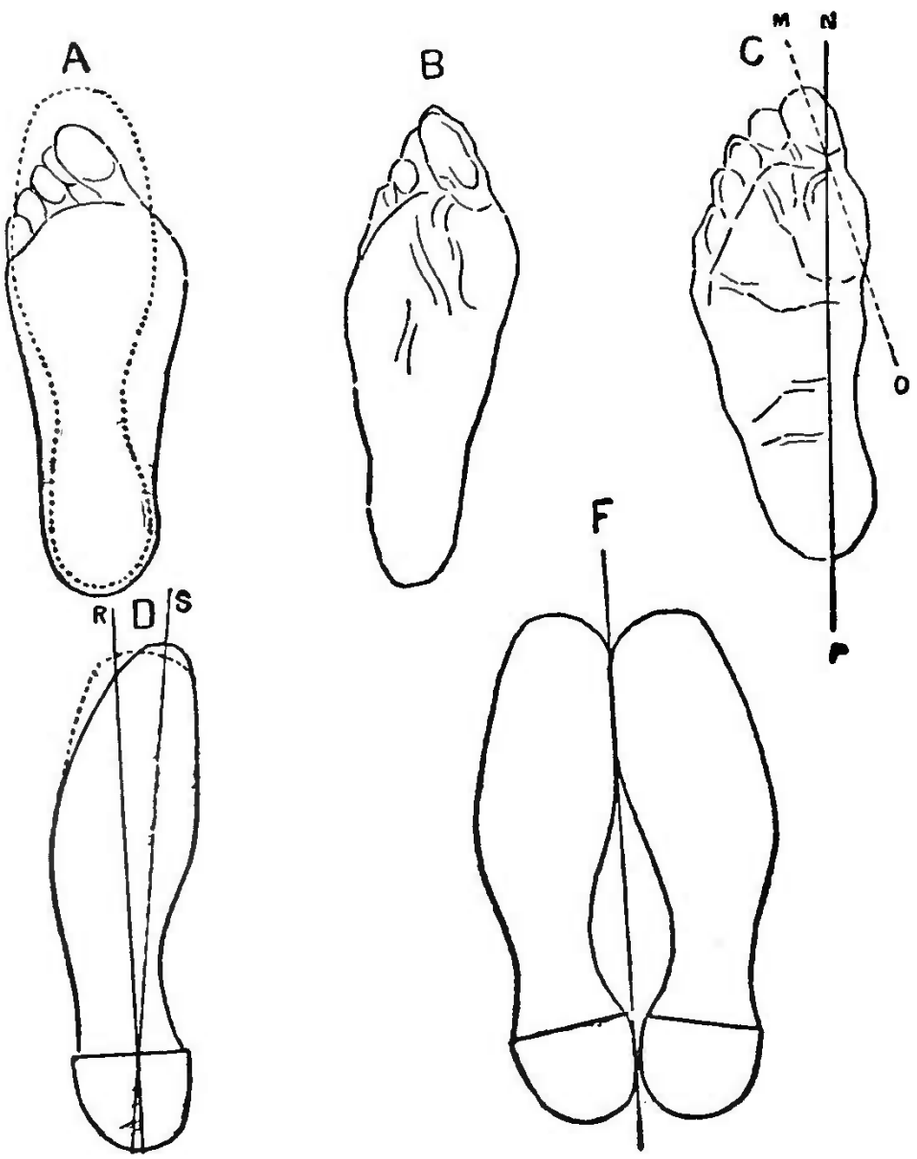

FIG. 68.

Feet, Perspiring.—Daily water tread; barefoot as much as practicable; wash daily with a strong tea of oak bark; avoid clothing the feet too warmly.

Feet, Malodorous.—Shirt wrap twice a week, daily sponge bath and water tread; wrap the feet every night for one-half hour in bandages wrung out of hot hay or oat straw

tea, with cold ablution afterward. Dust a very little menthymos in the stockings. Or, bathe the feet with equal parts of peroxide of hydrogen and water, and take one-half teaspoonful three times a day until cured.

Feet, Tender.—Treat as for perspiring feet. Wear hygienic shoes as in figures 68. *D F* show soles of the "Meyer" shoe. *R* represents the axis of an ordinary shoe, s that of the "Meyer" shoe, while the dotted line is the same shoe with a broader toe. *C* is a foot nearly normal, but *O M* shows that the axis of the toe does not correspond with the axis of the foot as it should. *A* and *B* are ordinary distortions of the

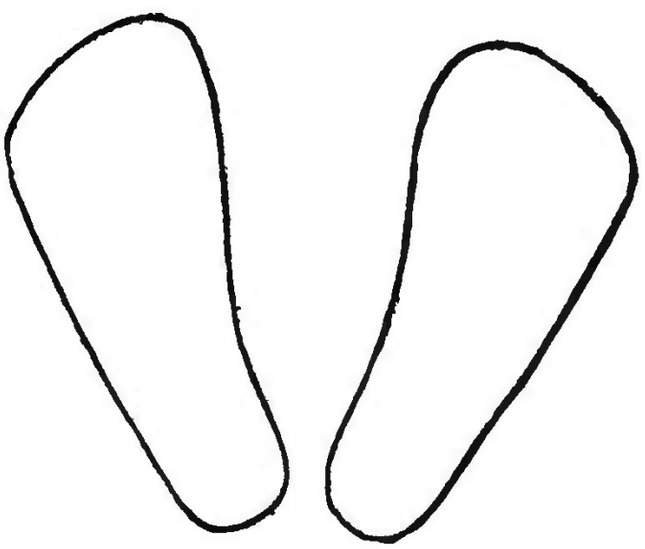

FIG. 69.

feet. The dotted line in *A* shows how great is the divergence from the correct form. Fig 69 outlines a pair of soles suitable for the relief of bunions.

Nails Ingrowing: *Causes:* Too narrow shoes and faulty manner of cutting the nails. The nail is bent down at its edge and the flesh crowded up over the nail. Inflames, enlarges and ulcerates. *Treatment:* Widen the shoe, leave the nail uncut, stuff a little cotton under its edge and apply water dressing. If ulcerated treat as for ulcer, which see.

Felons: A simple localized periostitis. *Cause:* Generally the result of an injury, a blow of some kind. *Symptoms:* Acute throbbing pain, worse at night. If the bone is superficial, there will be redness, heat and swelling, and if suppuration occurs, fluctuative. *Treatment:* First stage ferrum phos., later, silicea. Wrap the part in three thick-

nesses of linen dipped in eold mullein tea, or tea of hay flowers. Repeat as soon as it begins to warm.

Or roast poke root in hot ashes. When soft, pound it and form a poultice with hot water, or make one of equal quantities of elm bark and lobelia; add enough hot, weak lye to form a poultice. Or, take of grated wild turnip about the size of a bean, saturate it with turpentine and apply. Allow to remain about twelve hours, then dress with a healing salve. Or, in first stage, when feeling as if a sliver were in the place, a hot bath of the part for an hour, three times a day in a saturated solution of table salt, then apply finely pulverized salt, and keep wet with spts. of turpentine. If it suppurates. open, continue the hot bath with calendula (marigold) flowers in the water. For restlessness and irritability, aconite one drop in a gill of water, a teaspoonful every one or two hours, and the same applied to the sore.

Fever Sore (cold sore).—See herpes in skin diseases.

Fever Sore.—See ulcer, old.

Fever.—An effort of nature to expel foul matters from the blood, usually attended with irritation of the nerve centers. Blood vessels of skin distended, chemical changes very active, blood dark and with little oxygen, and when temperature reaches 109.4°, molecular decomposition occurs. A high degree of fever causes muscular tissue, especially the voluntary muscles and the muscular coats of the blood vessels, to undergo fatty and granular change. Same effect on the liver and kidneys. The oxygen-carrying functions of the red blood corpuscles become impaired, waste elements accumulate in the blood, until from the suppressed secretions it becomes a toxic, rather than a nutrient fluid.

Symptoms: Languor, debility, frequent pulse and respiration, high temperature and pain. The key of all treatment is found in the faet that fever indicates an expulsive effort of nature; therefore eorrect treatment consists in aiding those efforts by cool spongings of the surface, eool compress over abdomen and chest changed every three to five minutes, frequent cool packs, cold water drinking, and cleansing enema, followed by siphon enemas; this consists in injecting from a fountain syringe into the bowels from one pint to a quart or more of water at seventy to eighty-five degrees, retaining for five or ten minutes, then lowering the reservoir of the syringe to the level of the floor and thus allowing it to pass out without the necessity of using the bedpan. Repeat until six to eight quarts of water have been used, then an interval of rest for a half-hour or hour, and then repeat again. Should this cause chilliness while the fever is still high, apply a hot pack or fomentation to the spine or pit of the stomach. See cooling treatment, average to very strong. Exeernent method as needed. General diet: Milk and seltzer water, elabbered milk, clam broth, bar-

ley water, tamarind water, lemonade, current jelly water, toast water-cracker gruel; liquid diets, Nos. 5 to 13 inclusive, according to ease.

Fevers with irritability of the nerve centers, unnaturally bright eyes, flushed face, contracted pupils—gelsemium.

Bilious Fever, Remittent, and Bilious Remittent.—*Cause:* Blows, dress irritating the liver, microbes in the blood, excessive eating and drinking of carbonaceous articles. *Symptoms:* Those of simple fever, together with nausea, vomiting, brown coated tongue, yellow skin, constipation or diarrhœa, itching of skin, dullness, and stupor. *Treatment:* Colon flush No. 7; vinegar and water fomentations over the liver; lemonade freely; No. 4 ferr. phos. every hour, and No. 11, nat. sulph. three to six times a day; or phosphate of soda in mild cathartic doses, or euonymin (con.) one-fourth to three grains, as needed. Tonic treat, ment in convalescence.

Bilious Fever, Malignant.—Intermediate between malignant chills and fever and dengue. *Symptoms:* Those of bilious fever aggravated, heavy brown coat on tongue, black at the root. Treat as bilious fever very energetically, and add hydrogen peroxide a teaspoonful three times a day by the stomach, a teaspoonful in all enemas and spray frequently at the nostrils, also a teaspoonful in all sponge baths.

Fever, Catarrhal.—Bap. copaiva and phos. every hour in rotation until fever abates, then cimicif. in place of the bap. and give every two hours. For the chronic cough, copaiva, cimicif. and phos.

Cerebro-Spinal Meningitis or Spotted Fever.—*Cause:* Shattered vitality and the germs streptococcus. *Symptoms:* Rigors, fever, prostration, coma, head and heels thrown back, often purple spots on body, otherwise pallor, flushed cheeks, often convulsions.

Treatment: Hot colon flush No. 4, mustard from the root of the hair to between the shoulders, followed by hot fomentations, peroxide of hydrogen, as in malignant bilious fever, full pack with mustard water. Glycerite of sulphur one teaspoonful every three hours, nutritive enemas, bovinine and nutritive beef tea by stomach.

Constipation Fever.—The fever resulting from the absorption of poisonous matters from normal fæces. See pages 284 to 286. *Treatment:* Remove the cause.

Dengue Fever.—See dengue.

Exhaustion Fever differs only in degree from fatigue, which see. Treatment the same, but more heroic. May be mistaken for typhoid.

Enteric Fever.—See typhoid.

Ephemeral Fever.—*Cause;* Cold, wet, exposure, overwork, mental depression. *Symptoms;* Those of simple fever, pain in head, back and limbs, constipation, scanty urine, after a few days sweating or diarrhœa. Treat as simple fever.

Fatigue Fever.—*Cause:* The decomposition of the blood from the excessive infiltration into it of poisonous substances from the tissues.

Symptoms: Temperature one to three degrees above normal, loss of appetite, incapacity to sleep. *Treatment:* Rest, warm bath, our coffee hot, or hot milk, liquid foods until relieved.

Gastric Fever.—Peculiar to children, or as a result of strong stomach irritants like alcohol. *Usual Cause:* Eating pastry, cabbage, nuts, candies, etc. Duration seven to fourteen days. *Treatment:* Drinks of tepid water with bicarbonate of soda five to ten grains to the ounce followed by an emetic, warm bath, compress on stomach, spongings as required, peroxide of hydrogen one-fourth teaspoonful doses three to six times a day, fluid diets; otherwise treat as simple fever.

Hay Fever.—See acute nasal catarrh.

Intermittent Fever.—See ague.

Malarial Fever.—See ague.

Measle Fever.—See measles.

Phthisical Fever.—A vigorous cool or cold ablution of back, chest and abdomen.

Puerperal Fever, or Metria.—See parturition childbed fever.

Pernicious Fever.—See ague.

Remittent Fever.—A continued fever with remissions. *Symptoms:* Same as bilious fever, with signs of pulmonary congestion, great difficulty of breathing, cough, livid color, urine scanty, high colored, loaded with lithates, but increased during remission; remission usually in the morning, from six to twelve hours, or from twelve to twenty-four hours; usually runs fourteen to fifteen days, and ends in sweating, or merges into typhoid or cerebro-spinal meningitis. Treat the fever as for simple fever; bilious symptoms as for bilious fever.

Relapsing Fever.—Malignant, remittent or recurrent fever. *Cause:* Malaria and decomposing animal matter. *Symptoms:* Usually three or four days of prostration, headache, rigors, high fever, excruciating pains, temperature often 107, pulse over 160, great aggravations at night; about fourth or fifth day profuse perspiration, subsidence of fever; about fifth or seventh day, recurrence of all the symptoms in aggravated form; this continues until the sixth or seventh week when the patient succumbs or becomes convalescent. *Treatment:* As malarial, and typhoid symptoms as typhoid, which see.

Scarlet.—See scarlet fever.

Smallpox—Variola. *Cause:* A specific poison.

Symptoms: Ten to thirteen days incubation. Then chill, fever, head and back ache, tongue white-yellow, breath offensive, nausea, and vomiting common; sleeplessness, may be delirium. Throat red, swollen, initial rash on abdomen and thighs. Eruption from third to fourth day of red spots, which burn and itch, which on fifth day of disease become dark red pimples, which fill with milky fluid the next day and enlarge

one or two days, pit, and on the eighth day change to thick, yellow matter. If these pustules run together, it is confluent. The early symptoms subside with the appearance of the rash, but the fever returns on the eighth day and runs three to eight days. Pustules begin to dry about the twelfth day, forming one to two days later, hard, brown scabs, which fall off with intolerable itching later. Mucous membrane of mouth and throat goes through the same process.

Treatment: Kali mur. to control the formation of pustules. Ferr. phos. for fever. Kali phos. for exhaustion and putridity. Calc. sulph. for discharging pustules. Nat. mur. for confluent pustules and drowsiness. Kali sulph. to aid the falling of the crusts and give healthy skin. Feed generously on fluid diet. Call physician early.

Surgical Fever.—From the shock of surgical operations. *Treatment:* In simple form, rest, baths, fluid nourishment, peroxide of hydrogen; irritative form, retained enemas No. 22, warm baths, sulphonal if necessary; intermittent form, treat as ague; hectic form treat as fever of phthisis; typhoid form, treat as typhoid.

Typhoid, Enteric, or Nervous Fever.—Contagious and infectious. Its nature is unsettled; its predisposing causes are nervous prostration, mental strain, worry, exhaustion, overwork, solar heat, chills, exposure to damp. *Symptoms:* Languor, debility, headache, sharp features, pain in back and calves, nausea, diarrhœa, chilliness, usually from ten to twenty-one days. Rigors increase, may be vertigo, deafness, nose-bleed, great headache, intolerance of light, thirst, loss of appetite, great nervous irritability, nostrils pinched, often flush on each cheek, tongue first white with red tip and edges, later red and glazed, buff, dry or brown, sordes on gums, pulse small, wiry, 100 to 120 or higher, temperature 101° to 104°, breath offensive and ammoniacal. These symptoms slowly increase, tendency to diarrhœa becomes greater. About the commencement of the second week, typhoid rash—rose-colored spots on chest and abdomen, circular, disappearing on pressure; no rash in some cases. After middle of second week tympanitis, gurgling in right groin on pressure, pea-soup diarrhœa, may be watery blebs on skin, spasmodic contractions of muscles, picking at bedclothes, hiccough, deafness, hemorrhage from the bowels. Duration two to six weeks. The germ growth vibrios is greatest in the ileocæcal valve.

To prevent: Avoid water, milk, food, and air contaminated by the germ; all secretions of the patient should be thoroughly disinfected, then buried at a distance from any water supply. If water supply is suspicious, thoroughly boil it before using, and cool by packing ice around its container. Isolate the patient three months. Treatment direct: Place him in a well ventilated apartment with a fire in an open fireplace if possible, no curtains, carpets, or superfluous furniture; air constantly disinfected. Sustain with nutritive beef tea, and sterilized milk; sponge three times a day with castile soap water, dry well and rub with the dry hand of a strong, young nurse; once a day sponge with warm vinegar with a teaspoonful of peroxide of hydrogen to the ounce in it. Keep down fever as in simple fever. Elm mucilage flushes as in dysentery. Peroxide of hydrogen in one-half teaspoonful doses

every two hours, also spray into the nostrils frequently. Also teaspoonful added to each elm flush. Retained enema No. 22 to secure sleep. Da Costa gives three pints of milk and one of broth every twenty-four hours, with a midday meal of arrowroot or other thickened food. Feeds every two hours during the day, and three at night.

Typhus.—Putrid, jail, plague, pestilence, malignant, ship or hospital fever. Contagious and infectious. *Cause:* Absorption of the excretions of animal bodies. *Symptoms:* Incubation from three to ten or twelve days in which there is languor, debility, headache, pain in back or limbs, bleeding from nose, perhaps deafness; then rigors, greater headache, fever, chilliness, stupor, thirst, constipation, prostration, irritability, sleeplessness, and measly rash, which when dark colored shows that the blood is being disorganized by the abstraction of its oxygen. Pulse eighty to one hundred and sixty, temperature 100° to 105°, steady, not variable like typhoid. Tongue brown and dry. Stupor much like sleep but not refreshing. Retention of urine common, may be often suppression of, albuminuria and uræmia. Second week great prostration, muscular twitching, delirium, coma, and convulsions, may be bronchitis, pleurisy or pneumonia. Convalesence very rapid, generally beginning on the fourteenth day. Fatal period from the ninth to the twelfth. Duration fourteen to twenty-one days. Very nutritious diet; room disinfected constantly; peroxide of hydrogen as in typhoid; all antiseptic precautions; supply oxygen in every possible way; tinct. of iodine or resorcin to sterilize the blood.

Yellow.—See yellow fever.

Fishskin Disease.—See skin diseases.

Fissures.—Deep cracks penetrating the skin. *Treatment:* Calc. phos. internally, and externally as an ointment with vaseline.

Fissure ani.—Usually at the posterior external border. Intensely painful, and reflex effect upon nervous centers extremely damaging. *Cause:* Scratches, lacerations, straining at stool, etc.

Treatment: Cleanse the colon thoroughly with full cæcal flush. Then inject into the fissure from a syringe with a small nozzle warm castile soap water until every particle of loose matter is expelled. Then follow with peroxide of hydrogen and dress with equal parts of white pine canadensis and fluid extract of mullein, or with glycozone. Use only concentrated foods until it is soundly healed. If the bowels must be relieved before that occurs, fill the fissure with vaseline and use the flush again, then repeat the treatment.

Fissure, Lachrymal.—Solid extract of bugle-weed triturated into a strong ointment with lard and kept constantly applied.

Fistula.—An abnormal sinus or channel in the tissues. *Cause:* Abscess, bruise, pressure, the irritation of a foreign body.

F. in Ano.—In three forms, viz.: Complete, blind internal, and blind external. Complete, connects the rectal cavity with the skin by a tube leading outside of the sphincters. Blind internal when it has no internal opening; blind external when it has no external orifice. Treat as for fissure, and if not successful call a surgeon.

F. in Urethra.—Known by dribbling of urine.

F. recto-vaginal: Known by escape of gas from the vagina.

F. vesico-vaginal: Known by dribbling of urine from the vagina; for these consult surgeon.

Fits.—See epilepsy.

F. of Children: Red in face, jerk all over. Warm bath; warm enema. If not thus relieved, specific gelsemium twenty drops, aconite two drops, Lloyd's asepsin three grains, water four ounces; one-half teaspoonful every fifteen minutes.

Flatulence.—See dyspepsia.

Flooding.—See hemorrhage.

Flushes, Heat.—See heat flushes.

Foreskin, Diseases of.—See sexual diseases, male.

Gallstones (cholelithiasis).—See calculi biliary.

Gangrene (death of a part).—*Cause:* Inflammation or any agent which destroys the vitality of the tissues or cuts off the supply of blood, as injury, excessive heat or cold, chemicals, etc. *Symptoms:* First that of acute and extensive inflammation, then death of tissue, and a consequent sloughing.

Gangrene of Mouth: Usually occurs between two and twelve years of age, and as a sequel of measles or scarlet fever. *Symptoms:* Inflammation, sloughing. Treat as for ulcers, with utmost nutritive support, and large doses of capsicum.

Gangrene of Lung: *Cause:* Local obstruction of blood vessels, blood poisoning, dementia, epilepsy, chronic alcoholism, etc.

Symptoms: Very fetid breath and expectoration of dirty black or brown gangrenous material, containing small black masses. The last is the only symptom distinguishing it from fetid bronchitis. *Treatment:* Peroxide of hydrogen by stomach, inhalation, enema, and externally, the utmost nutrition without fats, and one to three grain doses of capsicum every four to six hours.

Gastralgia.—Pain at lower end of breast bone. *Symptoms:* Pain independent of digestion, may often be relieved by eating. Relieved by firm pressure, vomiting, and is complete

between the paroxysms. No fixed point of tenderness, nutrition usually good, generally associated with hysteria, neuralgia or ovarian tenderness and benefited more by nerve treatment, than by dieting. *Treatment:* Hot bath, or hot fomentations on stomach. Retained enema, No. 33. Treat nerves.

Gastric Ulcer.—*Symptoms:* Pain upon taking food and its intensity graduated by the quantity. Increased by pressure, usually at a fixed point, relieved by vomiting, but continuous in less degree, nutrition affected, neuropathic states not always present, benefited by diet rather than by nerve treatment, dilatation of stomach may follow. Tumor rare. Any age after childhood, one-half the cases under forty. Cause unknown.

Treatment: Absolute rest in bed. Nutritive enemas; tea of hydrastis. Nat. phos. three tablets four times a day. Creosote one-twelfth to one grain three or more times daily, or zinc sulphocarbolate one-half to five grains until stools are odorless, then just enough to keep them so. Ergotin for hemorrhage, Bonjean's one-half to two and one-half grains hypodermically. Cocaine hydrochlorate (alk.) to relieve pain and vomiting, one-twelfth to one grain every two to four hours as needed.

Gastritis. — Inflammation of the stomach. *Cause:* Exposure, irritating food, overloading the stomach when much fatigued, liquors, condiments, etc. *Symptoms:* When from poison, violent, burning, stabbing pain, tenderness on pressure, short, rapid breathing, retching long after the stomach is empty, excessive thirst; tongue like raw beef; later pulse feeble, surface cold, faintness, hiccough, perhaps diarrhœa. When from other causes, the same stomach symptoms in less severe form.

Treatment; First cleanse the stomach thoroughly, then give it rest. Revulsive treatment as needed. Nutrition entirely by the bowels. Compresses on stomach. Cold water in small quantities often as desired. Hot water four times a day slowly sipped. Gastritis chronic, see dyspepsia gastric.

German Measles.—See measles.

Gin-drinkers Liver.—See liver, gin drinkers.

Glanders.—See farcy and glanders.

Glaucoma (green tumor of the eye).—Begins with intense pain in the eyeball during the night, throbbing in eye and

temple, eye congested, sight lost, iris motionless, cornea dim, pupil dilated, ball hard, prismatic colors. Cause unknown. Lose no time in applying to the best oculist within reach.

Gleet.—See urethra, stricture of.

Glottis, Spasm of. Warm bath; magnesia phos.

Glycosuria.—See diabetes M.

Goitre (enlargement of thyroid gland).—See bronchocele.

Gonorrhea.—See sexual diseases.

Gout.—Uric acid, or the elements out of which it is formed, and soda exist separately in the blood. Certain food-elements, nervous conditions or functional abnormalities cause a combination of the uric acid and soda into urate of soda, which is generally deposited in the tissues most remote from the brain, in the most weakened parts. *Cause:* Heredity, male sex, alcohol, over-eating, working with lead.

Symptoms: Usually preceded by debility, flatulence, etc. The attack may come suddenly; acute pain in great toe, heel, instep or wrist, rigors, fever, irritability, restlessness, swelling and tenderness. Duration of attack five to ten days, longer the more frequently they occur.

Treatment: Rest in bed. Affected parts swathed in hay-flower tea, re-wet every hour or two until the pain ceases. Shawl wrap in hay-flower or oat straw tea every other day. Hot knee shower followed by cold dash every other day two to five minutes. Excernent method freely. Cooling treatment if there is fever. If medicine be required, keep bowels soft with Epsom salts, and take wine of colchicum fifteen to thirty drops every three hours, and phosphate of quinine one to three grains in alternation. Alcohol and fruit sugar together in the diet predispose to the disease. Avoid pastry, malt liquors and sweet wines. Drink much pure, soft water. Try diet as for chronic rheumatism, or strictly vegetarian, or fish, fats and vegetables. No single diet suits all cases.

Chronic Gout: Natr. sulph. with ferr phos. in aggravations.

Granular Eyelids.—See eyes.

Gravel.—See calculi, renal.

Graves's Disease (Basedow's disease, exophthalmic goitre).—Cause obscure. *Symptoms:* Pulse ninety to one-hundred and fifty, enlarged thyroid, soft and pulsating, eyeballs prominent, lids fail to follow motions of the ball, conjunctivitis, irritability, vertigo, headache, wakefulness, indigestion, anæmia.

Treatment: Extract of thyroid gland internally, iodine locally. May add to the extract ten grains of bayberry three times a day; scullcap for the wakefulness; rest; heart sedation if necessary.

Gum-boil (alveolar abscess).—Decomposition in a canal of a tooth or of the tooth structure. *Symptoms:* Soreness, pain, swelling, suppuration discharging through the gum. *Treatment:* Consult a dentist before the swelling begins. For soreness mag. phos. To prevent swelling kali mur. For suppuration silicea, frequency governed by urgency of symptoms.

Gums, Bleeding.—Kali phos.

Hæmatidrosis.—Hemorrhage from the skin. Rare. Treat on general principles.

Hæmaturia.—Bloody urine, from kidneys, bladder, or urethra. *Treatment:* Vapor bath; absolute rest; linseed tea; bladder injections of warm water; if bladder is filled with thick blood that cannot be passed or drawn, inject two ounces of warm water with five or six grains of papoid. If from bladder or urethra, urine is clear and blood follows. If from the kidneys, blood is diffused, giving a port wine tint to the urine. If there are inflammatory symptoms, give revulsive treatment average to strong, and hamamelis internally.

Hæmatemesis (bleeding from the stomach).—Biochemic treatment as for hæmoptysis.

Hæmoptysis (hemorrhage from the lungs).—*Cause:* The iron cell salt gives toughness and elasticity to the blood vessels, while nat. mur. furnishes moisture to them. One or both of these being deficient, weakness and brittleness of their walls result, and they give way under a local strain from heat, too much food, excess of waste matter, etc.

Treatment: With bright red blood that coagulates quickly, ferr. phos.; thin, pale-red blood not coagulating easily, nat. mur.; dark, thin, blackish red blood not coagulating, kali phos.; dark, black, clotted or tough, kali mur. A dose every one-half hour to two hours. Rest, recumbent posture, cold foods and drinks.

If these remedies are not at hand, hot water on the cervical and dorsal vertebræ, and drink a strong solution of salt water. If case is urgent, ligature the upper part of the left arm, then upper part of right thigh, and if necessary, right arm and left thigh in the same way. Loosen bandages gradually as soon as bleeding stops. Bleeding following bubbling in chest, ipecac. Profuse bleeding without effort, hamamelis. Constant tickling, with cough and expectoration of bloody mucus, belladonna.

Hair, Diseases of.—*Baldness:* Cause: Debility, local inflammations, vegetable parasites, dandruff, etc. Treat the cause. When the hair is falling out, apply to the scalp once a

day with friction, tinct's of cantharides and nux vomica of each one and one-half drams, tinct. cinchona ten drams, glycerine one to two ounces, alcohol sufficient to make a pint.

Dandruff: To cleanse the scalp, wash the head thoroughly with warm or tepid water six pints and one teaspoonful of borax, rinsing it with clear water. Rub a little bay rum into the roots of the hair after it has been washed and dried, to prevent taking cold. Then dampen the roots of the hair two or three times a week with the following preparation: Flour of sulphur two ounces, water one and one-half pints. Shake frequently for three or four days, then let it settle and pour off carefully. If any of the sulphur comes away with the liquid, it may be strained through a linen cloth or run through a filter.

Premature Graying: Wash once or twice a day in strong sage tea. Avoid all dyes—they are chiefly composed of acetate of lead, or nitrate of silver, and often cause disease.

Hallucinations. — Deceptions of one of the special senses. For example, seeing objects in utter darkness, etc. See insanity.

Hands, Sweating of.—Tinct. of belladonna one dram, cologne water one ounce. Add a little glycerine at the moment of using, and with the mixture rub the hands thoroughly. They should first be washed in soft water and thoroughly dried.

Chapped.—Potassa caustic, one part, glycerine forty parts, alcohol forty parts, water one-hundred and twenty parts. Bathe the hands in warm water, then rub mixture in; or compound tinct. benzoin one dram, glycerine one-half ounce. Use as a lotion. Or, glycerine one-half ounce, tint. hydrastis two drams, rose water four ounces. Use as a lotion. The last is the most elegant preparation. Calc. fluor. internally three times a day.

Hangnail.—A little tongue of flesh turned up by the side of the nail and inflamed. Treatment: Clean and cover with adhesive plaster until cured. Change and clean daily.

Hay Fever (summer catarrh, autumnal catarrh, hay-asthma, rose-cold, grape or rag-weed fever).—*Symptoms:* Violent sneezing, running of hot water from eyes and nose, headache, debility, irritation of nose, ears, throat. *Cause:* Action of pollen of certain plants on lining membrane of nose and head, that membrane being in a nerve-devitalized condition. *Treatment:* Restore the local vitality; remove super sensitive-

ness of membrane, and thus render it insensible to the peculiar irritating properties of the pollen floating in the air. Compound oxygen treatment inhaled through the nostrils is an excellent preventive and an efficient restorative.

Catarrhal Form: Head vapor and full pack each once a week; water tread daily; sprays of peroxide of hydrogen three times a day; atmosphere of room ozonized by frequent sprays of turpentine. Ferr. phos. and nat. mur. in alternation, one dose every hour or two.

Asthmatic Form: Combine treatment for asthma with that for the catarrhal form.

Headache.—

1. **Anæmiac:** Diminished supply of blood to the brain, marked by depression of spirits, brooding over events not likely to happen, dizziness, bad tongue, constipation. *Cause:* Debility, exhaustion, poor blood, hemorrhage, over-lactation. *Treatment:* A cup of coffee on rising, and treat as for enæmia.

2. **Hyperaemic** (congestive): Too great blood supply. Indicated by throbbing, pain increased when lying down, restless sleep, dim eyes. *Treatment:* Revulsive treatment average to strong. Ferr. phos. every hour or two. No stomach symptoms, glonoin; with stomach symptoms, cim. rac. or bell.

In severe cases have several large pitchers of water as hot as can be borne, poured on the base of the brain, to break up congestion. The patient should lie across the bed, with head extending beyond the edge, and hanging a little lower than the body, with a towel snugly pinned around the neck so as not to wet the clothes, and a basin placed below to catch the water. Then one should support the head while another pours a small stream upon the base of brain, allowing it to run over entire head, after which the hair should be carefully dried with a soft towel. Then wrap it in a dry towel, and let the patient sleep.

3. **Bilious:** Pain is diffused over head with vertigo, constipation, stools dry, in balls, or clay-colored. *Treatment:* See biliousness. With gray coat on tongue, kali mur. With vomiting of bile, bitter taste, and greenish-gray tongue, natr. sulph.

4. **Nervous Headache:** May be from poverty of nerve force, or reflex from some distant point of disturbance; marked by depression, shrinking from noise, light and exercise. *Treatment:* Kali phos.

5. **Malarial** (periodical): See ague. Arsen. or china, or phos. or sanguin. or sulph.

6. **Sick Headache:** Modification of nervous headache. *Symptoms:* Faintness, chilliness, pallor, paroxysmal pain usually in one side of the head, face flushed and anxious, pain dull and throbbing.

Treatment: Guarana thirty to sixty grains in water every hour until five or six doses are taken. Or, muriate of ammonia twenty grains in same way. Or, one-half to one teaspoonful of powdered charcoal, stirred well in half a glass of water, with ten drops of

aromatic spirits of ammonia. Or, nux every hour before the pain, macrotys and pod. in alternation every thirty minutes during the pain. Hot foot bath. Before, during and after menses, nat. mur., with pain in back every week, phytol.

7. Uterine: Worse on awaking and intense on the top of the head. May be soreness of the scalp, lump in the throat. Treatment: Menses too soon, profuse and long, calc. carb. or phos. acid; too late, scanty or suppressed, puls. With labor-like pains, cham. With nervous, rheumatic pains, bell., or cim. rac. or phos. acid.

8. Crown: On awaking with moist, yellow, creamy coat on the back of tongue, natr. phos.; with great weight, cactus grandor arsen; much heat, sulph; as if nail were driven in, nux.

9. Acid: Cause: Excess of acid in the stomach. Treatment: Compound tinct. of cinchona six ounces; aromatic spirits of ammonia two ounces. Dose, one-half to one teaspoonful.

10. Foul-air: Compound oxygen; peroxide of hydrogen.

11. Sun-headache.—Begins with sunrise, hardest at noon, ends with sunset. Nat. mur, or sanguinaria or spigelia.

12. Miscellaneous Headaches.—Worse in heated room and in the evening, and better in cool air—kali sulp.; worse in open air, caffea or ignatia. With darting pains relieved by heat and aggravated by cold, specks before the eyes—magnes. phos.; with cold feeling in head—kali phos. or calc. carb.; with small lumps on the scalp—silicea. Dull, heavy headaches with drowsiness—water secretions—natr. mur. Headache of children—ferr. phos.; vertigo and vanishing sight—bell. or phytol; head feels too small—caffea; as if back head were crushed—nat. sulph; throbbing all day—cocculus or puls; worse after sleep—lach.

Heart, Diseases of.—

Dropsy of the Pericardium (hydrops pericardium): *Cause:* Pericarditis. *Symptoms:* Difficult breathing, cough, general debility, muffled heart sounds, pale face, no numbness in left hand, respiration and pulsation low, usually dropsy of feet and legs. *Treatment:* Same as for dropsy, with addition of irritating plaster over the heart; persistent use of hair cap moss infusion; blood-making treatment.

Endocarditis *simple* (inflammation of the serous lining membrane of the heart): *Cause:* Rheumatism, Bright's disease, pericarditis, pleurisy and pneumonia. *Symptoms:* Similar to pericarditis. *Treatment:* Like pericarditis.

E. Ulcerative (diphtheretic, septicemic, malignant).

Heart, Enlargement of: *Cause:* Obstruction to the circulation, or over-exertion. *Symptoms:* Increased force of the heart-beat, may be ringing in the ears, spots before the eyes. *Treatment:* Remove causes when practicable; avoid unnecessary excitement, over-loading

the stomach and severe exertion. Calc. fluor in alternation with ferr. phos.

Heart Failure: A convenient phrase to express vital exhaustion; many times from causes unknown, and often really remote from the heart itself. When vitality is expended much faster than it is generated, the heart is likely to feel it most because of its ceaseless muscular work. *Symptoms:* Palpitation, irregular pulsation, sense of tire in the region of the heart, general nervous lack of tone, etc.

Treatment: Stop. Let up. Rest. General invigorating treatment. Careful study of Figs. 70 and 71 will show the necessity for this advice concerning so complicated an organ.

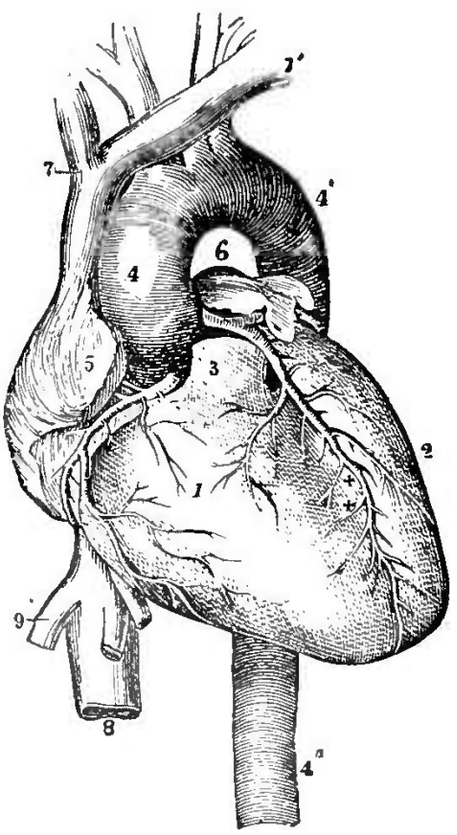

FIG. 70.

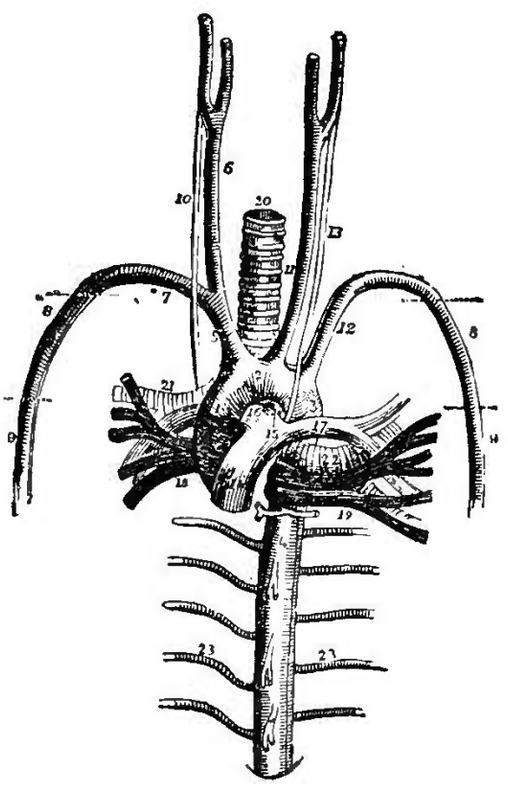

FIG. 71.

HEART.

FIG. 70. 1, front of right ventricle; 2, left ventricle; 3, pulmonary artery, cut short; 4, 4', 4'', the aorta; 5, part of right auricle; 6, part of left auricle; 7, 7, right and left veins which unite to form the upper vena cava; 8, lower vena cava; 9, one of the hepatic veins; xx, left coronary artery;

FIG. 71. 1, 2, 3, arch of aorta; 4, thoracic aorta; 5, innominate artery; 6, right carotid; 7, right subclavian; 8, axillary; 9, the brachial; 10, pneumogastric nerve on right side; 11, left carotid; 12, left subclavian; 13, left pneumogastric nerve; 14, 15, pulmonary artery; 16, 17, its branches to lungs; 18, 19, pulmonary veins; 20, trachea; 21, 22, large bronchial tubes; 23, 23, intercostal (between the ribs) arteries.

H. Myocarditis: Inflammation of the substance of the heart, not distinguishable by laymen, from pericarditis.

H., Neuralgia of: See angina pectoris.

Palpitation: Remove cause. Regulate heart-action by cactus grand, caffeine, or kola. If nervous, cold compress to the heart twenty

minutes twice a day. If from weakness of heart, kali phos. If spasmodic, magn. phos. If anæmie, natr. mur. *General Treatment:* Shawl wrap, body bandage, and foot vapor onee a week; sponge bath daily.

Pericarditis: Inflammation of the sack eovering the heart. *Cause:* Usually an aceompaniment of some general disease. *Symptoms:* Fever of the eausative disease increased, may be pain and tenderness in the heart region, breath short, pulse varies, may be dry eough and difficulty of swallowing, skin pale and bluc. Treat the eausative disease; keep quiet; stimulants if neeessary, irritating plaster over heart.

Heart-Pang: See angina peetoris.

H., Valvular Disease of: First, insuffieient. Second, thickening. *Cause:* Aeute artieular rheumatism, fevers, ete. *Symptoms:* Palpitation, short breath after exertion, suffocative feeling, bronchitis, dyspeptic symptoms, urine scanty and high colored, dropsy, and many other symptoms. *Treatment:* Quiet life; flanuel clothing; good rich blood; temperate eating; medical treatment must depend upon the preeise nature of the disease.

Most of the diseascs of the heart are so obseure that to the nonprofessional observer all seem alikc, so that the treatment of pericarditis, valvular lesions, palpitation, and heart failure substantially cover all the ground except by medical advice.

Heartburn; A butyric acid fermentation of starchy food, or its liberation in the stomach from food in whieh it previously existed. If temporary it may be relieved by an alkali. If habitual, salieylie acid, thymol or resorein six to ten grains three times a day, or guiaeol.

Heartburn with biliary troubles, nux and pod. for a male, puls. and pod. for a female.

Heat Flushes: A complication of the climacteric. See climacteric disorders. Rhus.

Heat Rash (or prickly heat). *Cause:* Excessive work of the sweat-glands. *Treatment:* Avoid the cause, frequent bathing without drying the surface, dusting with face or starch powder.

Heat Stroke (sunstroke, or coup de soleil).—A devitalized condition of the brain, caused by sudden abstraction of moisture from the tissues, producing dryness of the membranes. *Symptoms:* Violent: Active delirium, great restlessness, may be combativeness. Violent-passive: Sudden insensibility, great rise in temperature, pulse feeble. Symptoms of paralysis and insanity may be developed after apparent recovery. Milder: Great weakness, feeble pulse, cold, clammy face and extremities, nervous depression, vertigo, tightness of chest.

Treatment; Tepid dripping sheet; full tepid enemas; wet cap on

head; natr. mur. every hour or two; if much exhaustion, kali phos.; patient still insensible, mustards to feet, hands, and inside of thighs, and a long one between the shoulders; call physician.

Hemiplegia (paralysis of one-half of the body).—Two varieties. *Cause:* Embolism or thrombosis.

Congestive; Cause: Falls, mechanical violence, effusion of blood or lymph; tubercular, cancerous, or syphilitic deposits.

Anæmic: Cause: Defective nutrition from masturbation, sexual excesses, and various diseases. Symptoms: Embolism—sudden paralysis, rarely loss of consciousness, aphasia, or loss of power of speech.

The congestive form is accompanied by convulsions, cramps, twitching, priapism, itching, crawling, prickling sensations, pain, tenderness on pressure. In the anæmic form the symptoms are less decided, but worse in recumbent posture. To determine which, apply a sponge wrung out of hot water to the spine. The congestive form gives a burning or sore feeling at the damaged place. Treatment must be exactly opposite. In congestion, get the blood away from the brain and spinal cord; in anæmia, get it to them. To get it away, apply heat at a distance for long periods, alternated with cold for short periods, because when the heat is abstracted from a part, the blood rushes there to make good the loss. Then keep it there by dilating the blood vessels by heat. But lest they be dilated into weakness, apply the cold at intervals to preserve their contractility, and bring a fresh supply of blood again. To get the blood to a part, make a full supply of good rich blood by adequate nutrition. Muscular movements are the best agents to draw blood to a part; therefore, motions timed and graduated to the case are demanded; voluntary action if possible, or made active by external force applied as in massage.

Hemorrhage.—Escape of blood from the blood vessels. Traumatic or active when from a wound. Idiopathic or passive when from degeneracy of the blood vessels, as explained under hæmoptysis.

Hemorrhage from Rectum: May be from injury to the glands of Brunner and Peyer in typhoid fever, from tuberculosis, the congestion of inflammation, the rupture of pile-sacs, the cancer germ or the rupture of a blood vessel by a foreign body. *Treatment:* Rest; recumbent posture; fomentation of abdomen; enemas of witch-hazel, or a teaspoonful of Monsul's solution of iron to an ounce of water, or, by stomach or enema tincture of shepherd's purse; or, biochemic remedies as for hæmoptysis.

Hemorrhage in Skin: See purpura.

Hemorrhage, Uterine: Always severe and dangerous after abortion. May occur in childbirth, and prove fatal in a few minutes because the uterine contractions fail to close the open blood vessels in the womb. *Symptoms:* Great pallor, sighing respiration, prostration, the flow.

Treatment: Foot of bed elevated; uterine contractions secured by grasping it firmly with the hand, then give injections of hot water (110°

to 115°) into the uterus. If necessary, plug with a handkerchief. Internally, ergot fluid extract one-half teaspoonful every three hours. Revulsive treatment as far as practicable; or calc. fluor. in alternation with kali phos., and hot water to the lumbar vertebræ; or ipecac ten to twenty drops in four ounces of water. Dose, one teaspoonful every ten minutes. In urgent cases, ligature the limbs as in hæmoptysis.

H. U. in Change of Life. See climacteric. Lobelia and composition equal parts four to eight tablespoonfuls every ten minutes till well nauseated, then composition alone till free vomiting. Repeat every day if necessary.

Hemorrhoids (piles, varicose veins of the rectum). *Cause:* Heredity, constipation, high living, and sedentary habits, tumors, pregnancy.

Treatment: Keep liver and bowels active, skin healthy, and circulation well to the extremities. Cal. fluor. internally and in vaseline as an ointment to external tumors.

In alternation, ferr. phos. when blood is bright red, kali mur. when it is thick and dark, kali sulph. with yellow, slimy tongue, nat. sulph. in bilious conditions. Calc. phos. if anæmic, nat. mur. when stools are hard, dry, and crumbling with excess of saliva, mag. phos. with cutting, darting pains in external tumors. Fluid extract of yerba santa one teaspoonful three times a day cures some cases.

Cold, wet compress three-fourths of an hour the whole length of the spine, three or four times weekly; cold sitz bath, one to two minutes, three or four times weekly; or, inject into the rectum twice a day one teaspoonful of fluid extract of hamamelis and hydrastis three drams each, olive oil two ounces; or, if external, use mullein and white pinus canadensis as in fistula; or, take a tepid sitz bath, after which apply to the tumors a sponge or cloth wet hourly in potassium iodide two grains, iodine one-fifth grain, glycerine thirty-five grains; should that fail, use potassium iodide three grains, iodine one grain, glycerine thirty-five grains; or bitter sweet ointment—simple cerate four ounces, fluid extract bitter sweet one ounce; evaporate the moisture. Or, digest eight ounces of the fresh root in one-half pound of lard, strain and add two ounces of beeswax.

The above are nearly all palliative, sometimes curative; but a certain cure in all cases belongs only to surgery.

Hernia, Rupture.—A tumor formed by the protrusion of a viscus from its natural cavity. Reducible: One that can be returned to its cavity. Irreducible: One that cannot be returned. Strangulated: Constricted so that it cannot be propelled outward, and the venus blood cannot return. Inguinal: That which bursts through the abdominal ring. Femoral: That which descends on the thigh; almost peculiar to females. Umbilical: Rupture at the navel.

Treatment: On back, feet elevated, head low, make gentle pressure on the part until it returns, then bind a pad on it until a suitable truss can be secured. Failing to return it, give lobelia to the point of entire bodily relaxation, apply a cold local compress for fifteen to

thirty minutes, then try again to return it. This failing, call a physician at once.

Herpes.—See skin diseases.

Hiccough.—A convulsive, noisy, inspiration caused by spasm of the diaphragm. *Cause:* Violent laughter, temporary indigestion, great prostration. *Treatment:* A tight bandage around the abdomen, or a deep inspiration retained as long as possible, or a fright, or blow on the back, or eating pounded ice or ice cream, or the pressure of a finger upon the throat just above the sternum.

Hives.—See skin diseases.

Hoarseness.—See aphonia.

Hob-nail Liver.—See liver diseases, gin drinkers.

Homesickness, Nostalgia.—*Symptoms:* Fondness for solitude, indulgence in grief and despondency, loss of appetite, pain in stomach, difficult breathing upon exertion, face and palms cold, white tongue with dark stains, white lips, drowsiness, unwillingness to attempt and inability to perform motion. *Treatment:* Tinct. of oats, or fluid extract of coca.

Hydrocephalus.—Water on the brain, one form of tubercular meningitis (acute); basilar meningitis. See meningitis.

Hydrocephalus Spurious.—Hydrocephaloid disease, pseudo, or false meningitis, a dropsy of the head as a complication of summer complaint of infants in cities. *Cause:* Heart debilitated, blood thickened by the discharges, finally blood coagulates in the great veins of the head. *Symptoms:* Face pale, may be bluish and cold, fontanelle sunk inward; stupor, pulse and respiration more and more feeble, convulsions, death. *Treatment:* Distinguish from inflammation. Lose no time. It is sometimes fatal in twelve hours. Stimulation and nutrition are the only hope. Hot mustard baths. See the stimulative treatment of cholera infantum. Also see prostration. Do not treat as a fever.

Hydrophobia.—One of the most virulent of microbial diseases. *Cause:* Inoculation from rabies in an animal. *Symptoms:* Great nervousness, irritability, despair, haggard look, sharp pains run up the limb from the point of inoculation, aversion to liquids, slight spasms increasing in severity, length

and frequency, during which features are livid or purple, eyes protrude, thick, ropy saliva is abundant, muscular spasms, delirium.

Treatment: As soon as possible after the bite ligate between the wound and the heart thoroughly; then cut all around and below it so as to take out every particle of flesh that came in contact with the tooth, then foment with hot water to promote bleeding, then cauterize the whole wound with lunar caustic, aqua fortis, or a red hot iron, then keep patient thoroughly stupefied with skullcap tea until a physician can be called, or if one is not procurable, give lobelia by stomach or enema to the point of nausea and an alcohol vapor bath or full pack, repeating the lobelia until physician comes. The poison may be absorbed through a mucous membrane without a wound, in which case give the skullcap or lobelia and bath treatment while waiting for the doctor. If within reach of an institute seek inoculation by Pasteur's method.

Hydrocele.—See sexual diseases, male.

Hydrothorax (dropsy of the chest).—*Cause:* Pleurisy, or organic disease of the heart. *Symptoms:* History of the case, difficulty of breathing when in bed, lungs clear on percussion from top to bottom in recumbent position, but dull up to the water level in upright position. *Treatment:* As for dropsy.

Hyperæsthesia (acute sensitiveness of skin to external impressions).—Treat the disease of which it is a symptom.

Hypermetropia (hyperopia). — Far-sightedness. Remedy, proper glasses.

Hypertrophy (enlargement).—*Of breast: Cause*, obscure. Treatment, alterative and tonic; not encouraging.

Of Heart: Cause, tobacco, tea, alcoholic stimulants, worry, mental strain, diseases of brain and blood, violent muscular exercises, sexual excitement, and malt liquors.

Symptoms: Vertigo, noises in the ear, redness of face, or plethora; respiration, pulse, and temperature high, numbness in left hand and arm, difficulty of breathing, fulness about the heart. **Treatment:** Avoid the cause; nutritive diet; flannel clothing; fresh air, mountainous region, general massage; calc. fluor. in alternation with ferr. phos., or heart regulated with digitalis and strophanthus in alternation.

Of Liver; Cause, long continued congestion from the irritation of malaria and whisky. Treat as for chronic inflammation of liver.

Of Muscles: Cause, growth beyond adequate nerve supply, **Treatment:** Kali phos. and rest.

***Of Prostate*, rest and alteratives.**—See sexual diseases, male.

Hysteria (a form of neurasthenia, characterized by variable motor, sensory and intellectual disturbances).—*Cause:* Inheritance, anæmia, overwork, anxiety, grief, prostration, excessive sexual indulgence, masturbation, continence, fright, religious impressions, disappointed love, jealousy, uterine or ovarian diseases, digestive disturbances, etc. *Symptoms:* May simulate almost any disease, yet its sufferings are very real.

Treatment; As it depends on a perversion of function or of nutrition or of both of the central nervous organs, nutritive treatment and moral influence are of supreme importance. Correct bad habits, establish all good hygienic conditions, tepid sitz bath four to seven times a week, shoulder shower once or twice a week, general faradization and central galvanization every other day, or kali phos., and if sad, moody, with irregular menstruation, natr. mur.

Hysterical Fit; Cold douche to the head, ammonia to the nostrils, firm pressure over the ovarian region; internally, valerianate of ammonia, or asafœtida.

Ichorrhaemia.—A state of the blood in which it is charged with the germs of pus. Called septicæmia when fatal with no local formation of pus, and pyæmia when secondary abscess follows.

General Symptoms: Rigors, sweating, rapid pulse, sallow skin, hay-like odor of breath, diarrhœa, dysentery, inflammation of serous membranes, rapid emaciation and prostration.

Treatment: The bacillus pyocyanes must be destroyed in the blood. Peroxide of hydrogen sprayed frequently in the room, one-half teaspoonful taken every two hours, one-half to one ounce in a colon flush twice a day; or take lactic acid one and one-half drams to one-half pint of sweetened water twice a day. Open any abscess, wash out with peroxide of hydrogen and poultice with charcoal, yeast or wild indigo. Nutritive and rapid blood-making diets. Diaphoretic and excernent methods, strong as can be borne.

Inanition, failure of nutritive functions.—*Symptoms:* Feelings of *malaise*, and inability to do as much as usual. Heat reduction, diminution first of fat, then of muscular, and finally of nerve-center structures.

Cause: Insufficiency of food, impaired digestion, catarrhal obstructions to absorption. *Treatment:* Remove the cause. Adapt the diet to the condition. Give nutritive, blood-making, alterative and tonic methods as required.

Incontinence of Urine. The causes are various. Excessive acidity of urine, over-irritability of the muscular coat of bladder, weakness of the restraining muscles, irritation of some part of the genital tract,

too much urine, calculi, malformation of bladder, contraction of walls of bladder.

Treatment: Treat the cause; see that the bladder is emptied the last thing before retiring; if the wetting occurs with regularity at a certain time, wake him one-half an hour before that time for urination; little fluid at supper and in the evening; supper must not excite thirst; he must not get between cold sheets in winter; use blankets and avoid all causes of nervous tire; build up the nervous system by nutritious diet, not pastry and sweets, abundant sleep and not too much study, a daily rapid wash with cold, wet towel, dressing without drying, and taking good run to get warm; much outdoor air. If a drug is needed, give five to fifteen drops of fluid extract of rhus aromatica three times a day and keep bowels open. If the cause be nervous, give kali phos.; if from weakness of muscular coat, ferrum phos.; if from worms, natrum phos.; if all the above fail, belladonna every afternoon sufficient to dilate the pupil, usually one-eighth to one-fourth grain; if the afternoon dose does not accomplish it, repeat at bedtime.

Indigestion.—May be gastric, or intestinal and hepatic. If in stomach, pepsin; not relieved, an emetic with more frugal diet for a few days, or diet of carbo-hydrates with very little albuminous substance. If intestinal and hepatic, pancreatine and ox gall; not relieved, cæcal flush and liquid diet excluding the carbo-hydrates. Either, not thus relieved,—see dyspepsia.

Inflammation.—An excess of heat and congested circulation, may be either acute (active), or passive, or chronic. *Acute* when accompanied with rigors and fever; *sub-acute* when there is no fever; *chronic*, a sequel of either of the others, or may come without them. All terminate either by resolution,—that is, general dissipation of the effects and restoration of normal condition, or any other one of five ways. First, effusion of serum, that is dropsy; second, effusion of blood, hemorrhage; third, effusion of lymph, causing induration, thickening, mechanical obstructions; fourth, formation of pus; fifth, gangrene, mortification.

Treatment: To secure resolution, continued application of cold locally to astringe the vessels and abstract the heat, together with general revulsive treatment strong, to draw the circulation elsewhere; cooling treatment as needed for the fever; aconite or ferrum phos., according to the symptoms. This failing, treat effusion with rapid blood-making diet; kidney, skin and bowel excernent strong, see dropsy. Second, see hemorrhage. Third, seek to cause its absorption by local packs, and general alterative and tonic treatment. Fourth, see abscess. Fifth, see gangrene.

Inflammation of Bone.—*Cause:* Injuries, poisons, the microbes of

syphilis, rheumatism and tubercle. *Symptoms:* Deep, dull, severe pain, swelling of soft parts, rigors and fever, tends to caries or necrosis. *Treatment:* Rest, cooling method as needed, excernent active. Fomentations of lobelia days, chloroform liniment nights. If throbbing sets in, poultice and open as soon as indications are clear and inject peroxide of hydrogen. If necrosis occurs, known by gritty pus, treat as necrosis.

Inflammation of the Covering of the Bone (periostitis).—*Cause:* The same as inflammation of the bone, recognized by the history of the case and its sharp lancinating pain. *Treatment:* Lobelia in non-nauseating doses internally and keep fluid extract or oil of lobelia applied locally.

Inflammation of the Brain. See page 411.

Inflammation of the Brain, chronic.—*Cause:* Shocks, blows, sun, mental strain, worry, depressing passions, drugs, rheumatism, gout, syphilis, tubercle. *Symptoms:* Pain in head, aggravated by noise, light, heat and motion; irritability, restlessness, sleeplessness, mental depression, pallor of skin, anxious countenance, arrested secretions. *Treatment:* Rest, avoidance of the cause; excernent treatment average to strong; revulsive treatment mild to strong; alterative and tonic treatments; nutritive diet.

Inflammation of Membranes of Brain, acute, simple (meningitis). —See Page 411.

Inflammation of Membranes of Brain (tubercular meningitis).—Simple meningitis with tubercular effusions. Next to cholera infantum one of the most fatal diseases of city children. Predisposing cause, tubercle; exciting cause, blows, falls, shocks, etc., city life and solar heat.

Symptoms: Hot skin, malnutrition, short, dry cough, restlessness, irritability, headache worse by motion, light and noise; skin variable, tongue furred, breath offensive, constipation, drowsy, rolls head in sleep with eyes partially open, wakes screaming. If case progresses, child very quiet, countenance flushed or pale, eye-brows knit, pupils contracted, sensitive to light and noise, retching, pulse variable, fever high, stupor, head and heels thrown back, insensible, convulsions, paralysis, coma.

Treatment: Insure sleep with sulphonal; cooling treatment for fever; quiet well-ventilated room; diet, mother's milk, or infant's food Nos. 4, 5, or 6, page 248-249; revulsive treatment so far as can be borne; secure the best medical treatment obtainable.

Inflammation of the Bladder.—Sec cystitis.

Inflammation of the Bowels.—See enteritis.

Inflammation of the Breast.—See breasts, inflammation of.

Inflammation of Cellular Tissue.—*Cause:* The microbe of erysipelas, the germs of the cadaver in post-mortems and poisonous bites. *Symptoms:* Erysipelatous inflammation of the skin with its burning and tingling, also throbbing; stiff, brawny swelling, irritated lym-

phatics, rigors, fever, abcess in lungs, liver and other parts; perspiration offensive, stools fetid, stupor, delirium, difficult breathing, exhaustion. *Treatment:* Free incision and suction cups, warm water to promote bleeding; hot fomentations of solutions of boroglyceride; internally peroxide of hydrogen, or brewer's yeast one ounce doses, or resorcin.

Inflammation of the Cornea.—See eye (cornea).

Inflammation of the Eye.—See eye, diseases of.

Inflammation of the Middle Ear (otitis media), including the membrane tympani, the tympanitic cavity, the mastoid cells and chain of ossicles with their muscles, vessels and nerves.—*Cause:* Cold, damp, rheumatism, gout, boils, injuries, use of hair-pins in the ear, also from inflammation of the pharynx, from scarlet fever, quinsy, diphtheria, and other diseases. Every inflammation of the lining membrane of the ear is a true periostitis, and every ulceration is a caries.

Symptoms: The general symptoms of inflammation: Locally, lancinating pain in inner ear, impairment of hearing, giddiness, fullness in the head, increase of pain in moving jaws, head, or blowing the nose; great depression, suppuration sometimes in from twenty-four to forty-eight hours.

Treatment: Give head vapor, followed by hot foot bath, then cæcal flush; to bed; quiet well-ventilated room; heat to feet; two or three drops of pure mullein oil containing eight parts to 100 of peroxide of hydrogen, in the ear twice a day; ferrum phos. with kali mur. in alternation, dose every half hour; if suppuration occurs, then give calc. sulph. every hour until improved, then less frequently; follow with tonic and alterative treatment mild to strong.

Inflammation of the Heart.—See carditis.

Inflammation of the Kidneys (acute nephritis).—*Cause:* Tubercular diathesis, mental depression, poor living, cold, damp, exposure, injuries, strains, blows, calculi, beer or whisky drinking, drastic drugs.

Symptoms: Generally as of fever and constipation, pain over kidneys increased by pressure, sometimes even extends to bladder, groin, or testicles, numbness of front thighs, retraction of testicle, tympanitis, frequent micturition; there may be casts, or blood or pus in the urine.

Treatment: Lobelia emetic; full cæcal flush; alcohol vapor bath, then to bed; cool compress to kidneys; strong revulsive treatment; cooling treatment according to fever; fluid diet. Elderberry syrup for a drink, after inflammation has subsided, or epsom salts one-fourth teaspoonful largely diluted, or peach leaves, one dram infused in four ounces of tepid water. Two ounces every three hours cold.

Inflammation of the Mucous Membrane of the Larynx (acute laryngitis).—*Cause:* Adult male sex, inhalation of hot or acrid substances, abrupt exposure to excessive changes of temperature, sometimes in typhoid fever, small-pox, etc. Predisposing cause, depression of the great sympathetic; very dangerous. Symptoms: Rigors, high fever, fauces red and swollen, pain over cartilaginous part of the throat, difficult breathing and swallowing, soreness, loss of voice, brassy cough, long inspirations, paroxysms of threatened suffocation, face and neck first flushed, then livid, later purple; eyes protruding,

great distress, chest heaves, patient grasps at throat, soon becomes delirious or comatose from non-oxygenation of blood,—duration of disease forty-eight to seventy-two hours. Treatment: Most heroic as for croup, and secure best medical aid as soon as possible.

Chronic (simple).—Soreness, rawness, redness. Cause: A succession of acute attacks, or extension of chronic pharyngitis, or the same causes that produce the acute. *Symptoms:* (Syphilitic) Copper-colored, dry, huskiness, microbe syphilitica. (Tubercular) Mottled appearance, bacillus tubercle. *Treatment:* Best hygienic conditions, diet nutritive and blood-forming, mouth and throat gargled daily with solution of boroglyceride or permanganate of potassa; spray two or three times daily with terebene, resorcin or menthymos; alterative and tonic treatments strong; compound oxygen daily; neck bandage forty minutes daily, re-wet once; daily water tread; body bandage twice a week.

Inflammation of Liver (acute hepatitis).—*Cause:* Obstruction of bile ducts, or of hepatic and portal veins, mechanical irritation, heat, malaria, drugs, tight lacing, excess of carbonaceous food. *Symptoms:* Generally as of jaundice, with enlargement of liver, inability to lie on right side, high fever and pain worse by pressure.

Treatment: Diaphoretic treatment strong, excernent liver and bowel strong, cooling as needed; copious drinks of hot water; compress of vinegar and water one hour daily; revulsive treatment average to strong; fluid diet. (Chronic hepatitis): Shirt wrap twice a week; hot water three times a day; cæcal flush to secure free bowel movements; china one hour before breakfast, merc. sol. one hour before dinner, lep. one hour before supper, pod. at bedtime; daily bath of warm weak lye, followed with sponging of equal parts of alcohol and water in which forty grains of quinine to the pint are dissolved; plain animal food, milk, eggs, white fish, fruit and vegetables; phosphate of soda used in place of common salt, or white mustard seeds whole, one to two teaspoonfuls in water an hour before each meal.

Inflammation of the Lungs (acute pneumonia).—*Cause:* Cold, wet, inhalation of irritants, mechanical violence. *Symptoms:* Great lassitude, languor, debility, extreme difficulty of breathing, cough, prune-juice expectoration, flushed cheek, rigors, fever with evolution of the pneumococcus: called lobular when confined to one lobe; single when confined to one lung; double when both lungs are affected; pleural when the pleura is first affected; typhoid when complicated with typhoid fever. Has three stages.—First, congestion; pulse 140 to 160, temperature 105, respiration 40; may continue from a few hours to a week or more. Second, red hepatization; all the symptoms of the first stage together with blueness or lividity of the skin, delirium or coma, strangled breathing; may continue one week or longer. Third, gray hepatization; fever less, heat, pulse and respiration low, rigors, colliquative sweats, almost incessant cough, thick, ropy, tenacious pus; if typhoid complication, tongue buff-leather appearance, very

dry, or beef-red, or red at tip and edges with elevation of papillæ; pulse small, wiry, frequent; diarrhœa, sordes on gums, eyes sunken, nostrils pinched, face white, tympanitic abdomen.

Treatment: Perfect rest in bed, atmosphere kept moist, temperature of 70 degrees; if constipation, enemas; ferrum phos. every fifteen minutes. If with white tongue, mucous white and viscid, kali mur.; with much loose phlegm, clear, frothy, worse in morning, natr. mur.; with wheezing, yellow, loose phlegm or watery mucous, cough in children, kali sulph. Neglected pneumonia, or in acute suppuration, with fetid expectoration, silicia. Revulsive treatment average to very strong; oxygen in some form almost constantly; dripping compress to chest continuously; fluid diet; treat fever as fever.

Chronic Pneumonia: General tonic and alterative methods; if consumptive symptoms appear, treat as consumption.

Inflammation of the Mouth (stomatitis).—*Cause:* Unsanitary modes of life, insufficient or deleterious food, over-crowding, infection. Three forms; first, follicular. Little blisters on the lips, cheeks, gums, fauces. Second, ulcerative, when the blisters break. Third, gangrenous, when the ulcerated patches deteriorate instead of improve. *Symptoms:* Copious saliva, fetid breath, mal-assimilation, restlessness, fever, loss of appetite, offensive stools; the patches first dirty yellow slough, later purplish with pulpy, gray matter; still later gums spongy, teeth loose.

Treatment: Wash mouth and gargle throat every hour with teaspoonful of a saturated solution of boroglyceride in half a tumbler of sage or thyme tea, and internally every three hours five to ten grains of resorcin in water, or a few drops of peroxide of hydrogen; blood-making diet. Or, in place of the above, for redness and heat, ferrum phos.; white ulcers and fetor of month, kali mur.; ashy gray ulcers and fetid breath, gums bleed easily, kali phos.; for salivation, natr. mur.; peeling of lower lip, kali sulph.; anæmia, and pale, painful gums, calc. phos.

Inflammation of the Nails (onychia).—*Cause:* Mechanical injuries, broken down states of the constitution. *Symptoms:* Suppuration at the root with a foul ulcer spreading in all directions.

Treatment: Drip solution of hot permanganate of potassa on it night and morning; poultice with linseed and yeast in the intervals, or wash out with peroxide of hydrogen and dress with the same mixed with one or two parts of glycerine; nutritive diet; tonic and alterative treatment.

Inflammation of the Nose, see acute catarrah.

Inflammation of Pituitary Mucous Membrane (traumatic rhinitis.)—Much like acute coryza.—*Treatment:* Frequent sprays of alkaline solutions for cleansing, and wear plugs of absorbent cotton to protect from irritants; general alterative and tonic treatment.

Inflammation of the Parotid Gland (mumps).—*Symptoms:* Those of fever with pain and swelling over one or both parotids, stiffness of jaw, soreness in swallowing. *Treatment:* For the swelling, kali mur. every one-half hour to every two hours; if there is fever, ferrum phos. in alternation; with much saliva, or swelling of testicles, natr. mur., or swelling of breasts or testicles apis. mel.

Inflammation of the Pleura (acute pleuritis).—May be acute, sub-acute, or chronic; on one side or both. *Cause:* Exposure or fractured ribs. *Symptoms:* Those of mild pneumonia with a stitch or catch in the side, aggravated by expansion of the lung, coughing, moving or lying on affected side, or by pressure; frothy expectoration, friction sound to be detected by the hand over the affected place; may end in dropsy of the chest or emphyema. *Treatment:* Treat as for pneumonia with the addition of a flannel bandage pinned every inch from the armpit to the lower rib so as to prevent motion of the ribs.

Chronic Pleuritis: Alterative and tonic treatment; excernent treatment average to strong; applications of pustulent lotion every day or two until the catch is no longer felt.

Inflammation of Peritoneum (peritonitis).—*Predisposing Cause:* Depression of the great sympathetic. *General Cause;* Severe parturition, abortion, exposure to cold and fatigue after confinement or during menstruation, or by fluids thrown into the womb, finding their way to the peritoneum; injury. May occur in the course of Bright's disease.

Symptoms: May have a gradual onset, first abdominal pain and soreness, or it may come on suddenly being ushered in by a chill; a burning lancinating pain over the abdomen increased by deep inspirations, and the respirations shortened and increased in frequency; any movement or pressure of bedding causes intense pain; patient lies on back with legs flexed; vomiting, may be stercoraceous; bowels generally constipated; temperature raised, pulse small, wiry, quick, face drawn, mind clear, sometimes retention of urine.

Treatment: Most constant and persistent. Call physician soon as possible. Meantime empty the colon thoroughly with luke-warm cæcal flushes. Then wrap the feet to the ankles and the hands to the wrists in coarse cloths wrung out of vinegar and water equal parts and covered with three or four thicknesses of flannels. Re-wet every hour. Place a rubber under the patient, and with as long a tube as can safely be inserted, run a continuous flow of water five to ten degrees below the temperature of the body into the colon, and let it find its own exit to the rubber and thence into a pail below. At the same time keep a dripping compress of vinegar and water same temperature all over the abdomen. Ferrum phos. every one-half hour. Keep up the dripping compress and inner flow resolutely until the inflammation yields, then discontinue gradually. Sustain with very small portions of bovinine or nutritive beef tea. In convalesence feed very cautiously a liquid diet.

Inflammation of the Rectum (rectitis).—*Cause:* Violence or foreign bodies in the bowel. Treat as dysentery.

Inflammation of the Retina (retinitis).—*Cause:* Vivid light. Seek the best medical aid immediately.

Inflammation of the Stomach.—See gastritis, acute.

Inflammation of the Spinal Cord (myelitis).—*Cause:* Blows, shocks, microbial diseases.

Symptoms: If located in the cranial portion, convulsive movements of head and face, inarticulate speech, difficult swallowing, spasmodic breathing, paralysis. If in the cervical portion, difficult breathing, impossible to raise the head, pricking in arms and hands, paralysis of arms. If in the dorsal portion, pain over affected part, or pricking in fingers and toes, great difficulty of breathing, paralysis of arms and legs.

f in the lumbar portion, paralysis of lower extremities, abdominal pain, corded sense about the body, first retention then incontinence of urine, involuntary stools; wherever located, pain increased by pressure. *Treatment:* Seek best medical aid immediately. Meantime, give strong revulsive treatment, and sustain with fluid diet.

Inflammation of the Tonsils (acute tonsilitis).—*Predisposing Causes:* Constitutional weakness, tubercular tendency, mercury and other poisons. *Exciting Causes:* Cold, damp, cold drinks when body is warm, changes of temperature. May be in one or both tonsils, or in one then in the other as the first gets better. The tonsils are composed of follicles or secreting sacks bound closely together and ending in about fifteen ducts which discharge their lubricating fluid. Three stages: 1st, inflammation of the outer surface; 2d, more deeply seated well down the ducts; 3d, the whole structure inflamed.

Symptoms: First, languor, debility, chills, pressure, and stinging in parts, difficult to swallow, pain in eustachian tube, stiff jaws, fever, loss of appetite, hawking and spitting, tonsils swollen. Children may be delirious; lasts three to six days. Second, follicles involved, discharge offensive, symptoms same but more severe, deafness sometimes, temperature 102 to 103, tenacious, partly opaque mucus over the parts, fixed, oval, yellowish spots on membrane; lasts five to eight days. Third, when inflammation reaches the tissues of the glands the symptoms are still worse; suppuration in a few days, lasts indefinitely, but usually relieved as soon as it discharges. Distinguish from scarlatina by absence of strawberry tongue, exposure, absence of rash, etc. Distinguish from diphtheritic sore throat by the ovoid form of the patches instead of the roundish, very white and spreading patches distinctly upon the surface and soon elevated above it as in diphtheria.

Treatment: First, keep in room; hot colon flush; compress of cold mullein tea on throat well covered with flannel; hot lemonade freely as a drink, hot foot bath; inhale hot vapor every few hours. Second, keep in bed in warm room filled with vapor of vinegar water, one part to four; head vapor bath daily; frequent gargles of hot milk alternated with tepid gargles of sage tea with ten grains chlorate of potash to the ounce; hot colon flush and hot foot bath; over the tonsil put a plaster of lard thickened with lobelia powder, over which and enveloping the throat, continue the mullein compress; diet of milk, bovinine, clam juice, beef tea, etc. Third, if throat is dull red, inhalations of camomile steam and continue treatment as in No. 2; if pain becomes throbbing, change the compress to linseed meal poultice, and when the abscess points, *i. e.*, shows a yellowish ovoid spot soft to the touch, give a smart lobelia emetic to break it and eject its contents. Use camomile and peruvian bark tea all through as a tonic. Follow the discharge with gargles of peruvian bark and golden seal, alternated with gargle of permanganate of potash four grains to the ounce. The attending fever should be treated with full, warm baths, or sponging under the bed covering at such temperature as will not cause chills, lemonade drinks and tincture aconite seven drops in a tumbler of water, dose one teaspoonful every one, two or three hours, according to the fever.

Inflammation of the Tongue (glossitis).—*Cause:* Usually some irritant poison. *Symptoms:* Those of intense inflammation. *Treatment:* Very thorough cæcal flush; diaphoretic treatment, especially jaborandi; fever symptoms treat as fever.

Inflammation of Veins (phlebitis).—*Cause:* Infection from the germs of puerperal fever, erysipelas, pus and venereal diseases. *Symptoms:* Pain in the course of the veins, veins thick, cordy, swollen, red,

rigors and flylng pains in body, irritant fever; veins may suppurate; may cause embolism. *Treatment:* Suction and cauterization of the wound; leeches along the engorged vein; follow with hot fomentation of permanganate of potassa or peroxide of hydrogen; or, paint the vein with creosote, then poultice with tincture of iodine in lime water, belladonna to keep the blood fluid, or permanganate of potash; rapid blood-making diet, and seek best medical aid as soon as possible.

Influenza.—Infusorial catarrh, the disease-germ amœba enters the blood and gives rise to languor, debility, fever, colic, diarrhœa, dysentery, bronchitis.

Symptoms: Besides severe nasal catarrh symptoms, sore throat, nervous disorder, fever, very high temperature, great depression of the heart, and distress in breathing from accumulation of carbonic acid in blood; expectoration slight at first, then stringy, often bloody; bronchitis, pneumonia, pleurisy, gastritis, neuralgia, nausea, vomiting and diarrhœa are common complications.

Treatment: If vigorous, sponge bath of vinegar and water every hour and remain in bed in the intervals. Add diaphoretic method strong as can be borne without debilitating; particularly jaborandi. If feeble, warm baths, heat to feet, strong antiseptics, iodine, sulphide of lime, etc., in room, air kept moist. Peroxide of hydrogen and glycerine equal parts, internally one-half to one teaspoon three to six times a day; cactus grand. for heart; kali phos. for nerves. Menthol sprays of one to ten per cent. in fluid vaseline often beneficial. Compound oxygen inhalation gently, two or three inspirations every hour through the nostrils, water in inhaling bottle being kept warm; avoid breathing cold air or sleeping in cold room until recovered. Fever diet; treat complications as they occur. Alterative and tonic methods in convalescence very thoroughly.

Insanity.—That condition of mind in which the impulses irresistibly override the restraining faculties of will, judgment, reason and conscience, or in which certain feelings, affections or impulses are perverted, but with power of correct reasoning on other things, or in which there is a general wreckage of intellect, and madness or vacuity supervenes. *Cause:* Predisposing; inheritance, nervous shock, brain disease: exciting; anything that tends to weaken the regulative faculties.

Symptoms: *Delusions: i. e.*, False beliefs relating to something that has a real existence, as that of the possession of a royal title, etc. *Illusions: i. e.*, False interpretation of the true reports of the senses, *e. g.*, a reed is a scepter, etc. *Hallucinations:* False reports of the senses, *i. e.*, things are heard or seen that have no existence. *Actions against self-interest*, with no justifying motive; as indecent exposure, self-mutilation, suicidal attempts, acts of violence against others, or

as in pyromania, to set things on fire. *Mania:* Delirium, or violent actions and words. Kleptomania and monomania are mild types of this kind of insanity. *Melancholia:* Woe-begone feelings and expressions, delusions of the most depressing nature, as that of having committed the unpardonable sin, etc.

Treatment: If *predisposition* is known to exist, promote the general health by the hardening, secernent, excernent and nutritive methods, and specially guard against all exciting causes. If insanity is *already established*, removal of the exciting cause, sleep, mental rest or diversion, nutritious food, and the normal action of the excreting organs, are the objects to be secured by the best means within reach until competent medical supervision can be secured. Warm baths, sometimes full packs; sulfonal if ladies' slipper or scull-cap prove too weak to secure sleep.

Insomnia (sleeplessness).—*Cause:* Either a hyperæmic or anæmic state of the brain, transient, or more or less permanent.

Treatment: Remove the cause. Secure the best conditions of sleep. These are perfect quiet, or monotony of sound, like the surf; fatigue to some extent, but not enough to induce fatigue-fever, darkness, satisfied appetite, freedom from pain, warm extremities, favoring position. This should be on the right side, so that the heart can recline on the middle lobe of the right lung as on a cushion without cramping the other lobes, and the pyloric orifice of the stomach allow ready passage of the food into the duodenum; head slightly drawn down on the pillow, which should compress only to a thickness corresponding with the distance from the neck to the point of the shoulder, to give free action to the respiratory muscles and throw the stomach and liver downward and relieve the diaphragm from pressure; the right arm by the side and the left on the thigh, and every joint flexed enough to insure unobstructed flow of arterial blood, and no joint resting on another so that the flow of venous blood be unchecked, and the nerves be not obtunded. If *hyperæmic:* there is an over-supply of blood, as from excessive study, reading by a heating gas jet or lamp, congestion of the brain, etc. Warm water to the head, allowed to evaporate freely, heat to the feet, general revulsive method as needed. No reading or study in the evening. Ferr. phos. Un-dry cold sponge bath daily. Nerves tend to sleep by absorbing more water than when active, therefore a tepid or warm full bath at bed-time. If *anæmic;* blood-making diet, alterative and tonic methods average to strong, kali phos. A little liquid food at bedtime. Further treatment needed, see neurasthenia. Sulfonal if positively necessary. The blood stimulates the nerves in waking hours and *feeds* them during sleep, therefore sleep much in anæmic conditions. If with *spasmodic twitches*, mag. phos.

Sleeplessness of Children.—Coffea and bell. in alternation. With flatulency and green stools, cham. If from overloading stomach, ipecac and pulsatilla.

Intestinal Obstruction (invagination or intussusception).—*Symptoms:* Sudden, severe, persistent colicky pain, remitting, then returning again and again, vomiting, tenesmus, constipation or diarrhœa, hemorrhage; diagnosis difficult. *Treatment:* Place patient with hips high and shoulders low, and give three quart enemas of mild lobelia tea lukewarm, or catnip tea with boneset and lobelia; pressure upon the anus

and kneading of the abdomen; retain three or four hours. Call physician.

Ivy Poisoning.—See poisoning.

Jaundice is marked by a yellow skin, with or without itching; sweating is frequent, pulse slow, irritability and depression, secretions colored with bile and stools clay-colored, while hemorrhage may occur as tiny spots under the skin.

Cause: Obstruction to the gall duct, as the pressure of foreign bodies, or a swelling and inflammation of the duodenum, stricture of the duct, tumors pressing upon it, fæcal accumulations and the pressure of a pregnant uterus. May occur without obstruction, as in acute yellow atrophy and the poisons, as of malarial typhoid fever, blood poison, etc.

Treatment: Exercise 13 *a*, drawing in a deep breath as body is bent forward. Wear over the gall ducts an ointment made by stirring into lard as much pulverized lobelia seed as it will hold and remain an ointment. Retained enema No. 7 or 9 twice a day. Colon flush No. 10 every other day. Nightshirt wrap twice a week, sponge bath daily. Diet mainly of green vegetables, fruits and cold water, and very sparing. Further treatment should be directed to the cause. For obstructive, use kali mur. and nat. mur. or, fl. ext. of hydrangea thirty drops twice a day, or chloride of ammonium twenty grains in water every four hours.

Kidney Diseases.—Acute nephritis, see inflammation of kidneys.

Kidneys.—*Chronic nephritis, or chronic Bright's disease,* is a degeneration, or breaking down of the epithelium of the lining membrane of the uriniferous tubes, which chokes them up and obstructs secretion; finally they become either permanently filled or collapse.

Cause: Acute inflammation excited by the micro-organisms of serious diseases, such as scarlet fever, diphtheria, etc. Irritation from the excessive elimination of poisons, such as uric acid, lead, etc., and mechanical irritation from obstructed flow of urine by strictures, enlarged prostate, cystitis, tumors and pregnancy, and from valvular disease of the heart.

Symptoms: General languor and debility perhaps for years, then loss of flesh, prostration, vertigo, spots before eyes, noises in ears, uriniferous skin, pearly conjunctiva, large flabby tongue, feeble pulse, cold extremities, weight and may be pain in kidneys; urine free, copious, pale, albuminous, and of low specific gravity; towards the end may be scanty and high; dropsy, blood loaded with urea, its walls degenerated and arteries narrowed; casts, dyspepsia.

Treatment: Unload the blood through the lungs, skin and bowels, and leave the kidneys as little to do as psssible; flannel clothing day and night; tepid baths daily; the home Turkish bath or an alcohol vapor once a week twenty to thirty minutes, or a full pack thirty to forty-five minutes twice a week; the respiration tube freely; as much exercise as can be taken without fatigue; nightshirt wrap, cool, cold or hot according to the reacting power, once a week.

The kidneys require rest, protection and innervation. The diet should give these things: Sustain animal heat and force largely by the fats, because they are burned and eliminated in the lungs. Reduce the force foods to the lowest quantity, and select them from those foods that are blood-purifying instead of excessively carbonizing, *i. e.*, the fruits instead of sweets and starches. Give only enough albumen

to maintain the constructive work of the system, and in a form containing little mineral salts and no animal excreta, such as beef tea has: *i. e.*, confine the nitrogenous supply to milk and eggs strictly, and be sure that it is thoroughly oxygenated by deep breathing in the open air, and, if necessary, by the inhalation of oxygen or its absorption in the stomach, or by retained enemas. If the fruit supply be short, entire wheat bread may be used moderately. Keep bowels very active with cæcal flushes at such a temperature as will not irritate the kidneys, which can only be determined by experiment in each case.

The prominent characteristics, albumen, dropsy and uræmia, are mere *effects* that will pass away of themselves upon removal of their causes. A compress of vinegar and water, one part to three, an hour each day on the kidneys, followed by quick ablution of the plaee in cool water. If the innervation be not sufficient from the food alone, add kali phos. in alternation with the calc. phos., and for heat in kidneys, ferr. phos., a dose every one to two hours; for the albumen, calc. phos. four to six times a day.

Neuralgia of.—See neuralgia of kidneys.

Lactation, Deficient.—Use ditania digitifolia.

Laryngitis, Acute.—See inflammation of the larynx.

Laryngismus Stridulus.—Spasm of the larynx in teething infants and neurasthenic females. The cause, in children, is irritation of special nerves; in women, anæmia of the spinal cord. Treatment: Warm alkaline baths, hot fomentations to chest and throat, dry mustard in socks, compound syrup of lobelia freely, nutritive diet and tonic method.

Leanness.—*Local*, as of breasts and chest under collar bones. Dr. Roussel, of Paris, treats successfully by injecting a feeble solution of eucalyptol in olive oil into the localities. Saw palmetto fl. ext. in teaspoonful doses three times a day, and the oil made into an ointment and rubbed on the breasts once or twice a day, is better. Hypodermic injections of bovinine should be tried.

General, when the result of bad assimilation, see malassimilation; when constitutional, no help but easy living, gradually inducing the lymphatic temperament.

Lightning Stroke.—Excite breathing by a dash of cold water. This failing, resort to artificial breathing, as in drowning. Then perfect rest, gentle stimulants, bodily heat kept up by hot applications. Special injuries should be treated according to their nature.

Liver, Diseases of.—The symptoms of *cancer* in the liver are those of liver and stomach ailments, pinched features, dejected expression, no fever, liver hardened and irregular, pains increased by pressure; death certain within a year.

Congestion of the Liver.—Symptoms same as for enlargement, with probably some jaundice.

Treatment: For *acute* cases—injection of one pint of warm water, a tablespoonful of epsom salts and one ounce of sweet oil. As soon as it has passed off, give a lobelia and composition emetic, and follow it with a warm bath and hot teas until perspiration is free. Ferr. phos. every twenty to sixty minutes. Kali mur. if tongue is white and stools light. Kali phos. if nerves are depressed. Nat. sulph. with green evacuations and sallow skin. Nat. mur. if with jaundice. After first day, the emetic, flush and bath as often as needed to keep up their general effects upon the system without weakening the patient. Fluid diet.

Chronic Congestion of the Liver.—The emetic, etc., every week or second week. The appropriate medicine three times a day. A liver pack of vinegar one-third and water two-thirds, half an hour daily. Drink hot water four times a day. Sponge bath daily. Diet free from sweets and starches, the carbohydrates being supplied in cooked fruits.

Enlargement of Liver.—*Symptoms:* The early stage is like indigestion; later, loss of flesh, strength and appetite, pains about liver or right shoulder, and tenderness on pressure. Treat medically as for congestion of the liver, with occasional baths, etc.

Liver, Fatty, is due to infiltration of the liver cells with globules of fat. Cause: Wasting diseases, overfeeding, alcohol, acute phosphorus poisoning. *Symptoms:* None characteristic.

Treatment: If suspected, treat the cause.

Gall Stones.—See calculi, biliary.

Liver, Waxy, amyloid, scrofulous, albuminous, or lardaceous liver. *Cause:* Infiltration into the liver of the products of suppuration from some other part. *Symptoms:* Dyspepsia with diarrhœa, urine pale, increased and albuminous, emaciation, anæmia, enlarged spleen, short breath.

Treatment: Cure the causative suppuration. Tonic treatment strong, with hygienic measures. Diets No. 12 or 13, or the more solid diets that are destitute of starch, fat and sugar. Inunctions of vegetable oils. Excernent and secernent methods, as the case requires.

Locomotor Ataxia.—A disease of the posterior part of the spinal cord. Can be treated only by a physician. Usually deemed incurable, but in 347 cases in which Dr. Brown-Sequard's "elixir" was used, 314 were cured or greatly improved.

Lock-jaw (tetanus).—Due to a specific micro-organism localizing in the medulla and extending down the spinal cord.

Symptoms: Headache; in a short time the muscles of the face, neck, jaw, back and abdomen become rigid; there may be paroxysms; sensation and intellect not impaired; great pain; contraction of chest muscles may cause difficult breathing; pulse small and quick; temperature high. Patient often unable to take nourishment, any attempt increasing the paroxysms. Death follows from inanition. Duration usually three to five days.

Treatment: Call physician as quickly as possible. Meantime, give very full cæcal flush of lobelia tea. Follow immediately with a hot bath, thirty minutes, containing a pound of lobelia herb pulverized, and give every ten to twenty minutes a teaspoonful of the following: A heaped teaspoonful of lobelia seeds crushed, the same of the fresh plant, one tablespoonful of American valerian, and the same of powdered capsicum in half pint of brandy; shake well and settle. Should the bath not be practicable, apply cloths wrung out of hot lobelia tea to chest, abdomen and thighs; change frequently and continue until physician arrives, unless spasm breaks; even then, con-

tinue the stomach remedy in smaller doses at longer intervals, and alternate with it full doses of peroxide of hydrogen if possible. Cleanse the wound and inject peroxide of hydrogen, then poultice with tobacco and slippery elm. Keep room perfectly quiet and sustain with nutritive beef tea if possible. As much promptness and energy are required as in a case of hydrophobia.

Lumbago.—Gouty or rheumatic neuralgia in the small of the back, worse by bending the body forward. Cause: Anything that can prevent the proper nutrition of the nerve. Treatment: Tie on a cloth dipped in hot water and vinegar; renew every hour; or apply an ointment of three or four ounces lard, one-half ounce pulv. lobelia and one-fourth ounce capsicum; or give ten drops fl. ext. of gelsemium every four hours, or the negative pole of the faradic current strong, the positive at feet.

Lungs, Bleeding From.—See Hæmoptysis.

Lungs, Cancer of.—Pulmonary carcinoma. Usually secondary to cancers elsewhere. Can only be determined or treated by a physician.

Lungs, Congestion of.—Cause. The active form is arterial, due to violent exercise, great altitude, inhalation of irritants; the passive is venous, due to regurgitation of blood from the heart, obstruction of the circulation. *Symptoms:* Blood-stained, watery expectoration and the symptoms of dropsy of the lungs; sudden, rapid, dangerous. *Treatment:* Revulsive method, average to very strong. Perfect quiet, free ventilation, frequent change of position; fluid diet; ferr. phos. every half hour; call physician.

Malassimilation (malnutrition), words that express a defective appropriation by the tissues of the elements of food and consequent loss of vigor. May be slight, as in mild dyspepsia; or extreme, as in severe anæmia and marasmus. Cause: Anything that lowers the tone of the nervous system. Treatment: When apparently uncomplicated, tonic method according to the case. Treat complications as separate diseases.

Malaria.—See ague.

Mammary Undevelopment.—This is often the case with girls of nervous temperament, especially if the mind be highly cultured. It may result from disease, or want of development of the reproductive system. In any case, it is not only a serious deficiency in the attractiveness of the form, but augurs poorly for success in the possible future maternal func-

tion of nursing her children. No young woman ought to consider herself justified in remaining in this condition, since the proper use of an appropriate massage brush, together with the internal and local use of the serenoa serrulata is almost certain to correct the deformity at a small expense, together with a fair share of painstaking trouble.

Masturbation is the excitation of the genital organs by the hand, by pressure, by friction, or by any means that produces the pleasurable sexual orgasm in either sex. Ignorant nurses practice it upon restless children to keep them quiet, youths upon themselves and others, and even adults resort to it by perverted choice or as a makeshift for the natural intercourse that their instincts crave. If a male calf be castrated while young, he will make the patient, meek-eyed ox; if not until adult form has been obtained, he will become the slow, stupid, lifeless stag—the bull fire, courage and combativeness all gone, although the muscular form will be retained. So of other animals, and so of man. Eunuchs rarely ever exhibit even the average ability of men. The lesson taught by these facts is that the vim, enterprise, aggressiveness of men centers in the sexual system, and that anything that depletes that, robs the man of the noblest possibilities of his nature.

Upon this point such prudish notions have been entertained by most parents that their boys have been allowed to go into the world uninstructed as to the facts of their sexual organism, and the result is that the ranks of civilization are crowded with half wrecks of manhood surviving the innocently acquired and ignorantly practiced self-abuse that has hurried other myriads through the gates of consumption and acute diseases into the other world. It is a sickening and horrid spectacle to the professional observer, and the worst hell that this world knows to its victims.

One of the worst features of the case is that designing villains play upon the fears of these awakened but helpless sufferers, and by magnifying all the bad indications, cause them to almost despair of help at all, then promise all sorts of impossibilities, for the sake of gain.

The real truth is that physical, and, perhaps, mental damage will run all through life, regardless of the repentance of the subject. But, putting the soul right with God, and with all moral relations, confiding in Him for help, and then adding appropriate medical treatment, the majority of cases can so far recover as to reduce the lifelong damage to a small per cent.

We write thus plainly just here because of the tremendous importance of the subject. The possibilities, perils and conquests of manhood circle right about this pivotal point. The evil not only blasts young manhood, but enters the marriage circle with withering power and plants decay upon the very shrine of adult power. Disappointment, disgust, alienation, separation, divorce, or an unnatural constrained partnership without conjugality, are the successive steps that mark the downward progress from the altar to the welcome grave. But this is not all. Children are born emasculated of all the vim and

reserve power of normal childhood, who, if they survive the acute attacks of children's diseases, are nursed along only to slide at puberty, or later, into the many forms of decline that men deem so mysterious, but that God, in mercy to humanity, has established in order, by "the survival of the fittest," to keep virility in the race at all.

Mania-a-potu (delirium tremens).—See alcoholism.

Marasmus.—A disease of the mesentery glands, whose function is to raise the blood discs from white to red. In cholera infantum this function is destroyed and the tissues starved. Treatment: For the diarrhæa, elixir of coto bark ten drops or more each hour until checked. For the marasmus, quebracho fl. ext. one to five drops three times a day. Blood-making diet, inhalations of oxygen.

Mastodynia.—See neuralgia of breast.

Measles (rubeola).—Symptoms: Fever, skin hot and dry; restlessness, rash fourth day; dry, ringing, croupy cough; tongue coated, appetite lost, intense thirst. Rash first on temples, forehead, neck, down to chest and arms, body; suffused eyes, swollen lids, intolerance of light, puffy face, nasal discharge. The rash fades after three or four days, and the skin sheds in bran-like scales.

Treatment: Guard against lung complications. Keep room darkened. Ferr. phos. frequently in first stage, less often later. Kali mur. for hoarse cough and glandular swellings. Kali sulph., with warm covering, every hour, if rash recedes, and skin is harsh and dry. Nat. mur. occasionally for excessive tears or other watery secretions. With these remedies, and free spongings under bedclothes with tepid lye water, there are rarely any complications. Should any occur, treat each as a separate disease. Or, in place of above salts, give Helonine, one granule every hour. Drink cold water freely, a little at a time, and take puls. every two hours. If high fever, aconite in alternation. For sudden recession of rash, bry. and puls.; eruption slow, gels. five drops in four ounces of water, dose one teaspoonful hourly.

Melancholy.—See insanity.

Meningitis.—See brain, inflammation of, and inflammation of spine.

Menopause (change of life, climacteric, turn of life).—Natural cessation of menstruation, usually between forty-five and fifty, generally preceded by irregularity for a year or more. Sometimes attended with flushes of heat, colds, nervous prostration, uterine hemorrhage, and a great variety of unpleasant symptoms. One decisive symptom, viz., an accumulation of fat which often grows to form two distinct prominences on a level in the back of the neck with the two lower cervical vertebræ.

Treatment: More depends upon hygiene than medicine. When medicine must be used, the most mild and quieting articles suited to the case are the best. Avoid mental excitement and heavy labor, coffee and all fermented and alcoholic drinks. A hard bed, early rising and early retiring for the fleshy, but slender and nervous women should sleep all night and after dinner. Avoid wet feet, damp clothing and houses, and close rooms; also avoid sexual intercourse until the period is past. Nutritious diet, flannel clothing, general tonic treatment, change of scene if practicable, if not, change of reading, and, to some extent, occupation. Not often fatal. Fewer women than men die between forty-two and forty-nine.

For constipation, rectal flush of sugar or molasses and water, or of boneset tea, fifteen minutes before stool. Ripe fruits, succulent vegetables and brown bread. If not sufficient, hot cæcal flush twice a week.

For dizziness, headache and flashes of heat, drinks of whey, tepid or warm sponge baths with light friction. A lobelia pill every four or six hours.

For cold feet, cold water tread daily, when there is sufficient power of reaction; in other cases warm foot baths with mustard or capsicum.

For apoplectic symptoms, a retained enema of a teaspoonful of lobelia and lady's slipper. Tepid baths once a week, followed by light friction from the bare hand of a friend.

Milk-leg (phlegmasia dolens).—See parturition, diseases of.

Miscarriage.—See abortion.

Mouth, Diseases of.—For *Aphthæ*, see Aphthe; for *gangrene*, see gangrene of mouth; for *nurse's sore mouth*, see parturition; for *salivation of pregnancy*, see pregnancy, diseases of. In *salivation mercurial*, the gums, salivary glands, mucous membrane of the mouth and tongue become excessively inflamed, saliva and mucous flow sometimes several pints a day, breath fetid, copper taste, may lead to ulceration of the gums, loss of teeth, and even portions of the jaw bone. Use as a gargle every hour one-half teaspoonful of chlorate of potash to an ounce of water.

Thrush is an inflammation of the mouth with curd-like patches, and sometimes extends down the throat, with symptoms of simple inflammation. Attend to the infant's diet; improve the general health; wash the mouth every second hour with one dram of borax to one ounce of glycerine and water, or with one dram of borax in an ounce of strained honey.

Ulcer (canker; cancrum oris). Grayish or yellowish white ulcer with red margin, painful, may be fever. The treatment is the same as for thrush, with the addition of smearing the ulcers, between the other applications, with hydrogen peroxide and glycerine in equal parts.

Mumps.—See inflammation of parotids.

Myopia (nearsightedness).—Wear concave glasses.

Nephritis.—See inflammation of the kidneys.

Nervousness and Nervous Prostration.—Words that indicate different degrees of the neurasthenic condition. Slight nervousness indicates but a transient deficiency in the storage of force in nerve tissues. Needs rest, nutritious diet and general hygienic and tonic measures. Nervous prostration may be practically regarded and treated as neurasthenia. A diet exclusively of wine whey is sometimes appropriate until able to take the neurasthenic diet. This may be aided by the following nutritive enema: Two eggs, one-half teaspoonful salt, one tablespoonful of warm water. Beat well and inject three times a day, one hour after cleansing the rectum with hot water.

Neurasthenia.—A lack of nerve force manifesting itself through the organic functions, as nervous dyspepsia, diarrhœa, vomiting, amenorrhœa, retention of urine, etc., or through the sensory functions, as neuralgia, anæsthesia, or paralysis of special senses, or through the muscular functions in general or local convulsions, or through the psychical functions, as hysteria.

Cause: Degradation of the primary molecules of nutrition of brain and nerve tissue into diseased germs, in consequence of sexual abuse, the use of narcotics, worry, care, excessive brain work, insufficient sleep, social dissipation, unhygienic habits, following the over-developed intellectuality of childhood.

Symptoms: According to the particular functions implicated.

Treatment: In extreme cases, the rest cure, see page 273. For ordinary cases, as much rest, with good ventilation, as can be secured. Begin treatment with a thorough colon flush; massage after thorough sponging with castile soap and water, by a young, vigorous person half an hour twice a day over the entire frame, followed by electricity, faradic current from one-half to three-fourths of an hour twice a day, sponges moistened with salt water, placed about four inches apart and moved slowly up and down the muscles until they fully contract; to be used all over except neck and head. The massage to be gradually increased to five hours a day. Diet: At 5 a. m. a cup of nutritive beef tea with a dyspepsia cracker, to be followed by the first massage and electrical treatment of the day, and those to be followed by oatmeal porridge and cream. Breakfast at 9 a. m.; our toast, soft boiled eggs or broiled beefsteak and our coffee. At 11 a. m. a goblet of milk, kumyss, matzoon or kumyssgen. One p. m. dinner; boiled white fish or chicken, or mutton chop, with bread, fruit and cream. At 3 p. m. lunch as at 11 a. m., followed by massage and electricity, and these followed with beef tea or Mosquera's beef cacao. At bedtime a cup of hot milk or two ounces of grape juice. As patient improves, the lunches can be diminished in quantity, and finally omitted entirely, and the meals correspondingly augmented as well as more varied.

Neurosis.—Any disorder of the nervous system, as hysteria, epilepsy, etc. Treated under the respective names.

Neuralgia.—Nerve pain. Cause: Defective nutrition, overwork, worry, mechanical injury, chemical or disease-germ irritation, exposure to cold; certain diseases predispose to it, anæmia, malaria, etc.

Symptoms: May have chilly feelings and pain first, then sharp, burning, acute pain, increased on exertion. May come in paroxysms. Skin over pain may be less sensitive, or the sensitiveness may be greatly increased. Attacks may be at intervals, or not for a long time.

Treatment: First, of the irritative kind: Locally, fomentations of lobelia and retained enemas of lady's slipper, and lobelia emetic if necessary; warm bath; non-irritating food and drink.

Second, the defective nutrition kind: General nutritive and blood-making methods; locally, rub with hot vegetable oils; retained enema of skull cap; warm clothing; hardening or tonic methods as required; subcutaneous injections of bovinine near the seat of pain; tapping massage, force gradually increased, but not so as to cause pain.

General Treatment: Rest from care and worry. When worse in evening and in heated atmosphere, better in cool, open air, kali. sulph. When cold relieves, ferrum phos. When heat relieves, and cold aggravates, magne. phos.; but with excess of tears, natr. mur. In anæmia, sensitive to light and noise, relieved by gentle motion or pleasant excitement, kali phos. Night periodical neuralgia with crawling coldness, numbness, worse in bad weather, calc. phos. With white tongue, kali mur. As a general application, menthol crystals one dram, oils of cloves and cinnamon twenty drops each, alcohol four ounces, applied locally.

Neuralgia of Anus.—Commonly from fever or irritable ulcer, or reflex from some genital disturbance. Treat the cause.

Neuralgia of Breast (mastodynia).—*Cause:* Corsets, reflex from irritation of the genitals, occupation. Treat the pain according to the general methods specified under neuralgia; remove the cause; general tonic and alterative methods.

Treatment: One teaspoonful of fl. ext. of passiflora every three hours, and tinct. of oats ten to twenty drops every three hours. If necessary apply chloroform, aconite and belladonna liniment, or belladonna plaster. Locally fomentations of lobelia, or menthol mixture, as in neuralgia.

Neuralgia, Cervico-Tracheal.—Treat medically as for cervico-occipital. Electrical: Treat through and through both ways, light current five minutes, then hands holding negative, treat affected parts with positive ten minutes.

Neuralgia, Cervico-Occipital (upper part of the neck and base of the brain).—Tincture of oats ten to twenty drops in hot water every three or four hours for the anæmic variety. For the irritative cool compress locally and hot foot bath. Electrical, negative at base of spine, dampen hair and treat with positive over seat of pain and around the ears very light current fifteen minutes. For the anæmic reverse the currents.

Neuralgia of Coccyx.—*Cause:* Blows, fractures, horseback riding, parturition. *Symptoms:* Pain and soreness on sitting down and rising, in walking, defecating, or any pressure on surrounding parts. *Treatment:* Nutritive diet; alterative and tonic methods; bowels opened with colon flushes; warm hip baths; retained enemas of lady's slipper.

Neuralgia, Crural.—Medically, as in sciatica. Electrically, sponge electrode, negative pole, upper outside of thigh, positive pole from inside of upper thigh down, move negative down and treat through and through. 2. Treat as No. 2, in sciatica.

Neuralgia of Ear (otalgia).—Rapid blood-making food. Thermo-ozone battery.

Neuralgia, Facial (tic douloureux).—Treat the pain as for cerebro-occipital; or thermo-ozone battery; or aconite seven to ten drops in six ounces of water, dose one teaspoonful every twenty to sixty minutes; or citrate of caffeine.

Neuralgia of Heart.—See angina pectoris. Diet Nos. 21, or 32, or 43, r 48, etc.

Neuralgia, Hemicrania.—One side of the face. Treat as facial.

Neuralgia, Hysterical.—Fomentations of smartweed; internally ea of smartweed and lady's slipper, or valerian steeped, an ounce of he dry herb to a quart of water, without boiling. Dose one-half cup very one, two or three hours.

Neuralgia, Intercostal (pleurodynia).—Paint with menthol one unce, alcohol one ounce, oil of cinnamon thirty drops. Electrical: negative at base of the spine, treat affected side with positive pole, en to twenty minutes. Or, if there be anæmia, apply the negative to he side, and use tonic method.

Neuralgia of Kidneys (nephralgia).—Fomentations of hops locally; æcal flush of lobelia tea.

Neuralgia, Rheumatic and Gouty.—Salicylate of quinine in six grain doses, two or three times a day.

Neuralgia, Sciatic.—Neuralgia of the sciatic nerve. Medically reat as rheumatism. Electrically, first negative at feet, treat from eet all over. Second, negative at heel of affected leg, treat locally. Rub sulphur daily into the underclothing over the locality.

Neuralgia of Stomach.—See gastralgia.

Night Sweats.—Hot sponge bath, or inunction of quinine two drams, oil of cinnamon one dram, lard four ounces. Apply with brisk friction.

Nipples, Excoriated.—Tannic acid and glycerine one part to four, applied frequently.

Nipples, Fissured.—Calc. fluor. three times a day, or balsam peru one-half dram, tincture arnica one-half dram, almond oil one ounce, lime water one-half ounce. Apply locally.

Noises in Head.—From blood pressure, inflammatory states, ferrum phos.; with stuffy sensation, swelling of eustachian tubes, kali mur.; in watery conditions, natrum mur.; with weakness, confusion, general exhaustion, and for the aged, kali phos.; ears open at times with loud report, silicea.

Nose Bleed.—See epistaxis. Mustard over the stomach and on the calves.

Nose, Red, not alcoholic. Bathe it in hot five per cent. solution of boric acid.

Nostalgia.—See homesickness.

Obesity.—Obesity is of three kinds: 1. Caused by too much fat in the food, which is incompletely oxidized in the system—over-fed corpulence. 2. Fatty degeneration in which the normal tissue is replaced by deposits of fat—diseased corpulence. 3. The retention in the system of water, the unused products of digestion, and the broken-down tissue which should be expelled—cloister corpulence.

Certain physiological facts are observable in corpulence. The blood vessels are smaller than the normal average, and pulmonary respiration is below medium; short breath; spasmodic respiration and suffocation result when pushed. Hence cutaneous respiration is more imperative, and ability to wear warm clothing correspondingly diminished. Hoarseness, tendency to sleep and disinclination to activity are marked. Digestion is frequently very rapid and there is a strong desire for meats. There is special danger of heart affections and apoplexy. In some cases corpulence persists, even on almost a starvation diet.

Causes: In determining these regard must be had to two facts: (a) Cloister corpulence is the direct result of insufficient oxygenation; (b) over-fed corpulence is often the result of a constitutional tendency by reason of which it is overfed, even though the real supply be less than the average. (c) Diseased corpulency may be the final product of either of the others. Of two monks, both on the same abstemious diet, one will remain spare and become almost shadowy, while the other waxes to enormous proportions. Our explanation is this: By constitutional tendency the respiratory process in some cases may be underoperative in the presence of conditions that make it normally active in others. In both cases, therefore, whether overfed or under-oxygenated, constitutional tendency is the prime cause. But what is constitutional tendency? There are three kinds of nutrition, viz.: (1) Heat and energy nutrition, which keeps up the animal heat and supplies working power; (2) reparative nutrition, which replaces the wear and tear of the system; (3) growth-nutrition, which adds to the amount of tissue—normally confined to childhood and youth, except as seen in the healing of wounds by new tissue. By constitutional tendency in the overfed, we mean the growth-nutrition of childhood perverted and excessive in childhood, or perverted and prolonged beyond childhood, the perversion consisting in the assimilation of fat mainly, instead of fat and bony and muscular tissues in due proportions. This tendency is sufficiently accounted for in all cases of obese inheritance, but when it originates in the individual, to explain it would require a careful scrutiny of all the dietetic, respiratory and active forces of his childhood.

The Cure must be considered under two aspects, viz: (1) That which relates to the constitutional tendency, and (2) the merely incidental—*i. e.*, diet and hygiene. Suppose a child abnormally fat were to be treated. Obviously the thing to be done is to exalt every other vital function than that of fat production until the proper balance becomes normal and continued; then the perversion has ceased. Those vital functions are other tissue production, tissue metamorphosis and elimination. The adult in the same condition has only perpetuated that perversion of growth-nutrition beyond childhood and needs precisely the same treatment, *with the added vigor necessary to overcome an established physiological habit.* But, as these vital functions are best exalted by what we have termed the incidentals of diet and hygiene, so both may be embraced within the incidentals.

Diet. Breakfast: Five ounces of lean meat or the yolks of two eggs, two ounces of stale bread or toast with a little butter, tomatoes, radishes or lettuce and a cup of clear coffee.

Dinner: Seven ounces of lean meat or fish, spinach, string beans, beet tops, cabbage, asparagus, onions, cauliflower, celery, cresses, squash, turnips and cooked tart fruits as desired, rice or macaroni three ounces, lemon-water sparingly if urea is in excess, and plentiful if it is deficient.

Supper: Yolk of an egg or one ounce of lean meat, two ounces of stale bread or toast with butter, four ounces of grapes, oranges, cherries, berries or sour apples and a cup of clear black tea. Avoid fat, thick soups, sauces and spices, hominy, oatmeal, white and sweet potatoes, beets, carrots, starches, parsnips, puddings, pies, cakes, all sweets, milk, water if urea is in excess, alcoholic drinks, malt liquors, wines and cider. If necessary, eat but one article at a meal.

Hygiene: 1. Air of purest quality and in largest measure; systematic out-door exercise, the most violent and long continued that prudence will allow, with all necessary out-door rest intervals. Liebig held that obesity consisted in a "want of equilibrium between respiration and nutrition," therefore, help respiration up and put this kind of nutrition down. In other words, deepen respiration, which burns off the fat and removes solids from the body. Once every hour stand with hands pointing upward and fingers extended, then rise on tiptoe and stretch every muscle from toes to finger tips in the effort to reach higher. Once every hour stand on the right foot, take a deep inhalation and strike with the fist of the right hand straight out from the shoulder three times before expiration. Rest one minute and in the same way strike with the left. Repeat two to six times. These exercises will be useless if taken in corsets or tight dresses. For this purpose any dress is tight that prevents the fullest possible expansion of the short ribs. 2. Much perspiration by forced exercise in warm garments, followed by sponging off with cold water, two or three times a day. This exercise should be taken regularly, and may consist of a rapid walk, gymnastics, wood-pile, wash-tub, or anything that excites free perspiration and that can be repeated at the same hour every day. If the obesity be considerable, before resorting to any violent exercise a physician should be consulted, to be sure that the case is not diseased obesity, for if so, no self-treatment is safe. 3. Bowel cleansing three to seven times a week. Take two to four quarts of hot water, containing one to two drams of phosphate of soda, inject at bedtime and allow to pass off with the help of bowel kneading and shaking. 4. Take hot vapor bath once or twice a week. 5. Medication. For foul tongue, three doses a day of fluid extract of bladder wrack is very helpful, but the medicine should not be relied upon to the neglect of the other parts of the treatment. Fluid extract of poke berries is also very efficient, but either medicine should generally be dosed by a physician to suit the case.

Obstruction of the Bowels.—Complete stoppage of the passage. *Cause:* Strangulated hernia, permanent stricture, inflammatory adhesions to walls of abdomen, or of the inner coats of the bowel, tumor, impacted feces, solid concentrations of chalk, magnesia, etc., intussusception, and spasmodic stricture.

Symptoms: Colicky pain, increased by pressure, vomiting, tympanites, feeble pulse, haggard look. Difficult to distinguish any of the last four causes from the others, but these four only can be treated without physician; hence *always* secure one immediately. If this cannot be done proceed as follows:

Treatment: If of the rectum or colon repeated flushes of sweet oil two ounces, molasses four ounces, and milk one pint warm. If of the small intestines, first clear the colon its entire length, then foot of bed raised ten or twelve inches, inject warm sweet oil as much as possible, and gently knead the locality of the ilio cæcal valve until a portion passes into the small intestines, then knead gently all around the navel and gradually up toward the stomach. Retain it two or three hours, if practicable. Then when the obstruction seems to be softened give four to six ounces of sweet oil by the stomach. Or, give enemas of peroxide of hydrogen one to three teaspoonfuls in flaxseed tea. This generates ozone gas, and by expanding the bowel, may relieve the obstruction. These failing, steep fifteen grains of tobacco in one

pint of hot water, and give by stomach or enema one ounce every thirty minutes until nausea and free perspiration. Finally, if necessary, rectal injections of one-half pint to one quart of kerosene oil diluted with equal quantity of warm water.

Overwork Venous Congestion of Brain.—*Symptoms:* Loss of grip on affairs, thoughts slow, despondency, tearfulness, fearfulness, tendency towards melancholia. *Treatment:* Rest, mustard on legs and arms, sleep, recreate. Nutritive diet. Revulsive method more strongly if necessary.

Oxaluria.—Oxalic acid diathesis. The formation of oxalate of lime crystals in the urine, tendency to "mulberry" calculus. *Cause:* Impeded metamorphosis of tissue.

Symptoms: Nervousness, irritability, hypochondriacal, emaciated, pain in loins, irritability of bladder, weakness; these are decisive only when oxalic deposits also occur in urine.

Treatment: Much out-door air and exercise, much cold sponging, food in moderation, excluding all sweets, effervescent wines and beer, rhubarb, apples, and boiling all drinking water if in a limestone region. If necessary, take on an empty stomach three times a day one teaspoonful of permanganate of potassium eight grains, water two ounces.

Ozœna.—Treat as for nasal catarrh, chronic.

Pain.—The cry of a nerve for food, or because of chemical irritation or mechanical injury. *Treatment:* Remove the cause. Never narcotize if relaxation will afford relief. Narcotics, opiates, anodynes, sedatives, all strangle the cry but do not remove its cause. Relaxants open the emunctories and drain off the chemical irritation. The starvation-cry and the injury-cry must have ministration appropriate to the need, not strangulation. There are four remedies of chief importance for the relief of pain in a strictly physiological way, without doing violence to nature. It may sometimes be necessary to resort to narcotics, but it should be clearly necessary, and abandoned as quickly as possible.

Cypripedium Pubescens.—Lady's slipper is a pure *nervous* relaxant, but should never be used in advancing putrescent conditions. Dose ten to thirty grains every four hours.

Eupatorium Perfoliatum.—Boneset, thoroughwort, is nearly a pure relaxant to *muscular and fibrous internal structures*, but should not be used in cold, sluggish states of stomach and relaxed bowels. Used cold it is a soothing and relaxing tonic. Used warm it is a slow and persistent diaphoretic, one ounce to one quart. Dose one to three ounces.

Cimcifuga Racemosa.—Black cohosh is a *peculiar* nervous relaxant, soothing both body and mind. Softens and lowers the pulse, allays *serous* irritations and increases capillary circulation. Should not be used when pulse is depressed, skin cold and tissues relaxed. Dose five to ten grains every four to six hours.

Lobelia is a *universal relaxant*, equalizing the circulation and opening the excretory organs. Should not be used in low, semi-putrescent

conditions. Emetic dose forty to sixty grains. Broken doses two grains or more as often as needed.

First ascertain the kind of structure implicated, nervous, muscular or serous, then administer the remedy indicated by stomach or retained enema, and whatever relief results is curative, not deceptive. The parts are helped, not deadened. For urethral pain, inject mullein oil also, one-half to one teaspoonful.

Palate, Elongation (relaxation of uvula). — Gargle two or three times a day with an astringent, or negative sponge electrode at back of neck, repeatedly touch end of the palate with positive, fifteen minutes. Or paint it with tinct. calendula two drams, and tannic acid sixty grains, glycerine one ounce, three or four times a day.

Palpitation.—See heart, diseases of.

Paralysis.—Partial or complete loss of sensibility or power of motion of a part.

Cause: When there is no apparent cause the paralysis is called functional. Apparent causes are inflammations, disturbances of circulation, new growths, injury, pressure, poisons, as lead, arsenic, etc., infectious diseases.

Symptoms: Inability to use certain muscles. After awhile, from disuse, the muscles may become smaller, or atrophied. There may be anæsthesia or hyperæsthesia of the skin.

Treatment: Hemiplegia, paralysis of one half of the body from the crown of the head down; paraplegia, paralysis of one-half of the body below some point of the spine, and local paralysis, *i. e.*, of some single muscle or set of muscles or limb. Should all be treated upon these general principles, viz: 1. Ascertain if the cause be congestion of the brain, cord or local nerve. 2. If it be anæmia of the brain, cord or local nerve. If congestive, the application of a sponge wrung out of hot water to the spine will give burning pain. If anæmic it will not, and there will be other signs of anæmia. 3. If congestive, apply general revulsive treatment mild, and give a sponge bath under the bedclothes several times a day, rubbing dry with the bare hand. Ferrum phos. every one to three hours, and fluid diet. 4. If anæmic, nutritive and tonic methods, hot local baths alternated with cold, usually a two-fold change, *i. e.*, hot two to five minutes, cold one, hot one, cold one-half, every other day, and on the alternate days apply the muscle beater to the affected and adjacent muscles from five to fifteen minutes. This may be made as follows: Take four sections of rubber tubing fifteen inches long and three-eighths of an inch in diameter. Insert in each a whalebone of about equal length. Now slip one end of all the tubes into a larger tube three inches long, which will serve for a handle. Tie tightly. Strike so as to increase circulation, but not give pain. Give kali phos. every two to three hours, and sleep much. 5. If from lead or mercury, and circumstances forbid a thorough coarse of packs and baths, give five to fifteen grain doses three times a day of iodide of potassa to form an insoluble compound with the poison.

Electricity, selecting the current that gives the greatest muscular contraction with the least pain, is valuable, especially when caused by anæmia. The thermo-ozone battery is probably equally beneficial, and much more safe in unpracticed hands.

Paresis.—The paralysis of the insane. Infrequent, always fatal.

Parotitis.—See inflammation of parotids. Mumps.

Parturition, Diseases of.—

Child-bed Fever.—Inflammation of the uterus and peritoneum. Very dangerous. Call physician immediately. Meantime, as soon as these symptoms appear, viz.: slight chill and great depressions, another more severe, tenderness in lower abdomen, pulse rising, face flushed, pain, on back with knees raised. Move bowels freely with a pint of tepid soap water, and follow with retained enema every hour of an even teaspoonful of lobelia in a little starch water. Also give by stomach a tea of two parts white root, one each of ginger and lobelia in a pint of boiling water.

Dose: Eight tablespoonfuls every fifteen minutes, and treat abdomen, limbs and feet as for flooding. These failing, and breathing becomes short, countenance pinched, nausea, belchings of wind, vomiting of yellowish, greenish or black substance, push the injections, double the dose of lobelia in the tea until free vomiting, then continue in small doses. By so doing life may be saved. An acidulated drink of water one pint, sugar one ounce, and pure hydrochloric acid one dram, or pure nitric acid thirty-five drops, or pure nitro-hydrochloric acid forty drops, is very agreeable and useful. Keep in glass or porcelain.

Colic.—*Symptoms:* Abdomen tender on light pressure, relieved by steady, firm pressure; slight bloating. No fever, headache, or other symptoms of childbed fever.

Treatment: One teaspoonful of magnesia in mint water every four hours; enema of one-half pint of catnip and white-root infusion.

Convulsions, Puerperal.—Occur during and may remain after delivery.

Treatment: Give a tea of blue cohosh, lobelia seeds and ginger equal parts; cayenne half a part, a heaped teaspoonful to a pint of hot water. Dose, two or more tablespoonfuls every ten minutes. If unable to take it by stomach, give an even or heaped teaspoonful of the powder in three ounces of starch water as a retained enema every thirty to sixty minutes. If feet are cool wash them every two hours in strong cayenne water.

Flooding.—*Symptoms:* Fast, soft, fluttering pulse, cold cheeks and nose, pale lips and sighing respiration.

Treatment: Lose no time, whether there is any outward show of blood or not. Call physician at once. Meantime secure firm uterine contractions, and draw the blood to the surface. Combine stimulants and astringents (more of the first than of the last) in a tea for the stomach, of which give one to six tablespoonfuls every three to ten minutes, or give the powdered articles in proportionate doses in tepid or starch water enemas until the tea can be prepared. Same if stomach rejects the tea. The best stimulant is cayenne pepper, but prickly ash bark, black pepper, smart weed or ginger may be used, and dosed according to its strength. The best astringent is bayberry bark, but hemlock bark, sumac bark, raspberry leaves, beth root or witch-hazel may answer. At the same time bathe feet, legs and abdomen with the strongest possible tincture or tea of red pepper, and then wrap in flannel wrung out of hot water, re-wet every ten minutes, with hot bricks to feet and hips. Flooding may be averted by the use of composition tea during the last two hours of labor.

Pericarditis.—See heart, diseases of.

Peritonitis.—See inflammation of the peritoneum.

Perspiration, Offensive.—If of armpits wear daily a compress of pine twig, or hay-flower tea fifty minutes. Night shirt wrap, three times a week. Cold sponge daily, and keep bowels open with cæcal flush.

Petit mal.—A transient, mild form of epilepsy.

Pertussis.—See whooping cough.

Pharyngitis. — Inflammation of the pharynx; sore throat.

Cause: Exposure to cold when overheated; the irritation of much speaking, corrosive fluids, fumes, gases, dust, smoke, etc., the narcotism of tobacco.

Symptoms: Pain, redness, swelling, cough, hoarseness, expectoration, difficult breathing and swallowing.

Treatment: Remove cause. Average or strong diaphoretic treatment immediately. Flannel bandage four thicknesses, wrung out of hot water covered with similar bandage dry. Re-wet every five minutes three or four times, then oil-rub the throat a long time, then wrap in a soft linen cloth wrung out of warm water covered by a dry cotton one. In morning repeat the throat rub. If case is chronic, repeat local treatment every night, and three or four times a week take a hot sponge bath (alkaline) and rub dry with the hands. Inhale steam from a teakettle every evening.

Phthisis, Fever of.—Control as far as possible with water applications and air baths, avoiding antiphlogistic drugs. Apply the principles underlying the treatment of simple fever, using the wraps, baths, etc., at such temperature as is best found to accomplish the object in each case. If any article of diet, mode of exercise or custom increases the hectic, avoid it.

Piles.—See hemorrhoids.

Pin-worms.—See worms.

Plethora.—A morbid increase of the red-blood discs. *Cause:* Excess in eating and drinking, and want of exercise. *Treatment:* Cut down food, increase exercise, or, if that be impracticable take oxygen freely, colon flush daily, alkaline sponge baths daily. No malt liquors.

Pleurodynia.—See neuralgia.

Pleurisy.—Inflammation of the pleura. *Acute. Treatment:* A full, hot bath, then in bed with wet compress on the part and redden the legs with mustard. Not procurable, aconite and bryonia in alternation every twenty minutes, or lobelia tea, one dessertspoonful every fifteen minutes, until pain ceases, then every two hours until well. Feet and hands in hot water and heat to affected place. Harden the system after recovery by cold salt sponge bath daily and a morning foot-tread of cold water; shirt bath once a week; head ablution daily. See also, inflammation of pleura.

Pneumonia.—See inflammation of lungs.

Poisoning.—See poisoning and treatment for in accidents and poisons.

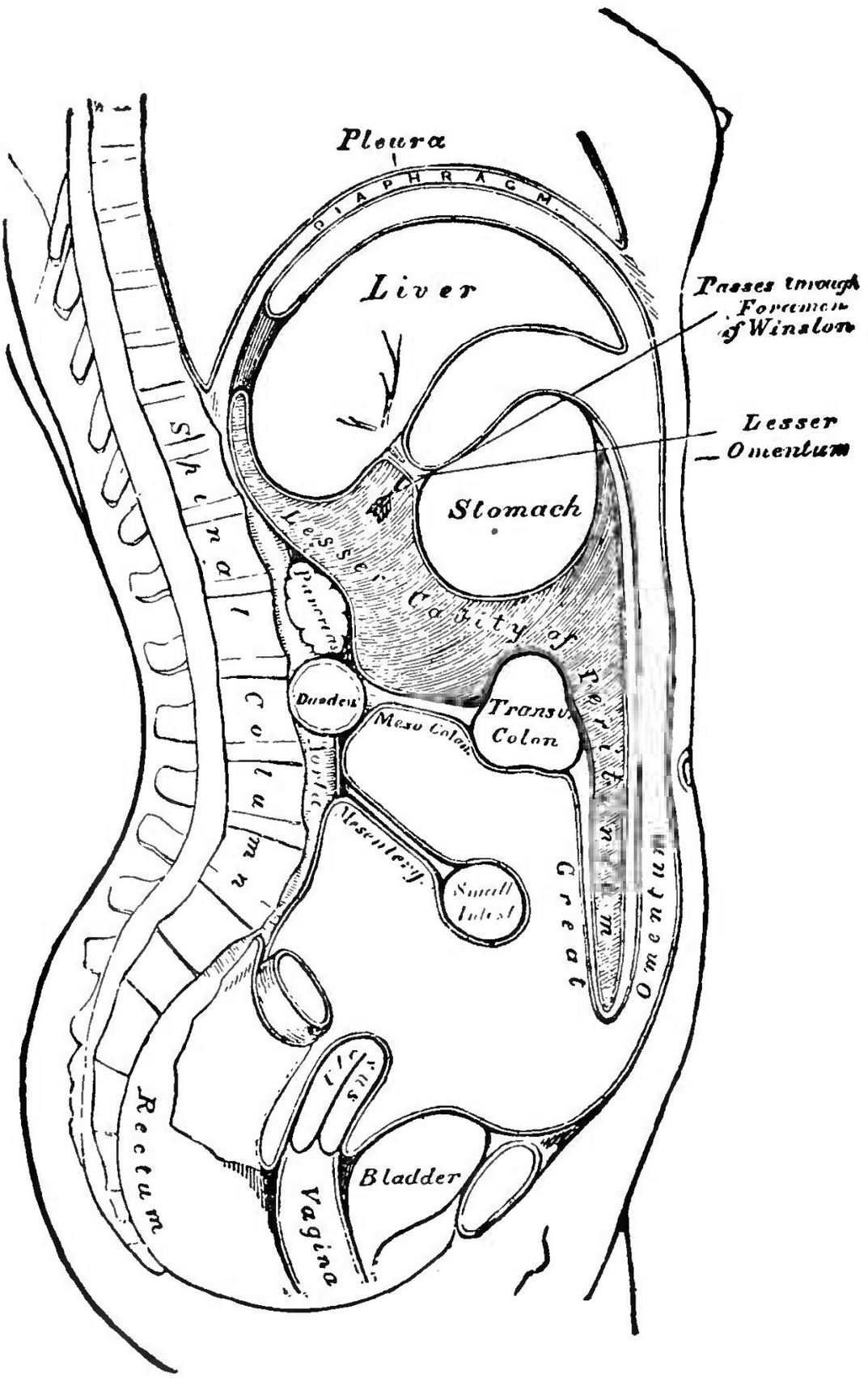
Pleura
DIAPHRAGM
Liver
Passes through Foramen of Winslow
Lesser Omentum
Stomach
Lesser cavity of
Pancreas
Duodenum
Meso Colon
Transv. Colon
Mesentery
Small Intest.
Great Omentum
Sacrum
Rectum
Vagina
Bladder

FIG. 72.

Polypus, Nasal.—Consult surgeon.

Pregnancy, Signs of.—There are none that can be deemed decisive until the sound of the foetal heart can be detected.

Pregnancy, Diet of.—Breakfast and supper largely milk, fruits and eggs. Dinner the best of meats, one vegetable and whole wheat bread. No desserts. Five pints of fluid in twenty-four hours, cold or hot, but none with food as drink. Intervals between meals should not be so long as to cause faintness. A light lunch between is preferable. During the last three or four months omit the meats and live largely upon fruits and whole wheat bread.

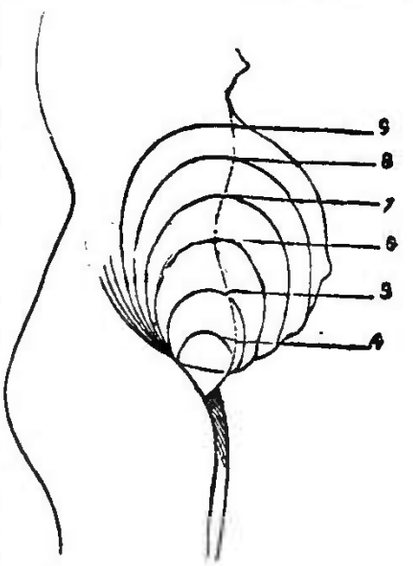

FIG. 73.

Pregnancy, When It Will End.—Count back three months from disappearance of last period, and add seven days. *e. g.* The last closed July 1. Three months back is April 1, seven days added fixes April 7 as the time.

Pregnancy, Diseases of.—These arise mainly from the disturbed innervation caused by the pregnant womb, and by the mechanical effects of its increase in size and weight. Fig. 72 shows the relative size and position of the organs prior to impregnation. Fig. 73 shows the size of the womb at different months of pregnancy. With a form like the Grecian statue, Fig. 74, this difference in size could be easily provided for by Nature, but with the improved (?) modern style, Fig. 75, it is no wonder that it is a state full of perils.

Albuminuria of.—Ten to twenty drops of chloroform four times a day. Calc. phos.

Appetite Morbid.—Eat a natural sufficiency of plain food at meal times only. Drink hot water or hot lemonade when it seems as if food must be taken.

Burning Feet, a barefoot walk in the grass while the dew is on morning and evening.

Constipation.—*Cause:* Too much abdominal clothing, too little on the extremities, restricted deep respiration, and the common use of drugs predisposes the bowels to feel the reflex nervous action from the uterus, or most easily to yield to its mechanical pressure. *Treatment:* In addition to what is said under constipation the following food table by Dr. Stockham will suffice with exercises 3, 12 b. 13 b. c. g. h. and 19, carefully adjusted to strength and condition.

Laxative: Rolled and cracked wheat, bread, gems, biscuit, griddle cakes, crackers, mush from flour of entire wheat, graham flour, granula, bran gruel and jelly, fruit puddings and pies, all fresh acid fruits, bananas, dried figs, prunes and prunelles raw, and stewed dried fruits that contain hydrocyanic acid, peaches, plums, prunes, the best New Orleans molasses, rhubarb, onions, celery, tomatoes, raw cabbage, corn, squash, cauliflower, green peas, spinach, beets, liver, oysters, wild game.

Constipating: Hot and white bread, white crackers, black pepper and spices, pastry of white flour and lard, bread, rolls, dumplings, etc., made with baking powders, cake, custards, salted or dried meats and fish. Smoked meats, poultry, cheese, chocolate, cocoa, boiled milk, tea, coffee, coffee from wheat, corn, barley, toast, etc., beans, potatoes, farina, sago, starch, tapioca, rice, raspberries, blackberries.

Neutral: Lean fresh meats, fresh fish, eggs, raw milk, oatmeal, buckwheat, cornmeal and sweet potatoes.

Cramps.—Reverse the circulation by lying with hips and feet high and head low, or take the knee-chest position, resting on knees and head.

Diarrhœa.—Treat as diarrhœa.

Enlarged Veins.—Bandage as for swollen limbs. Should one be ruptured, bind on it a compress wet in strong oak bark or hemlock tea. Re-wet every hour.

Fainting.—Patient on back with head low: loosen all tight clothing; admit plenty of fresh air, and fan gently; rub chest briskly with rough, dry towel; sprinkle cold water in face. Should unconsciousness be protracted, bathe arms, hands and lower extremities with any convenient stimulant.

Heartburn.—Equal parts powdered chalk, charcoal and blue vervain leaves, mixed; one-half teaspoonful every four or six hours. Or, two ounces golden seal made into half a pint of syrup, add a small,

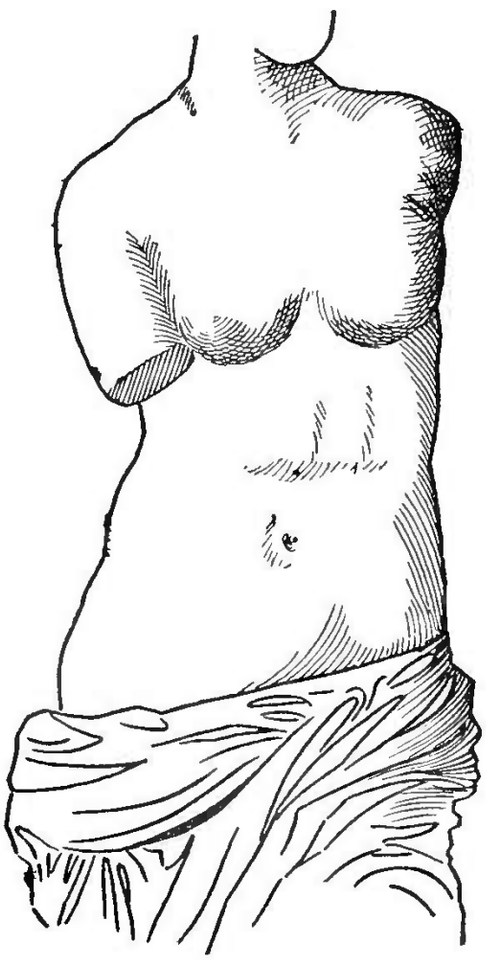

FIG. 74.

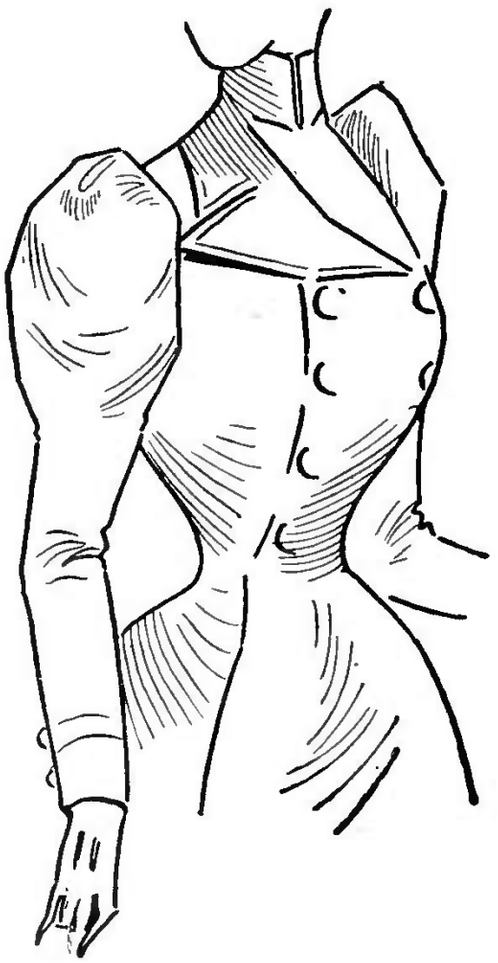

FIG. 75.

even teaspoonful bicarbonate of soda and one-half ounce of the tincture of gum myrrh; one teaspoonful or more every three or four hours. Or, fifteen to twenty drops of aromatic spirits of ammonia in water.

Headache.—*Cause:* Uterine irritation, or indigestion. Irritation—Symptoms, sore pain at base and top of brain, constant, generally worse toward evening and relieved by lying down. *Treatment:* Warm sitz bath daily, hot fomentations to back of neck, recline. Indigestion—treat as indigestion.

Insomnia.—Water tread, or sitz bath 90° with hand friction of spine from neck down. If anæmic or irritable without congestion, drink slowly a cup of hot milk or toast water. If sleep does not come do not care, take it philosophically. Change to a lounge or rug, and call up as pleasant thoughts as possible and wait.

Itching.—If from discharge, treat that. If from inflammation, daily sitz bath, tepid or cool, and cloths saturated with borax solu-

tion one teaspoonful to the quart. If from dryness, apply glycerine upon cotton. If from eruptions, apply upon absorbent cotton tinct. of lobelia two drams, glycerine and alcohol each one ounce, and slowly add two drams of benzoin tincture. If of vulvae, solution of equal parts of borax and alum; or, hyposulphite of sulphur one-half ounce, glycerine two drams, water five ounces, as a lotion; or, cleanse with hydrogen peroxide one part to three of soft water, then dust with Squibb's pure pulverized boracic acid, and keep irritated surfaces apart with absorbent cotton. Replace when they become moist.

Longings or Cravings.—If for articles that are harmless, indulge them to a reasonable extent; if for other things, divert the mind and resist.

Milk Leg (phlegmasia dolens).—An affection of mothers, usually beginning the second or third week after delivery. *Cause:* Thrombosis of the internal iliac and femoral veins, causing obstruction of the veins and capillaries, giving rise to painful hard swelling of the limb, with great prostration.

Symptoms: Total loss of muscular power, pain, fever, great swelling, with hard round cords, fetid flow, arresting or diminishing of milk secretion, profuse perspiration and thirst, and when suppuration occurs probably fatal.

Treatment: Perfect quiet in bed; simple diet; bathe limb, if not very hot, with camphorated sweet oil; if very hot, with lead water six parts and laudanum two parts. Or, foment with one pound of bicarbonate of soda, one-half pound peroxide of hydrogen, and four ounces of poppy heads to a gallon of tepid water, and wrap in impermeable cloths. After inflammation has subsided, bandage thoroughly and give tonic treatment. *Electrical. Acute.* Negative under foot, positive sponge all over the limb moving downward, ten minutes morning and night, light faradic current. *Chronic.* Currents reversed, and apply as hot as patient can bear hamamelis tincture one ounce, to water one pint.

Miscarriage. See abortion.

Morning Sickness.—*Cause:* Biliousness from too much sweet and starchy food, and reflex from irritability of the uterus.

Treatment: For the biliousness plain light diet free from fats and sweets. For the nausea, parched corn coffee before rising. Fomentations of stomach and liver an hour daily, followed by warm or hot colon flush. Small pieces of ice swallowed whole. Iced carbonic acid water. No increase of quantity of food unless a healthy appetite craves it. Wine of ipecac five to ten drops in a glass of water, one teaspoonful every ten minutes; or, five drops tincture of lobelia in the same way; or, if very obstinate, ten to thirty drops of fluid extract of adrue in water, as needed; or, sip water as hot as it can be borne. Digestants are often effective, lacto-peptine, ingluvin, papoid.

Nervous Cough.—Four ounces spikenard root, one ounce each of comfrey and cherry bark, and one-half ounce each of lobelia herb and blue cohosh; mix and pour on one pint of warm (not boiling) water; when cold, add a pint of Madeira wine and one-half pound sugar. One teaspoonful every hour, or oftener. Rest, fresh air and sunshine absolutely necessary.

Neuralgia.—Treat as neuralgia, but giving preference to hot baths, fomentations and magnetic rubs by the hand of a healthy person of congenial temperament and warm sympathy.

Palpitation of the Heart.—During the paroxysms lie or sit down, loosen clothing, admit free air; tea of lady's slipper or scull cap; or lobelia pill every hour; warm foot baths; plain diet.

Pigmentation of (discoloration).—Apply morning and evening of cacao butter and castor oil each two and one-fourth ounces, zinc oxide forty-five grains, oil of rose, sufficient.

Piles.—Live on liquid foods for a few days, and take hot colon flush. Apply externally or inject with a small syringe fl. exts. of witch hazel and mullein each one dram, linseed oil two ounces, or inject a gill of tepid water containing a teaspoonful of powdered elm.

Rigid Abdomen.—Compress of lobelia tea an hour daily, and rub in olive oil.

Salivation.—Drink hot water, or hold in the mouth very cold water. Or wash the mouth with solution of tincture of myrrh, ten to twenty drops in one-half cup of water.

Swollen Limbs.—Apply roller bandages from the toes to above the swelling. Remove nights, and wash the limbs in cold water morning and night. If face is swollen, pale and puffy, seek medical advice.

Urine.—*Inability to retain.* When from the sympathetic irritation of the first period, drink freely of cold tea of cleavers or elm bark, and every six to twelve hours use retained enema of elm and lady's slipper. When from the irritation or pressure upon the neck of the bladder, treat as above, keep bowels open and lie much with hips elevated.

Inability to void. When from spasmodic contraction of the neck, use retained enema of one-half teaspoonful of lobelia herb in elm, and repeat every three or four hours as needed. When from causes unknown, warm hip bath. Also use a wineglassful three or four times a day of trailing arbutus and hair cap moss each one ounce, liquor potassa two drams, warm water one quart. Infuse herbs two hours, then add the potassa.

Vomiting in.—Fl. ext. of hydrastis canadensis twenty drops four times a day; or, the bark from the last year's growth of the peach, filling a tumbler and covered with water. Dose, one teaspoonful after every act of vomiting, and one every hour after it stops; or, a dose of ingluvin after every meal.

For the stomach troubles of the last six or eight weeks of pregnancy five grains of papoid three times a day.

Vomiting of Blood.—Lie down, cover well; heat to feet; bathe extremities (if cold) with pepper and mustard water; warm composition tea.

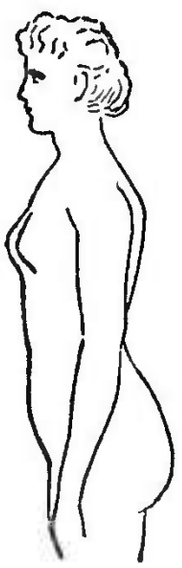

FIG. 76.

FIG. 77.

Prolapsus Ani.—Falling of the rectum. Protrusion of the mucus or muscular coat of the bowel. *Cause:* Straining at stool, or the irritation of worms, piles or enlarged prostate.

Treatment: Remove cause. Assume knee-chest position and return it. That not practicable, anoint the sphincter with sweet oil three parts, oil lobelia one part, and try again and again until successful. Then apply a compress and wear a T bandage. Keep bowels soft with extract of butternut, and three times a day take a retained rectal enema of a strong tea of witch hazel and golden seal one to two ounces. Avoid heavy lifting.

Prolapsus Uteri.—The fall of the uterus below its normal relation (see Fig. 72) with the other parts of the pelvic viscera. Its cause is, primarily, mainly the unnatural system of dress that prevails. Fig. 76 shows a natural female form. Fig. 77 shows one with the protruding abdomen, limp breasts, and weak attitude of a distortedform externally. Fig. 78 shows the gradations of the internal prolapse, while Fig. 79 shows the posterior displacement, and Fig. 58, page 400, the anterior, that occur when the prolapse does not.

Prostration, Excessive—Collapse.—Condition as of shock not rallied from. *Symptoms:* Face pallid, pupils dilated,

skin cold and clammy, breath gasping, pulse feeble or absent, brain perturbed, complete muscular relaxation. *Treatment:* Add to the whisky enemas for shock, spirits of turpentine one-fourth to one-half ounce in elm or gum water. Bathe with ammonia and warmwater, dry and rub with dry mustard, mustard plasters to feet, and scorching hot pillows to both sides of spine. Hot bricks all around body and in side of arms and thighs, and much warm hand friction.

Proud Flesh.—Over-production of the granulations by which an open wound heals. Perfectly harmless. Sprinkle with a little burned alum or tannin.

Pruritus. — Intolerable itching with intense desire to scratch; aggravated by heat. *Cause.* Pregnancy, change of life, prurigo, eczema, neurasthenia.

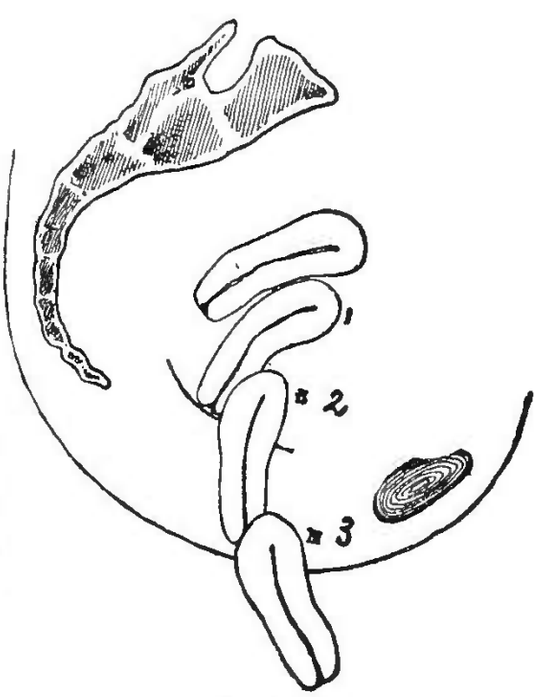

FIG. 78.

Treatment: Treat the condition from which it springs. Locally try one thing after another, if necessary, until the right remedy for that particular case is found. In inflammatory cases, tincture of myrrh well diluted, or a tea of poppy heads with one-half teaspoonful of sugar of lead to the pint. With eczema, a saturated solution of boroglyceride, four ozs and peroxide of hydrogen 1 oz. Apply frequently; or menthol two to ten grains to the ounce of water, used as a lotion; or menthol five parts, bals. Peru nineteen parts, lanolin 200 parts, use as an ointment. With no eruption—a lotion of a dram to the pint of powdered borax, or sulphate of soda; or, as an ointment, menthol three parts, olive oil thirty parts, lanoline thirty parts.

Pruritus ani.—A twenty per cent. solution of menthol painted on as often as necessary. A cold water pour is also excellent. Generally alkalis, such as sodium bicarbonate, lithium carbonate, and alkaline waters are beneficial in pruritus.

Ptomaines.—Brieger says that while a "certain quantity of oxygen is necessary to form ptomaines, a FREE SUPPLY invariably yields non-poisonous ones." Therefore crowd oxygen treatment in all ptomaine diseases.

Purulent Ophthalmia.—Water boiled and reduced to 105°, then poured from a pint tin on the eye and between the lids, ten to fifteen minutes every hour.

Pyrosis.—Water-brash, an alkaline or brackish fluid which rises to the mouth when the stomach is empty. *Treatment:* Avoid alcoholic drinks, and take an hour before meals, twenty grains of subnitrate of bismuth.

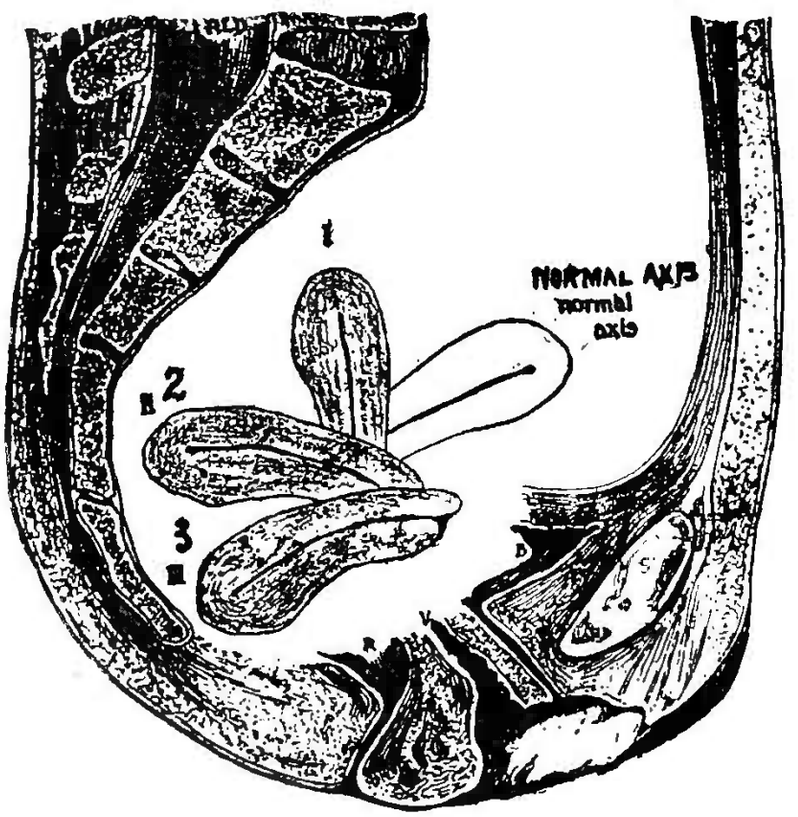

FIG. 79.

Quinsy.—See inflammation of tonsils.

Quinsy, Malignant.—Combine the treatments for quinsy and diphtheria.

Rabies.—See hydrophobia.

Rectum.—Abscess, cancer, foreign bodies in, polypus of, stricture and ulcer of, are all diseases for the surgeon.

Relapsing and Remittent Fevers.—See fever.

Respiration, Difficult.—Treat the cause. Quebracho, cactus grand., expectorants when indicated, stimulants if required, antispasmodics if needed. Fig. 80 shows a sling for the relief of such sufferers.

Respiratory Diseases.—As general remedies, when uncertain for what particular disease to treat, eucalyptol five

to ten minims in emulsion every four hours for chronic, irritable cough, chronic bronchitis and chronic pneumonia. Valuable in phthisis, reducing the amount of expectoration and holding gangrenous processes in check. Hydrogen peroxide one to ten parts per one hundred of water is never to be omitted.

Respiration, Suspension of—Asphyxia. — *Treatment:* Fresh air, cold water on face, warmth to extremities, artificial respiration as for drowning, legs rubbed upward, oxygen inhalations, or one to three teaspoonfuls of peroxide of hydrogen in bowel enema, or one drop of a one per cent. solution of nitroglycerine on the tongue.

FIG. 80.

Retroflexion and **Retroversion** are the same as anteflexion and anteversion except that the body of the uterus falls backward instead of forward.

Rheumatism (Bacillus Amylobacta).—*Cause:* There are two advanced theories: 1. The germicidal (*Acute*). Impaired nerve centers give feeble vitality, weak digestion and by reason of suboxidation of food, the generation of butyric and lactic acids, or of those products of change which are immediately antecedent to these acids; for lactic acid cannot exist in the blood.

Chronic: Insanitary conditions degrade certain primary elements of nutrition into the disease germ, which with its ptomaines are the factors of the disease. 2. Biochemic (acute and chronic). Certain atmospheric conditions cause a dificiency of sodium phosphate in the blood which deficiency allows the acids to irritate and cause articular rheumatism. A like deficiency of chlorate of potassa causes the exudation of fibrinous material and the swelling of arthritis, or acute rheumatism. Other forms are caused by lack of other salts.

Facts prove that the bacilli are present, and that supplying the deficiency of the indicated biochemical salt does cure.

Therefore *both* theories are correct, the biochemic giving the true explanation of causes, the germicidal, a statement of resultant facts both before and attending the attack. It also seems probable that inheritance may in some cases be equivalent to the atmospheric conditions referred to.

Acute Arthritis.—Acute or inflammatory rheumatism, or rheumatic fever. *Symptoms:* Chilliness. After some hours, fever, throbbing headache, thirst and high colored urine. A joint swells, pains, is stiff, red, hot. Fever increases, sour smelling sweat, intense sensitiveness of affected joint; appetite lost, tongue coated white, constipation, brickdust sediment in urine, sleep greatly disturbed. May be transferred to some other joint. The lactic and butyric acid elements irritate the red blood discs and cause inflammation of the white fibrous tissues, because not neutralized by a sufficiency of sodium phosphate, and if there be deficiency of chlorate of potash also, exudation, swelling occurs.

Treatment: Preventive. Thorough oxygenation of the blood to prevent the formation of the offending products. Fasting from four to ten days with plenty of water to drink and frequent spongings, will cut off the supply of these acids and expel them from the body and thus cure the disease. The alcohol vapor bath or home Turkish bath will hasten their expulsion from the system.

If medicines are preferred, ferr. phos. to reduce the congestion; kali mur. to prevent or control the swelling; kali phos. for stiffness, paralytic tendency, pain; kali sulph. for shifting, wandering attacks; mag. phos. alternately with kali phos. for severe pain, if that fails to relieve or generally, one teaspoonful of a solution of tincture of manaca one dram to ten ounces of water every hour or two. Lobelia tea in non-nauseating doses will sterilize the bacilli and fomentations of hot tansy or wormwood will neutralize their ptomaines, while a vapor bath of hemlock leaves will eliminate them from the tissues. So an ointment of salicylic acid, lanolin and turpentine each half an ounce and lard four ounces applied without friction and covered with flannel, has been found by Prof. Bourget of Lausanne to cure quickly with no other treatment whatever. Painting the joint with ichthyol has likewise been successful. Diet, No. 5 to 13, as may be preferred.

Sub Acute.—Is a repetition of former attacks of acute without the fever. Treat as for acute, but more mildly.

Chronic, is where the inflammatory conditions have been so long continued that new, devitalized tissues have been formed with more or less structural change.

Symptoms: Joints swollen and stiff, usually worse at night, in stormy weather, or exposure to cold or damp.

Treatment: Avoid causes that provoke it. Calc. phos. the chief remedy; kali sulph. for wandering rheumatism; kali phos. morning rheumatism, better by slight, worse by severe exertion; kali mur. for swelling and all movements give pain, or five drops of tincture of manaca every three hours. Hold the affected places under running cold water for an instant, then knead, rub, pinch and wring them with the other hand until dry. Rest and then hold them under again one to five minutes, repeating the kneading, etc., while under the water. Must be thorougly red and warm before dressing. If this fails try massage, as for sprains.

Many liniments are beneficial because they quicken the absorbents, or neutralize the ptomaines. Use liniment of oils of olive and wintergreen equal parts, or a four per cent. carbolic lotion applied on flannel compress nights, or Burgundy pitch softened with alcohol applied as a plaster.

Electrical Treatment: 1. Sponge electrode positive pole on left side below the heart, negative pole on right side over liver and back over kidneys, strong current five minutes. 2. Treat through and through the affected parts each way three minutes. 3. General faradization twenty minutes. Joints swollen and immovable, metallic band elec-

trode around the limb, positive, another below the joint, negative, current continued until some motion can be found. Then resume former treatments twenty minutes daily.

Water Treatment: Twice a week body bandage of oat-straw, hay-flowers or pine needles, one to one and a half hours. Twice a week a hot bath, alternating, the whole thirty minutes, and two shawl wraps, each one hour. Twice a day fomentations or compresses, as may best agree, of wintergreen tea on the affected parts, twenty to forty minutes. After decided improvement continue the local applications less frequently, one hot alternating bath a week, and a cool sitz three times a week one to three minutes. Liquid diet taken every two or three hours until the urine becomes normal, then add milk and eggs; a little later add meats, with horse radish dressing and fruits, and, finally, bread and vegetables sparingly, except potatoes. Ox gall before meals, and once or twice a week mandrake trituration enough to cause free yellow stools, will hasten the cure.

Rickets (rachitis).—Bony deformities of childhood; an abnormal growth of spongy, bony structure, with great deficiency of phosphate of lime. *Causes:* Rapid preceding pregnancies of mother, nursing while mother is pregnant, too long nursing, too early weaning, poor, starchy food, too much starchy food, sterilized milk, want of sunlight, impure air and other unhygienic surroundings.

Symptoms: Comes at about the first dentition. Nutrition usually impaired. Slight fever, restlessness, and child sleeps badly, shows no inclination to walk. Body seems tender. Sweating is profuse, especially at night, and about the head and neck. Nodules are felt first at the junction of the ribs and cartilages of the sternum and form the "rosary" of rickets. The sternum projects and forms the chicken breast. Spine is curved. Head looks large and the fontanelles are slow to close. Dentition is late, and the teeth are small and badly formed. The wrist and ankle joints are enlarged, the legs are bowed, or knock-kneed, abdomen enlarged.

Treatment: Kali phos. if there be atrophy of bones and putrid bowel discharges. Calc. phos. with open fontanelles, sallow complexion, lateral curvature, diarrhœa and emaciation; nat. mur. in early stages, with thighs notably emaciated; silicea with open fontanelles, head large and body emaciated, abdomen hot and swollen, ankles weak, head-sweat and body dry, offensive diarrhœa, boils, abscess, stools contain undigested food. Diet as in scrofula. Cod-liver oil inunctions. Best of unsterilized milk with malt. Cold sponge bath daily if there is sufficient power of reaction. Barefoot, outdoor life.

Rubeola.—A hybrid between measles and scarlet fever. The rash is deeper red than that of measles, and more in patches than that of scarlet fever. Throat more sore and cough less than in measles. *Treatment:* Good nursing.

Rupture.—See hernia.

Scarlet Fever, or Scarlatina.—A germ disease. Can be carried hundreds of miles in the air, clothing, mail; retains vitality for months or years; incubation one to eight or more days. Rash within twenty-four hours; chill, or convulsions, delirium, intense headache, sore throat, swelling of

glands behind jaw, nausea or vomiting, high fever, bounding pulse, dry skin. Rash on neck, shoulder, chest, abdomen, finally body, arms and legs. Rash and fever decline in three or four days. Skin peels ten to twenty days, may much longer.

Treatment: As soon as the symptoms appear give three No. 4 (B 4) tablets and put on a shirt wrung out of hot salt water and cover warmly in bed for an hour; if the eruption is not perfect repeat the hot shirt wrap two or three times the first day. Then if the fever is high, sponge over rapidly with cold water, and, if necessary, repeat the sponging every hour. Bed in separate, well ventilated room; cover lightly; hot foot bath; warm milk and lime water often; divest room of every surplus article; have one competent nurse; ventilate thoroughly, temperature 68°. Keep disinfectants exposed in room, oil of eucalyptus, tincture of iodine, etc.; and use for everything that touches the patient menthymos one dram to four or six ounces of water. One or two hours after the No. 4 (B 4) give three tablets of No. 5 (B 5), and so on alternately until the fever subsides; then every four hours give No. 6 (B 6) in place of the other two. Should there be drowsiness, twitching and vomiting of watery fluids, give No. 9 (B 9) every four hours. Should recovery be slow, glands swell and threaten to suppurate, boils, abscesses, or hardening of glands, give No. 12 (B 12) every four hours. Put one to three teaspoonfuls of hydrogen peroxide in the sponge baths twice a day. Move bowels with enemas containing one-half to one teaspoonful, and gargle or wash the mouth with water containing ten grains of menthymos to four ounces, or stronger, or with carbolic acid twelve parts, salicylic acid one and one-half parts, peppermint oil one part, made into a one-half of one per cent. solution by diluting ten drops in four ounces of water, and using the dilution. Throat compress, as for croup. After subsidence of fever use vinegar and water for the sponging, with every third one of hydrogen peroxide. Examine urine often. Keep in same room two weeks after eruption has faded, then change to another and fumigate twenty-four hours. The menthymos gargle also may be sprayed into the nostrils every hour or two. In severe cases give the medicines more frequently.

Sciatica.—Pain in the sciatic nerve. *Cause:* Overexertion of muscles, exposure, injury, pressure of tumors, etc.

Symptoms: If sudden, sharp pain along the posterior surface of the thigh and outside of leg to foot. Occurs again upon slight exertion, may become dull and constant, and worse at night. Pain on pressure, may be changed sensibility.

Treatment: First day shower on lower back in the morning, on upper back and shoulders in the afternoon. Second day reverse. Sitz bath every other day. Kali phos. with nervous complications. With spasmodic pains, mag. phos. Remittent pain in right hip joint and knee, relieved by heat, natrum mur.

Electrical: Sciatic rheumatism: Sponge electrode, negative pole, upper inside of thigh, positive pole over sacrum and down outside of the limbs, treating through and through as far down as the pain reaches. Feet in warm water, with negative pole, positive from sacrum down outside as far as pain extends, fifteen minutes each day.

Scrofula (king's evil).—A morbid condition of the system, one form of cachexia (which see), which, a few years ago, was a scape-goat for all ignorance, *i. e.*, anything that could not be otherwise named was called scrofula. Usual symptoms, glands of the neck swell, and, after a while, inflame, ulcerate and discharge. Heal, leave scars, others follow. *Treatment:*

Alterative, tonic, nutritive, and hardening as energetically as strength will allow. For the swollen glands, fomentations of wild indigo.

Scurvy (scorbutus).—*Cause:* A deprivation of vegetable food.

Symptoms: Skin pale, sallow or muddy; listlessness, pains in limbs; face puffy; constipation; spots like flea-bites on arms and legs, changing to bruised appearance; skin now dry and scales rapidly; gums swollen and spongy; teeth may loosen; breath offensive; saliva profuse; slight bruises cause burrowing sores, may be exhausting hemorrhage; difficult breathing; faintness.

Treatment: Fresh vegetables, especially potatoes, onions and salads; fresh fruits, lime juice and tonic method.

Sea-sickness (motion sickness).—Keep the face to the bow of vessel, or lie with head low and toward the bow. Bandage the abdomen. Cocaine one-tenth grain every three hours if necessary.

Senility (senile atrophy).—Buttermilk and kumyss diet because their lactic acid dissolves the phosphate of lime and prevents ossification in tendons, arteries, etc. Liquor auri et arsenii bromidi (Barclay), or try tinct. of oats twenty-five to thirty drops three times a day.

Shock.—A sudden nervous depression from some accident or blow, or evil tidings. The coats of the vessels of the vaso-motor centers lose their contractile power, hence blood currents lose velocity and patient is faint, cold, pallid; has mental confusion, sometimes uncontrollable restlessness, prostration, unconsciousness, with pulse fluttering and body temperature low.

Treatment: Recumbence, loosened clothing, external warmth. Heart stimulants are all-important, brandy or whisky if patient can swallow and there is no bleeding, or enemas of whisky one-half ounce, water at 110° three ounces, with friction, mustard on chest and abdomen, or hot fomentations. But do not over-stimulate. Just enough to restore the circulation, and no more, lest congestion supervene. Ammonia to the nostrils, or pure oxygen gas inhaled, very desirable. Subcutaneously, nitroglycerine, or one-thirtieth of a grain of sulphate of strychnine. Raise bedclothes on half-barrel hoops; insert under them one end of an elbowed stove-pipe, with a lighted lamp under the other end; at the same time two or more persons rub the surface toward the heart with salt or mustard on the hands. Not successful, tie patient's feet to foot of bed and raise the foot three or four feet from the floor, or bandage all the extremities. Only strong coffee and liquid diet by stomach or rectum when reaction has been well established.

Sick Headache.—See headache.

Sick Headache (nervous).—1. Sponge electrode, negative pole, back of neck, positive over the front of the ears and

lower forehead, very light current, five minutes. 2. Positive pole in one hand, negative in the other; strong current five minutes, then reverse the poles five minutes. 3. Positive at base of spine, negative over neck and base of brain, three minutes, very light current.

Skin Diseases are so numerous and complicated that their description and treatment would require more space than can be given in this work. Good general health, perfect digestion and freely-acting bowels and bladder, with cleanliness of the skin, are general rules for preserving the skin in good order.

Sleeplessness.—Wrap abdomen and lumbar region of back in cloths wrung out of warm water, cover with oiled silk or rubber and bind on with flannel bandage.

Smothering by Gas.—*Symptoms:* Swollen and purple face, livid lips, and bloodshot and staring eyes. *Treatment:* Place patient in open air and remove clothing. Hold in a half sitting posture, with head higher than feet. Rub whole body briskly with flannel; restore breathing by artificial respiration. From time to time dash cold water over body.

Sore Throat.—See inflammation of larynx.

Sores, Old, Sloughing.—See ulcers, old.

Sour Stomach.—See dyspepsia.

Spasms.—See cramps.

Spasm of Bladder.—Give retained enemas of lobelia.

Spinal Curvature.—If from diseased bones, employ the best physician that can be found. If from irregular action of the muscles, discard all braces, crutches, etc. Study the case until satisfied which muscles are weak, then apply regular, systematic, daily exercise to them followed by a cold, local sponge and general tonic method as needed. Of course, habits of lying, standing, carrying, etc., that perpetuate the trouble, must be corrected.

Spinal Irritation.—*Cause:* Usually poverty of nerve vital fluid and irritation transmitted.

Symptoms: According to the location of the irritation. If of the dorsal portion, tightness, suffocation, increased heart action, spasmodic cough. If of the lumbar, spasmodic action of the bladder, bowels, uterus, disturbed menstruation and cramps, numbness, tenderness in lower extremities.

Treatment: Remove the irritation at its source. General treatment as for neurasthenia as far as the feebleness of the patient requires. Locally, cool compress thirty minutes twice a day. Revulsive method as needed.

Splenitis, inflammation of spleen, and *induration* of spleen are usually so connected with malarial poisoning that they are referred to ague.

Sprains.—Lebelard and Ellaume, Rizet, and Dujuardin Beaumetz, have recommended massage. In the Prussian army it is obligatory, and the military reports of Starke, Gassner, Gerst, Brurberger and Korner, show that the average disability when massage is not employed is 27.3 days, but when it is used 8.9 days. Begin with long continued rubbing with hot, oily applications, followed by deep pressure and kneadings, and finally moving the joint, carefully at first, then more and more forcibly. If the time cannot be taken for this, apply hot fomentations of mullein leaf and tansy herb tea, or of mullein leaf and wormwood.

Stiff Joints.—Massage treatment as for sprains.

Stomatitis (cancrum oris).—Simple: See inflammation of mouth. Gangrenous: *Cause:* The streptococci of foot disease infecting milk. *Symptoms:* Great prostration, melancholy, pale; membrane inflamed and tense, turns purple, sloughs; tongue swollen, offensive odor. *Treatment:* Same as for diphtheria and scarlet fever.

Stone-bruise.—Soak foot in hot lye water, scrape off callous, and rest with cool compress. Not relieved—silicea and poultice; open and give cal. sulph.

Strangury.—Constant desire to void urine; with burning or cutting pain at the neck of the bladder and along the urethra. *Cause:* Irritation. *Treatment:* Remove cause of irritation. Soothe with warm hip baths, rest, retained enema No. 4, or No. 7 and 22 mixed. Revulsive method as needed. Demulcent drinks. If kidneys are at fault, a tea of parsley.

Stricture of Œsophagus (gullet).—If spasmodic, mag. phos. If this fails alone, alternate calc. phos. with it. If from ulcerations or tumor, consult surgeon.

Strumous Scrofulous Infants.—If inherited from the mother, she should not nurse her babe. If from the father,

she should nurse it, herself taking the most nourishing diet possible, until the double teeth appear. Anoint chest, abdomen and back daily with olive oil. Then give animal and fruit diet almost exclusively. If preferred for days together may subsist on fruits alone.

Stunning.—Concussion of the brain.

Symptoms: Cold skin, irregular, weak pulse, eyes closed and contracted.

Treatment: Rest, lying down, head raised, warmth to the extremities, head kept cool by cloths wet with cold water. No stimulating drinks.

Styes (hordeola).—Boils on the eyelids. *Treatment:* Correct the mal-nutrition. Apply solution or paste of boroglyceride.

Sun-stroke (thermic fever).—Cerebral exhaustion with evaporation of the watery constituents of the blood. *Cause:* High temperature, exposure to the direct rays of the sun, aided by too much heating food.

Symptoms: Pain in head, dizziness, opression, may be nausea and vomiting. Diarrhœa and frequent micturition is common. Insensibility (may begin with this), stertorous breathing, pupils contracted, skin intensely hot, pulse full and rapid, temperature 107° to 110°. Coma, pulse feeble, may be death within an hour from heart exhaustion.

Treatment: Remove to cool room, recumbent position near open window; nat. mur. every ten to thirty minutes. Hot water to the head and spine, and tepid to the body and limbs, if the skin be hot and pulse full, but if the skin be cold and pulse feeble, a hot mustard bath or fomentations and drinks, or enemas of hot water with ten to thirty drops of water of ammonia. A little beef tea or hot coffee when able to swallow. Heat to feet if they are cold. Ammonia to the nostrils, or amyl nitrite.

Suboxidation.—The absorption of an insufficient supply of oxygen to maintain the normal vital processes, as in the lactic acid urine of epileptics after a fit. Mantegazza says that a large quantity of ozone is discharged by odoriferous flowers, and that flowers destitute of perfume do not produce it. Cherry-laurel, clove, lavender, mint, lemon, fennel, etc., develop ozone largely on exposure to the sun's rays. Among flowers, the narcissus, heliotrope, hyacinth and mignonette are conspicuous; and of perfumes similarly exposed, eau-de-cologne, oil of bergamot, extract of millefleurs, essence of lavender and some aromatic tinctures. He also points out that the oxidation of the essential oils, such as nutmeg aniseed, thyme, peppermint, etc., are convenient sources of ozone, and concludes that the ozoniferous properties of flowers reside in their essences, the

most odoriferous yielding the largest amount of ozone. Hence some of these should always be in the sick room. Ozone may be liberated by half-immersing a stick of phosphorus in water in a wide mouthed bottle, or by gently mixing three parts of sulphuric acid with two parts of potassium permanganate.

Swallowing, Difficult.—See stricture of œsophagus.

Swellings, Cold.—Treat as dropsy.

Tartar, Salivary Calculus.—Different kinds deposited on the teeth. Always destructive. Keep teeth clean and employ a dentist.

Tearfulness.—Tears are the result of a nervous storm in the central nervous system so affecting the vascular terminals of the tear-secreting glands that they excrete water freely. *Treatment:* Change of scene, out door life, mental diversion, nervous equipoise; nat. mur. If the case be urgent, lady's slipper in strong, frequent doses.

Tenesmus.—Constant desire to evacuate the bowels. Treat as for inflammation of rectum.

Tetanus.—See lockjaw. Liermann proved that animals inoculated from the arm of a man who had died of it and been buried two and one-half years, took the disease.

Throat, Sore.—See laryngitis.

Thrombosis.—The coagulation of the blood during life. May be in heart or blood vessels.

Cause: Disturbance of the cell-salt that controls water in the blood. Often the result of taking some of the new coal tar preparations so freely prescribed by most physicians, such as exalgine, antipyrine, antifebrin, salol, antikamnia, etc. Should be used with great caution.
Treatment: General, as for embolism.

Thrush, Sprue.—Curd-like patches of inflamed mucus surfaces of the mouth and throat. Wash the mouth every two hours with borax and honey, one dram to one ounce; or with one dram of borax to one ounce of equal parts of glycerine and water, and attend to the diet.

Tobacco Amaurosis.—Gradual loss of sight from the use of tobacco. *Treatment:* Abstain.

Tobacco Heart.—A cardiac neurosis caused by the nicotine of tobacco. In smoking, carbonic oxide, several ammonias, and an empyreumatic oil containing nicotine, are

absorbed. The ammonias render the blood alkaline and fluid, thus impairing its power of nutrition. The stomach becomes debilitated, and dyspepsia follows. The heart, not being properly innervated, becomes weak and painful, palpitation, faintness and vertigo ensue. In the young, tissue becomes degraded and vision impaired. A majority of those rejected from the military schools are because of tobacco heart.

Symptoms: Palpitation, intermittent pulse, tightness of chest, pain about the heart, nervous debility, hands tremble, depression, difficult breathing, dizziness.

Treatment: Inhibit tobacco in all forms. Tepid or cold sponge bath daily; full pack twice a week; head ablution daily; nutritive diet; much sleep; rest and open air. Tincture of oats, or cactus in full doses every three hours.

Toe-nails, Ingrowing.—See feet, diseases of.

Tongue, Inflammation of (glossitis).—*Cause:* Stings, acrid substances, sometimes no apparent cause. *Treatment:* Treat as for other inflammations.

Tongue, Ulcers of.—*Cause:* Local irritation, fevers, digestive derangements, syphilis, mercury. *Treatment:* Constitutional according to the cause. Local. Lotions of hydrogen peroxide, menthymos, or listerine, diluted to suit the case.

Tonsilitis.—See inflammation of tonsils.

Tonsils, Enlarged.—*Acute:* Apply powdered salicylic acid on a large camel's-hair pencil, and give a tablespoonful every two hours of salicylic acid thirty grains, mucilage of acacia one ounce, simple syrup one-half an ounce, water four and one-half ounces. If heavily coated, apply with a brush—pepsin thirty grains, dilute hydrochloric acid one dram, water five drams, glycerine four drams.

Chronic: Pencil or gargle with tannin fifteen grains, ozonized iodine two drops, glycerine five drams, water one pint.

Toothache.—Pain in the body of the tooth from the microbe of dental caries, or of the root from the amylobacta of rheumatism. Some others.

Treatment: Soap tree bark, resorcin and peroxide of hydrogen sterilize the germs. Pain intense, shooting, relieved by pressure and hot liquids, worse by cold, mag. phos. From inflammation of gums or nerves, better by cold, worse by heat, ferr. phos. With swelling, kali

mur. in alternation with ferr. phos. Bright red line on gums, pale, nervous subjects, worn out, better by pleasant excitement, kali phos. Decayed, worse at night, calc. phos. Worse in evening or warm room, better in open air, kali sulph. With excessive saliva or tears, natr. mur. Loose, sensitive to touch, deficient enamel, calc. fluor. Abscess forming, better by pulling on tooth, violent at night, no relief from heat or cold, silicea. Same when caused by sudden suppression of foot sweat. General, apply three parts ichthyol to one of chloroform; or carbolic acid crystals, with an equal quantity of collodion. If the tooth is decayed, and no dentist at hand, wash the mouth well with warm water, then paint the hollow of the tooth all over two or three times with tannin ten grains, gum mastic one-half dram, carbolic acid ten drops, sulphuric ether one-half ounce. Use camels' hair brush. Keep medicine in glass stoppered bottle. The painting will last a month or more, then repeat.

Tubercles (tubercular bacilli).—Some defect in the vital force operating to transform the elements of food into normal blood plasma, evolves the tubercular bacilli instead, which is life upon a lower plane, therefore a diseased condition in the animal body. Tubercles may appear in bone, bowels, bladder, eyes and ears, hips, knees, lungs, larynx, mesentery, nose, prostate, peritoneum, rectum, skin, spine, testes and wrists. If any of these are not considered in their appropriate places it is because no advantage can be gained by it in a family doctor book.

Symptoms: Paleness, debility, rapid pulse, loss of flesh, rising temperature, dry hair; may be swelling of lips, nostrils, tonsils, glands of neck and throat; fetid odors, purulent discharges.

Treatment; In all forms. 1. Raise the standard of vital force, and thus stop production. 2. Kill the lower-life form, the bacilli, and thus deliver the system from its disturbing effects. How best to accomplish these is answered in consumption, which see.

Tubercular Cystitis.—Symptoms of chronic cystitis preceded by slight hemorrhage from the bladder should lead to immediate examination by a good physician.

Tuberculosis in Children.—If predisposed from the mother, she should not nurse the child; if from the father, and mother be healthy, she should. When teething begins add children's diet. If there are signs of strumous diathesis give ten grains of chloride of calcium in half a glass of milk after each meal to a child four years old.

Tuberculosis of Hip Joint, Coxalgia and Knee Joint (white swelling).—Can only be diagnosed by a physician, but his examination should be had if child drags one limb after the other, has pain in knee, stands with the dragged foot forward with everted toes; or, if there be slight lameness, swelling and stiffness of knee joint and wasting of the muscles of the limb.

Tuberculosis, Laryngeal.—Must have the best professional treatment.

Tubercular Meningitis (scrofulous meningitis).—This differs from simple meningitis, in that it comes on more slowly after signs of a scrofulous constitution, occurs nearly always in children, and is rarely cured. See meningitis, also brain, tubercular.

Tubercular Mesenterica, Marasmus.—Early symptoms those of severe diarrhœa or cholera infantum. Later, fetid stools, great emaciation, abdomen greatly swollen yet *lumpy, like large eggs.* The best of professional care.

Tubercular Nasal.—Not distinguishable, by laymen, from coryza.

Tubercular Peritonitis.—Can not be distinguished, by laymen, from acute peritonitis and typhoid fever.

Tuberculosis of Prostate.—Cannot be distinguished, by laymen, from stone in the bladder.

Tuberculosis of Rectum.—See ulcer of rectum.

Tuberculosis of Stomach and Bowels.—Should be treated as if complications of tuberculosis of the lungs.

Tumors.—New growths. Benign or malignant. Ascertain, by competent medical examination, to which class the case belongs, then, if benign, let it alone unless its size or location renders its removal important, in which case, as with all malignant tumors, secure the services of a good physician or surgeon.

Typhoid Fever (typhus).—See fever, typhoid.

Ulcers.—Gradual breaking down of tissues into pus, or liquid, constituting open sores.

Ulcers, Old and Sloughing.—Calc. phos. every two hours. Apply every three hours of sulphate of zinc one ounce, dilute sulph. acid one-half ounce, water one pint. Must not touch healthy tissue; or, inject around the ulcer in several places, about an inch from its margin, bovinine one part to boiled water three parts at 110°, one dram at each place, every other day, and increase the amount and inject nearer the edge as the ulcer heals. Wash it frequently with hot boiled water and cover with sterilized absorbent cotton. Vaseline dressing when healed until firm and sound; or, cleanse the ulcer with warm water and peroxide of hydrogen, lay in three pieces of lint saturated with bovinine, and covered with a larger piece smeared with vaseline or lard, extending one-half to one inch beyond the edges all around, to prevent evaporation, and bind on with light cotton bandage. Change two or three times a day. This is greatly aided by head vapor once a week for twenty minutes. Body bandage an hour and a half for two weeks. Whole ablution every day. Apply to the sore a linen rag dipped in the boiled water. Change several times a day. The third week body bandage half hour twice a week, and upper shower every day.

Ulcers of Anus.—Treat as fissure of anus.

Ulcers of Bones.—Calc. fluor. often, and calc. phos occasionally.

Ulcers of Bowels.—Cleanse with sigmoid or cæcal flush containing boroglycoride, hydrogen peroxide by mouth three times, and retained enema once a day, and general water treatment as above. If necessary, fluid diets, and avoid all seeds, coarse fiber, etc., if solid diet is allowed.

Ulcers of Eye.—Apply to an oculist.

Ulcers of Glands.—Calc. sulph.

Ulcers, Gangrenous.—Poultice with yeast; or, one ounce of bread soaked soft in five ounces of hot water, five drams of powdered flaxseed and two drams of powdered charcoal.

Ulcers, Inflamed, Irritable.—Hot fomentations of lobelia, then dress with linseed poultices and laudanum. When irritation is subdued treat as for ulcers of tibia.

Ulcers, Indolent.—Fomentations of bayberry (myrica cerifera), hydrastis canadensis, or bitter root (apocynum androsoemifolium) applied three times a day for thirty minutes. In the interval, dust on the powder of prickly ash bark (xanthoxylum fraxineum) or pulverized aloes, and give general tonic and alterative treatments, which see. Use capsicum freely internally. If this fails, mix the juice of wood sorrel (oxalis acetosella) with cerate, and apply as a plaster once a day as long as the patient can endure it. In the interval, emollient salves; or, swab out the ulcer, then flood it ten minutes with solution of permanganate of potassa, then sponge dry and loosely pack with strips of gauze soaked in the solution, and cover with a large permanganate poultice dripping wet, cover again with oiled paper and bandage lightly with cheese cloth.

Ulcers of Larynx.—Can only be determined positively by professional examination, and should have such treatment.

Ulcers of Nose.—Treat locally as for ozena, and constitutionally the syphilis, or scrofula from which it springs.

Ulcers Containing Proud Flesh.—See proud flesh, or apply to it chromic acid ten grains to the ounce of water.

Ulcers of the Rectum.—Treat as for fistula of rectum.

Ulcers of the Stomach (gastric).—Distinguish from dyspepsia and cancer. If there is vomiting of blood, pain soon after eating, ceasing when stomach is empty, seek professional advice.

Ulcers of Tibia.—Wash in hay tea and give silicea, or, if the discharge be yellow, calcarea sulph. and apply eucalyptus one-half dram, lanoline one-half ounce, twice daily.

Ulcers, Varicose.—Place four thicknesses of wet cloth over the ulcer on which rest the negative pole, positive pole at base of the spine five minutes, at the foot five minutes, strong current as can be comfortably borne. Cleanse with castile soap suds and apply following: Fl. ext. hamamelis two drams, fl. ext. hydrastis one dram, fl. ext. calendula one dram, cosmoline two ounces. Bandage with cotton from foot upwards; or, wash once or twice daily with acetic acid one part, water nineteen parts. Ulcers with white, thick, mild secretions, kali mur.

Uræmia.—A condition of poisoning caused by the retention in the body of the elements of waste that are normally excreted by the kidneys. *Cause:* Structural disease of the kidneys or occlusion (stoppage) of the ureters. *Symptoms:* Neuralgia, delirium, blindness, coma, convulsions, vomiting, diarrhœa, pallor and puffiness of face, uræmic odor of breath. *Treatment:* Remove the cause. Give oxygen freely and frequently. Excernent treatment strong or very strong.

Urethra, Neuralgia of.—Consult a surgeon.

Urethra, Stricture of.—1. *Spasmodic*, from weakness of its circular rings. 2. *Inflammatory*, usually from specific poison. 3. *Permanent*, from the effusion of lymph contracting the caliber of the channel.

Symptoms: 1. Difficulty of urination; comes on suddenly from cold, damp exposure, or from nervous influences. 2. Has the usual symptoms of inflammation. 3. A few drops of urine are retained; soon escape and wet the clothing. May be itching heat and pain in micturition; stream is forked, spiral or scattered. At last can only be voided drop by drop and bladder is irritable.

Treatment: Apply to physician.

Uric Acid.—In the process of removing the nitrogenous wastes from the system, far the larger proportion appear normally as urea. But if the oxygen-supply from respiration be insufficient, that which would have formed urea stops short in uric acid, which in abnormal quantities is extremely deleterious.

Cause: Deficient oxygen. As normally existing in the urine it is combined with alkaline bases into urates, but is often deposited as cayenne pepper-like crystals (brick dust) from its free state. If this red precipitation occurs before the urine cools there is reason to fear gravel or stone. Urea is the ashes of the tissues and is produced to the extent of five hundred to six hundred grains daily, while only six to nine grains a day of uric acid are normal.

Treatment: If to one atom of uric acid six of oxygen and four of water be added, it is resolved into urea and carbonic acid. Therefore, in all conditions of uric acid excess, use oxygen and water freely. If medicine be required give tinct. theaspi bursa pastoris five to thirty drops, three to five times a day.

Urine, Continence of.—Retention: Stool bath of hot vinegar and water and hot fomentation of the same over bladder for two hours.

Urine, Continence of.—From stricture: A warm bath of lobelia tea and a rectal injection of the same. While in the bath pass a catheter and retain it two or three days, then change to larger size and so on for ten days, having the last catheter the natural size of the passage. If this fails, see Stricture, urethral.

From spasmodic strictnre: Mag. phos., or three drops of tincture of gelsemium every four hours for a few days.

From enlarged prostate: See prostate.

Urine chylous: Pinus canadensis, one-half to one teaspoonful three times a day.

Urine bloody: Requires medical attention.

Urine dribbling: Erigeron oil, one-half to one drop three orfour times per day; or better first try mullein oil three drops three times a day.

Urine, Incontinence of.—Inability to hold.

Cause unknown: Water tread three to five minutes in fifteen inches of water, followed by an arm plunge, one minute daily. With smarting, cantharides. With pain in glans penis, copaiva and apis mel., or uranium nitrate one-sixth to one-half grain every two to four hours.

From partial paralysis of sphincter of bladder: Pod., or kali phos. and cal. phos.

From excessive acidity of urine: Fruit diet and acetate of potassa, one-third to one dram, three or four times a day.

From irritability resulting from over-distention: Ferr. phos. alternated with calc. fluor.

From too great flow of urine: Restrict the consumption of liquids.

From contraction due to hypertrophy of walls of bladder: *Treatment:* Long continued alterative method. Local compress of mullein thirty minutes daily.

From reflex irritation: Treat the disease which causes it. Sitz baths three to six times a week tepid to warm. Passiflora inc. in doses sufficient to subdue the reflex action.

Urine, Retention of.—Its forcible imprisonment in the bladder because of temporary paralysis of the bladder or spasmodic or mechanical urethral obstruction to its outflow. Treat its cause; if unknown treat as continence of urine.

Urine, Suppression of.—This is lack of secretion of urine by the kidneys. Extremely dangerous. Uraemia may be very near. Treat as for inflammation of kidneys until physician can be called.

Urination, Painful.—If from urethritis, inflammation of bladder, or prostate, or other ascertainable cause, treat the cause. If unknown, althea off.; or with dropsy of eyelids, apis. mel.; or with scanty brown urine, without sediment, asparagus. Dark brown, with white sediment, putrid; calc. carb. Scalding, drop by drop, constant desire, great pain; cantharides. Urging and burning, turbid soon after voiding; chamomilla. Dark brown, hot and burning, throbbing pain; digitalis. Clear,

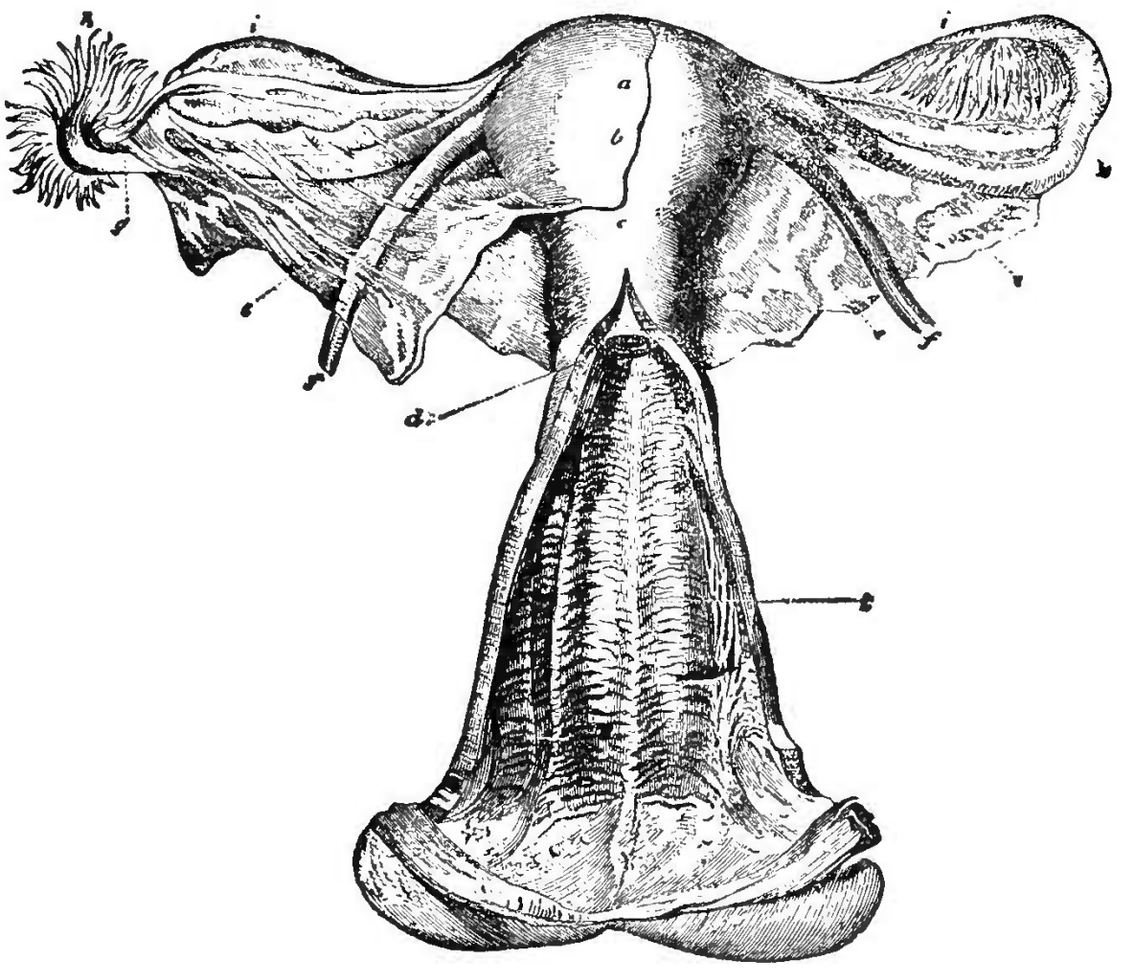

FIG. 81.

profuse, light color, burning, scalding; helonius, or tereb. Urging, must wait long, pain before voiding; lycopodium. Coffee-like urine, stitches, smarting, burning; nat. mur. Ammoniacal, can only be voided on knees and head; parei. brava.

Uterus, displacement of.—See prolapsus, anteversion, anteflexion, etc. Fig. 81 shows the uterus and appendages seen from in front. A, body of uterus; b, divided peritoneum; c,

cervix cr neck of uterus; d, os or mouth projecting into vagina; e e, broad ligaments which attach to the pelvis on each side; f f, round ligaments that connect with the pubis; g g, fallopian tubes; h, fringe-like extremity of fallopian tube, right side. The left shows the extremity ready to grasp an ovule from the ovary; i, ovary; k, vagina laid open through its front wall. For its relation with other pelvic organs see Fig. 72.

Uvula Elongated.—See palate.

Vaccination.—Inoculating with the cow-pox or vaccinia in order to prevent small-pox. It causes a small, red pimple, which on the eighth day becomes a vesicle filled with clear lymph which is surrounded by a ring of inflammation. After the tenth day, the ring fades and the vesicle dries, and on the twenty-first or twenty-second day the scab falls off. Should be repeated every five years and whenever there is special liability to exposure to the small-pox. If done within three days after exposure it will protect in most cases. Care should be taken to procure good virus, and not to rupture the pock.

Varicella.—See chicken-pox.

Varicose Veins (varix).—*Cause:* Debility; sedentary habits, pregnancy, certain occupations.

Symptoms: Veins relaxed, dilatable, purple; knotty and become filled with blood which often coagulates. Strengthen the system with tonics and best of diet; learn from a nurse or physician how to bandage them evenly and smoothly from the ankles to the knees; then, twice a day, wet a muslin bandage in witch hazel (distillation) one part and soft water two parts, and wrap with flannel just enough to be comfortable. Three times a day take three grains of calcium fluorine. After six weeks, if there is no improvement, get rubber stockings.

Varicose Veins.—Positive to the foot, treat affected part with negative twenty minutes. Also, if the case be bad, apply an ointment of fl. ext. of hamamelis four drams, lard two ounces, rub in the morning and bandage with cotton through the day.

Variola.—See fevers, small-pox.

Voice, Loss of.—See aphonia.

Vomiting.—Weak lobelia tea, one to two teaspoonfuls every twenty or thirty minutes; or, ten drops tincture of ipecac in a glass of water, one-half to one teaspoonful every ten to twenty minutes as needed; or in bad cases ten to thirty drops of fl. ext. of adrue every thirty minutes till relieved. Mustard on stomach.

Warts (bacterium porri).—An elongation of the cutis vera, or of follicles of the mucous membrane. *Treatment:*

Internal and local administration of thuja occidentalis, or locally, lactic or acetic acid, or peroxide of hydrogen.

Water on the Brain.—See tubercular meningitis.

Waxy Liver.—See liver.

Weeping Eye.—Transient or chronic stricture of the tear-passages. Apply to a surgeon.

White Swelling.—See tuberculosis of knee joint.

Whitlow.—See felon.

Whooping Cough (pertussis).—A contagious disease of childhood, usually occurring but once. *Cause:* Micrococci in the blood locating in and around the cervical portion of the spinal cord.

Symptoms: A convulsive, paroxysmal cough, beginning with a deep, loud inspiration, followed by a succession of short, sharp expirations, repeated several times. This has been preceded seven to ten days by the symptoms of cold and catarrh. The coughing paroxysms, usually four to ten a day, may reach twenty or thirty; last three or four weeks. Complications, as measles, small pox, bronchitis, pneumonia, cholera infantum, etc., very dangerous.

Treatment: Careful diet. No food between meals. No candies, sugar, sweetmeats, etc. The warm bath to restore circulation to surface and extremities every evening, if necessary. Rubbing, careful nursing; if the patient is feverish, the wet abdominal bandage re-wet and repeated every four hours. Short, spasmodic cough, white tongue and thick white expectoration, kali mur.; with vomiting of blood, ferr. phos.; mucus frothy, clear and stringy, nat. mur.; very nervous, timid children, or exhausted, kali phos.; weakly children, or teething, or emaciated, calc. phos. In all cases, magn. phos. all through.

Worms.—*Symptoms:* Irritation and pain in the bowels, fretful, peevish, restless, skin white, eyes partially open in sleep, dark circles around them, grinding of the teeth, clinching of the jaws, offensive, fetid breath, coated tongue, itching of nose, mouth, capricious appetite, cough, wasting, diarrhœa or constipation, shreds of mucus or pieces of worm, perhaps blood, tympanic abdomen; reflex symptoms, convulsions, chorea, spasm of glottis, hysteria, insanity, fever, nausea, vomiting; not all found in any one case.

Ascaris Lumbricoides.—Common round worms. Inhabit the small intestines, but sometimes ascend to the throat.

Treatment: Santonine every other night, followed by a cathartic the following morning. Repeat six to ten times; or, one teaspoonful of grated raw carrots the first thing in the morning. Naphthol in two-grain doses, repeated three times, has proved very good. Diet exclusively of chopped broiled steak, and good ripe fruits with little sugar. Drink hot water before meals and on retiring. The only drink for three days, beside the hot water, should be onion tea, made by slicing an onion into two pints of water and standing twelve hours. Sweeten with honey.

Oxyuris Vermicularis (pin or thread worms).—Inhabit the colon and rectum, causing much irritation.

Treatment: Rectal injections of salt water; or, infusions of hydrastis, or gold thread; or, give a strong dose of rochelle salts, and as soon as they have operated, follow with a strong tea of quassia as an injection. Diet for pin worms, mutton, beef, fowl and white fish, with salt freely. Avoid veal, pork, sweetmeats, sweet-made dishes and pastry.

Tape Worm (taenia solium).—Occupies the intestines.

Treatment: Clear out the intestines with a strong dose of castor oil, then feed for a day on onions, garlic and salt herring. Next morning before breakfast one to four teaspoonfuls of fl. ext of male fern, and follow with one and one-half ounces of castor oil at intervals of an hour; or, bruise to a paste three ounces of pumpkin seeds with the shells. A supper of milk and tea or coffee. A dose of salts at bedtime, and the paste the next morning. No breakfast until after the bowels have moved, then two hours later an ounce of castor oil with one-half drop of croton oil. Stools to be passed into a bucket of water to float the worm and prevent breaking. If the head has not passed, wait three months and try again.

If the kind of worm is unknown, soak an onion cut up in two pints of water. Drink the juice in the morning, fasting. Do this for several days; or, a tablespoonful of honey boiled in two pints of water, drank freely, and half an hour afterward a half cup of wormwood tea.

Wounds.—See accidents.

Wrinkles are smoothed out by the daily rubbing in of lanolin, a daily sponge bath, and preserving a "conscience void of offence toward God and man," and a countenance ever sunny with content.

Writer's Cramp.—From over-use of one set of muscles in writing. *Treatment:* Crampy pain, hand trembles, wrists ache, nat. phos. Hands get stiff while writing, kali mur.; or, the thermo-ozone battery, rest of the affected muscles, sea-bathing, or other hygienic means to increase nervous tone.

Wry Neck (torticollis—caput obstipum).—The head drawn toward one shoulder, with the face toward the opposite side. *Cause:* Spasmodic contraction of the muscles.

Treatment: If they are inflamed and rigid, fomentations of lobelia; if nervous, mag. phos.; if from unequal strength of muscles, or partial atony of those on the yielding side, strengthen them by appropriate exercises. If from injuries consult a surgeon.

Yeast Fungi.—In catarrh of all the hollow organs of the body, as the stomach, bowels, bladder, uterus, the yeast fungi grow side by side with the sarcinæ. Yeast torula consist of spherical or oval cells of many species, varying in size and in action on different fluids, but all split up sugar into alcohol and carbonic acid. Torula cerevisiæ, ordinary brewers' yeast, is found in the stomach in gastric catarrh; in the bowels in intestinal catarrh; in the uterus and bladder in catarrh of

both organs, causing great uneasiness and pain. In chronic cases the fungus is changed into the oidium albicans, producing ulceration. *Treatment:* Peroxide of hydrogen, or sulphide of lime in the stomach, Virginia stone crop in the bowels, iodol or resorcin in the uterus and bladder.

Yellow Fever.—A streptococcus, or fungus abounding at the mouths of great rivers and on the seashore of tropical countries, which, when inhaled, changes the primary bioplasm into a diseased fungus. The location and season are the chief means of diagnosis at outset.

Symptoms: Three stages. 1st. Chills, prostration, fever; hard, rapid pulse, violent thirst, red face, restless; nausea, vomiting slimy, greenish, coffee-ground matter; cerebral congestion, with pain; eyes red.

2d. Add to the above, gastric disturbance much worse, the tongue heavily coated, dry, cracked, irritability; much vomiting, persistent, of brown mass, with coffee-ground-like flakes.

3d. Face very yellow and livid, eyes dull, sunken, nose or lips pinched, tongue brown or black, intense burning pain in stomach liver and spleen; suppression of urine, oppression of chest, difficult breathing, pulse small and tremulous, skin cold, clammy, great prostration; vomit, brown turbid matter, mixed with dark clotty blood.

Treatment: The most rigid sanitary measures as for scarlet fever, diphtheria, etc. Upper room, free from noise and excess of light.

1st Stage. Treat each symptom as it occurs, and the general germ-smitten condition with body-spongings of water acidulated with nitro-muriatic acid, and by stomach, full doses of pilocarpine one-sixth grain in hot water, in alternation with one-half teaspoonful doses of peroxide of hydrogen in water; one medicine every one-half hour until profuse perspiration. This should be preceded by a mild lobelia emetic and a full colon flush. Warm water to head.

2d Stage. Three times a day a bowel injection of eight ounces—water six and one-half ounces, hydrogen peroxide one and one-half ounces. Mustard on stomach. Teaspoonful doses of the peroxide, one-half pure glycerine, every one to three hours. Nutritive retained enemas every three hours.

3d Stage. Increase the strength of the peroxide in the bowel injections to two ounces to six of water. Separate packs of body and limbs in cayenne water. Every two hours hot milk and brandy retained enemas. Sprays of pure peroxide frequently into the mouth. Convalescence to be dieted with the same care as dysentery.

PART X.

APPENDIX.

1. Quantities to be Taken by Adults of Remedies Named in the Foregoing Pages, where the Amount of Dose was not Prescribed—2. Special Foods Omitted from their Proper Place but Named in the Dietaries—3. Index of Contents and Glossary of Terms Used.

Adult Doses of Remedies named, but not dosed when prescribed, in the preceding pages:

Althea.—Fluid extract, one to two teaspoonfuls every one to four hours.

Arnica.—Fluid extract of flowers, five to fifteen drops; of root, five to thirty drops every four to six hours.

Amyl-nitrate.—Two to ten drops. Stop if face flushes.

Aftermath.—The second mowing of hay.

Aconite.—Fluid extract of leaves, two to five drops; of root, one-half to two drops. Better to put seven drops in two-thirds glass of water, and give one teaspoonful as a dose every twenty to one hundred and eighty minutes.

Aromatic Sulphuric Acid.—Ten to thirty drops in wineglassful of water three times a day. Protect the teeth.

Alkaline Water.—Vichy, Bladon, Fachingen, Ems.

Aromatic Phosphates.—One-fourth teaspoonful three times a day.

Atropia or Atropine.—See belladonna.

Ammonia, Chloride of.—As an expectorant five to ten grains every two hours in sweetened mucilage. For liver torpor twenty grains thrice daily. As a spray ten to twenty grains to one ounce of water.

Ammonia, Carbonate.—Five grains every two hours in mucilage.

Agrimony Tea.—One ounce to sixteen ounces water, simmered an hour in an earthen vessel; two ounces every one or two hours.

Angelica Root Tea.—One ounce to sixteen ounces water infused in covered vessel; one to two ounces, as needed.

Althea Off. Tea.—One ounce to sixteen ounces water; one to two ounces, as needed.

Ambrosia Leaves.—One ounce to thirty-two ounces water and one dram ginger; one to two ounces every two to four hours.

Belladonna.—Fl. ext of leaves one to four drops; of root one to three drops. Active principle, atropine, one-two hundredth to one-fiftieth grain, solution of once or twice a day.

Boroglyceride Paste.—Five to ten grains every hour until crystals of boric acid appear in the urine, then less. Solutions of three per cent for bladder injection.

Bath, Sponge.—Nitro-muriatic acid. Water acidulated to the strength of strong vinegar.

Black Willow.—Fl. ext. one-fourth to one teaspoonful three times a day.

Boneset (eupatorium perf.)—One ounce powder to one quart boiling water; one to three ounces, as needed.

Berberis Aquifolium.—Fl. ext. ten to thirty drops; solid extract two to six grains three times a day.

Blue Flag.—Fl. ext. ten to twenty drops; solid extract two to four grains (not iridin), cathartic.

Bryonia.—Fl. ext. ten to sixty drops; bryonin one-twelfth grain every one-half hour until it purges.

Bitter Root.—Fl. ext. as a tonic and diaphoretic ten to twenty drops; as an emetic thirty drops; solid ext. one to four grains. (Concentration) Apocynin one-half to two grains, tea one-half ounce to twenty-four ounces water; one to two ounces two or three times a day.

Butternut.—Fl. ext. of bark of root one to two teaspoonfuls; solid extract three to ten grains. Concentration, juglandin one to five grains every two to four hours.

Brewer's Yeast.—One ounce three to sixteen times a day. Yeast poultice. See poultices.

Biochemic Remedies.—Calcaria phos.; calcaria sulph.; calcaria fleur.; ferrum phos.; kali mur.; kali phos.; kali sulph.; magnesium phos.; natrum mur.; natrum phos.; natrum sulph.; silicea. Dose of each three grains every four to six hours in chronic cases, and every one-fourth to two hours in acute cases. Usual form, powders or one grain tablets; latest form three grain tablets.

Caulophyllum (blue cohosh).—Fl. ext. ten to thirty drops; solid ext. two to four grains; (conc.) caulophyllin one to five grains. Infusion, one-half ounce, water sixteen ounces one-half hour covered; one ounce every hour or two.

Cimicifuga (black cohosh).—Fl. ext. fifteen to sixty drops; solid ext. three to ten grains; conc. cimicifugin (macrotin), one to four grains. Infusion one-half ounce powdered, water eight ounces tepid; stand one-half hour; two teaspoonfuls every hour.

Cinchona (peruvian bark).—Fl. ext. one-half to one teaspoonful; solid ext. five to twenty grains every four to six hours.

Cinchona, Compound Tinct.—Huxham's tinct.; one to four teaspoonfuls every four to six hours.

Cinchona Tea.—Boil yellow bark one ounce ten minutes in covered vessel in one pint water. Strain, add water till one pint is obtained; one to two ounces three or four times a day.

Codeine (alk.)—One-sixth grain every three or four hours for cough; one-half to one grain at bedtime for insomnia.

Codeine, Syrup of.—Three grains in one ounce of simple syrup; dose one-fourth teaspoonful.

Coca.—Fl. ext. of leaves one to two teaspoonfuls; solid ext. ten to twenty-five grains one to four times a day.

Caffeine (coffee).—Fl. ext., one-half to one and one-half teaspoonfuls; solid, one to three grains; citrated, two to five grains; effervescent, one to three grains every three to six hours.

Calcium, Lacto-phosphate.—One and one-half grains three to six times daily.

Copaiba (balsam).—One-fourth to one teaspoonful every four hours.

Chloroform Liniment.—Commercial chloroform four and one-half ounces, soap liniment eleven and one-half ounces; apply and cover with waxed paper or oiled silk.

Chestnut Tea.—One ounce leaves steeped in two pints boiling water; use freely.

Calcium Sulphide.—One-twelfth grain three to twelve times daily.

Conium (hemlock).—Two to five grains; fl. ext. five to twenty drops every two hours.

Colocynth.—Fl. ext. two to five drops; powdered extract one to two grains.

Chamomile (anthemis).—Thirty to sixty drops of fl. ext.; eight to twelve grains of solid three or four times a day.

Chamomile Tea.—One-half ounce flowers to sixteen ounces water; one-half to one ounce four times a day as a tonic; two to four ounces at pleasure as a gentle relaxant three or four times a day.

Chionanthus (fringe tree).—One-fourth to one teaspoonful of fl. ext.; five to twenty grains solid two to four times a day.

Capsicum.—Five to fifteen drops of fl. ext.; solid one-half to two grains; tinct. thirty to sixty drops as needed.

Capsicum Tea.—Twenty grains to sixteen ounces water; one to three ounces every two hours.

Cactus Grand (cereus grandiflorus).—Fl. ext. two to five drops every two to six hours.

Cathartics, Saline.—Epsom salts one ounce; Glauber's salts one-half to one ounce; Hunyadi Janos; Friedrichshall; seidlitz; Crab Orchard; Estill; Harrodsburg; Kissingen, a sufficient quantity.

Catnip Tea.—One-half ounce steeped ten minutes in sixteen ounces water, and strain with pressure. Must not come near the boiling point.

Catnip Juice.—Put fresh plant under moderate pressure and add a little thirty per cent. alcohol for a day, then press powerfully; a teaspoonful for nervous convulsions of children, repeated hourly.

Cleavers Tea.—Digest two ounces in a quart of tepid water thirty minutes, strain with pressure; one to three ounces every two or three hours.

Dandelion.—Fl. ext. root one to three teaspoonfuls; solid, ten to thirty grains three or four times a day.

Dandelion Tea.—Digest four ounces of bruised root in twenty-four ounces hot water for an hour, boil a few minutes and strain; two to four ounces three times a day. Flavor with wintergreen.

Dwarf Elder (arabia hisp.)—Fl. ext., one to two teaspoonfuls every four hours.

Dwarf Elder Tea.—Two ounces bark of root to one quart water; two or three ounces three times a day.

Dusting Powder.—Strongly antiseptic, one part of menthymos to three parts of starch; mildly antiseptic, one part menthymos to seven parts starch.

Epsom Salts (sulph. magnesium).—One ounce; often better in one-fourth ounce doses, repeated.

Eyebright (euphrasia off.) **Tea.**—One ounce to sixteen ounces hot water; two ounces every two hours.

Euonymus (wahoo).—Fl. ext. one to two teaspoonfuls; powdered ext. five to fifteen grains. Decoction, crushed bark two ounces, boiling water one quart, one hour, strain with pressure, add two ounces sugar, and water enough to make a quart; two ounces every four hours, to break an expected chill.

Elderberry Syrup.—One quart of berries to one pint of honey, boiled to a syrup; one to two dessertspoonfuls in a glass of water, as needed.

Emetics.—Lobelia and composition equal parts, two tablespoonfuls in a quart of hot water; two to four ounces every five to thirty minutes. Lobelia emetics should always be preceded by warm drink of soda or bicarbonate of potassa.

Enemas.—Opiate. Opium one grain, to water three ounces; or, laudanum thirty drops, to water three ounces every four to twelve hours.

Enemas.—Stimulating. Capsicum one-half to four grains in four ounces of elm water; or, whisky or brandy one to two ounces in three ounces of water; or, water of ammonia one dram, in three ounces of mucilage or elm water every three to six hours.

Feverfew (wild chamomile) **Tea.**—One-half ounce of dried herb to one quart nearly boiling water in covered vessel; two ounces every one-half hour; fl. ext. one-fourth to one teaspoonfnl.

False Bittersweet (celastrus scand.)—Fl. ext. bark of root, one to two teaspoonfuls; tea, two ounces to thirty-two ounces water; two or three ounces every four hours.

Fomentations.—Wild Indigo.—One-half to one ounce to one pint of water, boiled a few minutes. Peroxide of hydrogen.—Saturate a thin layer of cotton with the peroxide, lay it upon the part, and cover with hot water fomentation. Permanganate of potash.—One to ten grains to the ounce of water; used the same as the peroxide of hydrogen. Smart weed (polygonum hydro.).—Dip the fresh herb in hot vinegar and water equal parts; apply and cover with hot flannels. Hops.—Steep one ounce in a pint of boiling water, covered, ten minutes, then add one-half pint of hot vinegar. Put the hops into a bag and apply hot and cover with hot flannel. Re-dip in the hot fluid every ten to twenty minutes.

Golden Seal (hydrastis).—Fl. ext., no alcohol, ten to thirty drops; colorless ten to sixty drops; solid or powdered ext. two to ten grains; (conc.) hydrastin one to three grains; berberine hydrochlorate one to four grains; (alk.) hydrastine one-sixteenth to one-fourth grain three times a day.

Germicidal Ointments.—One ounce of vaseline, or lanoline, or cerate, medicated with iodine, eighteen grains, and iodide of potassium four grains; or, iodoform forty-eight grains; or, salicylic acid eighteen grains; or, carbolic acid forty-eight grains; or, resorcin one dram; or, oxide of silver forty to eighty grains; or, glycozone one ounce, and many others.

Gelsemium.—Fl. ext. one to ten drops; solid one-fifth to two grains; (conc.) gelsemperin, or gelsemin, one-eighth to one grain; (alk.) gelseminine one-two hundred and fiftieth of a grain every three to six hours.

Gravel Root (eup. purp.)—Fl. ext. ten to thirty drops; powder thirty grains three times a day; tea one-half oz. root digested twenty minutes in a pint of hot water, covered. Acute cases one ounce every two hours; chronic two ounces four times a day.

Hamamelis (witch hazel).—Fl. ext. of leaves one to two teaspoonfuls; solid ext. five to fifteen grains; distilled ext. one to two teaspoonfuls; (conc.) hamamelis one to three grains; tea two drams in one-half pint warm water, one-half to two ounces every two to four hours.

Hair Cap Moss.—Fl. ext. one to two teaspoonfuls; tea, steep one-half ounce in a quart of water; one to three ounces every two to four hours.

Helonias (false unicorn).—Fl. ext. one-half to two teaspoonfuls; (conc.) helonin two to four grains; powder five grains every four to six hours.

Hensels' Tonicum (ferric and ferrous salts of iron).—One teaspoonful to eight ounces sweetened water one-half to one hour after meals.

Inunctions.—Olive oil, one-half to one ounce rubbed into the skin daily; or olive oil six drams, soap liniment two drams; or one-half to one ounce of olive oil one pint, oil of sassafras and oil of lavender each one ounce; or cod-liver oil, pale, used as olive oil; or quinine two drams, oil of cinnamon one dram, lard eight ounces; one-half to one ounce, rubbed in once a day.

Inhalations.—To be used by drawing the inhaled air through the solution five to fifteen minutes, two to six times a day. Creosote twelve drops, boiling water eight ounces; hydrogen peroxide one to two

drams in four ounces. Renew every time. Comp. tinct. benzoin, one dram in four ounces. Renew when necessary. Iodine tinct. one hundred and twenty drops, glycerine and water each one ounce.

Iodol Lotion.—Iodine one part, alcohol sixteen parts, glycerine thirty-four parts; applied with a brush.

Ipecac.—Fl. ext., expectorant, one-fourth to one drop; diaphoretic, one to two drops; emetic, twenty-five drops; repeated if necessary.

Ipecac Syrup.—Thirty grains in each fluid ounce; wine, dose fifteen to sixty drops.

Ipecac Tincture.—Fl. ext. two ounces, fifty per cent. alcohol fourteen ounces; dose forty to eighty drops; one to six drops for nausea, often.

Ignatia.—Fl. ext. of seed, one to ten drops; solid or powdered, one-sixth to one grain three times a day.

Iodoform.—Locally not over one-half dram applied at one time.

Iodine Lotion.—Three grains iodine and six of iodide of potassium dissolved in a pint of water, applied one to three times a day.

Injections.—Bowel or vaginal (antiseptic), menthymos. one-half to two drams to the pint; salicylic acid one-half dram dissolved in a little boiling water, and when cool added to one pint of water; peroxide of hydrogen one-half to four ounces to the pint; carbolic acid, one per cent. to four per cent.; boroglyceride one to three drams to the pint; boracic acid, one dram to the pint.

Ingluvin (gizzard of the fowl).—Ten to twenty grains before meals.

Jaborandi.—Fl. ext. of leaves of pilocarpus sell. ten to thirty drops; solid or powdered, three to ten grains. Pilocarpine (alk.) one-twentieth to one-sixth grain, hourly.

Kola.—Fl. ext. of nuts, ten to thirty drops on retiring.

Lobelia.—Fl. ext. expectorant, one to ten drops; emetic, ten to sixty drops; solid or powdered ext., one-half to two grains; powdered herb, one dram; powdered seed, one-half dram.

Lobelia (conc.) **Lobeliin.**—Emetic one to three grains, repeated if necessary; expectorant, one-twelfth grain, hourly.

Lobelia (alk.) **Lobeline.**—one-one hundred thirty-fourth grain ten times daily; increased if desirable.

Lobelia Tea.—One dram to four ounces water, not boiling, for emetic; one-half dram to sixteen ounces water, not boiling, two to four teaspoonfuls every one-half hour, as a relaxant.

Lobelia Oil.—Five drops or more as a powerful external relaxant.

Lobelia Embrocation.—Relaxing, one pint saturated tinct. of lobelia seeds (ninety per cent. alcohol), two ounces essence of wormwood and two ounces hard soap.

Lead Water.—Distilled water boiled and cooled, five ounces, add one teaspoonful of solution of subacetate of lead. Lotion.

Lime, Sulphide of.—One-twelfth grain three to twelve times a day.

Leptandra.—Fl. ext. fifteen to sixty drops; solid or powdered ext. three to ten grains; (conc.) leptandrin, in acute cases, one-fourth to one grain; chronic, one to four grains one to three times daily.

Lady's Slipper.—Fl. ext., fifteen to sixty drops; solid ext., three to ten grains. (Conc.) cypripedin, one-half to three grains every two hours as needed. Tea.—Powder one-half ounce, warm water sixteen ounces, steep below boiling in covered vessel one-half hour; one-half to two ounces every two hours. Double the dose if necessary.

Lithium Carbonate.—Five to fifteen grains, best in carbonic acid water two or more times a day.

Male-Fern.—Fl. ext. one-half to three teaspoonfuls; solid, nine to fifteen grains; powder, one hundred to one hundred twenty-five grains before breakfast; oil, thirty to sixty drops in an ounce of thick mucilage of gum arabic and four ounces of fresh milk given before breakfast, followed in two hours with a large dose of castor oil.

Menthol.—See menthymos for substitute.

Menthymos.—Standard solution, one ounce to one pint of pure soft water; drinking solution, ten to thirty drops of the standard solution in a goblet of water; syringe solution, one teaspoonful of standard solution to two quarts of water; spray or inhalation, dilute the standard solution until the desired effect is reached; eye solution, five to ten grains to an ounce of water, strain through cotton.

Nux Vomica.—Fl. ext., one to ten drops; solid or powdered, one-tenth to one grain three times a day.

Ox Gall.—Solid extract five to ten grains ; powdered the same.

Oats, Tincture of.—Concentrated, ten to twenty drops; ozonized, fifteen to thirty drops three to six times a day.

Pain Suppositories.—Two grains lobelia seeds and three of powdered lady's slipper made into a conical suppository with simple cerate stiffened with pulverized gum arabic. One in rectum every four, six or twelve hours for any pain that relaxation will relieve.

Poultices.—Charcoal: Soak two ounces crumbed bread ten minutes in ten ounces boiling water, stir, add gradually one and one-half ounces of linseed meal and one-fourth ounce wood charcoal and sprinkle one-fourth more charcoal on the surface of the poultice. Linseed: L. meal four ounces gradually stirred into ten ounces boiling water. Iodine: Use lime water for iodine lotion which see and thicken with powdered elm. Alkaline: Soft soap thickened with indian meal or powdered elm. Yeast: Mix six ounces of beer yeast with six ounces of water at one hundred degrees F. and stir in fourteen ounces wheat flour. Linseed and yeast: Make as yeast, using a sufficient quantity of linseed meal instead of flour. Permanganate of potash: See fomentations.

Passiflora Incarnata.—Fl. ext. fifteen to sixty drops every two to six hours.

Pancrobilin.—Pure ox gall two grains; pure pancreatin one-half grain; one to three pills before meals.

Pancreatin.—Pure, one to two grains; saccharated, four to eight grains before meals.

Peroxide of Hydrogen.—Fifteen vol. solution, eone-half to thre teaspoonfuls; "ozonized water," six drams to a pint of water; three goblets a day.

Podophyllum.—Fl. ext. of mandrake ten to twenty drops; solid or powdered two to four grains; (resin) podophyllin, laxative one-eighth to one-fourth grains; purge one-fourth to one grain; podophyllotoxin one-sixteenth to one-half grain. The trituration one to one hundred of sugar of milk is the preferable form of use, one to five grains.

Phosphate of Soda.—Twenty to forty grains in water after meals.

Phosphorus.—One one-hundredth to one-twentieth grain three times a day.

Pepsin.—Saccharated, five to thirty grains; pepsin, one to three grains; lactated, one to five grains after meals.

Papoid.—Papaw juice, one to five grains; solution, one part to two parts each of water and glycerine for dissolving diphtheritic membrane.

Phosphoric Acid.—Twenty to sixty drops largely diluted three times a day.

Phytolacca (poke berry).—Fl. ext. ten to sixty drops; (conc. of root) phytolaccin one-fourth to one grain three to six times a day.

Pleurisy Root.—Fl. ext. one-half to two teaspoonfuls.

Pleurisy Root Tea.—One ounce to one quart boiling water; four ounces every sixty to ninety minutes.

Perchloride of Iron (ferric chloride).—Solution one and one-half to six drams to the ounce of water.

Permanganate of Potash.—Wash, three grains to one ounce water.

Parsley.—One ounce to one pint hot water; one ounce every two to four hours.

Quebracho.—Fl. ext. of bark fifteen to sixty drops; powdered five to thirty grains every four to six hours.

Quinine Inunction.—See inunctions.

Quinine.—One to two grains every one to six hours; usually best with a dose of capsicum.

Rhus Aromatica.—Fl. ext. of bark five to thirty drops; solid ext. one to five grains every four hours.

Resorcin.—Pure, two to five grains; solution for mucus membrane one per cent. to twenty per cent.; in ointments for the skin five per cent. to thirty per cent. Pure, three times a day.

Solutions, Per Cent. of.—One drop of a liquid or one grain of a powder to ninety-nine drops of fluid make a one per cent. sol. Hence as there are four hundred eighty drops, or four hundred and eighty grains in an ounce, four and eight-tenths drops or grains will make one ounce of one per cent. solution, and the required multiple of this will give a solution of any strength.

Sulfonal.—Fifteen grains, then five grains every hour until sleep is induced.

Sumbul.—Thirty to sixty grains every three hours.

Sassafras.—Bark of roots one-fourth to one dram three times a day.

Sassafras Oil.—Two to four drops on sugar.

Sassafras Tea.—Two ounces to sixteen of water. Use freely.

Saw Palmetto.—Fl. ext. of berries one-half to two teaspoonfuls; solid ext. five grains and upward three times a day.

Sanguinaria.—Fl. ext. as expectorant two to five drops; as emetic, ten to twenty drops; powd. and solid ext. one to five grains; (conc.) sanguinariin one-eighth to one grain; (alk.) sanguinarine nitrate, one-eighth to one-twelfth grain every two to four hours.

Saracenia Flava.—Fl. ext. ten to twenty drops three times a day.

Shepherd's Purse.—Fl. ext. of herb, fifteen to sixty drops three times a day.

Sulphur.—One to three drams one to three times a day.

Santonin.—Active principle of levant wormseed, one-fourth to one-half grains; santonin-oxim is the preferable form, one to five grains; one or two doses fasting, and no more until next day.

Scull-cap.—Fl. ext. of leaves one-half to one teaspoonful; solid or powdered ext. four to fifteen grains; (conc.) scutellarin one to three grains every one to four hours.

Sprays.—Menthol, one per cent. to ten per cent. in fluid vaseline; resorcin, five per cent. to twenty-five per cent. in water; terebene sixty drops in one ounce fluid vaseline; eucalyptus oil, six drops in six drams of glycerine; beechwood creasote, thirty drops in one ounce oil of sweet almond, and one of peroxide of hydrogen; oil of tar, thirty drops in one ounce of alcohol; hydrogen peroxide fifteen vol. sol. clear or diluted.

Soda, Bicarbonate.—Ten to sixty grains.

Tartaric Acid.—Five to thirty grains.

Thymol.—See menthymos for substitute.

Tansy.—One to two ounces to one pint boiling water. Use externally.

Tooth Powder.—Antiseptic and elegant, one part of menthymos to three or four of chalk precipitate.

Virginia Stone Crop.—Fl. ext. of herb, ten to thirty drops three or four times a day.

Wood Sorrel.—Juice evaporated in the sun to a soft extract, stiffened into an ointment with simple cerate. For cancer apply once a day as long as can be borne, then remove and dress with some healing salve. For indolent ulcers apply often enough and strong enough to awaken life.

Wintergreen.—Fl. ext. one-half to one teaspoonful every four hours.

Wintergreen Oil.—Ten to twenty drops.

Wintergreen Tea.—One ounce to sixteen of water. Use freely.

Wormwood.—Powder, five to fifteen grains three times a day.

Wormwood Tea.—One-half ounce in sixteen ounces boiling water; two to four teaspoonfuls.

Wormwood Oil.—Used externally to stimulate and strengthen.

Special Foods omitted from their proper place, but used in the dietaries:

In Diet No. 38.—**Graham Gems:** Mix two cups flour, one-half teaspoonful salt, one tablespoon sugar. Add one cup milk to the beaten yolks of two eggs, then one cup water and stir into the flour, etc., then stir in the whites beaten stiff, and bake thirty minutes in hot gem pans.

In Diet No. 41.—**Egg and Brandy:** Eggs six ounces, water four ounces, sugar three-fourths ounce, brandy four ounces. **Whole Wheat Crisps;**—Whole wheat flour eight ounces, sugar two ounces, cream eight ounces, salt spoon of salt. Knead fifteen minutes, roll out thin and bake in ungreased tins. "Specially good for children."—Mrs. Lincoln.

In Diet No. 34.—**Chicken Salad:** Chicken sixteen ounces, celery sixteen ounces, cream four ounces, yolks of two eggs, one lemon, oil of olive sixteen ounces, sugar one-eighth ounce.

In Diet No. 31.—**Baked Indian Pudding:** Milk sixteen ounces, Indian meal four ounces, two eggs, sugar four ounces, cream six ounces. **Simple Pudding:** Bread sixteen ounces, cream sauce six ounces.

In Diet No. 42.—**Snow Drift Sauce:** Butter four ounces, sugar eight ounces. **Cream Sauce:** Cream eight ounces, yolk of egg two ounces.

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INDEX AND GLOSSARY

(*d*) signifies that the word is defined on the page named.

Errata. Page 278, fourth line from bottom, read **warm instead of "cold."**

Page 287, ninth to fourteenth lines mistakenly copied from a medical journal. They do not apply to the Hall system.