Life & Health

WASHINGTON, D. C. TEN CENTS A COPY

St. Helena Sanitarium

THE MAIN BUILDING—SHOWING THREE OF THE FIVE STORIES
New Concrete Hydrotherapy Building at the Right

AWAY from the noise, excitement, and contamination of the city, and nestled close to the heart of nature, on a beautifully wooded slope of Howell Mt., is situated the St. Helena Sanitarium.

ITS natural setting, in a forest of live-oaks, firs, manzanitas, and madronas, together with an almost unending variety of flowers and foliage, gives a beauty and fragrance to the place that beggars description. It must be seen and enjoyed to be appreciated.

EVERY modern facility favorably known to medical science in the treatment of curable conditions, has been incorporated into the institutional régime. Thus nature and science have combined to make the St. Helena Sanitarium all that can be desired by the diseased body or the weary mind.

Health is Contagious at St. Helena

Sixty-five miles from San Francisco, easily accessible by either steam or electric line; three and one-half miles from St. Helena; 750 feet above the sea level; splendid climatic conditions at all seasons of the year; pure mountain water; beautiful view of valley, mountain, and plain; seven physicians, seventy nurses; excellent service, liberal cuisine,—these and many other advantages are to be enjoyed at this beauty spot of California.

The St. Helena Sanitarium

Sanitarium, Napa County - - - California

Life & Health

PUBLISHED MONTHLY BY THE

REVIEW AND HERALD PUBLISHING ASSN., TAKOMA PARK, WASHINGTON, D. C.

Entered as second-class matter June 24, 1904, at the Post Office at Washington, D. C., under the Act of Congress of March 3, 1879

Acceptance for mailing at special rate of postage provided for in Sec. 1103, Act of Oct. 3, 1917, authorized on June 22, 1918.

VOL. 34 OCTOBER, 1919 No. 10

CONTENTS OF THIS ISSUE

SUBSCRIPTION RATES.— One year, $1; six months, 60 cents. Remit by Post Office Money Order (payable at Washington, D. C., post office), Express Order, or Draft on New York. Cash should be sent in Registered Letter. When a change of address is desired, both old and new addresses must be given. No extra charge to foreign countries.

Photo, International Film Service, Inc., N. Y.

FARMERETTES

Life & Health

HOW TO LIVE

EDITORS

L. A. HANSEN G. H. HEALD, M. D.

The Body and Character Development

THE laws of nature are God's ways of working. In other words, the way God does things may be seen in his created works. Thus in the study of his works we are really studying the character of God, so far as he reveals himself through nature. The masterpiece of his handiwork, the human being, with its wonderful capabilities and possibilities, is the highest study among the things God has made.

Man was made in the image of God. He was made a likeness of his Creator. Given a mind capable of understanding his Maker, of communing with him, and of developing ennobling qualities and forming a godlike character, man holds a place far above all other creatures of this world. Living a mere animal life is too far beneath his exalted privilege. Attainments almost equal to those of angels are before him.

It is quite consistent that we set our ideal, our mark, our aim, at the very highest point possible to human attainment. But nothing that we can ever do to reach our goal will take us out of this natural body of ours. We shall never get away from it or get anywhere without it. Our life on this earth cannot and will not be something separate and aside from our present corporeal existence.

We can treat of character building in essay and sermon, piling the world high with books and talking ourselves dry, but if we ignore the relation that habits of living sustain to conduct and character, we preach in vain. A man's living is his life, and his life is his living. He is just what he is. His identity cannot be separated from his own living.

The body of a man is the only place in which the man can develop himself. He can form a character only within himself. His influence, his reputation, and his usefulness reach out beyond himself, but what he really is or ever will be must be confined within his own being.

This means that the flesh of a man is his training ground for the development of character. The conflicts and the battles going on within the man are

the things that test him. The way he meets them determines what he is. Appetite, passion, love of pleasure, indulgence of all kinds, have their home within the bodily dwelling. It is in the flesh that the real struggle goes on. Temptations will come from without, but must be met and conquered within.

Eating and drinking have much to do with the control of appetite and passion. Some foods are stimulating to the lower passions, feeding the animal nature and making it more difficult to resist temptation. The development of moral power demands careful consideration to what is placed before the young on the dining table. The less feverish the diet the easier is the control of passion.

So then, the body is more than a thing that has to be fed, clothed, and given material care. It is the dwelling place of all the good that a man can ever know or possess. Through the faculties of the human being, the principles of right are to be worked out.

The study of ourselves is more than a study of flesh, bones, and organs. We may call the study anatomy, physiology, biology, or anything else; it is really a study of the laws of life. And life is but the manifestation of the power of God. Life in the human being is the operation of life that comes from God, working through man, the one creature made in God's image, possessing a moral sense of right and wrong, and designed to represent his Maker.

Harmony with the laws of God as seen in man means the unhindered working of God. It means the right use of all the faculties; the control of natural desires within the bounds of true temperance. This is the making of true character, and means the consecration of the whole being to the highest possible service. L. A. H.

Twisted Proverbs

A CLEAR, healthy conscience has no dread.
Sickness is no credit to anybody.
An aching stomach needs no accuser.
It is the bad liver who blames his illness to his "bad liver."
A sour stomach makes a sour face.
Doing nothing to keep well is doing a lot to get sick.
Sickness comes fast enough, but is slow in departing.
High heels add nothing to the stature.
A light view of living brings a dark view of life.
The size of the body does not measure the soul.
Little leaks drain large vats; little losses of strength sap much vitality.
All are not friends that bid us feast.
Laying up health means ability to pay it out.
All are not doctors that try to prescribe.
A man may cause his own wife to hate him.
All work and no play makes a very long day.
Sound arguments are not mere sounds. L. A. H.

First Knowledge First

WITH full credit to the value of any good study which all may follow, in school or out, we must say that no other study is so important as that of the human body and its laws. Interest yourself in botany, astronomy, language, art, music, or what you will; master all the sciences you can; become as proficient as possible in any trade or profession, but by no means neglect that most important study, the science of human life.

No knowledge, no ability, no accomplishment, can be at its best in one who knows not the care of his own body. A mastery of dead languages is of little value to one who does not know how to live. A knowledge of past history will not meet the needs of present living. Knowing all about the celestial bodies does little toward taking care of the physical body.

A knowledge of the laws that govern human existence is essential in every walk of life. It should be the basis of every other study and should come first. The more we have of it the better use can we make of any other knowledge we may acquire. And in strong ratio, the less we know about the body and its needs, the less value shall we find in any other knowledge.

Education in the science of living may begin with earliest infancy. Through childhood, youth, and each succeeding age, may knowledge be imparted and a practical training be given in health principles. Such knowledge will be useful and needful throughout life. Never, from infancy to old age, comes there a day that it is not well to know how to live.

With all that is known about the human organism there still remains much that is unknown. But so much has been learned and is made so plain and simple that ignorance is inexcusable and stands in gross contrast. Considering the vast amount of information now readily available concerning health and its great importance, we may well brand such ignorance as sin.

Many a woman knows more about the care of her sewing machine than she does about caring for her own body or that of her baby. She knows how to regulate its speed, when and where to oil it, and how to run it so as not to wear it out too fast. But this same woman may be wholly ignorant as to what her own body needs or just what it can stand. And worse, she seems to think more about caring for the sewing machine than for herself.

Many men know the best brands of lubricating oils for their automobiles and would not think of using any but the best. But these same men may know little or nothing about what they ought to put into their own stomachs to secure the highest physical efficiency. They will eat this or that, or swallow anything from a bottle, with little thought as to whether it will do good or ill.

In our knowledge getting, let us get down to first needs. There are a great many things in the world worth knowing. There are things we are better off not to know so much about. But when it comes to knowing ourselves and how to take care of ourselves, we cannot know too much. Here we can with profit begin early to learn, and keep learning as long as we live. L. A. H.

Health Hints *for* October

L. A. Hansen

WATCH out for changing temperature, and dress accordingly. There is no certain date on the calendar for changing underwear regardless of weather conditions, in either spring or summer. But while you should dress warmly enough to avoid being chilled on cold days, do not coddle yourself. There is colder weather coming; save the heavy underwear for the coldest days.

NOT TOO MUCH FRYING PAN

Be sparing in the use of the frying pan. Fat is a heat-producing food, but to take it in the form of grease-covered food is not a good way to get it. The starch foods especially should not be cooked in grease. When the small particles of starch are enveloped in grease, they become waterproof and saliva-proof.

A large proportion of the diet is starchy. Starch gives heat and energy to the body if the starch is digested. But small bits of potato or other starchy foods covered with grease are not easily digested, and with the little chewing that many people do, such particles of food are likely to give more or less trouble in the alimentary tract.

THE SCHOOL LUNCH

If your child carries a school lunch, give careful consideration to making that lunch the best you can. It is not an easy matter to put up a school lunch day after day through the long year and make it what it should be in variety, attractiveness, nutrition, and wholesomeness.

See that the child has a good breakfast, including warm food. If the school affords facilities for heating food, the problem of preparing the lunch is not so difficult. Bear in mind that the lunch is one of the regular daily meals for the child, perhaps taking the place of the principal family meal. Give attention to furnishing necessary food elements. Do not depend upon desserts to make up for lack in other things. Substantials are more needed. Little surprises will be enjoyed. Pack the lunch neatly and make the noon meal as pleasant as possible.

THE TONSILS

Does your child have diseased tonsils? Just one thing to do — have them out. The operation is a light one, and may prevent conditions that would seriously affect the general health. Now, before the school year gets far along, have this matter looked after.

The tonsils are two spongelike glands, situated in the back of the mouth, on either side. They are in the line of travel for any impurities entering by the mouth, and readily catch such poisonous germs as may be in the air. Easily subject to inflammation and enlargement, they become a center of disease infection. Little "pockets" in them are breeding places for germs. Their connection with the circulation makes them particularly active factors for harm when diseased. Through this doorway diphtheria, measles, mumps, scarlet fever, rheumatism, and other diseases may enter the system.

Enlarged tonsils hinder breathing and interfere with the speaking. Sometimes, because of their pressure upon the blood vessels of the neck, which carry the blood supply to the brain, they prevent clear thinking, thus interfering with study. As a consequence the child makes slow progress in school work and is considered dull.

Hearing is also interfered with by enlarged tonsils pressing against the opening of the tubes leading from the throat to the inner ear. Inflammation of the tonsils will cause inflammation of the tubes, and, when the inflammation

> "EACH day is a making or a breaking. Every year of life we add to the welfare and wealth of character, home, and community, or we deface, disorganize, demolish somewhat of good. Each life is either one of creating or of destroying."—"*The Soul in Suffering*," *Robert S. Carroll, M. D., p. 91.*

extends to the ears, will cause earache. Running of the ears may result, and sometimes the hearing is permanently impaired. Again we say, look after the tonsils.

ADENOIDS

ADENOIDS

Much of what has been said of diseased tonsils applies to adenoids, a sort of extra tonsil or glandlike growth back of the mouth where the nose passage joins the throat cavity. They are out of sight, so it takes more than an ordinary look to tell if they are present. They become inflamed as do the tonsils, swell up and interfere with nose breathing, and easily catch germs in the dust and air which may pass through the nose.

RIGHT TONSIL

LEFT TONSIL

Mouth breathing results from adenoids and this is an exceedingly harmful practice, for not only does the air enter the lungs unfiltered and too cold, but the child who breathes thus does not get enough air. This means a lack of pure blood to the brain, and again we have a supposedly stupid child. The effort to get enough air means an unconscious struggle, using energy that should go to physical growth and development, so again the general health is affected.

This handicap to the child, which, as may be readily seen, will hinder school work and cause much discomfort, can be remedied by a simple operation, requiring about five minutes' skilful labor on the part of the doctor, and a day in bed for the patient.

LONGER EVENINGS

If one would make the most of the opportunity the longer evenings of fall and winter afford for reading, study, and general mental improvement, the evening meal should be light. Fruit is not "lead" at night, but, contrary to an old saying, makes a light meal if not eaten with too many other things. Crackers and milk make a suitable evening meal, or rice or flake cereals may be served with the milk instead of crackers. Avoid heavy food. The brain cannot do good work while the stomach is heavily taxed, as each of these organs requires an extra supply of blood to perform its work.

Don't make the evenings longer than they are. There is also a night time, and night is for sleep. One third of a man's lifetime is or should be spent in bed. This amount of rest is important in order that the other two thirds of his time may be used profitably. Full time for resting and recuperation is a necessity to good health.

MISCELLANEOUS

Always remember that the real essentials of health are air, water, food, sleep, and exercise. Proper clothing is essential, and so is sunlight. And these should be supplemented with common sense and judgment. These few health needs are generally available anywhere and for anybody, and likewise are applicable everywhere and to everybody.

October is a bad month for taking patent medicines, no worse, though, than any of the other months. Make it an all-the-year plan to take no drug except on a doctor's prescription, and, of course, see to having a good doctor when you need one.

Look after the food-storing facilities,— cellar, bins, etc. Plan for a minimum of spoiled fruits and vegetables, not only to save the loss, but that you may have the best. Decide now that for the coming winter you are not going to be using spoiled apples all the time just to save them, and thus fail to enjoy the good sound ones you put away early in the season. That kind of sorting does not pay.

NATURE is very exacting in her payment as penalty for violating her laws, — sometimes physical bankruptcy is the result.

THE death certificate is too often the final evidence that nature has foreclosed on one who has been a physical spendthrift.

LAUGHING at small troubles will lighten the big ones — if they come.

THE biggest gain is a loss if it costs you your health to get it.

DISEASE means no ease and ease too often means disease.

A MAN can generally eat good, plain, wholesome food a long time without getting indigestion; which is more than we can say about the other kind.

RIDING a good hobby is not bad exercise.

Life and Nutrition

Edward H. Risley, M. D.

Professor of Chemistry

LIFE itself is a mystery. The Bible gives us plain evidence as to the source of life. "The Lord formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul." "God . . . made the world and all things therein." "He giveth to all life, and breath, and all things." "The Spirit of God hath made me, and the breath of the Almighty hath given me life."

From these statements it seems clear that man is not able to fathom the mystery of life, but he can follow many of its manifestations. There are, however, certain phases of the subject which cannot be fully explained by man.

Life has been defined as follows:

"A condition of restless change in which every cell of the organism takes part, the protoplasm of the cell and the oxygen of the air being the governing factors. Life is an unceasing building up and breaking down, or a continual replenishment of losses wrought by a species of slow combustion."

The basic principle in the phenomena of life is the substance protoplasm, which is composed chiefly of proteins which are viscid, jelly-like, and often granular in character. Protoplasm is specialized in the different tissues to meet the needs of the structure in a most marvelous way. In muscle tissue it gives ability to contract, and thus do the work of the body in lifting, carrying, etc. In the nervous system, it is specialized to originate and carry forward impulses to other organs and tissues. In the digestive organs it prepares and dispenses the juices which disintegrate the foods into substances which are available for the rest of the body. And so one might continue to enumerate the wonderful manifestations of life in connection with this "first form" of living material.

Living material exhibits five characteristic properties; viz., movement, growth, reproduction, respiration, and irritability. The meaning of the first three is clear. Respiration refers to the taking in of oxygen and the giving off of waste products, such as carbon dioxide. It is the process which produces the energy of the body. Irritability is the property by which the organism reacts to stimulation of various kinds.

The living cell is the most efficient of all mechanisms of which man has knowledge, producing energy in enormous quantities in the

form of heat and work, and in some cases in other forms, such as light and the electric current. The activities of living matter are characterized by their rapidity and the orderly way in which they are carried forward. Many of the changes, such as we see in living cells, are not brought about outside the living organism unless a much higher temperature is present than is found in the living tissue. The orderly way in which these changes are conducted is a marvel to those who observe them.

Living matter is composed quite largely of water. For example, about seventy-five per cent of the weight of the human body is in this form. Thus a person who weighs one hundred sixty pounds would have in his tissues one hundred twenty pounds of water and only forty pounds of actual solid material. This is a very striking observation when we think of the work the body is able to do, both physical and mental.

Another most interesting characteristic of the living organism is the fact that there are no rare elements in its make-up. We might expect to find some rare, unusually active substance present, such as radium, but this is not the case. The elements present are those with which we are the most familiar. True, the combinations of these elements are rather complicated in some instances, but yet the elements entering into their formation are relatively simple.

The various manifestations of living matter are collectively included under the heading of nutrition, which is defined as follows: "A function of living plants and animals, consisting in the taking in and assimilation, through chemical changes (metabolism), of material whereby tissue is built up and energy liberated." For the convenience of study, nutrition can be divided into several stages:

Digestion, a method of simplification. By this process the living organism takes a food which is more or less complicated, and subdivides it into more simple substances or building materials. The process of digestion can be illustrated by the sawing of a log into lumber, the log representing the original food, and the boards the digested product. Continuing the illustration, the body uses the simplified products to build its structure as the boards are used in the building of the house.

Absorption, the taking up of the food materials in their finely divided state, which results from the digestive process, and the carrying of these products by the blood stream — the transportation system of the organism — to the living cells of the different tissues.

Assimilation, the transformation of the food materials into living tissue; or, in the language of the previous illustration, it is the process of building the house. This part of the process is a difficult one for us to follow. We are not able to explain fully how various food substances can be converted into living cells. The methods of study in connection with the activities of the living organism have carried the processes of nutrition up to this stage, and then science has had to step over to the other side and study the products resulting from the wear and tear of the cell structures. Thus a gap is left which is still unfathomed.

Excretion, the elimination or casting aside of the smoke and ashes, as it were, which have resulted from the burning of the food materials. Excretion includes a number of most interesting processes, such as the output of carbon dioxide from the lungs; the elimination of sweat from the skin; the output of waste material from the kidneys and of the unabsorbed refuse from the intestinal tract.

The actual wear and tear of the tissues is comparatively small in amount, even when the individual is doing taxing physical work. When doing heavy work, the consumption of fuel foods is greatly increased. Such fuel foods probably do not become a vital part of the living machinery, but are simply burned in its presence to yield the energy necessary for accomplishing the work.

Here the comparison of the body with an engine is an interesting one. Although not strictly true in every sense, it helps us to form a more correct idea as to what the real changes are. The locomotive in climbing a heavy grade does not increase the wear and tear of the working parts to any great extent, provided it is properly lubricated and cared for in other ways, but it does require a tremendous increase in the amount of fuel consumed.

As we think of the various changes going on in the living organism, we are brought to realize the importance of making a wise choice of foods to keep this delicate machinery in proper repair and to supply energy. The nutritional studies of our time are giving us a more firm scientific foundation for the selection of foods and also better ideas of how to choose our modes of living. These studies are also leading us to realize that natural conditions of living are better for us than those which the stress and strain of modern business methods are pressing upon us.

This is particularly true in regard to foods. Modern methods for the refinement of foods are in many cases lessening the ability of those food substances to properly nourish the individual. Food has a great influence over the nutrition of the normal individual, and it is now known to figure to a marked degree in the production of disease processes. Dr. Osler says: "Ninety per cent of all conditions other than acute infections, contagious diseases, and traumatisms, are directly traceable to diet." The more thoroughly we understand the activities of the body, the more able shall we be to care properly for its needs.

How We Appropriate Foods

Frederick Bulpitt, A. B., M. D.
Instructor in Materia Medica and Therapeutics

AN engine must have fuel. The body is similar to an engine in that it must be furnished food in order for it to accomplish its work. But while an engine is an inanimate piece of metal which must be regulated and controlled by an engineer, the body is a living machine which is able to care for itself and regulate its own activities.

This human machine is made up of millions of cells,— blood cells, nerve cells, muscle cells, — each of which is alive and concerned in caring for its own needs. Each one is able to select its food from the fluids with which it is bathed, build up its own structure, and perform its appointed function. This process is called "the vital activity of cells," and is a basic principle to be recognized in understanding the various ways in which the body performs its tasks; and also is a clear indication of the wisdom and power of the Creator in imparting to the most lowly cell the life which comes from him.

PURPOSE OF EATING

The Scriptures tell us we should eat for strength rather than merely to indulge our appetite or desire.

Three distinct purposes should be kept in mind in choosing a diet to meet adequately the needs of the body for food:

1. Heat and Energy. Our bodies must be kept warm in order that they may remain active and in health. The lowering of the temperature by severe exposure results in great depression of vitality, or even death. Also we must have energy that we may keep active and accomplish our daily work. These needs are supplied by the classes of foods which we call the carbohydrates and fats. The carbohydrates include the sugars, honey, and the starches, such as flour, potatoes, and rice. The fats may be represented by cream, butter, cottonseed oil, olives, olive oil, etc.

2. Construction and Repair. The second purpose to consider in eating is to furnish building material for the body to maintain its framework and structure. A child needs such food to build new muscle, bone, and nerve, while an adult must have a certain amount to repair the wasting that is continually going on in the tissues due to wear and tear.

One of the important food elements which serves the body as building material is protein. Proteins contain a large amount of nitrogen, and are found in such foods as meat, milk, eggs, peas, beans, nuts, and whole cereals.

They are not adapted to the body as a main source of heat or energy, but are used by the tissue cells to insure their growth and development. Besides protein, calcium is essential for bone, iron for the blood, and phosphorus for the nervous system.

3. Maintain Body Tone and Balance. This last purpose which we must follow in choosing our diet is one of the most important of all, and yet unfortunately is probably the least recognized. Our appetite and hunger very seldom fail to prompt us to eat, but unless we realize the importance of each of the body needs, we are likely to eat what is set before us, without questioning ourselves whether we have really supplied the body those elements which are essential to its well-being.

This danger is especially true at this time when many of our foods have been so refined, purified, whitened, prepared, and predigested that they are strikingly lacking in substances vital to the harmonious action of the organism.

These important food substances are the mineral salts, and complex chemical bodies called "vitamines." They are essential to the perfect tone and balance of the organism, and if they are lacking, serious disturbance occurs in every portion of the system, being often marked by nervous exhaustion, anemia, weak dilated heart, decayed teeth, paralysis, and finally death.

The mineral salts and vitamines are abundantly provided by nature in the fresh fruits and vegetables, whole grains, eggs, and milk. This fact emphasizes the importance of daily including in the diet such fresh foods, and of using the flour of the whole grain of the cereals, rather than the bleached, sifted, and devitalized products on the market which for the sake of appearance have been robbed of their life-giving qualities.

THE REFINING PROCESS

Most foods in their natural state cannot be utilized by the body without a preparatory process by which their entrance into the tissue fluids is provided. This task is accomplished in the alimentary canal. Here the various food elements are segregated, simplified, and made ready for absorption.

Certain of the food elements, such as the vitamines and the mineral salts, probably do not require any digestive process for their utilization, but merely pass into solution in the intestinal fluids and are absorbed into the blood stream. The more complex food substances must be made ready by a more intricate process.

Beginning with the mouth, the teeth crush and tear the food, breaking it into small particles that it may be more accessible to the action of the digestive juices. At the same time, the salivary glands pour out their secretion, which on becoming mixed with the food, has the power of changing starches to simple sugars. This process continues in the stomach for twenty to thirty minutes after the food is swallowed, until the stomach contents become acid by the pouring out of the gastric juice.

In the stomach, protein material is partially digested, undergoing cleavage to simpler substances.

The digestive process is completed in the small intestine. Ferments are present here from the intestinal wall, and also from two near-by glands,— the pancreas and liver,— which pour their secretions into the intestine. The conversion of the starches is now completed, and as dextrose they are ready for absorption. The fats are split into glycerine, fatty acids, and soaps preparatory to their passage through the intestinal wall into the lymph channels and then into the blood. The proteins are reduced to very simple bodies called amino acids. These may be considered the building stones of the body tissues; for after they enter the blood stream, they are utilized by the tissue cells in building up their structure.

Now that the various food substances have been reduced to these simple end products, they are taken up by the cells lining the intestinal wall and introduced into the lymph or blood streams. This process is called absorption and is characterized by the "selective activity of cells."

DISTRIBUTION AND STORAGE

In supplying each cell of the body with its required nourishment, the blood-vascular system is the "grand trunk railway" of the circulation. By the ramification and subdivision of its many vessels, it carries the blood to distant places in the tissues. But it does not make immediate contact with the tissue cells. This is accomplished by the "rural stage lines" of the distributing system, the lymph channels and the tissue spaces. Into these flows the liquid portion of the blood carrying the necessary food elements to the cell. This nutritive fluid bathes every cell as it passes to and fro in the tissue spaces, and serves as a medium of exchange between the cell and the blood vessels in carrying food and oxygen to the cell, and returning wastes and carbon dioxide to the blood for elimination.

Certain provisions are made for emergency in the body economy by the storage of food in the tissues. In the liver and muscles, the sugar of the blood is converted to glycogen or animal starch, where it is held in readiness as a source of heat or energy.

Similarly the storage of fatty tissue in the body may be utilized in time of want to yield warmth and vigor.

For protein food, however, the body has no provision for accumulating a reserve supply, so whatever amount is introduced into the system in excess of the present tissue needs must be burned up and thrown out by the kidneys. As the kidneys are quite susceptible to permanent injury by overwork in eliminating such material, it is of practical importance to keep the supply of protein furnished the body within the limits of its needs,— two ounces of pure protein a day,— and thus prevent disturbance of function of these important organs and consequent impairment of health.

THE CONSUMERS

Each portion of the organism is specialized and devoted to its own function. To furnish the requirements essential to its activity, those food substances are chosen from the circulating fluids by the tissue cell and utilized as its nature may indicate.

Most of the body heat is generated in the liver and the muscles. The liver is an organ of many important functions. Within its interior, elaborate chemical reactions are continually occurring which are associated with marked heat production. The temperature may rise here as high as 105°.

By the activity of our muscles, as occurs in exercise or when we shiver on chilling, heat is generated and body warmth increased. This is due to the oxidation of the sugar dextrose, and also the fats. The only waste substances formed by burning these foods in the body are carbon dioxide, which is removed by the lungs, and water, eliminated by the kidneys.

The activity of the various organs and tissues, whether nerve, muscle, or gland, is also maintained by a supply of energy derived by burning the sugars and fats.

The protein "building stones," the amino acids, are seized upon by the various cells as they may need them for growth or repair, and incorporated within their structure.

(*Concluded on page 270*)

The Body Heating Plant

Mary C. McReynolds, M. D.
Instructor in Physiological Therapeutics

ATTACHED to the bony framework of the body and covering it completely are the skeletal muscles, so called to distinguish them from the smaller muscles which are found in the various organs and viscera of the body. By these muscles is largely performed the work of the body which has to do with the external world, and in their activities, most of the food we eat is used up. The chemical changes necessary to these various activities produce heat, and it is here that the greater part of the body heat is produced.

The internal organs which are concerned with the digestion and absorption of our foods, also produce heat by their activities. This is particularly true of the liver, "the chemical laboratory" of the body. It has been found by experiment that during the period of digestion the blood leaving the liver is from a degree to a degree and a half warmer than that entering it.

The muscles of respiration and of the heart are not to be ignored as a part of our body-heating plant. It is estimated that *in a resting body*, the heart work and the breathing work alone produce 174 to 210 calories of heat. It may be better imagined than estimated what the actual heat production would be during a day of average physical work. It is hard to realize the amount of energy (much of which is transformed into heat) used in the body. Stewart, in his "Manual of Physiology," page 663, tells us that "enough energy is transformed in twenty-four hours in the heart of the colonel of a regiment of one thousand men, to lift the whole regiment to the height of the mess table, if it could all be changed into mechanical work."

And the body expends only one fourth or one fifth of its energy in mechanical work; the remainder is transformed into heat. When all of these auxiliary sources of heat are recognized, it still remains that the greater part of the heat production of the man doing ordinary work is accounted for by the contraction of the voluntary and involuntary muscles.

THE FUEL

The best fuel is dictated, not by taste, but by body needs.

Recent discussions which have appeared in journals and magazines have acquainted even the casual reader with the various foods and food elements and, to some extent, with their value. It is not our purpose to discuss this subject, but merely to suggest which foods are best adapted for heat production.

In managing the steam engine, we feed wood, coal, or oil into the fire box, to be consumed in the production of steam, reserving the bolts and scrap iron for whatever repairs may be necessary. Similarly, in the human engine, we should so select our foods that the fuel and the repair material may be taken in proper proportions.

The foods most easily prepared for oxidation in the body are the carbohydrates — starches and sugars. Of these, those most readily absorbed are the fruit sugars. It follows that a glass of fruit juice is more refreshing to a tired body, and indeed, gives more easily available energy, than heavier foods such as an egg or a glass of milk.

Food elements, whether burned inside the body or outside of it, yield exactly the same amount of heat. It has been determined that one gram of carbohydrate, in becoming oxidized, or burned, yields four calories of heat, protein almost five calories, and fat a little more than nine calories. In the body this burning process is carried on at a lower temperature, and is called oxidation; but it is none the less a burning, and reduces the foods to the same elements.

In the body, fats and carbohydrates are completely oxidized to water and carbon dioxide. These are called the end products of metabolism. The heat and energy liberated has been used in body function, and these products are now eliminated by the skin and lungs. The protein foods contain nitrogen as well as carbon, hydrogen, and oxygen. This food is much more complex, harder to break down, and is not entirely oxidized in the body. That is, some of the end products of protein metabolism are capable of being further oxidized. The urea which is eliminated by the kidneys contains the nitrogen of the protein food, and is not fully oxidized in the body. While the fats and carbohydrates are used by the body for the production of energy in its various forms, the protein food is largely used for repair purposes and should be taken in only such quantity as is needed for the replacing of body tissue, very little of which is actually broken down in a normally functioning body. One needs approximately one tenth of his food as fat, the same amount as protein, and the other eight tenths as carbohydrate.

In the oxidation of all foods, energy is produced, which may be manifested as muscle contraction by which external work is done, glandular and tissue activity by which internal body function is carried on; or it may be transformed into heat directly or indirectly by the very activities above mentioned. Thus, no energy is lost in the human body. The very activities of the body, which require energy, produce the heat which maintains the body at that temperature where its activities may be carried on. The very coursing of the blood in its vessels produces heat by friction, and this heat with that produced by muscle contraction and glandular activity, is carried throughout the body, thus equalizing body temperature.

CONTROL OF HEAT PRODUCTION AND ELIMINATION

With heat production so constantly going on in the body, some means of control and of elimination is necessary, or the body tissues would soon be injured. This is exactly what happens in those diseases where poison is present in the system. The body increases its heat production to destroy the infectious agent. It is the business of the physician and the nurse to see that the heat is eliminated rapidly enough so that it may not accumulate and become so intense as to damage the body tissues.

Heat production is controlled by the kind and amount of food taken, by muscular activity, and by external agents which act upon the nerves of the skin and blood vessels. When heat production is being carried on rapidly, as in a case of severe fever, we give only the lightest possible food, if any, and reduce muscular activity to the minimum. In addition to this, the elimination of heat is hastened by cool baths or cool sponging. The heating of this water to the point where evaporation may take place, requires heat of the body. Heat elimination is thus increased and body temperature lowered accordingly.

This process is apparent also on a warm day with those who perspire freely. The more active the sweat glands, the more rapidly the body is cooled. It is well known that if a fever patient can be made to perspire freely, the temperature will presently be lowered very markedly. If the nerves controlling the blood vessels are irritated by the poisons to the point of contraction and the skin is cool and clammy instead of hot and dry, the hot sponge relaxes the tension, dilates the blood vessels in the skin, draws the overheated blood to the surface, and thus assists in the elimination of the heat and the consequent lowering of body temperature.

These commonly observed experiences and scientific experimentation have taught us that the mechanism for the ultimate control of heat elimination is in the skin. Regardless of the wide limits in external temperature to which the body is exposed, it maintains its temperature (in health) at or very near that point at which its tissues and organs do their work best. The body is assisted in this very important work by the clothing which we voluntarily adjust according to the degree of exposure to which we are subjected. A rabbit whose skin has been varnished freezes to death, because the layer of air usually maintained near the skin by the fur is warm, and without this protection heat is rapidly eliminated from the animal's body. The human body which has suffered extensive loss of skin by burns must be kept very warm. Why? Because the heat-regulating mechanism has been seriously interfered with, and body heat is rapidly lost and body function will cease unless the necessary temperature is maintained by artificial means.

It was mentioned in a former paragraph that heat production may be controlled by the quantity and the quality of food. During a recent very warm season in the East it was noticed by a physician during his postgraduate course,

that those physicians who used meat, tea, coffee, and other foods which require the most effort on the part of the body to oxidize and eliminate, were entirely prostrated by the heat. The physician who lived upon fruits, grains, and a few light vegetables, worked throughout the hottest of the summer, long hours every day, without missing a lecture or a clinic. This would emphasize the advisability of eating light food, and not so much of it, during warm weather if one would preserve his comfort and efficiency.

THE CLINKERS

The coarse fibers of vegetables, the husk of grains, etc., are thrown out of the body by way of the colon. This bulk is necessary in order to carry to elimination other products which leave the body by the colon but which of themselves do not stimulate peristalsis sufficient to cause an evacuation of the bowels.

There is another class of waste which serves no such good purpose. It has been mentioned before that the carbohydrates and fats are completely oxidized in the body to water and carbon dioxide. If these elements are not needed for heat or energy at once they are not oxidized, but stored as glycogen and fat respectively; the glycogen in the liver and muscles, and the fat in the supporting tissues or as padding about the organs or under the skin. But there is no storage place for protein. All that is not needed for immediate repair, must be eliminated at once or it becomes a "clog" in the system, a "clinker" in the grate. An excess of protein food throws a heavy burden on the liver in its attempt to prepare the food for elimination, it irritates the kidneys, and so affects the circulatory system as to cause a rise in blood pressure. Nor is this all: the condiments and rich seasonings and the extractives in meats, the elements introduced in the popular beverages, all become so many "clinkers" overburdening the organs, retarding oxidation, clogging the elimination, and generally hindering the "heating plant" in its legitimate work, i. e., the production of heat and energy for the protection of the body and the carrying on of its important functions. A grate must be cleared of its ashes and clinkers or the stove will not draw — the fuel will not burn; the body wastes must be thoroughly eliminated or the overburdened organs and muscles cannot properly oxidize more food, and the accumulation of waste increases, until liver, kidneys, and brain alike become sluggish and inactive, while the muscles tire easily. The resistance to disease is lowered and body efficiency is greatly decreased.

SUMMARY

1. The body-heating plant is composed of the muscles and glandular organs supplemented by tissue activity in every form, throughout the body. The heat is produced by the oxidation necessary to the contraction of muscles and the functionating of organs and tissues.

2. The fuel is the food which is taken into the body, digested, absorbed, and assimilated, and oxidized in body activity.

3. Heat production is controlled by, *(a)* Kind and quantity of food; *(b)* muscular contraction and glandular activity.

4. Heat elimination is controlled by, *(a)* The amount of blood circulating in the skin as determined by the contraction or relaxation of the vasomotor nerves; *(b)* evaporation of water from the surface of the body as determined by the activity of the sweat glands and the surrounding temperature; *(c)* the clothing worn, which, by quality or number of layers, may hasten or discourage heat elimination.

5. The clinkers are those things taken into the system with food for which the body has no use in its normal activities, and which by their presence, or by the burden they put upon the body to eliminate them, hinder the organs in their work. Any food taken in excess, especially protein foods, may become such clinkers, and the heating plant may fail in its endeavor to properly maintain body temperature and function.

"UNQUESTIONABLY the most determining influence upon the attitude of the individual is that of the Unseen upon his soul. Imperfect religions may breed all sorts of ugly attitudes. The religion of spirituality will ever develop the highest type of soul-life, will ever unfold the most perfect expression of human character, will ever reveal to waiting, needing mankind the latent capacity of the human to take on the divine."—"*The Soul in Suffering*," *Robert S. Carroll, M. D., p. 62.*

BETTER to hunt in fields for health unbought,
Than fee the doctor for a nauseous draught.
The wise for cure on exercise depend;
God never made his work for man to mend.

— *Dryden.*

The Common Carrier

Arthur N. Donaldson, A. B., M. D.
Professor of Physiology

IT is through the operation of mechanical, nervous, and chemical factors, that the varied functions of the body are successfully unified. Bone is tied to bone, muscle is made fast to bony insertions, organs are cushioned in body cavities, muscle fibers are bound into muscle bundles, all through the operation of an indispensable mechanical agency,— strong, fibrous connective tissue.

Impulses starting activity in a group of muscles are conveyed over lines of living tissue. A wonderfully elaborated mechanism controls the charges of physicochemical energy that "zips" hither and yon to establish our well-coordinated movements. We will to eat a morsel of food. At once the hand reaches out, obtains the bit, and carries it to the opening mouth. Its arrival at the mouth cavity is the signal for efforts of mastication, and, with the food reduced to the proper grade of fineness, the swallowing act is instituted. Such splendid co-operation of movement is characteristic of all body processes. The head, the foot, the mouth, the finger, are joined in a mutual benefit organization through the nervous system.

At bottom, however, stands the blood as the most important unifying factor of them all. Were it not for the numerous branching of the blood vessel system, carrying its fluid to remotest areas, connective tissue, which binds and holds us together, would entirely fail of its function. The transfer of energy over living lines of tissue demands the vital activity of cells, and as no cell can maintain its integrity unless bathed with tissue fluid derived from the blood, the nervous system also is really a dependent factor in body unification.

Let us repeat, then, the correlation of all body functions into a harmonious unit, is fundamentally dependent upon the blood. From it all cells select materials which are utilized for repair, growth, and energy, and to it waste products are given, to be eliminated through the various excretory channels.

The chemical unification of the body is specifically a function of the blood. Chemical substances prepared in one organ are carried in mass to remote parts, and there act as stimulating agents. We have, for example, a substance known as secretin which is produced by cells of the small intestine. This is absorbed by the blood, carried to the pancreas and liver, and there serves as a secretory stimulant. The secretions of the thyroid, adrenals, pituitary, parathyroids, and all the rest of the ductless glands, so essential to growth, development, and the maintenance of the body in health and vigor, are thrown into the blood stream and thus distributed where needed. For example, epinephrin, secreted by the adrenal glands, stimulates a specific set of nerve endings throughout the entire body.

This particular system of nerves, because of its physiologic action, is known as the sympathetic system, and supplies fibers to the muscles of the blood vessels, to the muscles of the gastrointestinal tract, and to the pacemaker of the heart. Stimulation of these fibers causes a contraction of the blood vessels, whips up the heart, and relaxes, for the most part, the muscles of the gastrointestinal tract. Naturally an opposing set of fibers from another system will balance the normal activity of the sympathetic fibers, so that no harm will result. Epinephrin serves as the normal stimulus for maintaining the tone of this system. It is by way of the blood stream that this chemical substance is distributed to all parts. We note the evidence of its production and distribution in abnormal amounts when we are under the strain of fear, anger, worry, or embarrassment. Our blood pressure goes up by reason of the constriction of our blood vessels; the tone of our stomach is reduced and the pyloric sphincter tightens, with the result that the movements of the stomach necessary to digestion practically cease, and the food, undigested and unable to move on, ferments. Epinephrin has done it. The function of the rest of the ductless glands is equally as important, and altogether dependent upon the blood stream for action.

And then the blood gathers the waste of food combustion — carbon dioxide — from the many cells of the body, and thus charged, bathes the respiratory center in the brain. This chemical stimulates the center and, through the nervous system, causes the muscular movements necessary for respiration. We have noted the effect of rapid accumulation of carbon dioxide in the blood resulting from increased metabolism in fevers or during exercise. The activity of the respiratory center is increased for the purpose of eliminating the excessive waste.

Perhaps more wonderful yet is the work of the blood in combating disease. Some one falls a victim to typhoid fever. Typhoid is caused

by a specific organism, the typhoid bacillus, which, infesting the blood stream by the millions, poisons the system with a toxin elaborated by the germ. A bit of the patient's blood is drawn, mixed on a glass slide with a culture of typhoid bacilli, and watched under a microscope. We note that the very active organism is becoming less active; slowly, but surely, it assumes the appearance of a piece of wood, and we note that groups of them are drawn together into piles, like sticks of cordwood thrown carelessly about, helpless within four minutes. What has done it? An agent in the blood stream, known as an agglutinin has been the great unseen force active in incapacitating these organisms and rendering them as harmless as so much débris, to be picked up and disposed of by the white cells. This agent is specific. The agglutinins that will pile up typhoid germs will have no influence over the organisms responsible for cholera. When the germ enters the body, its presence acts as a stimulus to the tissues causing the production of the agglutinin, active for this germ only.

The poison elaborated is equally well cared for. The presence of this toxin stimulates the tissues to the production of an agent known as an antitoxin. As the name implies, this substance acts against the poison. It is specific. It is an antitoxin for the one type of toxin only. But before it can become active, it must unite with another element always present in the blood, and arbitrarily designated as a complement. We thus have three elements uniting in the production of an inert substance from the dangerous toxin elaborated by the typhoid germ. These elements theoretically unite in a sort of lock-and-key order. The antitoxin is the key, and it must have just the right chemical formation to fit into the lock provided by the chemical formation of the toxin. An antitoxin against cholera, or tuberculosis, will not fit the typhoid toxin lock; and the antitoxin against typhoid will not fit the diphtheria toxin lock. The antitoxin is absolutely made to order. The little complement is not specific, but fills an essential niche in the make-up of any antitoxin, thus making of it an active and formidable foe of death-dealing agents.

The fact that a substance may be elaborated in the presence of germ toxins, which can successfully combat the activities of those toxins, is the sound scientific foundation upon which vaccine prophylaxis is built. A small quantity of dead bacteria and toxin peculiar to some disease, typhoid for example, is injected, or, as in the case of smallpox, the virus is rubbed on a scarified area. When absorbed, this material stimulates the healthy tissues to the production of agglutinins and antitoxins, which, accumulating in the blood stream, will be ever watchful and ready for active combat, should the area by chance become infected. Such an uprising is often put down without our knowledge. Had the patient not been vaccinated he might have suffered the full terrors of the disease. The body, racked by disease, is not in a state of vitality well qualified always to produce antitoxins early enough and in sufficient quantities to save a person from death. But when he does make a recovery from an infectious disease, he has the antitoxin to thank as a very important member of his fighting forces.

The white cells, of course, come in for their share of glory. They have gone down in nontechnical literature as the policemen of the body, and it is to our interests to keep that splendid force up to the *n*th power in efficiency. Daunted by nothing, they plunge into the thick of the fight with no regard for their lives. We find them in infected areas and sometimes draw off their dead bodies by the pint. We call it pus. We ought to bear in mind that a number of drugs in common use — drug-store remedies for headache, colds and the grip — are debilitating to these cells. The white cell is drugged, and a drugged cell is not qualified to render the service demanded in the face of infection. Thousands were drugged to death in the recent pandemic. Nature was thwarted in any attempts she might have made at restoration by the knock-out blows delivered at her agents. We can rally our natural forces to renewed vigor through the use of therapeutics not inimical to the vitality of cells, and it is this therapy we should choose.

Every cell of the body is dependent upon the blood stream. Upon the kind of nourishment it carries, upon its power to defend from infectious processes, upon its ability to remove waste and to supply with oxygen, depends the well-being of cellular life from toe to finger. How careful we should be in these days when the matter of keeping fit is vital, that we safeguard the blood, the common carrier. Keep it clean. Don't foul it up with "dope," poor food, and preventable diseases. Eat, drink, and live to the glory of God.

"TRULY do we need a religion which brings some sense of horror at the sins of physical neglect. Man needs a physical conscience if he is to attain whole living. He must realize, in life's great unity, he as truly transgresses by breaking the physical as the moral law; that misuse of the body, so far from being religious, stands only for unholiness."—"*The Soul in Suffering*," *Robert S. Carroll, M. D., p. 236.*

Prescription Fakes

A "prescription fake" is a "patent medicine" advertised as one of the ingredients of a prescription, the other ingredients being official products.

PARNOTIS

Baking Soda (Sodium Bicarb.) -	75 Per Cent.
Impure Sodium Sulphate -	25 Per Cent.

Retail price of Parnotis, one-half dollar; estimated cost of ingredients, 2 cents.

SPURMAX

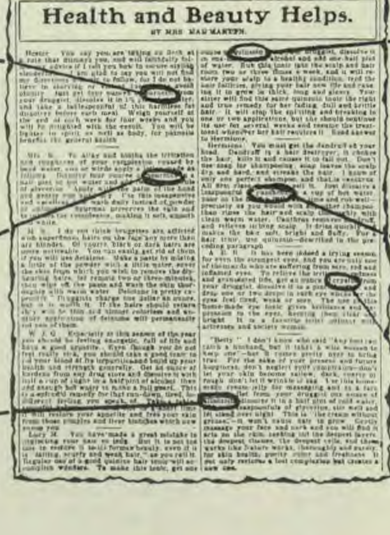
Epsom Salts -	100 Per Cent.
Perfume - -	Trace
Coloring Matter -	Trace

Retail price of Spurmax, one-half dollar; estimated cost of ingredients, 1 cent.

ALMOZOIN

Borax - -	40 Per Cent.
Tragacanth -	40 Per Cent.
Magnesium Carbonate -	20 Per Cent.

Retail price of Almozoin, one-half dollar; estimated cost of ingredients, 3 cents.



QUINZOIN

Baking Soda	About 50.4 Per Cent.
Coarsely Ground Quassia	About 49.0 Per Cent.
Quinin Sulphate	About 0.6 Per Cent.

—Kansas State Board of Health

CANTHROX

"Is principally a Cocoanut-Oil Soap."

—Kansas State Board of Health

CRYSTOS

Dried Borax -	20 Per Cent.
Common Salt -	20 Per Cent.
Boric Acid -	60 Per Cent.

Retail price of Crystos, one-half dollar; estimated cost of ingredients, 1 cent.

This fake "Health and Beauty" department is really an advertisement. Each "answer" contains a "joker" in the form of a "patent medicine."

[An Educational Exhibit by the American Medical Association]

(27)

Do not be fooled by the gratuitous advice given in the health and beauty columns of the newspapers.

QUESTIONS AND ANSWERS

Conducted by J. W. Hopkins, M. D., Washington (D. C.) Sanitarium

This is a service for subscribers to LIFE AND HEALTH.
If a personal reply is desired, inclose a two-cent stamp.
If you are not already a subscriber, send also the subscription price with your question.
Replies not considered of general interest are not published; so if your query is not accompanied by return postage for a personal answer, it may receive no attention whatever.
Remember that it is not the purpose of this service to attempt to treat serious diseases by mail. Those who are sick need the personal examination and attention of a physician.
State your questions as briefly as possible, consistent with clearness, and on a sheet separate from all business matters. Otherwise they may be overlooked.

Tobacco Using

"Is the moderate use of tobacco, as a mild cigar twice daily or a pipe once or twice a day, harmful? Does tobacco raise the blood pressure? Give treatment for tobacco habit."

Tobacco, even in the smallest amounts, is harmful and raises the blood pressure. I have seen the use of one small cigar by a person with high blood pressure, produce symptoms of hemorrhage of the brain which lasted for several hours. The inability to speak or to swallow, and partial paralysis of one hand and one foot, were too marked to call it a coincidence.

In addition to raising the blood pressure, tobacco depresses the heart. It thus increases the work of the heart by increasing the blood pressure and decreases the strength by paralyzing the heart muscle. Tobacco also deranges the digestion, and the continuous excretion of the nicotine injures the liver.

The tobacco habit is best treated in most cases by the complete withdrawal of the drug. Some cannot bear the abrupt termination of the use of tobacco, and in these cases it should be gradually but rapidly withdrawn. The bowels must be kept active and the skin and kidneys kept in good condition by moderate eliminative treatments once or twice a day, such as electric light baths, warm tub baths, etc. A purely vegetable diet should be used instead of the mixed or flesh diet, as the use of flesh stimulates the desire for tobacco and alcohol.

In the case of cigarette smoking, a gargle of a very weak solution of silver nitrate with the use of gentian root between meals will help to remove the desire.

Jaundice

"Give the diet and treatment for jaundice."

Any food which burdens the liver with an extra amount of waste matter or digestive work should not be used in jaundice. Such foods are fats and flesh foods. Ripe fruits, well-cooked fruits, tender vegetables, well-cooked cereals, and fresh milk are indicated.

The patient should drink much water between meals, before breakfast, and at bedtime. The bowels should be moved by a cleansing enema, followed by a cool enema once a day, and twice a day the patient should have hot fomentations or alternate hot and cold applications to the liver and abdomen. A moist abdominal girdle should be worn continually between the treatments, night and day. Warm bran baths or warm soda baths will relieve the itching.

Sun Baths

"How are sun baths and air baths curative?"

These baths act by stimulating the nerves in the skin and also by their direct influence. The direct rays of the sun produce heating of the body and increase the peripheral circulation, while the chemical rays stimulate glandular action.

Cold-air baths act as a tonic, similar to cold-water baths, and for those who are weak they may perhaps be used in preference to cold water.

Abscess of the Tooth

"My physician says that I have an abscess at the root of one of my teeth. Is this ever a cause of disease, and if so, how should it be treated?"

Abscessed teeth are often a cause of rheumatism and other similar ailments. In the majority of cases this difficulty is best treated by extraction of the teeth, but you should leave the matter to the best dentist you can find.

It seems to me that the proper way to treat these conditions is to prevent their formation. This is done by keeping the body in a high state of resistance to disease and to the entrance and growth of disease-producing germs. This is accomplished by abstinence from flesh foods, by keeping the eliminative organs in proper condition, by securing the right amount of exercise, fresh air, and rest, and by taking healthful foods at proper intervals.

Flesh foods contain many disease-producing germs. These begin to multiply immediately after the death of the animal, even when the meat is supposed to be fresh, and when they enter the body they continue to increase in number. They finally find a location in the tissues, where the resistance is least. It is, of course, necessary to take ordinary care of the teeth to prevent their decay, but besides the use of toothbrush and paste, the mastication of hard foods, as zwieback, raw vegetables, and whole cereals, well cooked, will insure a good circulation around the teeth and do a great deal toward preventing infection at the roots.

Brill's Disease

"What is Brill's disease? Give cause and treatment."

Brill's disease is typhus fever. It is an infectious disease, and should be treated the same as typhoid fever, with rest in bed, isolation of the patient from other people, disinfection of the discharges, protection from flies, and the usual dietary and medical treatment for typhoid fever.

Honey

"Do you consider honey a proper substitute for cane sugar?"

Honey is a more natural food than cane sugar, but as it is partly composed of cane sugar, its free use should be avoided.

Cane sugar requires digestion, and this occurs in the small intestine. Its use irritates the stomach, and in large amounts it causes sluggishness and disease of the liver.

Vitamines

"Are the vitamines of fresh vegetables, fruits, and milk destroyed by cooking, and if so, what do you recommend?"

Yes, some of these vitamines are destroyed by a high degree of heat, but the vegetables and fruits are even then valuable because of the nutritive food and mineral salts which they contain.

The vitamines may be supplied by the use of raw vegetables, raw, ripe fruits, and whole milk.

Vaccination

"Do you recommend vaccination in typhoid fever, smallpox, and other diseases?"

Vaccination for smallpox has prevented the occurrence of numerous plagues and epidemics of this dread disease and the frequent loss of life and the ill health following.

Vaccination has in a great measure prevented the incidence of typhoid fever. Vaccination against disease is one of the most rational and reasonable measures to prevent disease, and should be carried out faithfully.

Oranges

"Are oranges as good as grapefruit or apples, and may these fruits be taken between meals?"

Oranges are undoubtedly one of the best of fruits. There may be some personal preference between apples, oranges, and grapefruit, but they are all valuable as foods. Their acids are cooling to the blood, and as they are oxidized to alkaline carbonates in the tissues, they aid in the elimination of acid wastes.

The sugar, acids, and other food elements of these fruits are digested and ready for absorption if the fruits are ripe, and in the ordinary healthy stomach they will create no disturbance if eaten between meals. Those with slow digestion or irritable stomachs caused by catarrh of the mucous membrane may find it necessary to abstain from their use.

Alcohol in Diabetes

"Why is alcohol sometimes administered in diabetes?"

The Allen treatment of diabetes is a somewhat radical departure from old methods. Formerly it was the custom in diabetes to cut down the starch and sugar ration and even the protein, relying on fats to furnish the energy. This course in a while results in the formation of certain acid by-products, causing acidosis — perhaps the most serious complication of diabetes. Allen, if necessary, puts his patients on practically a starvation diet until the output of sugar ceases, then if there is acidosis, in place of the fats he gives alcohol in very small doses, for the purpose of furnishing energy. The alcohol in the case seems to be burned in the body as fuel.

In disease conditions it is often expedient to do things which would be entirely out of place in health. For illustration, it would not be considered good practice to break the plate-glass windows or knock in the door of the house; but if the house is afire the firemen may find that the quickest and best way to get at the trouble. In an emergency we sometimes use emergency measures. Hundreds of such measures occur in medical and surgical practice which would certainly not be advisable in ordinary circumstances. Surgeons remove a tongue or a breast or a stomach for cancer, or a diseased appendix, or a thyroid gland, or an eye. No one would argue from this fact that such procedures are in general beneficial. And it would be left with the surgeon to decide when and how the operation should be performed. So the fact that in certain disease conditions some doctors have had good results from alcohol does not prove that alcohol is a good beverage or a food. G. H. H.

Drafts and Colds

"Is there any way to prevent taking cold from drafts when one's skin is susceptible?"

Sometimes a draft striking a bald head will start sneezing, followed by a cold, if not prevented. Rubbing the head hard at once to restore the circulation will prevent it. If sneezing has already begun and the nostrils close up, bend forward as if to pick up some small object from the floor, and compress the abdomen until the face is red. Then stand erect and attempt to breathe through the closed nostrils. Repeat this body bending and breathing until the nostrils are freely open. To prolong the effect of the treatment take muscular exercise and hot lemonade. G. H. H.

Bran

"Is bran a satisfactory laxative?"

Bran is undoubtedly one of the best of laxatives, and agrees with the majority of patients. It should be taken twice a day in doses of one or two tablespoonfuls mixed with other foods.

In the care of some patients, where the lower bowel is irritable, bran cannot be used unless a mineral oil is taken also, and in some cases the occasional enema is required to relieve this irritation.

BOOK REVIEWS

How to Live. Rules for Healthful Living Based on Modern Science

by Prof. Irving Fisher and Eugene Lyman Fisk, M. D. Fifteenth edition, completely revised and considerably enlarged, $1.50 net. Funk & Wagnalls Co., New York.

This volume, which has had a sale of more than 100,000 copies, has been used as a textbook of hygiene in the University of California, Yale University, Mills College, and elsewhere. Translations have been made into Japanese, French, German, Italian, Dutch, Chinese, and Spanish. According to the authors there seem to be three chief reasons for the success of the book.

"One is, that unlike any previous book on the obscure and only partially developed science of individual hygiene, it represents not simply the opinion of one man, but the composite judgment of more than ninety leading authorities on the subject in all its branches.

"A second reason is that the readers of the book find in it something new and contrary to conventional ideas, for the authors decided at the outset to show the courage of their convictions and of those of the whole Hygiene Reference Board. Even where certain members of the board would have preferred, because of lifelong habits of extreme scientific conservatism, to refrain from changing their own personal customs and those of the people, as for instance in regard to alcohol, tobacco, tea, and coffee, the book has consistently and unhesitatingly given the conclusions of physiological science instead of taking counsel of tradition or of easy compromises with accepted indulgences.

"The third reason is that those who have bought and distributed this book have had the satisfaction of knowing that its royalties went not into private pockets, but into the philanthropic activities of the Life Extension Institute."

Notwithstanding the general tendency to backwater in the matter of tobacco using, this book gives a straightforward testimony regarding its injurious effects. It also has a strong, but thoroughly scientific chapter on alcohol. Regarding the use of meat, tea, and coffee, it counsels moderation.

In the preparation of the new edition, the Hygienic Reference Board, to which are referred any open questions, had been straightened by the substitution of a number of men eminent in their respective spheres — men who have brought their subjects right up to the minute. In a word, it may be said that this book more than any other issued represents the consensus of scientific opinion regarding personal hygiene.

HOW WE APPROPRIATE FOODS

(*Concluded from page 259*)

All these processes again demonstrate the vital activity with which each tiny cell is endowed in the accomplishment of its function, and force us to realize that the hand which formed them and gave them life and direction is divine.

THE SELECTION OF THE DIET

The choice of our foods should be made in view of body requirements for health and vigor. It should not only include adequate amounts of starches, sugars, and fats for heat and energy, or protein for growth and repair, but should also supply the mineral salts and vitamines which are so essential to well-being. Hence it is especially important to make a part of the daily diet, fresh fruit and vegetables, milk and eggs in proper amounts, and the entire grain of the various cereals. Thus we can live for efficiency, and accomplish the work given us to do.

WELL observe
The rule of Not too much, by temperance taught,
In what thou eat'st and drink'st.

— *Milton.*

THE tree of deepest root is found
Least willing still to quit the ground;
'Twas therefore said by ancient sages,
That love of life increased with years
So much, that in our latter stages,
When pain grows sharp, and sickness rages,
The greatest love of life appears.

— *Hester L. Thrale.*

NEWS NOTES

Is It Worth While?

According to an estimate made by Dr. Pollock, after a careful survey of the situation, New York State suffers an annual economic loss of $5,000,000 due to the decreased productivity and loss in earnings on account of syphilitic mental diseases.

First on Health Program

At a conference in Washington with the officials of the United States Public Health Service the representatives of practically every State board of health in the United States considered venereal diseases so great a menace that they placed that subject at the very top of their health program for the coming year.

Temperance Progress in New Zealand

New Zealand by a small number lost prohibition. But it has 12 of its 76 electorates dry, has reduced the licensed drinking places from 1,750 to 1,200, and the drinking hours from 16 to 9 a day, or 54 a week, and has reduced the total consumption of liquor by one twelfth, and the convictions for drunkenness from 13,000 to 6,000 a year.

Work of Central Control Board, England

This board, established to rush the production of munitions, did it very largely and very well, by using the utmost of its power to limit liquor drinking. Incidentally, it diminished infant mortality. In one item alone it reduced infant deaths — those caused by suffocation by drunken mothers — to less than half, from 1,314 in 1913 to 557 in 1918.

Baby Week in England

England needs more babies. It realizes the need. It has adopted Uncle Sam's "baby week" as a means of conserving baby life. One thing they have done is to take public houses — saloons, we call them — and turn them into baby-saving stations or infant-welfare centers. One of the important factors in the preservation of baby life is, of course, to teach the mothers the value of sobriety.

Industrial Farm

An industrial farm for women, supported by the State of Kansas, has been most effective in caring for venereally diseased women. During the first year of its establishment, just ending, some 800 women, most of them prostitutes, were sent to the home to be treated, and at the same time to learn some occupation before being released. Every possible assistance is furnished to enable them to become useful members of society.

Grading the Cities

The task of the United States Public Health service to grade 710 cities of 10,000 population and over, according to the effectiveness of measures for venereal disease control, has met with such approval that already about 70 cities have been tentatively graded. With the exception of Washington, D. C., the cities are in Washington, Georgia, Michigan, and Pennsylvania. The grading is only tentative, however, due to the fact that the plan is just now getting under way and returns in almost every instance are incomplete. Comparatively few of the tentative grades credit a city with more than 500 out of 1,000 points, and in the cities with a population under 20,000 the grades will approximate nearer 300 points.

The Psychological Moment

Backed by the United States Government, largely as a war measure, all the States except five have adopted, or put into effect, legislation for the control of venereal diseases, and they are making rapid headway toward the eventual goal. The war measure has become a peace-time necessity. Convinced that there are few diseases so generally prevalent, so easily communicable, and so great an economic drain, the numerous State assemblies and boards of health have decided to take advantage of the ground gained through war legislation and clean up right now.

Subsidized Parentage

There is a movement in England favoring the payment of a bounty to mothers. Opposed to this idea are those who assert that the population is increasing too rapidly, having doubled in England and Wales in the sixty years ended in 1911. What is needed is not so much a prize for babies, but a prize for better babies. The improvement should be in quality rather than in quantity.

Malaria in the United States

According to a statement published by the United States Public Health Service, more than 7,000,000 people in the United States have malaria, and this disease in the South is a more serious problem than typhoid fever, tuberculosis, hookworm, and pellagra combined. This remarkable statement would be hard to credit if from any other source.

Incorrigible Consumptives

Iowa has a law providing that the consumptive who is careless with his sputum, and who, having been warned, refuses to be careful, may be committed to some tuberculosis institution. And if in an institution a patient refuses to take ordinary care, he may be retained in a room or inclosure in such hospital to prevent his being a menace to others.

Narcotic Drug Research Bureau

A Bureau of Narcotic Drug Research, which has been established with offices at 47 West Forty-second St., New York, is collecting data, and providing for the dissemination of information through proper channels. The services of the bureau are at the disposal of physicians, the medical press, and drug addicts.

Temperance Zones in Paraguay

Paraguay has provided by law for the creation of temperance zones in which alcoholic drinks can neither be manufactured nor sold. Any industrial establishment having at least one hundred permanent employees may be declared a temperance zone by the president of the republic. It is a sort of local prohibition.

League of Red Cross Societies

The Red Cross leaders have perfected a league, co-ordinating the Red Cross organizations of the United States, Great Britain, France, Italy, and Japan. It is hoped that the league will eventually unify all the Red Cross activities in the world.

England Cancer Mortality

During 1917, according to announcement, there were in England and Wales 18,145 cancer deaths among males and 23,013 among females — the highest figures yet recorded.

Infant Mortality in New York

New York City had in 1918 the lowest infant mortality of the ten largest cities of the United States, being 91.7 per thousand births reported.

Free Treatment of Venereal Diseases

The United States Public Health Service, Washington, D. C., has prepared a list of hospitals and dispensaries in the United States where those who are infected with venereal disease may obtain free treatment.

To Study Tuberculosis

The National Association for the Study of Tuberculosis has received a grant of $10,000 for making an exhaustive study of the underlying causes of tuberculosis. The study is to be conducted in Baltimore.

Potatoes and Scurvy

When scurvy broke out among the British soldiers in the Mesopotamia campaign, it was found that the best remedies (antiscorbutics) were fresh sour limes and raw potatoes. The potatoes were made palatable by cutting up into small pieces and mixing with onion and vinegar.

Influenza Among Indians

Among the American Indians, during the period Oct. 1, 1918, to March 13, 1919, there were 73,651 cases of influenza reported with 6,270 deaths, a mortality rate of 41.2 per thousand — about four times the influenza mortality for the larger cities of the United States during the same period.

Tuberculosis and the Army

The National Tuberculosis Association announces that 62,000 men were rejected in the draft because of tuberculosis. About 20,000 were rejected from the army camps for the same reason, and nearly 6,000 now in service are under treatment for tuberculosis. The National Tuberculosis Association is co-operating with the Surgeon-General by following up these cases. Fifteen hundred State and local societies provide the care and treatment.

School Children Undernourished

The New York City Health Department has shown that there has been a marked increase the last three years in the undernourishment of school children. In 1914 there were 5 per cent of the children undernourished; in 1915, 6 per cent; in 1918, 19 per cent. The cause is insufficient or wrong feeding, due to the fact that prices have risen faster than wage scales. The increase in prices of food is nearly 100 per cent, the increase in wages about 18 per cent.

Prepared Milks

Feeding experiments on babies, by a French investigator, indicated that sweetened condensed milk is superior to sterilized milk and milk powder.

So-Called Egg Substitutes

An analysis of forty-two so-called egg substitutes and egg savers showed that none of them resemble egg in nutritive value, most of them being composed of starch artificially colored.

Bright's Disease in 1917

Bright's disease and acute nephritis caused in the registration area 80,912 deaths, or 107.4 per 100,000. The mortality rate from these diseases has increased from 89 per 100,000 in 1900, with some fluctuations from year to year, and since 1914 the increase has been continuous.

New Source of Food

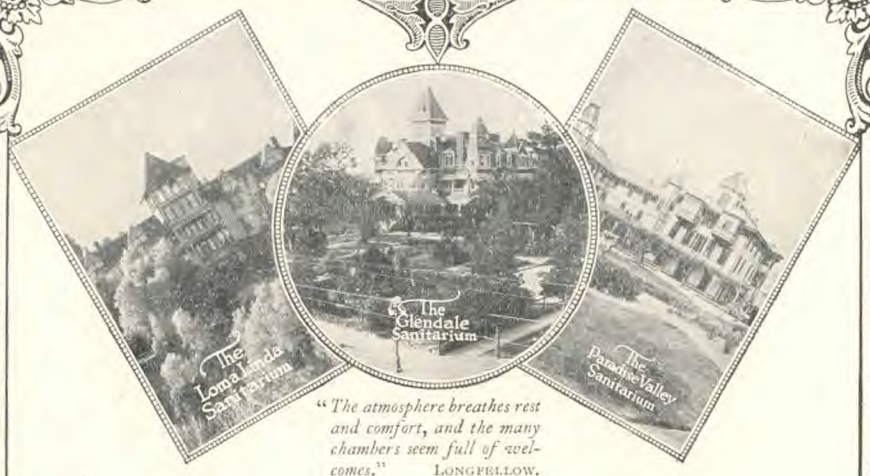
A. M. Reese, in the *Scientific Monthly*, advocates the use of certain reptiles, such as turtles, lizards, alligators, and crocodiles for food. Why not? Some one tried the cicadas, or seventeen-year locusts, and found them palatable. If we are going to eat insects and mollusks, why not reptiles?

Seaweed as Food

A seaweed (*gulaman dagat*) which is plentiful throughout the Philippine Archipelago, is used as food in two ways. It may be washed free from salt, boiled, and eaten as a salad, or it may be sun-bleached, dried, and used in place of gelatin to make jellies. It does not, however, have a food value equivalent to gelatin.

Poisoning by Sprouted Potatoes

In Glasgow there was reported in 1917 an outbreak of food poisoning supposed to be due to the use of sprouted potatoes. Two investigators who made an examination of the sprouted potatoes and found five or six times the normal amount of solanin (a poisonous principle) present, have issued a warning against the use of sprouted potatoes.



"*The atmosphere breathes rest and comfort, and the many chambers seem full of welcomes.*" LONGFELLOW.

Come!

COME out to California—out where the skies are a trifle bluer—out where the sun is a little brighter—out where a fresher breeze is blowing—out where you can rub elbows with Nature and revel in the great outdoors.

Come!—break up the monotony—get away from the toil and moil of city life—cut loose from the daily grind—leave workaday responsibilities far behind—and dedicate a few weeks to health-building. *It pays!*

Once a year, at least, the body should be given a chance to catch up—to recuperate. Tired muscles and fagged-out nerves should be relaxed. Pleasant recreation should take the place of nervous tension.

And this rest period should be more than an aimless absence from daily routine. It should be a period of actual body-building.

The value of several weeks of healthful living under such ideal conditions can hardly be overestimated. The natural results are sound, refreshing sleep—good digestion—a clear head—increased energy—and a sense of zest and buoyancy that makes life worth while.

It is a treat to see the outdoor life work its charm. Men and women with the pallor that comes with fatigue and indoor air, become ruddy, clear-skinned and healthy.

Come to one of these places, then, for your "rest-vacation". For here a quiet, restful atmosphere prevails. Here you get all the pleasant diversion of a resort, with none of the health-defeating distractions.

WHY spend your "rest-vacation" in California? A natural question and an ample answer—if you'll send for our illustrated literature. Today is the day to do it.

The Loma Linda Sanitarium
310 Pepper Drive, Loma Linda, Cal.

The Glendale Sanitarium
210 Broadway, Glendale, Cal.

The Paradise Valley Sanitarium
110 Sanitarium Ave., National City, Cal.