ENCYCLOPEDIA OF DIET

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A Treatise on the Food Question

IN FIVE VOLUMES

EXPLAINING, IN PLAIN LANGUAGE, THE CHEMISTRY OF FOOD AND THE CHEMISTRY OF THE HUMAN BODY, TOGETHER WITH THE ART OF UNITING THESE TWO BRANCHES OF SCIENCE IN THE PROCESS OF EATING SO AS TO ESTABLISH NORMAL DIGESTION AND ASSIMILATION OF FOOD AND NORMAL ELIMINATION OF WASTE, THEREBY REMOVING THE CAUSES OF STOMACH, INTESTINAL, AND ALL OTHER DIGESTIVE DISORDERS

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VOLUME V

NEW YORK CITY
CORRECTIVE EATING SOCIETY, INC.
1917

PUBLISHED AUGUST, 1914

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Adapting Food to Special Conditions

INFANT, OLD AGE, AND ATHLETIC FEEDING, SEDENTARY OCCUPATIONS, CLIMATIC EXTREMES

Diet may be divided into three distinct classes—normal, preventive, and curative. In order to understand the application of diet to these several conditions, it is necessary to observe the following rules:

1 Foods must be selected which contain all the desired nutritive elements

2 They must be so combined as to produce chemical harmony, or should at least produce no undesirable chemical action.

3 They must be proportioned so as to level or balance their nutritive elements; that is, to prevent overfeeding on some elements of nourishment, and underfeeding on others

Many fine specimens of men and women have been produced without knowledge of these laws, but in nearly every case it may have been observed that the person was normal as to habits, and temperate in eating, therefore led aright by instinct.

If one lives an active life, spending from three to five hours a day in the open air, the body will cast off and burn with oxygen much excess nutrition, and will also convert or appropriate certain nutritive elements to one purpose, which, according to all known chemical laws, Nature intended for another. Much better results, however, will be obtained by giving Nature the right material with which to work, thus pursuing lines of least resistance.

What foods to select, how they should be combined and proportioned, is determined mainly by laws dependent upon the following conditions:

1 Age

2 Temperature of environment—time of year or climate

3 Work or activity

(1) As to age:

If we wish the best results we must select and proportion our food according to age, because the growing child or youth needs much structural material—calcium phosphates—with which to build bone, teeth, and cartilage. This is found in cereals and in all grain foods. The middle-aged person needs but little of these—just enough for repair, and the aged person needs practically none.

While the growing child needs calcium phosphate, he also needs milk and natural sweets, which named in the order of their preference are honey, maple-sugar, dates, figs, and raisins. This does not mean that a generous quantity of vegetables and fruit cannot be taken, but that the articles first mentioned (cereals and starchy foods) should form a conspicuous part of the child's diet.

The adult needs a much less quantity of the heavier starchy foods, because the structural part of the body has been built up. The diet of the adult should consist of vegetables, nuts, and a normal quantity of sweets, a normal quantity of fruits, milk and eggs, with rather a limited amount of cereal or bread products, while the aged, or those having passed sixty, could subsist wholly upon a non-starch diet (non-cereal starch), such as vegetables, milk, nuts, eggs, salads, and fruits, including bananas, which is not a fruit, but a vegetable, and which

contains a splendid form of readily soluble starch.

(2) As to time of year:

In selecting and proportioning our food we should observe the laws of temperature or time of the year. We should not eat foods of a high caloric or heating value at a time when the sun is giving us this heat direct, thus building a fire inside, while the sun is giving us the same heat outside. The violation of this simple law is the cause of all sunstroke and heat prostrations. On the contrary, if we are going to be exposed to zero weather, we should build a fire inside by eating foods of a high caloric value.

(3) As to work or activity:

We should select and proportion our food according to the work we do, because eating is a process of making

energy, while work is a process of expending energy, and we should make these two accounts balance.

THE NORMAL DIET

Effects of overfeeding on starchy foods and sweets

While in some respects each body is a law unto itself, there are a few fundamental rules and laws that apply to all alike. For instance, overeating of starchy foods, in every case, will produce too much uric acid, and finally rheumatism. Also the overeating of sweets and starches will cause the stomach to secrete an oversupply of fermentative acids, the effects of which have been discussed in a previous lesson.

Temporary disturbances caused by radical changes in diet

In laying out the diet, under all conditions, the practitioner must be governed by the above-named rules. He should exercise his judgment, however, in each case according to the prevailing conditions. In prescribing diet

it is well to remember that Nature will not tolerate, without protest, any radical change. It often occurs, therefore, that the most correct and thoroughly balanced menu will cause violent physical disturbances which the inexperienced may consider as unfavorable symptoms, but in a majority of cases this is merely the adjusting process, similar to that which occurs when the body is suddenly deprived of narcotics and stimulants after their habitual use.

The practitioner should exercise much care in diagnosis. He should study all symptoms and lay out the diet so as to counteract prevailing conditions, and to produce normality.

The stomach should agree with natural food

The tendency of the body, that has been incorrectly fed for many years, to protest against the right kind and the right combinations of food, is often very deceptive. It is not always correct to say that the food did not agree with the stomach,

but more correct to say that the different foods did not agree with themselves. The patient should be thoroughly acquainted with these facts, and mentally prepared for some temporary discomforts or physical protest against the new system.

INFANT FEEDING

Large percentage of infant mortality due to incorrect feeding

The tremendous mortality among infants and children is due to incorrect feeding more than to all other causes. In the process of reproducing animal life, nearly all abnormal conditions are eliminated. The best that is in the mother is given to the child. The trend of Nature is upward toward higher intelligence and more perfect physical development. For this reason infants are usually healthier than their parents, though millions of babies are rapidly broken in health by improper feeding.

The economy of Nature is perfect, therefore all natural forces conspire to preserve the life of the young. This is the natural law governing the preservation and the development of human life, and that this condition does not obtain is the most striking evidence of our lack of knowledge in feeding the young.

Infant feeding must be considered from two points of view: (1) Dealing with the child or infant as we find it, where the mother has so violated Nature's laws of nutrition and hygiene as to afford no breast-milk for her child; (2) where this condition does not prevail, and the child receives ample nourishment from the breast of the mother.

Point of view to be considered in infant feeding

We will first consider the diet and the conduct of the mother during pregnancy and prior to it.

Preparation for motherhood is one of woman's most sacred duties, because it involves not only the happiness and

health of herself, but it shapes, in a large degree, the mental and the physical conditions of another being which will wield an influence over its whole life.

The unwelcome child

The common error of most women is that they do not desire children when they are first married, and in the pursuit of other pleasures they violate and disregard the laws of Nature; the baby is a mere accident—probably unwelcome. During the entire embryonic period the same old habits and diet are indulged in; the mental and the physical condition of the being-to-be has received no consideration, and, unwelcome in a strange world, the little eyes are opened. Then the instinctive love of the mother is kindled and lavished; the child's every want is law; it needs maternal nourishment and the mother desires to give it, but the natural fountain is insufficient, and probably dry. The mother's thoughts and inspirations can no longer

become a part of the child, except through education in later years—they are two separate beings; the opportunity to endow it with a part of her life is forever gone.

Under the most favorable conditions we meet a constant resistance to life, and the higher we ascend in the scale of civilization the greater is the resistance encountered. It is therefore the duty of the mother, as also of the father, to remove every obstacle that would offer resistance to the physical and mental growth of the child. In order to do this it is necessary to carry out certain well-established laws concerning diet, exercise, fresh air, sunshine, and mental training.

Resistance to infant life should be removed as much as possible

GENERAL RULES FOR THE PROSPECTIVE MOTHER

From the time conception is recognized the following general rules should be observed:

1 The corset or all tight-fitting garments that would in any way interfere with freedom of exercise and thorough development of the abdominal muscles should be discarded.

2 As much time as possible—at least two hours each day—should be spent in the open air, and a system of moderate trunk exercises followed, together with deep breathing, calculated to expand the lungs to their fullest cell capacity, which is Nature's method of burning or oxidizing waste matter, and thereby keeping the blood pure.

3 The mental occupation should be an important factor in the daily regimen. Some congenial study should be chosen with the view of making it useful, while some remunerative employment should be sought and indulged in for a portion

of each day. Avoid idleness by all means, or an idle roaming of the mind and spirit. Learn to think, to concentrate, to work, and to do something for others, as it is from these things that all happiness is gained.

4 The diet of the future mother should be governed somewhat by the laws laid out in the first part of this lesson; that is, age, temperature of environment, and occupation should be considered in its selection.

SPECIAL RULES FOR THE PROSPECTIVE MOTHER

There are some specific rules in regard to diet, however, which every mother should observe. The diet should be balanced so as to contain all the needed elements of nourishment in approximately

Suggestions for the diet

the right proportions. The proportions, however, should differ in many cases from that which she would take if she were in a normal state, especially in regard to starchy foods or calcareous matter. An abundance of green salads, sweet ripe fruits, fresh vegetables in season, eggs, milk, nuts, and not more than two ounces of bread, potatoes, or dried beans should be taken daily. If flesh food or something salty is craved, tender chicken, or fish, may be allowed in small quantities.

It should be borne in mind that I do not advocate the use of flesh foods, but during pregnancy the appetite is varying and sometimes tyrannical, and it has been found better to compromise with this condition than to combat it. The use of a limited quantity of tender meat, or any other article of good food for which there should arise a craving, is therefore advisable.

Abnormal appetite during pregnancy

In the selection of meats, the flesh of young animals is best, for the reason that young animals are more healthy and less liable to contamination by dis-ease. The meat of either fowl or fish is rather appetizing, and often satisfies the craving that many pregnant women have for the heavier meats such as pork or veal, which are, of course, very much more difficult to digest.

Flesh of young animals preferred

There is, notwithstanding the opinion foolishly held by many doctors, no difference in the nutritive qualities of white or dark meat, as either variety is nourished by identically the same blood supply, and contains the same sort of protoplasm.

So it is a mistaken idea to think that there is any appreciable difference in the digestibility of white meat as compared with dark, except as the effect of mental suggestion may be operative. Of course, we know that if you tell a person

often enough that a certain thing is true, eventually he will act upon it automatically. And so it is with the white and dark meat fetich.

THE NURSING MOTHER

Breast milk vs. artificial foods

If the mother supplies enough milk, this is infinitely superior to any artificial combination of so-called infant foods. Unfortunately a large majority of children are not breast-fed, and must depend upon the various commercial infant-foods, or upon the judgment of the untrained nurse, or the mother.

The lives of babies often depend upon the mother's diet

The majority of mothers, if so disposed, could, by studying their own diet, supply the most robust child with ample breast-nourishment until it is ten or twelve months old, after which period the infantile crisis would be passed, and millions of little lives would thereby be

saved. However, the confinement and the trouble to which the mother is subjected by the nursing baby causes the majority of infants to be weaned within a few weeks after birth, and turned over to the hazard of prepared food, soporific drugs, and nurses.

Child-love stimulated by nursing

If mothers could realize the love that is daily kindled and strengthened; if they could be made to know how much more their children would love them, and they would love their children; if they could look into the years and see how the link of love between them and their children had been shaped, molded, and fashioned by the simple act of nurturing them from the breast (to say nothing of the lives that would be saved), the artificially-fed baby would be a rarity, and the mother would be queen in the hearts of the nation's children.

The most beautiful thing that ever graced the canvas of art, or shed its love

into the cold realism of nature, is a nursing baby pushing from its satisfied lips the mother's breast, and smiling its sweet content into her face.

It is almost criminal to withdraw the breast from an infant, and to turn it over to the treachery of prepared foods, when, by devoting a little time each day to the study of the science of eating, it is possible for the mother to supply the child with her own milk.

CARE OF THE CHILD

The following are general rules for feeding the infant from birth to about one year of age.

These rules cannot be made inflexible because all children differ in temperament, vitality, and as to prenatal influences, but if the mother will observe these instructions with reasonable care, her child can be brought healthfully through the most critical period of its

life, and will enter the solid food age with good digestion, a strong body, and an excellent chance to withstand all children's dis-eases.

Where artificial feeding becomes necessary, then the preparation of the baby-food is of primary importance. Cow's milk is, of course, the logical food, but taken whole, that is, the entire milk, it is too high in proteids, and deficient in sugar; therefore, in order to make a healthful infant-food, it must be modified according to the requirements of the infant body.

The nurse or the mother should prepare a quantity sufficient for only one day's supply at a time, after the following formula:

Cream	2 ounces
Milk	2 ounces
Water	15 ounces
Milk-sugar	4 level teaspoonfuls
Lime-water	2 teaspoonfuls or ½ ounce

This should be thoroughly mixed, placed in the bottle, and set in warm

water until it is brought to the temperature of breast-milk. The above formula may be used during the first month of the baby's life.

The quantity and the frequency of feedings should be according to the following table:

AGE	FEEDINGS	OUNCES	INTERVALS OF
1st day	5 to 6	1	3 or 4 hours
2d day	7 to 8	1	2½ to 3 hours
3d to 7th day	9 to 10	1¼	2 to 2½ hours
2d, 3d, and 4th weeks	10	2 to 3	2 hours

Formula for the second and the third months:

Cream	3½ ounces
Milk	1½ ounces
Water	14 ounces
Milk-sugar	5 teaspoonfuls
Lime-water	2½ teaspoonfuls

Quantity and frequency of feeding should be about as follows:

MONTHS	FEEDINGS	OUNCES	INTERVALS
2d and 3d	7 to 8	3 to 4	2 or 3 hours

Formula for period from the fourth to the twelfth month:

Cream	6 to 8 ounces
Milk	2 to 3 ounces
Water	10 ounces
Milk-sugar	5 to 6 teaspoonfuls
Lime-water	2 to 3 teaspoonfuls

Quantity and frequency of feedings should be about as follows:

MONTHS	FEEDINGS	OUNCES	INTERVALS
4th, 5th, and 6th	5 to 6	4 to 6	3 to 3½ hours
7th, 8th, and 9th	5	6 to 7	4 to 4½ hours
10th, 11th, and 12th	5	6 to 8	4 to 4½ hours

The above formulas for infant-food are the best that can be made from ordinary cow's milk.

The milk-sugar and the lime-water herein named can be purchased at any first-class drug store.

These tables are not given as exact. The mother should exercise careful

vigilance and judgment, especially in reference to the quantity of each feeding, and the frequency. The moment the child shows symptoms of overfeeding, which symptoms are usually evidenced by vomiting or discomfort, the quantity of cream and the amount at each feeding should be reduced. In fact, it is healthful, and often necessary for the child to allow it the opportunity to get hungry. The digestion of many a baby is totally ruined by continuous feeding, which is done out of motherly sympathy, or merely to keep it quiet.

Avoid too frequent feeding

The mother or the nurse should exercise great care in the cleanliness and the hygienic preparation of children's foods. Milk should be fresh, and of the very best. It should not be left uncovered or exposed. It should be kept continually on ice until ready for use. The cream should be taken from the top of the bottle, or

Importance of cleanliness in preparing child's food

from fresh milk. This insures better quality of butter-fat than is generally supplied in ordinary commercial daily cream.

As the child advances in age, whole milk, cereal gruel, and egg mixture (two whites to one yolk) may be administered according to the child's normal appetite and digestion. The egg may be prepared by whipping the whites and the yolks separately, adding to the yolk a teaspoonful of cream and one of sugar, then whipping the beaten whites into this, and serving.

CONSTIPATION

The stools of natural, healthy children should be bright yellow and perfectly smooth. If grainy and soft, food should be made richer. If in curds, it evidences too rapid coagulation; therefore an alkali should be added. If the stools are white and oily, it indicates an excess of cream.

If hard and dry, it indicates an insufficient amount of cream. If green, reduce the quantity of milk, or omit it altogether, and increase the quantity of barley-water.

The majority of bottle-fed children suffer greatly from constipation, caused largely by the milk, or the failure to modify the milk properly, or to make it contain the constituent elements of breast-milk. This condition can be relieved by giving the child sweet orange juice every night and morning, or the juice from soaked prunes, if preferred. This should be administered in quantities ranging from a dozen drops to two or three teaspoonfuls, according to the age of the child and the severity of the condition. Intestinal congestion can often be relieved, however, by giving the abdomen gentle massage, preferably with a rotary or kneading motion.

In cases of diarrhea, infants from three to eight months old should be given first an enema, and then a diet entirely of

boiled milk mixed with rice or barley-water.

EXERCISE

All infants need some exercise. They should be gently rubbed and rolled about after the morning bath, before they are dressed. There is nothing more healthful than exposure of the baby-skin to fresh air in a normal temperature.

CLOTHING

Next in importance to the food of the infant is its clothing. The usual style of dressing babies the first three months of their lives is positively barbaric; not that it imitates uncivilized people, but because it evidences the grossest ignorance and cruelest vanity. The mother seems to have no way of expressing her pride in her child except by bedecking it with elaborate garments. These usually consist of three long skirts, two of them

attached to bands which are fastened around the body. The weight of this clothing prevents the free use of the baby's feet and legs, putting it into a kind of civilized strait-jacket, thus preventing it from exercising the only part of its anatomy that it can freely move.

It is nothing uncommon to see a beautiful baby sore, irritated, and broken out with heat all over its little body by being heavily enveloped in barbaric rags. The child, therefore, is made to suffer merely that it may please a proud mother, and conform to an ignorant custom a thousand years old.

The only purpose clothing should serve is that of bodily warmth. When it is made the instrument of painful adornment it is serving the same purpose as "rings in the ears and bells on the toes," and the mind of the mother who thus afflicts her child is in the same class as that of the ignorant barbarian whom she imitates.

TEMPERATURE OF BABY'S FOOD

It should be remembered that all liquid food for a child up to twelve or fifteen months old should be administered at a temperature no lower than blood-heat. The liquid mixtures named herein may be made in advance of the needs, and placed upon ice merely to preserve them, but should be warmed to a temperature of at least ninety-nine degrees Fahrenheit before administering to the child.

Pure water should be given to all children from the time they are two weeks old.

BANDAGE

The bandage should be removed about the close of the third month.

EMACIATION

In case of slight emaciation or lack of fat, the child should be given an olive-oil

rub once or twice a week, rubbing gently into the skin about one teaspoonful of oil.

GENERAL INSTRUCTIONS FOR CHILDREN AFTER ONE YEAR

All children, whether breast-fed or bottle-fed, are subject to practically the same health rules after they are about one year old. Therefore I will now consider all children in the same class, and lay out for them what may be termed general instructions in health and hygiene.

Care should be exercised to omit from the diet of children just beginning to take solid food, all articles that will not dissolve readily without mastication.

GENERAL DIET FROM AGES ONE TO TWO

The diet from the first to the second year should consist of:

Baked apples
Baked potatoes—sweet or white
Cereal—limited quantity (thoroughly cooked)
Cream soups—home-made, such as:

Cream of celery	Onion
Potato	Rice
Tomato, etc.	

Eggs
Milk
Pulp of soft ripe fruits
Vegetables—thoroughly mashed, such as:

Fresh { Asparagus, Squash, Spinach

The above vegetables contain much cellulose or pulp which should be entirely discarded, leaving only the meat or purée; but to the child from eleven to fifteen months old, they should be administered in very limited quantities.

SIMPLICITY IN FEEDING

Especial attention should be given to simplicity in feeding:

1 Avoid giving too many things at the same meal; from three to four articles at one time are sufficient

2 Mothers should be especially cautioned against giving a child bread made with yeast, or baking powder, and against the old diet of milk toast

3 All meat, flesh food, stimulants or narcotics of every kind should be omitted from the diet of children

4 The crowning mistake of the doting mother is often made in feeding her child from the conventional table, on such things as weakened coffee or tea, meats, and condiments

5 The custom of giving children an excess of sweets has ruined millions of little stomachs, and

has given them a heritage of dis-ease and suffering before they have entered their 'teens

6 All condiments, such as pepper, salt, vinegar, pickles, and all pungent things should be eliminated from the diet of children—the taste of the child is very susceptible to cultivation, and with very little encouragement it will accept things that have no place in the human economy, and which are positively harmful

7 When a child begins teething, it may be given a small piece of hard water-cracker with safety

If the above rules are observed, it is reasonable to assume that normal hunger of the child will guide it very correctly in selecting, proportioning, and combining its food through the period of childhood until it enters the period of youth.

OLD AGE

There seems to be two critical periods in every life—the ages of thirty and sixty. If the sixtieth year can be turned with good digestion, normal assimilation and excretion, it is fair to assume that with reasonable care the century mark may be easily reached. It is also reasonable to assume that experience will have taught most thoughtful people what to eat and what not to eat, but the mortality tables of nearly all civilized countries, of which the writer has made a careful study, prove that a majority of people do not reach their sixtieth year, and but a very small per cent of those who do are blessed with good digestion. Therefore an old age diet is quite as important to the student as infant feeding.

Necessity for old age diet

For purposes of convenience, I will put all cereal products, legumes, and white

potatoes in the starch or bread class, and henceforth they will be referred to as such.

Meat and bread produce old age

The majority of disorders that mark the difference between youth and age may be traced directly to the over-consumption of meat and bread, especially cereal starch. The hardening of the arteries, the stiffening of the cartilage, the enlargement of the joints, and the general lack of flexibility throughout the body is due almost wholly to the over-consumption of these two staples.

Uric acid in rheumatic conditions

Uric acid is always present in gouty and rheumatic conditions, but it is there as Nature's defense against our sins, and not as a primary cause. Meat is not the cause of uric acid as has been popularly taught. Uric acid is one of the constituent elements of all animal bodies, and when the normal supply in the human body is supplemented by that which is contained

in the body of the animal upon which we prey, we are oversupplied. This is as far as meat-eating contributes toward uric acid poisoning.

When the body is young and growing, it can consume and appropriate a considerable quantity of starchy or structural material, but when it is fully grown, or has turned forty, it can subsist healthfully upon a diet containing only from three to five per cent of starch, and as one becomes older the more soluble forms of starch should be taken, such as the starch contained in green peas, beans, and corn, which, immature, is readily soluble and assimilable. The starch in the banana is also easily appropriated and easily oxydized, and will be found to agree with many who cannot eat starch in any other form without producing fermentation.

Soluble starches desirable

After the fiftieth year the diet becomes more and more a factor needing special attention in the daily regimen, both as to

selection and quantity; and with advancing age the quantity of food should be gradually reduced until the minimum which will support life healthfully is reached.

In old age the diet should be governed by the same general rules as those of younger people; that is, elderly people should select, combine, and proportion their food according to temperature of environment, labor, and age. Those performing manual labor can use and eliminate food material which would produce uric acid and other poisons in the body of the sedentary worker.

Importance of diet with advancing age

THREE PERIODS OF OLD AGE

Old age may be divided into three periods. From fifty to sixty the diet should consist of a very limited quantity of bread products (not more than two per cent); fresh green vegetables, fresh

Diet from fifty to sixty

mild fruits, nuts, a normal quantity of milk and eggs, a limited quantity of sugar, and a moderate amount of fats.

Diet from sixty to seventy

From sixty to seventy the amount of cereal starch should be reduced to one per cent, or not more than two per cent, while the other articles named may be taken as suggested from fifty to sixty, gradually eliminating starchy foods, and increasing foods containing proteids, casein, and albumin.

Diet from seventy to one hundred

Between the ages of seventy and one hundred, the same general suggestions as those above laid out should be followed, eliminating entirely all cereal products. The more soluble forms of starchy or carbohydrate foods, such as potatoes, bananas, and green peas, beans, corn, etc., may be taken. (See Lesson XIII, Vol. III, p. 632.)

The necessary amount of fats, albumin, casein, and proteids must be governed

by activity and temperature of environment.

The following are suggestions for one day's menu, in spring and summer, age between fifty and sixty. Choice of menus may be exercised, but each menu should be taken in its entirety.

MENU I	MENU II
BREAKFAST	
Melon or subacid fruit	One or two very ripe bananas, with figs, cream, and nuts
One egg—coddled	Choice of fruit—non-acid
A potato or a very little coarse bread	Two glasses of milk
A glass of clabbered milk or buttermilk	
Two tablespoonfuls of raisins, with cream and nuts	
LUNCHEON	
Choice of peas, corn, beans, or creamed onions	Choice of carrots, parsnips, beans, squash, or asparagus
Eggs or buttermilk	A baked sweet or a white potato
A baked potato	A glass of buttermilk
A salad or something green, with nuts	Cream cheese, dates, and nuts
A banana, with cream, nuts and dates	A very small portion of green salad, with grated nuts
DINNER	
One fresh vegetable—spinach, cooked ten minutes	A green salad
One egg or a very small portion of fish	Two fresh vegetables
A baked potato	A sweet or a white potato, with sweet butter
Choice of dates, figs, or raisins, with cream cheese and nuts	A glass of sour milk

In cases of constipation, two or three tablespoonfuls of coarse wheat bran (cooked, if desired) should be taken with the breakfast and the evening meal, and a spoonful just before retiring, taken in a glass of water. Such fruits as plums, peaches, or berries should be taken daily, just after rising and just before retiring.

The following are suggestions for fall and winter menus, for a person between the ages of fifty and sixty:

BREAKFAST

Oranges, apples, pears, or soaked prunes
An egg and a small portion of either plain boiled wheat or rice
A very ripe banana, with nuts and raisins

NOTE: Sweet fruits may be taken instead of the acid fruits suggested, and milk instead of eggs.

LUNCHEON

One or two fresh vegetables, such as carrots, onions, turnips, cabbage, or beans
Celery or any coarse plant
A potato or a very small portion of corn

If not very active, the luncheon may consist of two glasses of buttermilk and a spoonful of wheat bran.

DINNER

Choice of two fresh vegetables
A baked potato
Choice of fish, eggs, or buttermilk
Corn bread or a very small portion of coarse cereal

All fresh, watery vegetables should be cooked in a casserole dish.

A sufficient quantity of water should be drunk at each of these meals to bring the moisture up to about sixty-six per cent of the meal—two to three glasses.

These meals are mere suggestions, and are therefore subject to many variations.

All green salads may be substituted for one another; all starchy products—grain, potatoes, and legumes—may also be substituted for one another.

ATHLETICS

Every diet should be an athletic diet

The diet for the athlete really differs but little from that which should be taken by every person in normal health, the object in all cases being to secure the greatest degree of energy from the least quantity of food. In order to do this, the laws governing the selecting, the combining, and the proportioning of foods should be observed. When the digestive, the assimilative, and the excretory organs are properly performing their functions, the object should be to gain the highest efficiency in food with the least amount of loss or waste. Every diet, therefore, should be made an athletic diet.

In dealing with the public at large, the work of the practitioner will be confined very largely to prescribing for those who, by violation of Nature's laws, have become dis-eased, or in some way

physically abnormal, and in these cases, of course, a remedial or counteractive diet first becomes necessary.

In dealing with the athlete as a special class, however, we must consider him as a normal creature, somewhere between the ages of twenty and forty. We must also consider that his digestion and assimilation of food, and elimination of waste are normal. Under these conditions, the diet should consist of highly nitrogenous and proteid compounds, leveled or balanced by the requisite amount of carbohydrates and fats.

General diet for normal athlete

If the athlete is training for action in summer, the quantity of fat should be reduced according to temperature or climate. When the thermometer ranges in the seventies and eighties, one ounce of fat each twenty-four hours would probably be sufficient, while if the mercury is down in the twenties or thirties, from

Quantity of fat required at different seasons

two or three ounces may be required to keep up bodily heat.

The following are suggestions for summer athletic diet:

BREAKFAST

Fruit or melon
*Corn, or boiled wheat, with nuts and cream
Eggs, whipped, with sugar and cream—lemon juice flavor

LUNCHEON

Break from four to six eggs into a bowl, adding a heaping teaspoonful of sugar to each egg; whip five minutes; while whipping, add slowly one teaspoonful of lemon juice to each egg; to this add half a glass of milk to each egg, and drink slowly
*Corn or a potato

DINNER

Fruit, berries, or melon
A salad of lettuce, tomato, and grated carrots; serve with dressing of lemon juice, grated nuts and olive-oil
One fresh vegetable
An egg or tender fish
A baked potato
Buttermilk

*NOTE: Corn to be prepared as follows: Cut lightly from cob with a sharp knife and scrape down with a dull one; serve uncooked with a little salt, sugar and cream.

The following are suggestions for winter athletic diet:

BREAKFAST

A baked apple or an orange
One coarse cereal, with nuts and cream
Two eggs, either whipped or boiled two minutes
Very ripe bananas, with dates, nuts and cream
(If bananas are not very ripe, they should be peeled and baked) See recipe, Vol. III, p. 677

LUNCHEON

Beans or lentils
Carrots, turnips, squash, or corn
Fish or eggs
A baked potato
Buttermilk

DINNER

Two fresh vegetables
A green salad, with oil
Omelet, with grated nuts
A banana, with nuts and cream, and either dates or raisins
Buttermilk

These menus, like those given for summer, are merely for the purpose of suggesting selections, combinations, and proportions of food that will meet the exigencies of temperature, environment,

and work. The quantity of food required will depend largely upon the size (physique) of the individual, the severity of training, and the feats to be performed. It is especially important that these suggestions be well considered at least one day before engaging in any athletic event or work requiring extraordinary physical effort, as the human body appropriates or uses food from twenty-four to thirty-six hours after it is eaten.

Exposure to extreme cold or exertion

If one is to be exposed to extreme cold, an excess of fats should be taken, beginning thirty-six hours before exposure. If much physical effort is to be exerted, the diet should be balanced as to all nutritive elements, with an excess of nitrogenous foods. In fact, these rules should be observed by every one who desires to make feeding scientific, and to make food his servant instead of his master, as our civilized habits have a tendency to do.

SEDENTARY OCCUPATIONS

Cessation of activity means disintegration

Nature demands from every form of life a certain amount of activity or motion. Any transgression of this law means disintegration. Rest is merely the process adopted by Nature to reconvert matter into its original elements. To whatever extent one ceases activity, Nature, under normal conditions, inflicts this penalty.

The penalty of civilization

Man's civilized habits and customs have produced a class of workers who, while at work, are deprived of their requisite amount of motion, and who, therefore, pay the penalty by shortened periods of life, and by numerous disorders which we have come to characterize as dis-ease. There is but one method known to science by which these penalties may be avoided, and by which the worker whose occupation must be sedentary may become as

healthful as his brother who can order his life in conformity with Nature's laws. That method lies in the ordering of his diet.

All dis-ease may be called *congestion*, or the failure of the body to eliminate poisons and waste matter. The process of elimination is assisted by activity (work or play). The accumulation of waste and poisons in the body is measured or determined almost wholly by the diet.

Dis-ease is merely congestion

The man who is swinging a pick or a sledge hammer in the open air may eat or drink almost anything, because his powers of eliminating waste are aided by his work. It follows, therefore, that those whose work is of a sedentary nature must procure their nutrition from substances containing the minimum of waste, and producing the maximum of energy, and the quantity must be measured accurately

Diet governed by work

by the demands of the body, or auto-intoxication (self-poisoning) will result.

Intestinal congestion (constipation), which is almost universal among sedentary workers, is caused in nearly all cases by consuming a quantity of food in excess of the physical demands, and which cannot be thrown off owing to the lack of exercise. It is at this point that science must lay out the dietetic regimen so as to make it conform to the occupation, or to the lack of physical activity.

The following are suggestions for a spring or summer diet for the average sedentary worker:

BREAKFAST

Cantaloup, berries or peaches, with sugar and cream

An egg

One or two bananas, with nuts, cream, and raisins (Bananas should be baked, if not very ripe)

LUNCHEON

Peas, beans, or asparagus

A heaping tablespoonful of nuts

A salad of lettuce and tomatoes, with nuts

A baked potato, tender corn, or a very little coarse bread

DINNER

Melon or cantaloup

Two tablespoonfuls of nuts

One or two fresh vegetables, including an ear of tender corn

Fish, eggs, or buttermilk

Plain ice-cream, if something sweet is desired

GENERAL DIRECTIONS FOR SEDENTARY WORKER

The student will recognize that in these menus the heavier foods are prescribed sparingly, while the lighter or the more readily soluble articles predominate. From these suggestions a fair idea of a fall and winter diet can be drawn.

Indigestion, sour stomach (hyperchlorhydria), constipation, malassimilation, and general anemia are the disorders with which the sedentary worker is most commonly afflicted.

In dealing with each and all of these conditions, including obesity, which is often the result of sedentary habits, the first thing to be done is to limit the quantity of food to the normal requirements of the body, and in extreme cases a diet below the normal should be observed; no one was ever made ill by underfeeding. Then, with proper care

as to the selection, combination, and proportions of food, and an increased amount of exercise and deep breathing, the person of sedentary habits should be made as healthy and strong as the outdoor worker in the fields of manual labor.

CLIMATIC EXTREMES

In considering a diet to meet the requirements of climatic extremes, either hot or cold, it is necessary to reckon from normality, both as to climate and as to the health of the individual.

All the foregoing lessons, taken as a whole, are designed to teach one method or theory, involving two principles:

1 Selections, combinations, and proportions of food that will counteract and remove the causes of unnatural conditions called dis-ease

2 Selections, combinations, and proportions of food that will bring the body up to its highest degree of development and there maintain it

Under normal conditions the temperature of the body may be thoroughly controlled by feeding. The principal process of metabolism is that of making heat out of the fuel given to the "human boiler." The amount of heat, therefore, that a given quantity of food will produce is determined very largely by the amount of resistance that is met from natural environment.

Amount of fat required in different temperatures

The human body, under ordinary conditions, in a temperature of 60° Fahrenheit, will use about two ounces of pure fat every twenty-four hours. If the temperature should drop to 30° Fahrenheit, it would require about three ounces of fat every twenty-four hours to keep the temperature of the body at normal.

Under certain conditions of exposure it might require as much as five and even six ounces of pure fat to maintain normal temperature of the body, and in the extreme north, where the temperature ranges in winter from 25° to 30° below zero, the natives often take as much as sixteen ounces of fat during the day. Fat being the principal heat-producing element, it is, therefore, the most necessary thing to consider in a temperature of extreme cold.

The student will readily understand that, in order to maintain a normal standard of vitality and endurance, the selection of foods must be made according to age, activity, and temperature.

For a person undergoing a reasonable amount of exposure, and working in a climate where the temperature is ranging between 20° and 30° Fahrenheit, the following menus, covering one day, may be suggested:

Immediately on rising, drink a cup of hot water, then take vigorous deep breathing exercises, followed by a cool sponge bath and rub down.

BREAKFAST

(An hour later)

Add half an ounce of sugar to two or three eggs, and whip five minutes; add a tablespoonful of lemon juice while whipping; mix with this two glasses of rich milk

A tablespoonful of nuts

One very ripe banana, with cream

LUNCHEON

One fresh vegetable

Lima or navy beans

A salad, with either olive-oil or nuts

A baked potato or boiled wheat (A liberal supply of butter or cream)

DINNER

A baked sweet potato

One or two vegetables

Eggs, or buttermilk, unskimmed

A baked white potato, with either olive-oil or butter

Dates, with cream cheese, or gelatin, with cream

As the temperature becomes lower, the amount of fats and proteids should be

increased according to exposure and activity.

The student should bear in mind that carbohydrates, proteids, and fats are the most important factors in the winter dietary. Other articles can be held level over a wide range of temperature, provided these three staple nutrients are taken in the requisite proportions.

Nearly all people in normal health instinctively avoid heat-producing foods in hot weather, and as in warm or hot climates people live more in the open air, oxidation is therefore more perfect, and has a tendency to aid elimination, so the errors of diet are not so serious. Nevertheless, the food to be taken in hot climates, or the heated term of summer, should receive scientific consideration.

Summer diet requires scientific consideration

Anthropoid life, of which man is the highest type, originated in the tropics, and nearly everything necessary for his highest physical development grew prodi-

gally in that country. His natural or primitive diet was nuts, fruits, and salads (edible plants).

Civilization has transplanted him in the north, and has laid heavier burdens upon him, therefore he needs, in many instances, heavier and different foods, such as the carbohydrates, proteids, fats, and the albumin and the phosphorus in eggs.

As the temperature becomes warmer, the heat-producing factors, such as fats and carbohydrates (starch and sugar), should be gradually reduced.

The following menus are suitable for the average person, in normal health, between the ages of thirty and sixty, when the temperature is ranging from 70° to 90° Fahrenheit:

BREAKFAST

Cantaloup, peaches, or berries
Very ripe bananas, with grated nuts and cream
A glass of milk

LUNCHEON

One whipped egg
A fresh vegetable
A teaspoonful of nuts
A lettuce and tomato salad
A baked sweet or white potato

DINNER

Peas, beans, asparagus, or corn
A salad, with grated nuts and carrots
A potato
One whipped egg
Half a glass of milk
A service of gelatin

These menus are mere suggestions, not invariable, and in following them it should be remembered that all green salads may be substituted for one another, and as a general rule such underground articles as beets, carrots, turnips, and parsnips may be substituted for one

another. Also green corn, peas, and beans are in the same general class. (See "Constipation," Vol. III, p. 761.)

Observation of these rules will give the student rather a wide range of articles to draw upon in selecting a diet for the normal person.

LESSON XVII

NERVOUSNESS
ITS CAUSE AND CURE

LESSON XVII

Nervousness
Its Cause and Cure

The nerves of the human body are the most important, the most complex, and probably the least understood of any part of the human anatomy. In conditions of health they are never heard from, therefore every expression of the nervous system is a symptom of some abnormal physical condition.

The usual term "nervousness" conveys to the mind of the average person such conditions as sleeplessness, restlessness, lack of mental and physical tranquillity, but to the trained mind of the food scientist or physician, it means mental aberration, hallucinations, morbidity, mental depression, lack of self-confidence, uncertainty,

True meaning of nervousness

loss of memory, fear of poverty, anticipation of accident, tragedy, death, insanity, and a multitude of things that never happen. Language cannot adequately describe or convey to the mind of another person the strange impressions that sweep o'er the mind—the mental anguish caused by an ordinary case of nervous indigestion. Those only who can understand why many good men and women sometimes take their own lives, or commit some great crime, are those who have experienced the same affliction.

If we could correctly interpret the various symptoms given to the brain from the nervous system, and would heed these symptoms, the body might be kept in almost perfect health under all conditions of civilized life.

Relation of nutrition to nervousness

The lack of fresh air and exercise is always told by nervous expression, but the most important and significant message conveyed by the nerves at the brain is

that concerning food and general nutrition. Instinct often leads us to fresh air and exercise, but with our food it is vastly different. We acquire a taste for certain things; the habit grows upon us, and though the nerves tell the story to our senses over and over, we heed it not because we are held behind the bars of habit by the tyranny of appetite. In this respect the tobacco fiend, the drug fiend, and the food fiend are all in the same class.

CAUSES

Nervousness usually has its origin in disorders of the functions of metabolism, assimilation and elimination. In other words, somewhere between the time the food is first taken into the system, and the time the poisonous débris of the food and the body waste is finally eliminated, there are some grievous faults of function.

Some deficiency in the activity and in

the secreting power of any of the digestive organs; some defect in the assimilation of the finished pabulum; some shortcoming in the process by which oxygen is carried through the system to convert the "end-products" into less toxic substances for final excretion—any or all of these causes may conspire to produce nervousness. These may again, in their turn, be due to causes that arise within the mind, inhibiting the proper functional activity of the body.

But overfeeding, or eating the wrong combinations of food, and lack of proper elimination, are probably the most frequent causes of nervousness. When we take into the system more food than the body requires, there is bound to be a certain amount of it which cannot be utilized to build tissue, or furnish heat, or supply mineral salts.

This excess food, under the influence of fermentative processes, breaks down into various poisonous products. This

is especially true of the albuminous elements of the food. For these, in the heat and moisture of the small intestine, rapidly undergo a process of rotting—this is exactly what it is—and develop some of the most virulent organic poisons known to man.

They exercise a profound depression upon all the physiological functions, and cause an actual toxic degeneration of the nervous protoplasm. This, in turn, causes nerve irritability, insomnia, and many of those protean symptoms roughly grouped under the head of neurasthenia.

To completely relieve the condition means that a thorough reform in habits, —and particularly in dietetic habits—must be undertaken.

Excesses of every kind—even of play or work—must be stopped. All possible sources of worry must be removed. Rest and recreation should be made quite as important—in fact more so, than housework or business.

Sleep, and plenty of it, should be secured at all costs. Eight hours are none too many—although ten would be better.

Needless to say, the question of diet is of prime importance. The use of tea, coffee, tobacco, alcohol, and all stimulant beverages, as well as condiments, should be discontinued.

Plain, wholesome food—with an ample supply of lecithin (or nerve fat) such as eggs, milk, olive oil, etc., should be taken liberally.

All sources of fermentation—especially those forms due to an excess of starch, sugars, and acids, should be avoided. Careful attention should be given to securing free bowel movement.

And, above all, an equable frame of mind should be cultivated; the way to defeat this purpose is to overwork and worry in order to accumulate the thing called property.

The desire to accumulate property has for its excuse immunity from work at

some future time so that we can enjoy life, but experience teaches us that the physical cost of this effort defeats the very purpose for which we are striving.

Working for wealth alone defeats its purpose

THE REMEDY

The victim of nervousness should first seek a complete change of environment, and engage in pleasant, and, if possible, profitable occupation.

Thousands of people become nervous wrecks by pursuing work for which they have no natural taste or ability, and many become nervous from the monotony of environment. This is especially true with women, and while it is exceedingly difficult for countless housewives and mothers to escape from this monotony, yet they can secure relief by becoming interested in some work of a public or quasi-public nature, or by taking up a

Therapeutic value of working for the public good

"hobby" that has for its purpose some form of public good.

All people love the plaudits and esteem of their fellow-creatures, and there is nothing that will relieve the monotony and bring that satisfaction which all of us desire more quickly than earnest labor in a worthy cause. Therefore, this is one of the first and the best remedies for that character of nervousness caused by the monotony and narrowed life of the average woman.

The most prolific cause of nervousness, however, is incorrect, unnatural habits of eating and drinking, therefore, the logical remedy must be found in simplifying, leveling, and making the diet conform to the requirements of the body governed, of course, by age, occupation, etc.

The effects of wrong eating and drinking

The nervous person should eliminate from the diet acids, sweets (see Lesson VIII, Vol. II, pp. 313 and 332), flesh foods, and all stimulating beverages.

The following menus, with variations according to the available supply of fruits and vegetables in season, should be adopted:

SUGGESTIONS FOR SPRING

Choice of the following menus:

MENU I	MENU II
BREAKFAST	
A cup of hot water	Very little farina or oat-meal, with cream
Two baked bananas	A glass of buttermilk
Steamed wheat—cream	
LUNCHEON	
Corn hominy, with butter or cream	A white potato, baked
Raisins, nuts, cream cheese	A large, boiled onion
One or two glasses of water	Corn bread
	A glass of milk
DINNER	
A pint of junket	One egg or a morsel of fish
Bran gems	A baked potato
A coddled egg (For bran meal and coddled eggs, see Vol. III, pp. 677 and 683)	Choice of carrots, parsnips, or onions
Hot water	(A green salad or spinach may be eaten at this meal, if desired)

One or two glasses of water should be drunk at each of these meals.

If there is a tendency toward constipation, a liberal portion of wheat bran, thoroughly cooked, should be taken at both the morning and the evening meal.

Bran possesses valuable nutritive properties, such as mineral salts, iron, protein and phosphates, and it harmonizes chemically with all other foods.

SUGGESTIONS FOR SUMMER

BREAKFAST

Melon, or any mild subacid or non-acid fruit, such as pears, baked apples, sweet grapes, very ripe peaches, Japanese plums, or persimmons

Choice of whipped egg or junket

A banana—natural, or baked, if the digestion is slightly impaired

LUNCHEON

A fresh green salad, such as celery or lettuce, with oil or nuts

Onions, uncooked

A whipped egg

Carrots, peas, or beans

DINNER

Corn, carrots, peas, beans, or squash

Half a cup of plain wheat bran, cooked

A baked potato

A glass of water

SUGGESTIONS FOR FALL

In adopting the two-meals-a-day system, the noon meal should be omitted. This gives the stomach and the irritated nerves a rest, and creates natural hunger which augments both digestion and assimilation. (See Lesson XIII, p. 630).

BREAKFAST

Melon or peaches
A very ripe banana, with soaked prunes and cream
A spoonful of nuts
One or two spoonfuls of whole wheat, cooked very thoroughly
One egg, prepared choice—preferably whipped
One glass of water

A green salad or some sweet fruit may be eaten at noon if very hungry.

DINNER

Squash or pumpkin, cooked en casserole
Fresh string beans
A baked sweet potato
One or two tablespoonfuls of nuts—choice
Junket or gelatin
A glass of water

SUGGESTIONS FOR WINTER

First Day: On rising, drink two cups of cool water, and devote from five to ten minutes to vigorous exercises and deep breathing.

BREAKFAST

A cup of hot water or thin chocolate
A small portion of boiled wheat
One exceedingly ripe banana, eaten with cream
One or two eggs, whipped—cream and sugar added
One or two figs, with cream and either nuts or nut butter

LUNCHEON

Two eggs, whipped; add a flavor of sugar, orange juice, and a glass of milk
A cup of hot water

DINNER

Turnips, carrots, parsnips, onions—any two of these
A baked potato or baked beans
A small portion of fish, white meat of chicken, or an egg

Just before retiring, take exercises as prescribed for the morning, and, if constipated, two or three tablespoonfuls of wheat bran.

SECOND DAY: The same as the first, slightly increasing the quantity of food if hungry.

THIRD DAY: The same as the second, adding one or two baked bananas to the morning meal, and varying the vegetables according to the appetite for the noon and the evening meal. Nearly all vegetables such as turnips, beets, carrots and parsnips may be substituted for one another.

Fourth Day:

BREAKFAST

Tokay or Malaga grapes
A cup of hot water
Two eggs, lightly poached, or a very rare omelet
A whole wheat muffin or a bran gem
A cup of chocolate
A liberal[1] portion of wheat bran (one-fourth oatmeal), cooked and served as an ordinary cereal, eaten with butter

LUNCHEON

Choice of either *a* or *b:*

a Two eggs, prepared as follows: Break into a bowl. Add a teaspoonful of sugar to each egg. Whip five minutes very rapidly with a rotary egg beater. Add a glass of milk and a teaspoonful of orange juice to each egg

b A quart of milk and half a cup of bran
One baked banana

DINNER

Any green salad—celery or shredded cabbage (very little), with salt and nuts

Choice of any two fresh vegetables
Choice of:

a One or two exceedingly ripe bananas, baked, eaten with butter or cream

b Figs or raisins, with cream
A glass of water

Exercise the same as prescribed for the first day.

FIFTH DAY: The same as the fourth day.

SIXTH DAY: The same as the first, repeating these menus for a period of three or four weeks.

The nervous person should eat very sparingly of bread and cereal products, with the exception of bran and a few coarse articles, such as flaked or whole wheat or rye, and these should be taken sparingly while under treatment.

A generous quantity of water should be drunk at meals, and mastication should be very thorough.

If the body is overweight or inclined toward obesity, the diet should consist of

fewer fat-producing foods, such as grains, potatoes, milk, eggs, and an excess of vegetable proteids. If underweight or inclined toward emaciation, the fat-producing foods should predominate.

Under all conditions of nervousness the patient should take an abundance of exercise and deep breathing in the open air, and sleep out of doors, if possible. An abundance of fresh air breathed into the lungs is the best blood purifier known, and if the blood is kept pure, and forced into every cell and capillary vessel of the body by exercise, the irritated nerves will share in the general improvement.

The cool shower or sponge bath in the morning, preceded and followed by a few minutes' vigorous exercise, is a splendid sedative for irritated nerves.

RECREATION

The nervous person should divide the day as nearly as possible into three equal

parts—eight hours' pleasant but useful work; eight hours' recreation, and eight hours' sleep.

Necessity for true recreation

Under modern civilized conditions the majority of people do not seem to understand recreation. The summer seashore resorts, with their expensive attractions and whirling life, the great hostelries in the hills and mountains, and the lakes where thousands of people congregate, entail upon them certain duties, anxieties, expectations, disappointments, and often financial strain that deprive these places of all features of recreation, and make the sojourn there one of labor and strife. The real purpose that takes most people to these resorts is to be seen; to "star" themselves before the multitude, which in its last analysis is a kind of vanity, and it is obvious that from any effort in this direction no recreation can be obtained.

The nervous person should seek a few congenial and thoughtful companions,

and get back into the great heart of nature where everything moves in obedience to supreme law. Associate intimately with animals; study their habits, and notice how they respond to kindness; admire their honesty; analyze the love and fidelity of a dog. This is true diversion and recreation. This defines the purpose of life, if there be purpose behind it. This draws a sharp distinction between the condition that makes nervousness and the condition that makes honest, thoughtful, useful human beings.

LESSON XVIII

POINTS ON PRACTISE

INTRODUCTION TO POINTS ON PRACTISE

The preceding lessons were written through a period of many years' active practise in treating dis-eases by scientific feeding. They were intended as a normal course to qualify doctors, nurses, and those who wished to treat dis-ease by this method. However, the demand for this class of information has come from people in every walk of life, therefore the lessons, and all technical matter composing this entire work have been most carefully revised and rewritten in simple language so that any person of ordinary intelligence can comprehend them.

The following lesson is intended for the guidance of the practitioner in beginning his work in this branch of the healing art.

Inasmuch as nearly all human ills are caused by errors in eating, the preceding lessons have been confined almost wholly to dis-eases that originate in the digestive organs.

LESSON XVIII

Points on Practise

There are a great many abnormal conditions of the human body classed as dis-eases that bear a very remote relation to diet, but in practise the student will soon learn that many of these conditions, which have not been considered in these lessons, will entirely disappear when the diet is perfected. This is true because dietetic treatment, based upon the fundamental laws of nutrition, is reconstructive, hence every part of the anatomy shares in the general improvement.

Dietetic treatment is reconstructive

There are many logical arguments to support the theory that there are no incurable dis-eases. There are many cases, however, where the vitality has be-

come so low that recovery from dis-ease is impossible, but if the patient could be taken in time, the correct diagnosis made, and the proper food, air, and exercise given, Nature would begin her work of rebuilding at once. In view of these facts it is somewhat difficult to fix a limit to the scope of scientific feeding.

Scope of scientific feeding

SUGGESTIONS FOR THE PRACTITIONER

The science of prescribing diet is a work that can be best conveyed to the patient in writing, hence one of the first and most important things for the new practitioner to do is to study the art of polemics—acquire the ability to write plain, convincing literature and letters. This is one of the greatest arts within the scope of human learning, and is probably susceptible of greater development than any other branch of human endeavor.

The value of letters

Every person has his own individual method of expression that should be preserved and cultivated. Select some good author and copy his logic, but not his language. For this purpose I would recommend the works of Henry George, the great economic philosopher—and probably one of the greatest polementitians that ever lived.

The student should begin by taking up some simple branch or certain subject of his work, and writing a short argument or essay upon it, using every fact that he can possibly command to convince imaginary readers of the correctness of his theories. Select a new subject and write something on it every day. This is merely mental calisthenics, and after a month's training the thoughts and the language will flow with a freedom that will enable the student to write just as he feels.

Writing is mental calisthenics

It would be well to arrange an argument based upon each lesson separately,

dividing it into short chapters. These arguments or essays should be logically arranged to form a booklet, with proper title, as such representative literature is vitally necessary to the growth and the success of your work. It will also be found that this will be splendid mental exercise, and will serve well in presenting your work, either orally, or by letter.

A booklet describing your work

Every one should endeavor to be original in his literature; in other words, no special effort should be made to quote any "authority" or to copy the style of other writers. Put your own personality into your work, for the most successful writer is not always the one who uses the most learned, polished or scholarly language, but the one who can convey his thoughts to the minds of others in the simplest and the most comprehensive language.

The personality of the writer

Language at best is but a vehicle for conveying the thoughts of one person to the mind of another, and while there are accepted standards in literature and letters, from which one should not make too radical a departure, yet the ability to present one's convictions, or position convincingly should be of first consideration.

The most important thing in writing is to have something to say; then to say it so that it can be understood.

VALUE OF EXPERIENCE

Experience is the only method by which theory can be converted into knowledge. The best possible source of information, therefore, is personal experimentation. If the student should have any disorder, especially of digestion and assimilation of food, or elimination of waste, he should experiment upon

himself along the lines laid out in this course. He should keep an accurate record of selections, combinations, and proportions of food, with results or symptoms. He may thus be able to arrange menus for himself, even more effective than those given as examples or guides throughout the course.

If there are no personal disorders that will permit of such experiments, then they should be made upon some other person with whom the student is sufficiently familiar in order that accurate information concerning the results may be secured.

Though the student may be normal and healthy, it is possible to make many valuable experiments in regard to special adaptations of diet, such as combinations to induce natural sleep; to produce and to relieve constipation and diarrhea; to produce excessive body-heat when exposed to cold, or the minimum of heat in summer, or in warm climates.

VALUE OF DIAGNOSIS

Correct diagnosis is one of the most important factors in the practise of applied food chemistry, and when a correct diagnosis has been made the remedy will suggest itself if the student has a thorough understanding of causes.

In diagnosis it is often necessary to ascertain the patient's general habits of eating during the few years prior to the appearance of the disorders. As an example, rheumatic conditions are often superinduced by an overconsumption of starch, usually cereal starch and acids. This overindulgence may have continued for several years before the appearance of any rheumatic symptoms. The primary causes being residual in the body, exposure, low vitality, or extreme climatic changes may give expression to them in the form of rheumatism, or some kindred trouble.

Causes sometimes very remote

After determining the causes, a diet should be designed which will counteract existing conditions. This may usually be accomplished by limiting the quantity of food somewhat below the demands of normal hunger. This will give the digestive organs less work to do, and the body an opportunity to take up or consume any excess of food matter that may have become congested. In cases accompanied by loss of hunger, it is sometimes necessary to put the patient upon an absolute fast from one to three days, but in the majority of cases a semi-fast is best, prescribing light, nutritious foods of a remedial character.

Value of limited feeding

EDUCATE YOUR PATIENT

In beginning treatment each patient should be made acquainted with the fact that the radical change in diet may bring slight discomfort. While the sys-

tem is adjusting itself to the new regimen, there is usually a slight loss of weight and a feeling of weakness or lassitude.

It should be impressed upon the mind of the patient that regaining health and strength is in reality a process of growth or evolution, hence slow and gradual; that when one has violated the laws of health for many years, Nature will not, or probably cannot forgive all these sins and repair all these wrongs in a month or two. However, when one gets in harmony with the physical universe, and conforms to the laws of his organization, Nature will construct (cure) much more rapidly than she formerly destroyed (produced dis-ease).

Curing a slow process

The practitioner may have many cases that for some seemingly mysterious reason will not respond to a perfectly natural diet and will, therefore, be called upon to change the diet from time to time in

The patient should agree with the diet

the vain hope of finding combinations of food that will agree. In these cases the student should not be led to deviate too far from what he knows to be a natural and chemically harmonious regimen. If such a diet does not produce the desired results, it is not always the fault of the food, but the fault of the patient. If the food is right, and does not agree, it is the patient that is wrong, hence the logical thing to do is to make the rebellious patient agree with the food, instead of searching for a food to agree with the patient.

These facts should be impressed strongly upon the mind of the one under treatment, and he should be prevailed upon, if possible, to conform strictly to a correct diet until Nature is given time and opportunity to bring about an adjustment between the individual and his food.

It has been the custom of the medical profession for centuries to shroud its work in mystery, to write prescriptions

in a dead language, to keep patients in ignorance of the remedies being applied. This seems to be necessary, probably because an intelligent discussion of allopathic drugs, their sources and their constituent elements would, no doubt, prove fatal to their administration. The food scientist should follow exactly the opposite course. He should make a very careful diagnosis, taking into account the diet, habits of exercise and exposure to fresh air prior to the appearance of the dis-ease, as well as at the time of treatment. By giving the patient a thorough understanding of your work, you gain his confidence and faith, which wield a very powerful influence over the body.

EFFECT OF MENTAL CONDITIONS

A very careful examination should also be made of the mental conditions. Worry, fear, or anxiety often produce seri-

ous digestive trouble which is generally attributed to other causes, and which should be treated very differently from the same trouble caused by errors in eating.

Worry or fear causes stomach trouble

During my professional work many patients have come to me laden with fear, caused by the thoughtless or perhaps reckless statement of some physician. It is indeed as great a crime for a doctor to pass the "sentence of death" upon a man who comes to him for help as it would be for the judge of a court to pronounce the death sentence upon a prisoner without hearing the evidence, and some day when the power of the mind or suggestion is understood, it will be so considered.

It is impossible to fully estimate the effects of fear on the human body. Each year I become more and more impressed with the fact that fear is one of the most potent factors in the cause of dis-ease.

What Christian Science has done

Christian Science has relieved thousands of people through the simple presentation of a philosophy that induces the individual to throw off this burden of fear. It matters not whether this burden is cast upon the Gentle Nazarene or John Doe, the fact that it has been disposed of often leads to relief and recovery. Christian Science has done the world a great service —it has put out the fires of an orthodox hell by pouring into it orthodox medicine.

With a clear knowledge of the powerful psychological law, and the laws of human nutrition, the student has at his command two of the greatest forces in Nature for the relief of human suffering.

PUBLICITY

Judicious and truthful advertising is another important factor in the success of the food scientist. Advertising has been considered unethical by medical men

for years. It has been discredited, not because it is wrong, or because there is any harm in telling the public the truth about one's business, but because so many spurious nostrums and patent medicines were exploited by "quack" doctors, that the respectable physician deemed it best to adopt the other extreme in his effort to keep entirely out of this class.

Value of truthful advertising

Advertising, however, is rapidly acquiring a more honest and upright character. The best magazines and some weekly newspapers will no longer accept advertisements of a questionable character, especially regarding medical remedies. Many of these excellent publications go so far as to vouch for and guarantee the honesty of everything exploited in their pages. Such methods are gradually purifying the advertising atmosphere.

There is no logical reason why anybody who has a virtuous and useful article, or

who has discovered anything in the realm of science that would be a benefit to humanity, as well as a profit to himself, should not make it known as widely as possible through the instrumentality of advertising.

Advertising both virtuous and necessary

In preparing advertising literature, whether for magazines, booklets, or letters, facts and truth concerning your work are all that is necessary. No statement should be made that can in any way jeopardize your reputation; nothing should be stated or claimed that cannot actually be made good.

For many years it has been my policy to keep my advertising conservatively below the full limit of facts; in other words, the whole truth concerning that which can be accomplished by scientific feeding sometimes seems so startling to the lay mind that the experienced advertiser will not state it as it really is.

A patient of mine who had been in a wheel chair for twelve years, and afflicted for twenty years with locomotor ataxia, was so much improved within a year's time that he walked from Brooklyn to my office in New York City to exhibit himself. He gave me a testimonial letter and the privilege of using it in my advertisements. I wrote up the facts in regard to his case and submitted them to my agent, who was an expert advertiser, and he advised me not to state the facts as they were; the public, he contended, would not accept them as true.

BE COURTEOUS AND TOLERANT

It is almost impossible to estimate the moral effect of a broad-minded, tolerant and courteous attitude toward others engaged in the practise of the healing art. Medical doctors seldom agree, especially those of different schools. They accuse each other of ignorance and incompetence,

and the public is sometimes inclined to concede that they are right.

In certainty and in truth one has confidence and strength which is always conducive to tolerance. The food scientist, knowing the laws of cause and effect in regard to nutrition, and knowing the proper use of natural methods of diet and hygiene in the prevention and the cure of specific dis-eases, needs neither to dispute with a fellow practitioner, nor to argue with his patient. He can afford to state his position and quietly allow Nature to prove his claims.

LESSON XIX

EVOLUTION OF MAN

The following lessons, while they do not treat directly of either the chemistry of food or the chemistry of the body, are so closely allied to these subjects that this work would not be complete without them.

LESSON XIX

Evolution of Man

WHAT IS EVOLUTION?

If a resident of a city, who is not familiar with modern farm machinery, should see a grain-binder at work, he would be impressed with the skill and the ingenuity of man. In all probability he would think that the machine was the product of one inventive mind. In this, however, he would be mistaken. The reaper in its modern form is the result of gradual development or growth.

The earliest method of gathering grain was pulling it up by the roots. Later, as cutting tools were invented, a rough knife was used to sever the stalks just above the ground. An improvement

An example of evolution

upon this method was the cycle; then came the scythe, then the cradle; and next came the mower which was operated by horse-power. From the mower was developed the self rake, which bunched the grain so that the hand-binders could work with greater facility. The next improvement was a self-binding machine. In the present machine we have all of these and many other improvements, which give greater speed with less waste of labor and time.

This development of the grain-binder is a process of evolution. In order to understand a machine so as to use it intelligently, or to make improvements upon it, it is necessary not only to know the machine as it actually is, but also to know the history of its development up to its present form.

The story of the evolution of a machine is, at best, but a crude illustration of the evolution of man. Nevertheless, the conclusion is the same. If we are to un-

derstand man, we must study not only his present physical and mental state, but also the history of his development. Yet those whose work is concerned directly with man—whether they be teachers, guiding the growth of the child; statesmen, formulating the laws and regulations by which men are to be controlled in their public actions; or physicians, who are supposed to instruct and to guide men in the care of their physical well-being—are often densely ignorant of the most rudimentary knowledge of the evolution of man as it is now known and understood by the leading scientists of the world.

To know man is to know evolution

Our entire system of education, our ideas of health and dis-ease, our social customs, the principles of our form of government; our ideas of right and wrong, of rewards and punishments, are all fundamentally concerned with the evolution of man, and when this knowl-

edge is studied with as much application as are the ancient languages, we may expect to see humanity progress at a rate hitherto unknown.

The evolution of man has been very much misunderstood. The term "evolution" is a broad one. It may refer to the growth of the individual, or to the race. It may mean the development of strictly physical organs, or of mental habits, of social customs, or of material products of man's genius, as the great works of civilization in the form of recorded learning, and the wonderful products of man's building ingenuity as seen in modern cities.

Significance of the term "evolution"

The subject of the evolution of the human race may be grouped into three general kinds of development or growth:

1 The development of the physical man

2 The development of the mind

3 The development of custom and of external civilization

Evolution in these three directions has taken place simultaneously. The mind and the body depend upon each other for their life and actions; while customs are merely the product of many minds working together and communicating their ideas to each other.

The human race is but the sum of the individuals composing it. We cannot consider the development of the individual without considering him in his relation to the race, neither can we understand the development of the race without understanding the growth of the individual.

One distinction too often overlooked by those who are not familiar with physiological science is the difference between actual physical inheritance and external

customs. I wish to dwell at length upon this distinction, because a lack of understanding upon this point has been the source of many errors of judgment on the part of those who have been interested in the subject of physical training and food science.

Difference between inherited and acquired characteristics

At birth the individual inherits an organism with certain tendencies, both physical and mental, but this inheritance should not be confused with the physical habits which the child acquires by training from its parents and its associates. Thus, the child may inherit a brilliant mind, a weak stomach, or a sixth finger, but the child does not inherit a liking for broiled lobster, or a fondness for golf, or for driving an aeroplane. These are acquired and developed as habits, the same as the child would learn English or French, or would cultivate a fancy for parting his hair in the middle, or on the left side.

THE THREE GREAT PROOFS OF THE EVOLUTION OF ANIMAL LIFE

At the present time scientists are agreed upon the general theory of the evolution of man. The discussions pro and con regarding this, which exist today, are either discussions of minor points which have not yet been clearly worked out, or are the discussions of people who have grasped only a portion of the idea of evolution, and who are ignorant of its broader conception and of the facts which science has brought to the light of day.

The three great proofs of evolution are:

1 The actual history of the past recorded as fossils in the rocks and in the relics of pre-historic races

2 The existence in the world today of a range of animals and plants which shows living examples of earlier types

3 The repetition of the development of man as found in the growth of the individual

These three separate records of the development of living beings are considered by scientists as a most conclusive proof of the truth of evolution. Recorded as fossils in the rocks, we find the story of the development of all life upon the earth, from its simplest to its highest forms of plants and animals that live today, among which is man.

The first forms of animal life were, in all probability, minute one-celled organisms; these left no visible fossil remains. As soon as animals developed hard parts in their bodies, such as shells and bones, we find a record of their existence as fossils. The earliest recorded forms of life were various kinds of sea-creatures, of which the modern crustacea (lobsters, etc.), snails, clams, and various shellfishes are types. Later were developed

The earliest forms of animal life

boneless fishes, on the order of skates. After these came true fishes; then amphibia (frogs, etc.); then reptiles, birds, and, last of all, mammals, including man.

The facts are the same, whether we take the history of the successive forms as recorded as fossils in the rocks, or the living representatives that remain to tell the story in another form.

The third proof, which is the story of evolution recorded in the growth and development of the individual, is yet more interesting. As life developed from simpler forms, each individual animal or plant became more complex, or carried a little further the process of growth. But the method of reproduction of new individuals remained fundamentally the same. Each individual began, like its ancestors, as a single-cell being. By the process of nutrition these single cells in each case would grow, divide, and produce various tissues and organs, but

The single cell is the nucleus

always repeating the general story of the development of the race.

Gills in the human embryo

The growth of the human embryo offers many proofs of evolution, which are wholly unexplainable upon any other theory of the origin of man, and would in themselves prove the truth of this view of man's creation were the proofs of geology entirely lacking. A single example will serve as an illustration. The human embryo at a certain period develops gill slits in the neck, the same as the embryo of a fish. This formation of unused or rudimentary organs which are afterwards outgrown, is very common throughout the animal world. In the upper jaw of a calf there are formed at a certain period incisor teeth, which never grow through the gums, but are reabsorbed and disappear as the calf develops.

I will not go further into the proofs and facts of the general theory of the evolution of animal life, but will now

consider the later period of the development of man, which will show us his relation to other animals, and from which we can derive much valuable information regarding his natural physiological requirements.

MAN'S ANIMAL KINSHIP

The conception of man being descended from a monkey has been the subject of much wit and mirth.

The scientist is not concerned with this theory; he only claims that man is very closely related to certain monkey-like forms known as anthropoid apes. The proofs of this assertion are abundant and conclusive. In fact, anthropoid apes, such as gorillas, chimpanzees and orang-outangs, are much more closely related to man than they are to other kinds of monkeys. This relation is shown by very close resemblance between the anatomy of man and apes, especially as to the teeth and

Man's relation to anthropoid apes

digestive organs. Other facts are now known, of which Darwin and early investigators were ignorant, which prove this relation in a much more striking manner.

Late studies upon the growth of the embryo of anthropoid apes have shown that they were at certain periods almost indistinguishable from human embryos. Another proof, quite striking and interesting, is in the similarity of the parasites and dis-eases of men and apes. Scientists have, within the past few years, made a series of comparative investigations upon the blood and serum of men and apes, which have resulted in most remarkable discoveries. There are certain accurate tests known to the physiological chemist by which human blood may be distinguished from the blood of all other animals, but the blood of these man-like apes is an exception to this, and cannot be distinguished from human blood.

Comparison of blood from man and apes

From these facts it is clear that the earlier types of men were creatures whose physical development and whose habits were not very different from those of apes. The development that has taken place since that time is truly very wonderful and has resulted in a widening gap between man and apes that today seems very great. The truth remains, however, that this gap is not so much one of anatomy and physiology as it is one of mentality and of external habits and material aids to living that have resulted from man's greatly developed mental faculties.

Difference in the development of man and apes

Thus, when the mind of man reached the stage of development in which the use of articulate speech became possible, the evolution of intelligence proceeded at a very much more rapid pace than had been possible before. He could communicate his ideas to his fellow-creatures; concerted action became possible, and the

Power of speech a factor in man's evolution

faculty of reason, or the ability to think was multiplied by the number of beings who could communicate with each other.

The power of reason and the ability to communicate ideas resulted in the formation of those habits which distinguish man from other animals. When one primitive man learned the use of a club as a weapon, found how to use sharp-edged stones as cutting tools, or discovered the wonders and power of fire, he communicated his new-found knowledge to the other members of his tribe, with the result that new ideas became common property.

This spreading of habits or customs took place very rapidly among men and was the source of the various changes which distinguished civilized life from savage life. But we must here point out that not only good habits were so spread, but bad ones as well. The origin and the use of opium and of alcohol, the injuries of fashionable

Man's bad habits have kept pace with his progress

dress and the economic wrongs of tyrannical government originated along with the birth of language, art, science, and all that uplifts and benefits mankind.

Clearly, then, that man is misinformed who defends a wrong by referring to its age and reasons that, if certain things were harmful, they would not have survived. To the young thinker the existence of harmful ideas and habits among mankind may at first seem inconsistent with the principles of the survival of the fittest, but this difficulty will disappear upon further investigation.

Factors that determine the survival of races

Since the beginning of recorded history many factors have helped to determine what kind of individuals and races should survive. War, economic wealth and poverty, intellectual beliefs, religions, and social institutions have all been potent factors in determining who should survive. With wealth and conquest came

the opportunity to gratify tastes and passions of which the poor individuals of weaker races could not avail themselves.

Many habits and customs detrimental to life and health

Many of the habits and customs which man has developed are not necessary to life, and may be positively detrimental to health and longevity. They have been handed down from generation to generation, not because of their benefit to man, but in spite of their detriment.

Such condition of affairs would not be possible if man were not the dominant animal. Man's intellectual supremacy has given him power over the rest of nature, which has resulted in making his struggle for existence much less severe. His use of weapons and of artificial protection from natural destructive forces, as severe heat or cold, has made it possible for him to live and to produce offspring in spite of wrong habits and wrong methods of living, and the natural resistance of life.

A prevalent error that is due to an incomplete knowledge of the facts of evolution is the belief that organs readily change or adapt themselves to the habits or environment of the individual. This is not true to the extent that it is ordinarily believed. Each individual has a certain limited power of adaptation. He may develop his lungs to a greater breathing capacity, or train his hand for certain skilled work, but these particular acquired habits of the individual are not inherited.

Man's organs have a limited power of adaptation

Evolution of the race proceeds by the law of natural selection. Thus, if those who are born with great vigor and strong lungs are enabled to live where their weak-lunged neighbors will die, the result will be that their offspring, having greater lung capacity, will form a race with increased lung capacity. But the individual training of the lungs, or of the hand, or of any other organ of the body,

will not of itself change the inherited tendency, or, to use a common term of the scientist, the germ-plasm of the race.

Organs and functions will change or become evolved by natural selections; that is, where it is a matter of life and death. But where the selective agencies depend upon other things, an organ may be used or abused for thousands of successive generations, and yet the natural inherited organ of the new-born child will be identical in development and function to that of the remote ancestor.

There are abundant proofs that so-called "acquired characteristics" are not inherited. Were acquired characteristics inherited, Chinese women would be born with small feet and the babies of the Flathead Indians would inherit the flat head which has for generations been produced by binding a flat stone on the soft skull of the new-born infant.

Acquired characteristics are not inherited

In the light of this fact we may understand how it has been possible for man to live through the varying dietetic habits and customs that the constantly changing ideas and tastes of civilization have thrust upon his physical organism. Each individual has transmitted to his offspring the same type of digestive organs and functions that he himself inherited from his remote anthropoid ancestors.

Thus, such terms as "back to nature," "natural diet," etc., only mean to the food scientist the habits of life or the dietary which is most suited to the unperverted physical organism of man. They do not imply the meaning that is popularly given to the term, of casting aside all the habits and customs of civilized man, but only the adapting of these customs to the inherited physiological organism of man.

Meaning of expression "natural" diet

Indeed, science may actually improve upon primitive conditions, and still not

be inconsistent with the requirements of the inherited physiological machine. No intelligent man will dispute the advantage of a house in a snowstorm. Yet the house is artificial. It is not "natural" in the sense that the term is commonly used.

Or, again, man has by the aid of civilization rendered it possible for us to use foods far removed from their source of production, or, by preservation, to have them at seasons of the year when nature does not provide them. These artificial results of civilization are good. They are a part of the story of evolution, the benefit of which no one can question.

But the great majority of the dietetic "frills" of modern man are actually unsuited to his physiological make-up, and exceedingly harmful.* They have been developed as have habits of drink or personal adornment and may be in direct antagonism to the ultimate well-being of the human race.

Man's dietetic development

I have briefly reviewed the history of the evolution of man. The facts to be remembered are:

1 That men are descended from earlier and more primitive types of beings and are governed by the same general laws of heredity and nutrition as are other forms of animals

2 Man, being a distinct species of animal, has particular laws that apply only to him, and therefore we should be careful not to judge him too closely by facts regarding other forms of animal life

3 Man has changed very materially in the few thousand years of his civilization, in his external habits and customs, but very little in his fundamental physiological processes; therefore we should be able to judge what will be best suited

for his needs by studying the process of the development of his organs during the millions of years that preceded the historic period. This plane of life is best seen today in the case of savages unacquainted with fire, and in the case of anthropoid apes.

With this general survey of evolution, and a clear understanding of the principles involved, I trust the reader will consider the facts here presented in the unprejudicial spirit of the true scientist.

LESSON XX

SEX AND HEREDITY

LESSON XX

Sex and Heredity

THE ORIGIN OF SEX

That part of human life and living that is associated with the functions of sex and reproduction is at once the cause of the world's greatest misery and the world's greatest happiness. It is the subject of the greatest popular ignorance and superstition, and at the same time the field of the most wonderful of all scientific knowledge.

For the origin of sex we must look back into the remote ages of creation in the early stages of organic evolution.

The first essential property of matter that makes life possible is the power of

nutrition, which means the ability of the living cell to transform other chemical substances into its own protoplasm or living substances.

Fundamental function of the cell

But this world would have remained a barren mass of igneous rock if nutrition had been the only function with which the earlier forms of life were endowed. Not only must the living cell be enabled to grow by absorbing other substances, but it must reproduce itself, or multiply the number of living individuals.

The first method by which this was accomplished was undoubtedly one of simple division; that is, the living cell grew by absorbing other substances and when sufficient size had been attained, divided, forming two daughter-cells. This division process of reproduction is the form by which all bacteria (so-called dis-ease germs) and many other lower forms of life increase their numbers.

First form of reproduction

This process of reproduction, by simple division, was early supplemented by another process of reproduction in which two living cells first fused or combined and then divided to form two or more daughter-cells. This form of reproduction seems to have added stimulus or vitality to the organisms. The supposed reason for this is that the isolated cell was inclined to weaken or lose its chemical balance or tone. The exact nature of this deterioration is not very clearly understood, but in a higher form of life it is well illustrated by the tendency of certain plants to "run out" when grown continually in the same soil, or of animals to become weakened when inbred. At least, all scientists concede that with the process of fusion or the combining of two cells there is added a stimulating and invigorating force which enables life to combat more successfully the unfavor-

Second form of reproduction

Strength in fusion of cells

able elements of its environment, and to change or evolve into higher forms.

Throughout the range of plant and animal life this process of cell union, or sexual reproduction, has grown and become elaborated into most varied and wonderful forms. Large volumes could be written describing the many wonderful adaptations of plant and animal life, the purpose of which is to secure sexual reproduction. All those who have studied botany are familiar with the many ways in which the seeds of plants are fertilized by pollen. For instance, certain species of orchids have a receptacle in the blossom, shaped like a teapot, which is filled with a fluid resembling water. This little tea-pot has an entrance and an exit. Near the entrance is sweet-scented nectar which attracts the bee. As the bee passes through this gateway he is tripped up on a little trap-door arrangement and pre-

Sexual reproduction in plants

Fertilization of orchids

cipitated into the fluid. His wings having become wet, he is obliged to crawl out through the exit.

The object of this elaborate device is as follows: In the entrance passageway is located the stigma (female organ), while in the exit passageway the male or pollen-bearing organ of the orchid is found. The bee visits several of these flowers consecutively, and, as he makes his exit from each flower, he bears away on his body a portion of the pollen, which is transferred to the stigma of the next flower visited; while the bee, being forced to go through a "plunge bath" before visiting another flower, acquires a fresh load of pollen in each case. This scheme is a certain means of securing fertilization or sexual reproduction, and positively prevents inbreeding (the fertilization of a flower by its own pollen). This is merely one of the wonderful adaptations of nature in the solution of the sex problem.

The wonderful process of flower fertilization

In the animal kingdom the methods of sexual reproduction are also varied and wonderful. In many of the lower forms of animals, such as the various sea-creatures, the methods of reproduction may be those of division, as first mentioned, or a method combining division with true sexual reproduction. In the case of fishes, the eggs of the female are deposited in the bottom of a stream and are later fertilized by the sperm-cells of the male fishes. This involves a tremendous waste of reproductive cells, scarcely less extravagant than the waste of pollen in plants, such as is seen in a corn-field when the ground becomes yellow, during the tasseling season, with the myriads of pollen grains that failed to secure lodgment upon the silks of the young ears of corn.

Reproduction among fishes

Nature's wasteful methods

In the types of animals that are of higher form than fishes, that is, reptiles,

birds, and mammals, the fertilization of the germ-cell (egg) takes place within the body of the female. In the case of the latter group—mammals—the true egg is hatched within the body of the female, and the offspring, or embryo as it is known to scientists, grows there for a considerable period before birth.

Reproduction in higher forms of life

A RATIONAL VIEW OF SEXUAL HEALTH

The anatomy and the physiology of reproduction will not be considered in detail in this work, as this would require a very lengthy and technical treatise. The remainder of the lesson will be devoted to the relation of the reproductive functions to general health and happiness.

In the process of evolution this function of reproduction was vitally essential to the life of the race. As a result there developed in all animal life strong sexual

or reproductive instincts. As is plainly evident, all animals, including man, with such instincts most strongly developed would be the most successful in producing young, and through these offsprings the race or species would inherit like reproductive desires.

Development of reproductive instincts

In the case of man and the higher form of animals, this general instinct, the purpose of which was to produce offspring, became diversified into many instincts. Not only does the reproductive instinct in this broad sense include what is commonly known as sexual passion in man, but it may very truly be said to be the essence of sexual love and parental love. Broad-minded scientists are even inclined to believe that the so-called social instinct or love for our fellowmen is but a distant reflection or shadow, as it were, of the original or natural instinct to produce offspring.

Kinship of the sexual, paternal and social instinct

There has arisen among civilized man a tendency to separate and class as two distinct things the strictly physical element of sexual desire, and the associate emotion of intellectual love between the sexes. As a matter of fact there is no distinct line of demarcation.

That the former instinct has grown into disrepute and has come to be considered a forbidden topic in polite society, is due to the fact that sexual passion, like all other human acts which may be a source of gratification, can degenerate by overindulgence into a destructive and demoralizing vice. This is equally true of other forms of appetite, but the reason that the instinct of sex, when degenerated, becomes such a tremendous source of destruction and death is because of the important part played in the game of life by the reproductive function.

Overindulgence, degenerating and destructive

The functions of reproduction are, in both sexes, very intimately and closely

associated with the nervous or vital mechanism of the entire body. For this reason, when the sexual functions are perverted or abused the result is serious injury to the general nerve tone or vital force of the system. Likewise the contrary proposition is true; therefore, when for any reason, the general nervous tone or vital force of the body is deranged, the associated result is frequently abnormal passion or weakened sexual functions.

Relation of sexual functions to the nervous system

A great deal of literature has been written and circulated throughout the country by well-intentioned individuals purporting to give popular knowledge regarding the subject of sex. But such literature has greatly exaggerated the evils and the dangers connected with sexual health. Outside of specific germ dis-eases transmitted through the sexual organs, and which, while serious, have been painted much darker than the facts

Necessity for popular knowledge concerning sex

justify, there is little excuse for all this horror and scare about sexual weakness and perversion.

Relation of nutrition to sexual health

Sexual health, like mental or muscular health, is a matter of common sense and right living. Proper feeding, proper oxidation, proper circulation (exercise), perfect elimination of waste-products, and a suitable distribution of both mental and physical work will result in perfect nutrition. This means normal, wholesome body-fluids and body-cells. With these things gained, the sexual organs and sex-function will have a fair opportunity for normal existence, and the matter of sexual health, and the consequent happiness which accompanies it, is then simply a matter of temperance, common decency, and self-control.

EMBRYOLOGICAL GROWTH—PRENATAL CULTURE

Upon the growth of the human embryo, or so-called prenatal culture, there

exists a great deal of popular superstition, which is utterly groundless from the stand-point of accurate science. The views that have been promulgated regarding prenatal culture are for the main part harmless, and, for that matter, may be productive of good.

Superstition concerning prenatal culture

The idea of the prenatal culturist is that the mental as well as the physical growth and development of the unborn child can be controlled by the mother. The only ground for this belief is as follows: The child is nourished from the blood or nutritive fluid of the mother, with the result that the growth and the development of the child may be very readily influenced by the nutrition of the mother.

Theory of prenatal culturists

The mental condition of the mother has an influence on the growth of the child, but it is indirect. All organs and

functions of the human body are controlled by the nervous system, and if the nervous impulse be deranged or weakened it may result in a serious impairment of nutrition. For this reason fright, anger, and other strong passions may result in lasting injury to the unborn child, but this injury is at most a matter of stunting or malnutrition, and cannot result in the voluntary mental life of the mother being transmitted to the child.

Influence of fright, anger, etc.

As evidence of these assertions, I would call the reader's attention to the fact that there is no nervous connection whatever between the embryo and the mother, but after the fertilization of the germ-cell, the only way in which the mother can influence the growth of the child is by the nutrition which her blood supplies to the growing tissue of the embryo.

Mother's nutrition the only factor in influencing her child

As further proof of these statements, I will cite the investigations of Darwin in regard to the popular superstition of birthmarks. At the instance of Mr. Darwin, some seven or eight hundred women of a London hospital were very carefully questioned before the birth of the child, as to any incidents which had happened that, according to popular notions, might result in birthmarks or deformities. In no instance was any incident given which resulted in the expected deformity; but the most interesting feature of the investigation was that several women whose children were born with birthmarks recalled, upon seeing the deformity, some incident which seemed to give a possible explanation, thus showing to the mind of anyone familiar with psychology that the true explanation of all so-called remarkable incidents of birthmarks and of prenatal influence is merely one of superstition or self-deception.

Birthmarks

HEREDITY

How often we hear someone remark upon the wonders of heredity. People are astonished because John should look like John's father. As a matter of fact, the astonishment should come the other way. The child is but a continuation of the life of the parents. The cells from which the child develops have within them the power to grow and to produce individuals like the parents. This is wonderful, but it is only another form of the wonder of a willow twig growing into a willow tree when placed in moist earth.

To the scientist, then, the wonder comes, not in the fact that the child resembles the parent, but in the fact that the child is not identical with the parent. Part of the explanation of this lack of identity, or, as it is known to science, variation, is due to the fact of sexual reproduction; that is, to the fact that

Why the child is not identical with parents

the child has two parents instead of one.

The physiological process which takes place in the union of two reproductive cells is truly most wonderful. Of late years this has been studied under powerful microscopes and has resulted in some very wonderful revelations of the mysteries of Nature.

Microscopic study of reproductive cells

The nucleus (center of growth) of the parent cells contains little thread-like structures known as chromosoms. These chromosoms are considered to be the physical basis of heredity. In each species of animal there is a definite and a different number.

Chromosoms in different species

When the sperm-cell unites with the female or germ-cell, these thread-like chromosoms pair off and unite each chromosom with the corresponding structure from the other cell. The combined

Action of the chromosom

structures then divide, and half of each chromosom is cast out of the cell-nucleus, and plays no part in the life of the future being; the other half is retained and divides as each new cell is formed.

Thus we see that every part of the new individual is the result of the fusion or combination of the two parents. This explains the variation of inheritance, and through this source must be traced all traits of heredity. After the original fusion of these microscopic physical elements of heredity, the future development of the individual is wholly a matter of environment and nutrition.

WHAT HEREDITY IS

What heredity is and what it is not will now be considered in a practical way.

General characteristics due to heredity

It is clearly a matter of heredity that a man is born a man and not a monkey. Likewise, it is clearly a matter of heredity

that distinguishes the various races of men. We could go farther and trace out and describe many of the physical distinctions which mark families, and even individuals, such as general size of frame, form of countenance, color of hair and eyes, etc.

Characteristics not attributed to heredity

Among mental traits we can safely ascribe to heredity only general distinctions. Intellectual parents are more likely to give birth to intellectual children than are parents whose natural mental faculties are less developed. There is also no doubt that certain natural characteristics of mind, such as quick temper, musical ability, etc., may be inherited. The belief, however, in the inheritance of many less distinct features, both physical and mental, is not well established by scientific investigation. Strength of muscle, control of the nervous system, susceptibility to, or freedom from dis-ease, etc., are more matters of nutrition and environ-

ment than of inheritance. The idea that consumption, alcoholism, etc., are inherited, or that the education or training of parents along certain lines will result in children with faculties adapted to similar education, is not in accordance with scientific knowledge.

SUMMARY OF FACTS REGARDING SEX AND HEREDITY

1 The function of sex has been developed in the process of evolution for the purpose of perpetuating life.

2 The sexual functions are very closely related to the life of the individual, and can be normal only when the laws of nutrition and of general hygiene are observed.

3 The idea of prenatal culture as commonly taught is a delusion; the only method that the mother can employ to control the growth of her unborn child is to live a wholesome, normal life,

physically and mentally, and thus supply her own body and that of the child with perfect material for the building of living cells.

4 The powers of heredity are often overestimated, and many of the weaknesses and disorders of life supposed to be inherent can be overcome by proper nutrition and environment. All life, whatever be the inherited tendencies, will be developed to the highest possible capacity by obeying the laws of individual growth, for in the individual, as in the race, Nature is always striving to bring the products of her work to the highest degrees of perfection.

LESSON XXI

REST AND SLEEP

LESSON XXI

Rest and Sleep

REST

Throughout all nature we observe the phenomena of universal rhythm, manifested in opposing forces, such as heat and cold, light and darkness, construction and destruction, etc. The human body is as much affected by this rhythm as is any other form of life.

Opposing forces in nature

There are two forces continually at work within us, one toward destruction and disintegration, and the other toward construction and upbuilding. The common physiological terms for these activi-

Opposing forces in human system

ties are "waste" and "repair," and we observe them as one of the distinct manifestations of the universal laws of growth, progress, and evolution.

History moves in cycles. Even the life of nations depends somewhat upon this same principle of the interplay of the positive and negative forces of life.

We see the same thing in the changes of the seasons upon the face of the earth.

Life and death in changes of seasons

Throughout autumn and winter there is a process of decay, death, and disintegration; leaves fall; plants and vegetables die; fruits ripen, fall and decay. This process continues until former beautiful and symmetrical bodies of matter are thoroughly disintegrated, and the particles once composing them are separated into their original elements, to be appropriated in new manifestations of life in springtime and summer.

We are inclined to think of the human body as a machine—a marvelous, intri-

cate, and complex mechanism which serves our will and our desires; as a tool with which we work out our earthly destiny. But, unlike man-made machines, it is self-repairing, self-adjusting, and contains within itself the forces of construction, which are constantly tending toward perfection, while our industrial machines are constantly tending toward their own disintegration and destruction.

Human body compared to a machine

Every movement of the body, conscious or unconscious, even thought and emotion, use up some part of the body-tissue which must be replaced by new material. This constant change in the texture and the make-up of the body we call "metabolism," involving the functions of digestion, absorption, assimilation, and elimination.

Constant changes in body-tissue

While we may regard the body as a machine, there are many points in which

the favorite comparison to a steam-engine is not exact.

The inert metal composing the steam-engine has no power in itself, nor does power act through the different particles of metal, but it is controlled by the external application of force, which is the result of chemical changes caused by combustion in the fire-box. The metal of the engine has no part in the production of this energy. It does not need to take periods for rest, and if it were possible to supply it continually with water and fuel, it could run steadily from the time it was started until one or more of its essential parts were destroyed through friction.

Favorite comparison of the body with the steam-engine

But the engineer and the fireman who drive the engine find it necessary to rest from their labors at certain intervals, not merely for fuel and water, but to prevent serious destruction of body-tissue. This

Necessity for rest

is true because man is compelled by hitherto unrecognized laws to give his body an opportunity, not only for readjustment in its composition, but also for the actual renewal of that power which animates him and makes him an intelligent, self-adjusting, and self-controlled being.

THE OLD PHYSIOLOGY

According to the teachings of the old physiology, our stomachs were fire-boxes of the human engine; food was fuel, and the stomach was supposed to transform this fuel into work or energy by a process not entirely clear. Just as it is impossible for the lifeless iron and steel, within itself to transform coal and water into dynamic power, and to apply that power to its own locomotion, so it is impossible and entirely incompatible with reason for mere muscular tissue of the body to

The stomach as a fire-box

extract enough energy from the food we eat to perform the work necessary for that transformation itself, besides enough more to carry on all the functional activities of the system, and at the same time to do hundreds of foot-tons of physical labor. In this fact lies the key to some understanding of the phenomenon of rest and sleep.

Phenomenon of rest and sleep

The old physiology was really never able to explain how it was possible for the digestive apparatus to extract, from the amount of food consumed, the enormous amount of energy which the average person expends each day.

REST AND RE-CREATION

These terms are often confused. When one is engaged in some occupation or activity other than his regular vocation, it is commonly called "re-creation." This is a misconception, because it is merely a

Change of occupation not re-creation

change in activity and must also be more or less destructive to other sets of nerves or muscular tissue. It is not in reality re-creation—it simply throws the life-power into a new channel, which is more responsive, and calls for less action from those parts of the mechanism which have been employed in the work from which one is seeking relief. It is for this reason that we find some pleasure in a new and different activity, though it, too, may be destructive to the human cell.

Specialization in business not conducive to health

One may alternate from one kind of activity to another indefinitely, which would be better than *no* change, but the human mechanism would finally give way under such violation of fundamental law. The mental worker may change, however, to any manual labor requiring little thought, and the physical worker to some form of mental labor, with far better effect. But, in our present civilization, specialization has become so far

advanced that the physical laborer is seldom qualified for mental work, and the mental worker has almost neglected manual training.

True rest and re-creation is found in mental tranquility and sleep.

SLEEP

From observation and study of the state we call sleep, we notice that as night approaches and the activities of the day wear upon us, both the nervous and the muscular organisms relax, so that it becomes more and more difficult to maintain a positive and an active attitude of mind. There is a tendency toward cessation and rest, which gradually brings upon us that passive condition called sleep.

In spite of the fatigue often experienced before we retire, we awake again on the morrow with renewed strength and power. From these and other reasons we

are led to believe that during the hours of activity the body is constantly expending vital energy in both internal and external work, and that during the hours of sleep, through some unknown process, the body is charged with vital energy which is stored up and used gradually for carrying on the various functions and activities of the system.

Evidence of acquired energy during sleep

Just what this energy is, just where it comes from, just how it is stored, just the manner in which it is delegated to the body, we cannot say. We can only observe its workings, or effects, and formulate therefrom a theory. We are led to believe, however, that this energy is stored in the nervous organism, perhaps most largely in the brain, as brain tissue is the last to break down or waste away in sickness, ill health, dis-ease, or starvation, often maintaining its full weight up to the point of death.

The mystery of energy

Even in sleep the expenditure of energy in the vital processes continues vigorously, depending upon conditions immediately preceding sleep, but usually in a much more passive degree than in the waking hours. These activities, however, are no more pronounced in their constructive action or repair, than in ordinary periods of rest during the waking hours.

Vital processes expend energy during sleep

SOME REASONS

The processes of nutrition, alone, demand the expenditure of much energy, and the degree of energy available from foods, even by perfect combustion, would yield but a fraction of the energy expended by the body.

Food furnishes but a fraction of the total body-energy

The average laborer in shoveling coal, swinging an axe or a pick, expends energy far in excess of the amount that could

possibly be obtained from his food. A day laborer may eat a piece of beefsteak, two or three potatoes, and a few slices of bread, and will shovel twenty tons of earth to a height of five feet; a Japanese soldier will carry a heavy load and walk all day, subsisting only on a handful of rice, and besides this, will do some thinking, which consumes energy.

Energy required for work in excess of energy obtained from food

We also have on record fasts, of from thirty to forty days, which, in some cases, show a slight gain in strength. There are also hundreds of students of natural living who adopted the "no breakfast plan" and again many, only one meal a day, limiting their consumption of food to comparatively small quantities of nuts, fruits, and vegetables, who have found thereby a remarkable increase in vitality, strength, and general physical and mental power.

Evidence gained from "fasts" and "no breakfast" plan

Since the processes of nutrition, including digestion, circulation, assimilation, and excretion consume energy, and notwithstanding this we are able to perform hundreds of foot-tons of labor a day besides; since we have found it possible to continue to live, and in some cases to even increase the amount of strength and work-power on a very limited diet; since it is a mathematical impossibility to produce as much energy from the food consumed as the body expends, we are forced to the conclusion that we do not obtain all our energy from food. Therefore, from a careful analysis of the phenomenon of sleep, we conclude that it is very closely connected with this mystery.

Relation of sleep to expenditure of energy

OXIDATION AND AIR

One of the most important of the vital functions is breathing. Physiologists, teachers, and lecturers continually remind

us of the comparative time we could live without food or water, and the remarkably short time we could live if entirely deprived of air.

Relative importance of air, food and water

Oxygen is vitally necessary for the purpose of purifying the blood and supplying the various tissues and fluids in the body, of which oxygen forms an important constituent. However, oxygen is not the only necessary element which is utilized by the system in the process of breathing, as human beings die immediately upon being placed in a receptacle of undiluted oxygen. Just what this other factor is, science has not clearly defined, but that it is concerned with rest and sleep we have at least unconsciously recognized, as shown by our often referring to periods of rest as "breathing spells"; from the fact that we have found it of great importance to keep the air we are breathing moving

Oxygen not the only required element in breathing

constantly about us, especially while asleep. From all these facts we are forced to believe that sleep plays an important part in producing and maintaining body-energy, besides constantly recharging the system with oxygen.

LESSON XXII

A LESSON FOR BUSINESS MEN

LESSON XXII

A Lesson For Business Men

That which tends to make a good business man, in the popular mind, is the establishment of great industries and enterprises, coupled with accumulation of money by the individual.

A careful review of the history of business men who have made a success along these lines shows that the majority of them sacrificed their health and their lives to their business. In the last and final analysis, therefore, these were not good business men.

The best musician is he who can bring more sounds into harmony. The best artist is he who can best harmonize colors and reproduce nature. Likewise, the best business man is he who can best harmonize or balance the affairs under his control.

Health being entirely under and within his control, if he disregards it—gives it no thought—violates the laws that govern it, and finally wrecks it, he is not a good business man, as all business depends upon the power of the individual, and the powers of the individual depend upon his health.

Examples of poor business men

The man who, from a cheap tin store, founded "The Fair" in Chicago, and allowed the business to dethrone his reason, and to send him to his death before he was sixty, could hardly be considered a good business man. Measured on the same scale, Marshall Field, the merchant prince, was not a good business man. President Roberts, who arose from the ranks of a car-wheel molder, to the presidency of the Pennsylvania railroad, and died at the age of fifty, was not a good business man. J. P. Morgan, who accumulated many millions of dollars, and who died when he should have been

in his prime, was not a good business man.

Wealth at the expense of health

The accumulation of money and the founding of great industries is only one requisite of the business man, and by no means the most important one. What profiteth a man to make a great fortune; to put in motion a million spindles; to chain continents together with cables; to flash his silent voice over oceans and continents on currents of common air; to make the ocean's billowed bosom a commercial highway; to transform the oxcart into a palace, and set it on wheels and hitch it to the lightning; to build sky-scraping structures of stone and steel; to transfix human figures and faces on sensitized glass; to direct the methods of burrowing in the earth for coal and gold until his name is known around the world, and his fortune is a power in the land?—what boots it, I say, to know all these things and to glide blindly into the

shambles of unrest and dis-ease, or to furnish a fashionable funeral at forty?

The religious fanatic who robes himself in sackcloth and eschews the razor; the food crank who cries out, "back to nature," and takes to grass; the one-idea social reformer who preaches on the curb, and the business man who allows his business to become his absolute master and governor, are in reality all in the same class. The unfortunate thing is that the business man sits him down and weaves about himself the meshes of a prison. Every year puts in a new bar, every month a new bolt, and every day and hour a new stroke that rivets around him what he calls business, until he feels and really thinks he cannot escape.

The abnormal, or one-idea man

A GOOD BUSINESS MAN

A good business man is the man who can direct the wheels of industry, who can draw a trial balance between his

income and his expenses, and who can measure his own ability on the yardstick of endurance.

Qualities of a good business man

He is a good business man who gives as much study to the laws of his own physical organization as he does to the organization of his business, and in the final analysis I doubt if he would not consider himself a better business man, "Penniless," and in good health at ninety, than sojourning in a sanatorium with a million at his call, but out of the fight at fifty.

Knowledge of health-laws a public necessity

It is truly unfortunate that the general laws of health and hygiene are not more universally taught and understood. We learn that best with which we are thrown in most frequent contact. The business man would absorb enough information on these subjects to extend his period of longevity and usefulness many years, if they were taught in our public schools, or were matters of general knowledge.

THE ROUTINE LIFE OF THE AVERAGE BUSINESS MAN

Bad habits of the business man

He rises between six and seven a. m., takes no exercise or fresh air; eats a breakfast composed largely of acid fruit, cereal starch, meat, and coffee. He then goes at once to his business, sits at a desk until noon, takes luncheon at a neighboring cafe. This repast is composed of meat, cereal, or potato starch, beer, or coffee. He hurries back to his business, sits at his desk five or six hours longer, hurries home, takes a dinner composed of more meat, more starch, more tea or coffee—no exercise, no diversion, no association with the great authors; no music, no poetry, no change.

The ancient remedy for Nature's warnings

A friend may come in, or he may go out to visit; then comes the soothing and soporiferous cigar which may have been his companion since breakfast. The

market, the business, the chances for making or losing dollars are the topics of discussion. He is in the power of his master, "business," and must do him continual obeisance. Within the domain of the tyrant he lives, moves, and has his being. If he has a headache, sour stomach, indigestion, a tinge of rheumatism, dizziness, insomnia, nervousness, or any one of the thousand symptoms or warnings that Nature gives him for the violation of her laws, instead of thinking a little and trying to ascertain the cause, he sends, with "chesty pride," for His physician, and his physician writes out something in a dead language—the only suitable language. The local druggist sends over the "stuff," and it is swallowed with that childish confidence that fitly becomes the modern business man who knows a great deal about business, but nothing about himself.

The days and the months go on, the symptoms or signals become more numer-

ous, more expressive, more impressive, more painful. His physician is called more often; the dead language paper goes to the druggist more frequently, and with faith he still swallows the drugs; they relieve him for a little while, usually by paralyzing the little nerve fibers that are carrying to the brain the messages of warning.

HIS physician finally acknowledges defeat, and prescribes a trip, or a sanatorium. It is either this procedure or the fate that befell Messrs. Roberts, Morgan, Colonel Ingersoll, and the uncounted thousands who had no reputation beyond the domain of their own locality, and of whom we never hear.

The ancient system declared a failure

SOME SUGGESTIONS FOR A GOOD BUSINESS MAN

Don't allow your business to become your master.

Twelve health rules for the business man

Don't discuss business at home, or in social life.

Immediately on rising, take a cool shower bath, followed by vigorous exercise before an open window.

Eat a very light breakfast an hour after rising, eliminating tea, coffee, white bread and meat.

Walk to your business, if possible; breathe deeply.

Eliminate woolen underwear; dress as lightly as possible.

Take an hour for luncheon. Omit tea, coffee, tobacco, beer, and sweets.

Keep your office well ventilated.

Secure competent help and trust them.

Love some one or some thing—a dog will do.

Leave your office early enough to walk home, or at least a part of the way.

Masticate your food infinitely fine, and by all means *do not overeat.* This is the crowning sin of the civilized table.

Take from ten to fifteen minutes' exercise before retiring; sleep in a cold, thoroughly ventilated room. Spend as much time as possible in the sunshine and open air. Drive an automobile, play golf, join a gymnasium, dance, sing, kick and play with the boys, for it is infinitely better to dig in the ditch for your dinner and be able to digest and enjoy it, than to lie invalid in your self-made prison, and perhaps die. (Probably if the truth were written on your tombstone, it would read:

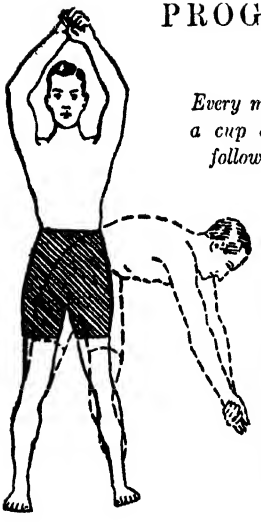
There was a fool who made a fortune, but he died;
The world called him great, but it lied.)

LESSON XXIII

EXERCISE AND RE-CREATION

PROGRAM FOR DAILY EXERCISE

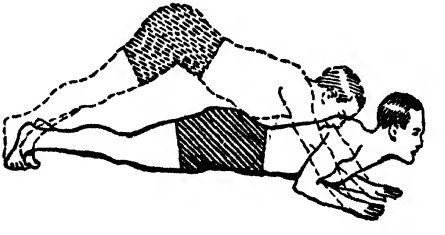
Every morning, just after arising, take a cup of water, and go through the following deep breathing exercises:



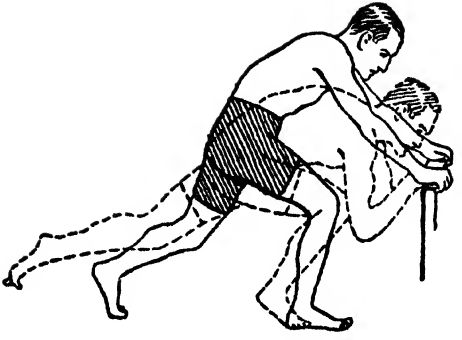
EXERCISE No. 1

Stand erect, feet about 30 inches apart, extend arms above head, clasping hands and holding elbows rigid, inhale deeply Bend toward the left and try to touch the floor with the clasped hands as far from the foot and to the rear as possible. Exhale while returning to position. Inhale deeply, reversing motion to the right. This movement should be repeated about 24 times.

EXERCISE No. 2



Rest the body upon tips of toes and the palms of the hands. Move the body up and down as far as possible, bending only at the waist line. If this position is too strenuous the tension can be reduced by resting on the elbows, knees, or both, while executing the movement. Inhale deeply while taking this exercise, and exhaust the breath suddenly, as if coughing, with the downward motion. This movement should be repeated about 12 times.



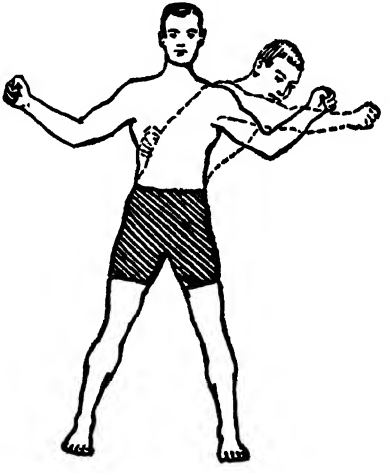
EXERCISE No. 3

Rest the hands on the rim of a bathtub or on two chairs placed about 2 feet apart. Assume position shown by cut. Lower the body until chest touches the knee; rise, bringing the other knee under the chest, repeating the movement. Execute this movement rapidly as if running, rising first on one foot and then on the other, from 50 to 100 times.

If sufficiently strong, this can be taken without support for the hands. This exercise is especially recommended for those suffering from constipation.

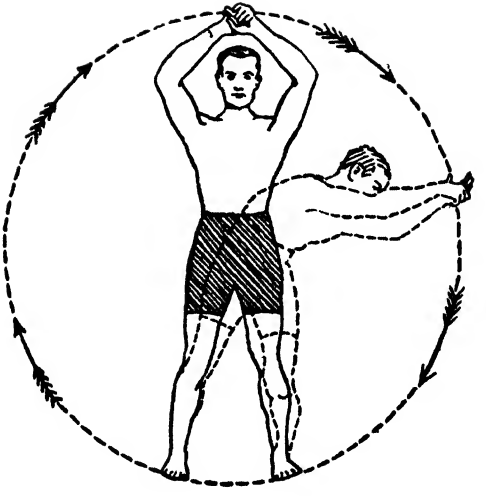
Every evening, just before retiring, take a glass of water and go through the following movements and deep breathing exercises:

EXERCISE No. 3.—Same as in the morning



EXERCISE No. 4

Stand erect, feet about 30 inches apart, inhale deeply and strike a blow toward the left with the right fist, passing the left fist behind the back. Alternate this movement, striking toward the right with the left fist, giving the body a swinging and twisting movement.



EXERCISE No. 5

Stand erect, feet about 30 inches apart, hands clasped over head, elbows rigid, inhale deeply. Bend toward the left, describe a complete circle with the clasped hands. Exhale when erect. Reverse, describing a circle in the opposite direction completes the movement.

LESSON XXIII

Exercise and Re-creation

EXERCISE

The child from the time it begins to walk until it is ten or twelve years old, or until the pressing hand of necessity forces upon it the power of restraining duty, will in a great measure obey the play instinct or the natural laws of exercise. However, our complex industrial organism forces most of us into its vortex at the very time we are beginning to change the body from the youth to the adult, and the responsibilities with which we are laden, the struggles we carry on, prevent the majority from giving attention to and maintaining a system of development

Civilization prevents the play instinct

exercises which is so vitally important, and which would provide a great storehouse of energy to be drawn upon in after years. Inasmuch, therefore, as the conditions under which we exist prevent the free play of our instincts, and the exercise of our natural desire for certain kinds of play or motion, it becomes necessary for us to devise a method of overcoming the repressing influences that crush out the play instinct of civilized man.

CONSTRUCTIVE EXERCISES

Constructive exercises should be taken and practised regularly between the ages of fifteen and twenty-five. It is largely during this period that the physical condition of the body for the balance of life is determined.

Constructive period of life from ages 15 to 25

Many a college youth, endowed by Nature with a sound physical body and a healthy brain, has irreparably injured both by sitting on the end of his spine

with his feet higher than his head, poisoning his blood with tobacco narcotics from a stylish pipe, and failing to keep it purified by obeying the laws of motion and of oxidation. Constructive exercises should employ every muscle in the body long enough once in every twenty-four hours to generate sufficient heat to cause perspiration, or at least to force twice the normal quantity of blood to the lungs for purification. Exercise thus taken up to the point of fatigue, and of sufficient duration to use all the nutrition taken in the form of food, will, under favorable conditions, build the body to its highest degree of physical strength, provided we keep Nature supplied with the right kind of material (food) with which to do her work.

Poisoning and purifying the blood

EXERCISE FOR REPAIR

After the body has reached maturity, or attained its full growth, the only exer-

cise needed is for repair. This it must have or Nature will inflict her inexorable sentence in some form of congestion.

In mature life exercise only for repair

In various industrial and professional pursuits the legs, neck, and arms are used enough to keep them in a fair state of repair. That part of the body, therefore, that suffers most for want of motion, or exercise, is the trunk. In this part of the anatomy are located the vital organs controlling not only the circulation and the oxidation of blood, but also those organs upon whose normal action depend solely the questions of digestion, assimilation of food, and elimination of waste.

Why the "trunk" requires exercise

If the food is selected, combined, and proportioned so as to produce chemical harmony in the stomach, and to meet the requirements of age, temperature of environment, and work, the body will be kept sufficiently charged

If properly nourished the body will demand a certain amount of exercise

with energy to demand a certain amount of exercise. If the command is obeyed the body can be trained to work automatically, as it were, but where the vocation is sedative, or prevents obedience to these demands, the trunk should be exercised in the open air from thirty to forty minutes daily by flexing, tensing, twisting and bending in every possible way, long enough and rapidly enough to double the normal heart action and inhalations of air.

PHYSIOLOGY OF EXERCISE

Necessity of motion for body development

By motion (exercise) the muscles are stimulated in growth, becoming larger and more firm, thus giving strength and symmetry to the body. Food, without proper motion, will not develop muscular tissue to its highest degree. Exercise must be taken to stimulate the growth of the tissues forming the muscle-cells.

Among the benefits derived from exercise, the following may be noted:

First: Surplus nitrogen is usually cast from the body as waste matter when it is not deposited as muscle-tissue by proper exercise. If the diet is balanced, regular exercise will add this nitrogenous substance to the muscle-cells far beyond normal growth, thus causing an actual increase in the size and the number of fibres.

Growth produced by exercise

Second: A second benefit derived from muscle activity is the consequent change that occurs in brain and in nerve activity. There are certain cells in the brain and in the nervous system which control the movements of the muscles. When these cells are not used, they degenerate, but their use in exercise is not only beneficial in developing a well-rounded nervous mechanism, but also in strengthening the brain-cells that are used in intellectual work.

Brain and nerve force increased

Third: A third and perhaps most important of all the benefits to be derived from exercise is the general increase in the circulation of the blood. The muscles form a larger proportion of the body-weight than any other group of organs. When general exercise involving the larger muscles is participated in, the demand for food material in this particular muscular tissue is so great as to cause a notable increase in the strength and in the rapidity of the heart beat, and consequent deep breathing. This acceleration of the circulation continues long after the exercise has ceased, thus replenishing and building up the muscles. As a result of the better circulation of the blood, all organs receive an increased blood-supply, and every part of the body shares in the general improvement. This explains why one can do better brain work, or digest food with greater ease after taking moderate exercise.

Blood circulation increased

Exercise is constructive up to the point of fatigue, but beyond that point it is destructive. The waste-products of all cell-metabolism are harmful and poisonous. When exercise is long continued, the waste matter accumulating therefrom weakens or poisons the cells that secrete them.

Evil effect of long-continued exercise

The products of cell-metabolism are of two classes, and each class has different effects. The first is due to oxidation. A runner, who falls exhausted from shortness of breath, has simply been suffocated by the excess of carbon dioxid in his muscles. After the breath is regained, or, in other words, after the body has had time to throw off the carbon dioxid, the runner is in nearly as good condition as before. A more lasting and serious form of exhaustion is due to the accumulation of nitrogenous decomposition products, which, not being in a gaseous

Different forms of exhaustion

form, cannot be thrown off from the lungs, and hence are not as rapidly or as easily removed from the tissues. The presence in the tissue of these waste-products is the cause of extreme weakness and fatigue.

The causes of soreness or stiffness of the muscles

The well-trained muscles contain only healthy protoplasm, and give off but a small percentage of nitrogenous decomposition products. Let the well-fed person who takes but little exercise, run half a mile, or play a simple game of ball, and the following day the muscles will be stiff and sore; this unusual exertion has caused the breaking down of much loosely organized tissue which could have been made firm and healthy by daily muscular activity.

Why vegetarians have more endurance than meat eaters

Those subsisting upon a low nitrogenous diet, especially vegetarians, are affected much less by fatigue than meat eaters whose muscles contain larger quantities

of unnecessary nitrogen and nitrogenous decomposition matter.

The common laws of health demand that sufficient motion be taken every day to prevent the accumulation of carbon dioxid or waste matter throughout the body. Both the production and the accumulation of waste matter depend very largely upon the diet. All animal flesh (food) is undergoing gradual decomposition, and adds its waste matter to that of the body, therefore meat eaters require a much greater amount of exercise to maintain a given standard of blood-purity than do vegetarians.

The diet governs the production and the accumulation of body-waste

SYSTEMS OF PHYSICAL CULTURE

Numerous schools of physical culture and artificial methods of exercise have flourished in all civilized countries within the past few years. This fact emphasizes

the pressing need for a general change in our methods of living.

The various systems of indoor exercise popularly taught are at the best weak substitutes for the more natural and wholesome forms of combined exercise and re-creation found in outdoor life and outdoor sport. Some of the methods referred to are as follows:

Tensing

Tensing, which consists of slow movements in which opposite muscles are made to pull against each other. The student can easily grasp the principle involved in this system, and from his own ingenuity extend it as fully as he desires.

Vibratory exercises

Vibratory exercises, which are somewhat similar to the tensing system; however, instead of slow movements, the arms or other portions of the body are moved with a rapidly vibrating motion. The effect produced is essentially the same as in the tensing system.

Heavy-weight exercises

Heavy-weight exercises, consisting in the use of heavy dumb-bells or other apparatus in which the actual physical pull exerted by the body in moving the weights is sufficient to try the muscles to their maximum capacity. This system of exercise should be discouraged; while it may add to the mere lifting strength, it takes from the muscles their flexibility, and from the body its agile and supple activity.

Indoor exercises

Indoor exercise with light apparatus such as wooden dumb-bells, Indian clubs, wands, Swedish and Delsartic movements. These forms of exercise, which compose most physical culture drills, as given in schools and gymnasiums, are to be highly recommended. For adults, however, such exercises require considerable indulgence in order to gain much physical benefit therefrom.

Exercises of this nature are especially well adapted to school children. They

Exercise for school children

depend upon the rhythm of the music, the good fellowship of their companions, and the pride of keeping up with the class to make them interesting. For this reason they are not suitable to the individual who must exercise alone in his room. Dancing can well be considered in this class, and could be highly recommended as an important exercise and re-creation, were it not so frequently associated with loss of sleep and other forms of intemperance.

Dancing as an exercise

All of the above systems are not only at the best imperfect, but poor substitutes for natural exercise, and not likely to be kept up by the ordinary sedative worker. Every individual should, so far as possible, indulge in some form of outdoor exercise, which gives all the advantages of the indoor systems, together with the added advantages of fresh air,

Importance of outdoor exercise

mental pleasure, long range of vision, and the general exhilaration that comes from close contact with nature. However, for the city man outdoor exercises are too difficult to be practised with sufficient regularity to bring the desired results; therefore, it is best to adopt some definite daily program of vigorous muscular exercise which will keep the body in fair physical condition. Exercises of this kind should be made a regular daily habit, and though at times a little tiresome, can, by practise, be made to become the expected thing, so that the day will not seem complete until the daily exercises have been taken.

Exercise for the city dweller

From long experience I have found that the following exercises give the greatest benefits with the least expenditure of time and labor. They are all especially designed to promote healthy action of the vital and the abdominal organs

Exercises giving the best results

which are so much neglected by the average person.

PROGRAM FOR DAILY EXERCISE

Every morning, just after rising, and every night, just before retiring, take a glass or two of pure cool water and execute vigorously the following movements:

EXERCISE NO. 1

EXERCISE No. 1—Stand erect, feet about thirty inches apart. Extend arms above head; clasp the hands; hold elbows rigid, and inhale deeply. Bend toward the left and try to touch the floor with the clasped hands, as far from the foot, and as far to the rear as possible. Exhale while returning to position. Inhale deeply, reversing motion to the right. This movement should be repeated from 25 to 50 times.

EXERCISE NO. 2

EXERCISE No. 2—Rest upon the tips of the toes and the palms of the hands. Move the body up and down as far as possible, bending only at the waist line. If the movement is too difficult in this position, the tension may be reduced by resting on the elbows, or on the knees, or on both. Inhale deeply, and exhaust the breath suddenly as if coughing, with the downward motion. This movement should be repeated from 20 to 30 times.

EXERCISE NO. 3

EXERCISE No. 3—Rest the hands on the rim of a bathtub, or on two chairs placed about two feet apart. Assume position shown in cut. Lower the body until the chest touches the right knee; rise, and lower the body until the chest touches the left knee. Execute this movement rapidly as if running, rising

first on one foot and then on the other, swinging the body from side to side with each step or movement.

This exercise is especially recommended for those suffering from torpidity of the liver, or from constipation. It should be executed from 100 to 500 times.

EXERCISE NO. 4

EXERCISE No. 4—Stand erect, feet about thirty inches apart. Inhale deeply, and strike a blow toward the left with the right fist, passing the left fist behind the back. Alternate this movement, striking toward the right with the left fist, giving the body a swinging and twisting movement.

EXERCISE NO. 5

EXERCISE No. 5—Stand erect, feet about thirty inches apart, hands clasped overhead, elbows rigid; inhale deeply.

Bend toward the left, describing a complete circle with the clasped hands. Exhale when erect. Reverse; describing a circle in the opposite direction completes the movement. This exercise should be executed from 25 to 50 times.

RE-CREATION

Idleness contrary to natural law

The small boy who described work as "anything you don't want to do," and play as "anything you do want to do," had in his mind the fragment of a great truth. True re-creation should afford DIVERSION, ENTERTAINMENT, and WORK. The average business man who is threatened with a breakdown, and who goes away for a rest, should in reality go to work, but it should be a different kind of work from his routine duties. No one was ever benefited by idleness; it is contrary to nature—contrary to the universal laws of construction which govern all forms

of life. If digestion and assimilation have been impaired, if, from errors in eating, or from sedative habits, congestion has taken place in the alimentary tract, then muscular work becomes absolutely necessary in order to use more nutrition, to eliminate more poison and waste, and to increase and normalize the peristaltic activity of the intestinal tract.

Exercise necessary for assimilation and elimination

The business man who likes to hunt and to kill innocent animals; who runs, walks, and thinks, and perspires in the effort, is taking a good kind of re-creation—perhaps the best he knows; but the fat man who sits in a boat all day and catches fish that he cannot use, or slays a cartload of ducks that he has deceived with a decoy, has received neither benefit nor re-creation; he has only yielded to his primeval instincts to secure his food by slaughter and has been merely entertained—probably debased.

Hunting and fishing

True re-creation for the mental worker is manual work—labor in the open air that requires but little thought. Every business man who values the sacred heritage of health, should provide himself with a place where he can go one day out of each week and chop wood, prepare soil, plant or harvest something, get close to Mother Nature, and receive the blessings of her life-giving sun by day, and rest in her open arms at night. Men are but big children, and, like the child who cries and reaches for the bubble because it reflects the prismatic colors of the sun, most of the things for which they struggle are equally as worthless and deceptive.

True re-creation

Worthless objects for which men struggle

Mental supremacy, which means the keenest sense of love, justice, and mercy, that great triad of all that is best in man, is all that really pays. If, at the close of every life, the question, "What has

The triad of all that is best in life

brought most happiness?" could be answered, it would be, "THE GRATITUDE OF MY FELLOW MEN." The average business pursuit is not conducive to this end. It is unfortunate that commercial and financial success are too often secured by methods that produce just the opposite results, therefore the whole life-work of the average man is really reduced to no higher object than that of securing food and shelter, which is the primitive occupation of the lowest forms of life.

Rest in solitude

One day in the week spent close to the soil with gentle cows and horses, affectionate cats and admiring dogs that have no "axe to grind," and one night every week spent in thought and reflection under the wilderness of worlds that whirl through the abyss of space, will sharpen the senses of love, justice, and mercy, give true diversion, true entertainment, true work, and true rest.

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