BUILDING OF VITAL POWER

BY

BERNARR MACFADDEN

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VITAL POWER

DEEP BREATHING AND A COMPLETE SYSTEM FOR STRENGTHENING THE HEART, LUNGS, STOMACH AND ALL THE GREAT VITAL ORGANS

BY

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PREFACE.

My friends, do you realize the meaning of VITAL POWER? Have you ever experienced that superabundance of health which breeds an intense satisfaction with life and all living things? Have you ever felt the supreme joy of mere existence? The satisfaction that makes you exclaim: "There is indeed zest in life!" Are you filled with a sense of exhilaration, almost amounting to intoxication? If not, you do not possess the subtle force of life in all its pristine strength! You do not possess the power that the Creator meant to be yours every day—every hour of your life! Artificial environments have robbed you of the primal element of your existence as it should be and you are, in consequence, to be vastly pitied.

Vital power is the force that makes itself manifest in every act and thought of your being. It is the cause of the unceasing crimson tides that course through your veins, of the exquisite sensibility of your nervous system, of the untiring strength and elasticity of your thews and sinews. Of the laugh that enlivens, the eloquent flash and glance of the eye, the dreams of the poet, the musings of the philosopher, the marvels of the scientist. We see it in its

perfected physical form in the shape of a stag or race horse. We note it in its mental attitudes when we consider the miracles of an Edison or a Marconi. It is life itself and only they who have it in abundance know what living actually is.

Without a normal degree of vital power, the attainment or retainment of health is impossible. Herein lies the close relation between physical culture and vitality, for the former is the parent of the latter by enabling all the organs of the body to perform their individual functions in that orderly fashion that Nature intended that they should when she designed them. So that physical culture makes for health, and vital power is invariably the outcome or rather the companion of a perfectly balanced physical organism.

This book was written for those who desire absolute health; who wish to possess the best there is in life, to have all their vital bodily powers magnificently developed. Vitality is needed in every sphere of human effort. It imparts the power to *do* things! Every one of us desires to feel "good and strong" and "up to the mark." Health and a fine physical organism are worth more than all the wealth in the world.

For those who are wishing to obtain that physical

condition which is ordinarily termed "perfect health," I consider no one of the many books that I have written to be superior to this in value.

That it may go out into the world and make each of its readers better equipped for life's duties and responsibilities is the wish of

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CHAPTER I.

WHAT IS VITAL POWER?

MAJORITY OF PEOPLE LACK FULL POSSESSION OF VITAL POWER—CIVILIZED CONDITIONS TO BLAME—NOT TO BE HAD THROUGH DRUGS—VITAL POWER WITHIN THE REACH OF ALL.

"That amount of vital capacity which shall enable each man in his place to pursue his calling, and work on in his working life, with the greatest amount of comfort to himself and usefulness to his fellow-men."—*Archibald Maclaren.*

What is vital power? It would certainly seem that Maclaren, Oxford's great physical trainer, has given us a better definition than that offered by the dictionary makers, who assure us, merely, that vitality is "the power of continued endurance."

But vital power is more than the capacity to pursue your work with comfort! It is more than the power of endurance! It is, as has been said, *life itself!* It is the force that is hidden latent in the seed of everything that is created. It builds the beautiful human structure, cell by cell, within the womb of the mother. It is the power that makes us attain a certain stature. Without it we cannot be safe-guarded against disease. With an abundance of it we can defy contagion.

The lack of vital power is easily discerned. If you

are frightened somewhat, does your heart begin to beat furiously and suffocatingly? If you run, are you distressed for lack of breath? Is your digestive apparatus easily disarranged? Do your kidneys or liver give you trouble? Are you subject to severe headaches? Do you lack strength and endurance? Does an ordinary day's toil fatigue you? Does even a little addition to your usual amount of labor leave you exhausted? If so, you may rest assured that you are lacking in vital power.

It is he who is able to retire at night and sleep soundly, who awakes refreshed in the morning; who leaves his home for his business feeling strong and contented, and able to do and dare; who goes blithely and easily through the day's work; who finds rest, not fatigue in an evening's recreation; who can stand an extra strain upon his physical resources when that strain comes; who enjoys life and does not find time for moping or for dreading; who always feels as if he could cheerfully undertake to do far more than the task that faces him; who hardly realizes the meaning of illness, and who believes that health is largely a result of will power; who enjoys every waking moment of life and who feels that his career does not give full scope to his energies—THIS IS HE WHO POSSESSES VITAL POWER!

And you, my friend, can have this power! If you are devitalized, sapped of your strength, shrinking from effort, or even weakly dodging it; if you are timid and miserable, inclined to morbid thoughts; if you wonder why you were placed in this life, anyway, and speculate gloomily on the "good of living"; if you are unable to sustain continued effort, and look enviously around you at those who appear to possess abounding health—THERE IS A WAY OF CHANGING YOUR UNHAPPY CONDITION FOR THE BETTER AS SURELY AS THERE IS A SUN IN THE HEAVENS!

Health is the rightful heritage of every human being. Vital force—*stamina*—is possessed to-day by but a comparatively small percentage of the Anglo-Saxon peoples. Yet we come of the ruggedest, boldest, brainiest ancestry that the world has seen.

Why is it, then, that the most of us to-day are either ailing downright, or, at the best, lack our full measure of normal vital power? We must, in the main, blame the current conditions of life. For our ancestors were strong, virile and conquering because they lived close to Nature and so absorbed her inexhaustible vitality. *But we are losing our inherited vitality, slowly perhaps, but none the less surely.*

Now what is to stay departing vigor or, if we have

lost some portion of it, to induce its return to normal proportions? The query is readily answered. All that we have to do is to revert to the methods of our rugged forefathers, adopting the praiseworthy features thereof and putting aside those that we know are useless or unwise. In other words, we must hark back to Nature, our path to her being lit by the rays of old time experience and modern knowledge.

By many, Physical Culture, as the term is understood to-day, is looked upon as a new science. It can make no claim to being such. PHYSICAL CULTURE IS MERELY THE RECOGNITION OF THOSE BASIC TRUTHS CONCERNING THE LAWS OF HEALTH THAT ONCE WERE FOLLOWED AS A MATTER OF COURSE. Increasing knowledge has enabled us to add much to what our ancestors discovered in regard to the natural laws of health. And the observance of every one of these laws, both the old and the new, leads to the attaining of normal vital power.

Drugs contain no elements of vital power. So-called "medical science" began to allegedly discover new "remedies" and "tonics," and to devise new and often unnecessary surgical operations within the past century. But how much has the race benefited through these discoveries? There is a distinct ad-

vance in vitality—and so great an advance as to seem miraculous—among a small percentage of our people it is true. Yet these who have so advanced are those who have learned to follow the laws of true physical culture. The dupes of medicine are still degenerating physically.

In these pages I shall treat wholly of the subject of increasing vitality until the full, normal amount has been obtained. No space is to be given to theory; all that is to be stated is the exposition of what is now recognized natural law. The secret of vitality is such a simple one that he who wishes this great blessing with longing enough to make him seek it, can readily possess it.

THERE ARE NO FAILURES FOR THOSE WHO START IN TIME, AND WHO MOVE STEADILY ONWARD IN THE QUEST FOR VITAL POWER!

CHAPTER II.

VITAL POWER DEPENDS ON FUNCTIONAL VIGOR.

DEVELOPMENT OF VITAL POWER MEANS MORE THAN DEVELOPMENT OF EXTERNAL MUSCULAR SYSTEM—STRENGTHENING OF VITAL ORGANS MOST IMPORTANT PART—MORE THAN EXERCISE NEEDED—IMPORTANT VALUE OF AIR AND WATER, RESPIRATION AND FOOD.

"Body and mind are great gifts, and for the proper use and keeping of them we are held fully responsible by Nature."—*H. Rippon Seymour.*

To those who are not familiar with the subject, it will come as a surprise to be told that muscular exercise does not comprise all that there is to physical culture. Exercise plays a very important part in the scheme of the healthy body, but it is not by any means the sole factor in the true science of health.

Yet it must be borne in mind, as a basic truth, that *without exercise,* there can be no physical culture. Exercise is just as an essential portion of it as are nourishing food, pure air and water.

The systems of exercises that I shall present in this volume are adapted to both the weak and the strong. They have the unique advantage of being adapted to the strength of any pupil. There can be but little or no possibility of a strain resulting.

These lessons are equally applicable to both women and men.

I intend to illustrate and describe exercises that will build internal vital strength, and conduce to that feeling of continuous health which is so valuable a possession in this strenuous age.

The lungs must be strong, of a proper capacity, and capable of performing their important office of purifying the blood, by absorbing oxygen and eliminating the impurities that are carried to them by the circulation. The stomach, that great organ which performs such onerous offices, must also be given special attention. The assimilative and excretory systems must be developed to the highest possible state of vigor. If, subsequently, you perfect your external muscular system, you are then in possession of powers which are complete in every respect. Manhood, or womanhood, in a perfected form has then been attained, and can be retained until an organ wears out, or some cord snaps and you pass into the misty unknown.

I want every reader to begin with this chapter, and conscientiously select from these lessons those movements recommended for their especial needs. Give careful attention to every word that I write. I shall

not waste space. I do not wish my readers to wade through a vast quantity of reading matter in order to reach the essential information, and so every word will be important and should be heedfully read. Do not expect to be benefited by merely looking at the pictures, or by practicing the exercises on two or three occasions. *You must follow instructions accurately.* You must continue each exercise until the muscles you bring into use are thoroughly fatigued. You must persistently practice the movements day after day if you expect to note an improvement in yourself. There is no earthly reason why every one of my readers cannot be greatly benefited by this book. I care not how much experience you may have had, or how much you may have studied the subject of physical development, yet I assert that you will find a vast quantity of information and a large number of exercises in these chapters that will be of great benefit to you.

Physical culture, or physical development, or whatever you may choose to term it, means to the ordinary individual simply the strengthening or development of the external muscular system. This is really but a part of its work. The most important portion of its duties is the strengthening of all the

vital organs—the lungs, heart, stomach, intestines, liver, kidneys, etc. In the chapters that follow I intend, however, to treat the subject in its broadest possible sense, and so shall include those things that tend to physical vigor.

Now, in order to determine the relative importance to the body of its various requirements, it becomes necessary for us to understand exactly what is essential to the maintenance of life and health. The most important element in the cultivation of general vigor must be that which is most requisite to life. One can *exist* for an indefinite period without exercise, but one cannot really and truly *live* without it. There is a vast difference between merely existing and living, between being a mollusc or a man, so to speak. Your mind and body may fulfill their functions, but in a very lethargic and spiritless fashion because of a vast accumulation of dead cells within your system. Nature intended that every part of your being should be active and alive and alert.

We can live in apparent good health without food many days. There are several fasts of sixty days and more on record, where health seemingly lost forever has been regained. We can exist without food and water for from one to two weeks. We can do without the recuperative influence of sleep and rest

for many days. But, as illustrating the vast importance of air to the human body, we note that we cannot live more than from two to five minutes without it. Reasoning from this standpoint, it must be clear to my readers that the relative importance of the various primary essentials of life, health and strength is about as follows:

1. Air.
2. Water.
3. Rest and relaxation.
4. Food.
5. Exercise.

This would indicate that the most important knowledge in this connection is that which pertains to feeding the body with its needed oxygen. This chapter will offer some preliminary advice on the subject, which will be treated more extensively, however, in Chapter XV. Strange as it may seem, there are but few persons who breathe properly, which means breathing deeply and fully. The average breathing capacity among men is small, and no woman who wears a corset can possibly breathe as she should.

Now, I want my readers first of all to make every possible endeavor to acquire a proper method of breathing, and in order to still more strongly emphasize the information here illustrated in reference to this subject, I would advise my pupils to view a little child as it breathes, standing or reclining. Notice

how the air is brought down to the lowest part of the lungs by the expansion of the body a little above the waist line. This shows you that a waist restricted either by a tight pair of trousers or a corset, interferes decidedly with your breathing.

Not only should one learn to breathe properly, but a custom should be formed of taking deep, full inhalations frequently during the day, more especially when walking in the open air. This habit can be cultivated just as are the other habits of one's life. Ultimately deep, full inhalations will be taken involuntarily. Whenever the air tastes fresh and good, the inclination will be to draw in all you can, just as you are induced to eat heartily when an appetizing meal is set before you.

My readers can thus readily see my reason for emphasizing the importance of breathing exercises. I wish every pupil to start in at once and learn how to breathe, and continue these vastly important exercises day after day. Results will be noticed in a remarkably short time in the broadening of the shoulders and chest, in the erect carriage assumed, and in the increased strength and upbuilding of the vital powers of the body in general.

CHAPTER III.

BLOOD AND VITALITY.

THE PURER THE BLOOD THE GREATER THE VITALITY OF THE BODY—VITALITY STORED IN LIVING CELLS—IMPORTANCE OF HAVING DEAD CELLS REPLACED BY THE CELLS FULL OF LIFE.

"The blood has been called the life of the body from the fact that upon it depends our bodily existence."—*Albert F. Blaisdell, M.D.*

Just as life is impossible without vitalized blood, so is health impossible without blood that possesses a fair degree of health. And it follows just as logically that one's vitality will be in exact ratio to the vitality of his blood.

All of the tissues of our flesh and bones are made up of infinitely small cells—so small, in fact, that hundreds of them, if massed, would be invisible across the table. Each cell is born, lives and dies by itself. As fast as a cell dies—and some of them live but a few minutes, or a few hours—a new cell is supplied to take its place.

Exercise, even of the slightest, such as opening or closing the hand, destroys a multitude of cells. Even thinking causes the death of cells, and Nature immediately supplies new cells to take the place of those

that are defunct. One of the important benefits of bodily exercise is that it causes the destruction—death—of many all but exhausted cells, which, in turn, are replaced by cells that are full of life—vitality.

But the cells die, too, in a body that is actually without motion, in a body whose brain is in a state of complete lethargy. The only difference is that in the inactive body the cells do not die as soon as they should, nor are the new cells by which they are replaced as healthy as they should be.

All of this repair work in the body is done by the blood. That fluid carries to all of the tissues of the body the fresh matter that is to build up new, vitalized cells in the place of those that are dying. This repair material is secreted from the food that is digested in the stomach and in the intestines. Hence the need of the most nourishing of foods. Improper food furnishes but poor repair material. That which goes into the stomach and is digested becomes the actual, living body. In this connection I cannot help but refer once more to the value of adopting, if not wholly, then partly, an uncooked or natural diet. As stated more fully in another chapter, cooking destroys to a great extent and sometimes entirely, the cell-life of the food intended to nourish the body.

It is reasonable then that this devitalized or dead cell matter will never furnish material of a suitable kind for building up or even repairing the body. WE ARE JUST WHAT WE MAKE OURSELVES THROUGH THE ACT OF EATING.

But the blood does more than this. From the air that is breathed into the lungs the blood takes oxygen, and carries it through all the parts of the body. Wherever the gas encounters dead cell-matter it burns it up, and the results of the combustion are carried by the blood to the lungs, there to be eliminated from the body.

Now, you will easily understand why the blood must be pure and rich. At the very foundation of increased vitality must come a radical improvement in the quality of the blood.

While food is the basis of the tissue-building power of the blood, a generous amount of water is needed to maintain the fluids of the body in a proper condition so that they may flow freely. Deep, full breathing of pure air must be had in order that the dead cells may be burned up as fully as is possible.

Exercise plays an important part in the bodily processes just related, also increases the powers of digestion by giving greater muscular activity to the stomach and intestines, while the heavier, more fre-

quent breathing caused by muscular effort forces the heart into more rapid action, and sends the blood coursing through the body on its repair and purifying mission at an increased speed.

From this brief statement the reader will be able to understand fully that vitality depends upon the blood, and that the purity of the blood is contingent on the selection and digestion of the right foods, exercise, breathing, and the drinking of sufficient quantities of water.

CHAPTER IV.

ORGANS OF DIGESTION, CIRCULATION, AND RESPIRATION.

THE MAKING OF THE BLOOD—THE WORK IT DOES—HOW THE WONDERFUL PROCESS OF DIGESTION IS CARRIED ON—HOW CELLS OF THE BODY ARE NOURISHED AND REPLACED—THE ORGANS OF RESPIRATION—HOW THE OXYGEN IN THE BLOOD BURNS UP WASTE.

One who has the happy faculty of finding the charm of romance in what too many people call the "dry facts" of science, will find the miracles of childhood's fairy stories altogether tame as compared with the narrative that tells us how the food that we eat is converted into living flesh.

For the layman—for him who cares not for the technicalities, and who is content with the results alone—it is a simple tale and easily told. Leaving out the detailed description of the finer parts of the mechanism with which Nature has endowed the organs, the process of making food over into living tissue in the human body may be briefly related as follows.

The change that the food undergoes begins right in the mouth, in which are a number of glands that supply saliva whenever food is chewed. As this saliva

must be thoroughly mixed with the food if the best vitalizing results are to be obtained, thorough mastication is needed at the outset. The most important work that the saliva has to do is to convert the starchy portions of the food into sugar—not the sugar that we find in the dining-table bowl, but a form of it nevertheless. This is because sugar will dissolve in water and starch will not. Hence, as water is the fluid that is supplied to the body, if the starch were not changed into a soluble sugar it would be compelled to leave the body as it entered it, and no nourishment could result from it in consequence.

No other part of the food is altered by the saliva. If water be drunk with meals to wash down improperly masticated food it interferes with the action of the saliva and also the digestive juices of the stomach.

From the mouth the food passes into the pharynx, a little sac that empties into the gullet, or esophagus. This latter tube empties directly into the stomach through the cardiac opening at the left side of the organ, while at its right side is located the pyloric opening. Both connect with the stomach on the upper edge.

Now the four coats of the stomach are most abundantly supplied with involuntary muscles. When empty, the coats of the stomach lie in folds, but as

soon as food enters it these coats immediately unfold to give accommodation to the food. And at once the involuntary muscles begin to work, churning the whole stomach and causing the food to move about in a very lively manner. Both the cardiac and pyloric openings are closed, except when their opening is necessary for the passage of food.

The churning that takes place mixes and mingles the food most thoroughly, especially if it has been well chewed by the teeth. The gastric juice is supplied from glands that line the innermost coat of the stomach. Interspersed between the glands are a myriad of tiny blood vessels. The inside of the stomach is dull, almost colorless when empty. But as soon as food enters, blood hastens to it from all parts of the body—not in a helter-skelter way, but through the regular blood channels, and in a highly orderly manner. The blood is "hungry" so to speak. As soon as the work of digestion has gotten well under way, the blood vessels begin to absorb nourishing particles of digested matter through the thin membranes that separate them from the contents of the stomach.

This digested matter, which becomes of a dull grayish color and is called chyme, is the product of the action of the gastric juice on the food in the stomach.

In this juice are pepsin and rennet. The rennet by the aid of the free hydrochloric acid that is found in the stomach, dissolves all of the proteid elements that exist in the food. The proteids are substances that contain nitrogen, and are necessary to the maintaining of life. Wheat is a sample of a proteid food; so are peas and beans, lentils and cereals. The fats are not dissolved in the stomach, but their tiny particles are set free in globules, and pass on to the small intestine, there to be acted upon further.

After the digestive process has been carried as far as it can be in the stomach, the food passes on to the small intestine, some twenty feet of which lie coiled in the abdomen. Here the fat is attacked by the intestinal juice and is rendered fit for the blood. The food passes continuously through the small intestine, impelled by the involuntary contractions of the muscles of that organ. All that the mouth and the stomach have left undone in the way of digestion is completed in the small intestine, which is lined with tiny blood vessels that absorb whatever is needed of nutriment from the food fluid.

And then what is left of the food—mainly offal, refuse—passes into the large intestine, composed of the ascending, transverse and descending colons. Along these three parts the blood absorbs little, if

any, remaining nourishment, and the waste matter is expelled from the body through the descending colon.

It is the function of the liver to add bile, and of the pancreas to supply pancreatic juice to the contents of the small intestine. The result is that a milky fluid known as chyle is separated in the small intestine from the chyme. This chyle is absorbed by the lacteal vessels and through them is assimilated with the blood. In addition, the liver, through having a very important system of blood vessels, acts as an excreting organ in removing many dead and poisonous matters from the blood.

Now the blood—which, bear in mind, is the vitalizing fluid of the whole body—is pumped through the arteries by the ever-busy heart. It is the work of the arteries to carry the enriched blood through the body. These arteries are everywhere dividing and subdividing, and becoming smaller and smaller with each new subdivision until their course is lost to the naked eye.

Everywhere that the hungry cells are crying for new nourishment they seize it from the fresh, pure blood that is coming to them. And everywhere that new, good material is left by the blood, the old, dead cell matter is taken up by it in exchange. The oxygen that is mingled with the blood burns up much of

this waste matter, which is found mainly in the form of carbon.

And when the blood has reached the limits of the arteries it is soaked up greedily by the capillaries—tiny, hair-like canals that pass between the arteries and the veins. And these capillaries give out much of the nourishment that is left in the blood to the cells that want it.

So through the capillaries the impure blood is carried into the veins, whose mission it is to carry the bad, or venous, blood back to the heart. All through the body the blood is also enriched as is necessary from the lymphatics, a system of vessels that carry the lymph. Now, this lymph is very much like blood itself, except that it does not contain red corpuscles. Acting with the lymphatics are the lacteals, and the lacteal fluid is very like lymph and is used for the enrichment of the blood. Thus we understand that, at whatever point the blood needs enrichment, Nature has provided the means; man has only to provide the supply through food. But he must be sure that his food contains the needed elements.

But the venous blood comes back to the heart in a befouled condition. It flows into the upper chamber (auricle) of the right side of the heart, is forced down into the lower chamber (ventricle) and thence

to the lungs. Here the important work of purification goes on. And how? By fresh, sweet air.

Air that is breathed in passes down through the trachea or windpipe, which is subdivided into two tubes or bronchi, one passing to the right lung and one to the left. These are again subdivided into a great many bronchial tubes that reach all parts of the lungs, becoming at last very fine indeed. At the end of each of these very tiny tubes is a small, bell-like opening that is known as an alveolar cell—although it is not a cell at all in the strict anatomical sense of the word.

Now, through these cells the inhaled air passes through the very thin membranes of the blood vessels in the lungs. Wherever a bit of dead (poisonous) carbon is found in the blood, the oxygen of the air in the lungs burns it up, forming carbonic acid gas, which, together with surplus moisture in the blood, is expelled from the body by the exhalation of the breath. Dust and other irritating foreign substances that are inhaled may be gotten rid of by the act of coughing.

And now, when the blood in the lungs has been cleansed of its impurities, it passes on to the left auricle of the heart, thence down into the left ventricle, and is pumped once more through the body

on its round of revitalizing all of the tissues, even to those of the bones—for bones must be fed as well as flesh.

Thus we have traced the digestion of food, the work of the blood and its ultimate purification before being used over again. It will be seen that blood cannot be purified unless sufficient quantities of absolutely unpolluted air are taken into the lungs. Hence the necessity for breathing exercises which enable the lungs to attain their ultimate power for good by developing their air-capacity to the utmost. Health, without an ample supply of oxygen for the body through the lungs, is out of the question.

CHAPTER V.

BUILDING VITAL POWER WITH LONG WALKS.

NECESSITY OF WALKING PROPERLY—WHEN, WHERE AND HOW TO WALK—HOW TO DRESS FOR A LONG WALK—ENERGIZING EFFECT UPON THE BODY OF A LONG WALK.

In my various writings I have frequently referred to walking as a valuable means of exercise and an aid to the acquirement of vital vigor, but have never attempted to furnish my readers with detailed information on the subject. As a rule, if one walks a great deal, a proper position of the body will naturally be maintained, though it must be admitted that the average man is not enough of a pedestrian to make a correct method of walking a habit. There is a right way to walk just as there is a right way to do anything. Yet no matter how you walk, a certain amount of vigor will be secured from the exercise. But if you move in a slip-shod manner, if your movements are not harmonious, you will tire quickly, and will fail to secure the benefits that are easily within your reach by acquiring a proper gait and position of body. Even those who possess more than the average strength will become exhausted after walking a few

miles, if they do not understand the secret of the proper method. In fact, an improper manner of walking will exhaust rather than increase the fund of vitality owned by the body.

FIGURE 1. My favorite walking costume. Hat in one hand, coat and shoes in the other. Though not ideal, it was the most convenient under the circumstances when it is remembered that I was compelled near the end of the walk to assume the conventional manner of dressing.

It is only within the last few years that I have really learned how to walk. In order to do so one

must acquire an easy gait, every movement must be rhythmic, and the position of the body must be such

FIGURE 2. Correct attitude while walking, showing forward incline of the body that should be assumed. The head in this illustration has been held a little too high.

that you go forward with strides that are made almost without effort.

Several years ago I remember that a walk of eight or ten miles would frequently tire me out, and this,

in spite of the fact that at the time I was somewhat prominent as an athlete.

Now I can easily walk from eighteen to twenty-five miles, and after a rest of an hour or two feel sufficiently refreshed to cover a similar distance. During the last few months I have been experimenting with the view of accurately determining the effects of long walks upon the vital powers of the body. Ordi-

FIGURE 3. Showing sandals I wear frequently. This style of sandal, though comfortable, is of little value on roads where there is much dust or gravel. Sandals for roads of this kind should have the entire front of the foot covered.

narily, five to ten miles a day had been the limit of my walking exercises. But realizing the great value of long walks I concluded to extend them very materially for the purpose of forming more accurate conclusions as to their effects. For some time now I have been taking walks of from fifteen to twenty miles in the morning before going to business, and the more I experiment, the more I am inclined to en-

dorse the exercise as one of an especially valuable nature.

Even under the most disadvantageous circumstances, a short brisk walk is always beneficial; but a long walk that will take from three to five hours of steady rhythmic movements, considered as a means of rousing the functional system to increased activity, can hardly be improved upon. The vital organs—stomach, heart and lungs are all beneficially affected. All the depurating organs of the body are prompted to healthful action. The blood is cleansed of impurities, the eyes become clearer, the complexion is improved, the flesh firmer, and all parts of the body are augmented in strength and general hardiness.

Several cases have been reported recently where consumption and other serious maladies have been cured by walking. For those who are striving for health, for those in the grasp of a grave chronic disease, no exercise is quite so valuable as walking combined with deep breathing. It is more especially valuable for cases of this kind named because the exercise is difficult to overdo. If you will simply stop when you are tired, nothing but benefit can be derived from it. I do not mean by this that you should cease at the very first moment that you feel a slight twinge of fatigue, but you can continue with benefit until

you feel that you can enjoy a rest with a feeling of pleasurable relief. Naturally, any exercise continued to exhaustion cannot be called beneficial, but it requires a vast deal of will power to continue walking to such an extreme.

In this chapter I have tried to illustrate as clearly as possible the proper method of walking. Of course, the average individual believes that he knows how to walk. But I am inclined to think that a careful study of the illustrations and the comments made, will result in many admitting that they do not know how to walk properly. Remember that if you are not maintaining a proper attitude and making perfectly rhythmic movements, you are ignoring the first principles of correct walking.

When assuming the proper attitude the pedestrian inclines his body well forward. For walking should be a continual fall forward just as in running. Each step should save you from a fall, and the body should be always inclined far enough forward to insure a continuance of the movement. The entire form should always be erect, shoulders back, chest prominent, head back and eyes looking straight to the front, unless it is necessary to look to the ground in order to select your path. Many are of the opinion that because an erect attitude is advised in walking, it is

necessary to swing the body far backward. This is a serious mistake.

Every step must furnish a progressive propelling power, and if the body is not leaning forward this is impossible. If you will be sure all during your walk that the body is held in this fashion, remembering to make every step appear as though it would save you from falling on your face, then you can rest assured that your gait will be commended by the professional pedestrian.

Of course, it is not easy to break old habits, and it will require close attention for a time in order to assume the attitude I have indicated; but careful attention will make a radical change in a very short time, and after a while it will become natural for you to assume a correct gait.

The benefits of walking are immensely increased if one will form the habit that I have recommended so strongly throughout this book; that of drawing deep inhalations of pure air, thus filling the lungs to their greatest possible capacity. In another chapter I give illustrated breathing exercises. As a means of increasing one's endurance and the general pleasure of a walk, and assisting in the building of greater vital power, the value of such exercises cannot be overestimated. One such illustration shows the position of

the body when the waist is drawn in as far as possible and the greater part of the air has been forced from the lungs. It is a comparatively easy exercise. Simply expel all the air that you possibly can from the lungs while walking at your ordinary gait. Next you inhale all you can, expanding from the abdominal region upward, as shown in the second illustration. This exercise will vastly increase your endurance, and as stated, you will derive pleasure and benefit from it.

As has been said elsewhere the lungs furnish the blood with those elements that are essential to continuous muscular effort. This is illustrated very emphatically when one attempts to take very violent exercise. The muscles quickly tire, because of the inability of the functional processes to supply them with sufficient rapidity with those elements that are quickly used up by long continued, violent effort.

Though walking even on brick sidewalks is beneficial, it is far better to do so on the grass or ground if possible. Especially will a walk of considerable distance seem far more difficult on hard pavements of any kind. The proper place to walk is in the country, away from the foul air and the dirt, dust and smoke incidental to urban life. If you live in the city your walk can be made far more pleasurable and

beneficial if you will ride out into the country before beginning it. If you are compelled to go to your business at a certain time each day, walk to it instead of riding. A walk of three to six miles in the city, though not so pleasurable nor so beneficial as it would be if taken in the country, is still a hundred times preferable to riding. If you live in the country you are fortunate, for you can walk almost any distance you choose before arriving at your place of business, providing, of course, that you do not begin work at a very early hour. If you commence your daily duties at eight or nine o'clock it will not be found difficult to arise at four or five o'clock, and in the interval you can take a long and pleasurable promenade.

I have been living several summers a little over twenty miles from New York, and unless the duties of the day were especially exacting, it has been my usual habit, since I have been experimenting with long walks, to rise between four and six o'clock. Though walking at any time is pleasurable, I must assert that in the early morning hours there is a peculiar, almost intoxicating element in the air which greatly adds to its pleasure. The air seems far more exhilarating at this time of the day. Another special advantage of the early hour in my case was, that my costume was likely to excite the curiosity of the

ordinary late riser. Those who leave their beds at four or five a. m. are, as a rule, too busy to be curious. I know many of my readers might suggest that I adopt the costume which I consider best, regardless of conventional criticism, but I must admit that I have hardly advanced that far. I like to attend to my business and my work without molestation. I prefer to be left alone, but if one excites curiosity by adopting extreme reforms, he will always be subject to annoyance. So I start out dressed only for comfort, but I always prepare for making the change necessary in order to enter the city in a conventional garb. I start out with hat in one hand and coat and shoes in the other. Thus equipped, when I arrive at the point where I again wish to enter the realms of so-called civilization, by stopping at a convenient brook by the road it is an easy matter to remove the dust of travel and assume the articles of clothing that qualify one to become one of the conventional human sheep.

But the pleasure and benefit that I derived from all this was well worth the trouble. I will admit that the first fifteen or eighteen-mile walk I attempted tired me, though after a few mornings I was able to cover this distance with but very little fatigue and after a short rest, would hardly notice any undue ef-

fects apart from the extraordinary appetite that was induced.

Though my favorite method was to walk barefooted, occasionally I have used sandals such as are illustrated in this chapter. Foot-wear of this character, however, can hardly be recommended for wear on a dusty road or one on which there is much gravel or stones. Small particles get into the toes of the sandals and are a considerable annoyance. For ordinary road walking the sandals should have the entire front part of the foot covered.

A method in long distance walking that can undoubtedly be recommended for the reason that it makes it more easy for one to assume the forward incline, the importance of which I have already and so strongly emphasized, is the long stride in walking.

High speed should be avoided. Three and a half miles an hour is as fast as one should walk to secure the greatest possible degree of benefit and pleasure. If you walk faster you are bound to tire quicker, and there is not nearly so much benefit secured from the exercise. A long, easy stride is advised, making every step a little in excess of that which it is your custom to use in ordinary walking.

It is undoubtedly true that the majority of people walk with nervous tension so that the steps they take

are jerky and impulsive, and are devoid of rhythm. The same steps, if taken at greater length, will make it possible for the walker to cover more ground with greater ease and less expenditure of nervous energy and will result in a more natural tired feeling than that that follows the short step action.

It might be well to mention to those who wish to follow my example in walking without shoes, that it will be found difficult to do so until the soles of the feet are hardened. The first few attempts must be confined to a very short walk, but before long, a callous surface will form on the bottom of the feet and you will then be able to walk almost any distance barefooted. I must say that I favor walking without shoes where the roads are at all smooth. I seem to move with less effort, and do not tire nearly so quickly as when wearing shoes. Of course, if sandals are worn that do not confine the feet, there is not a great deal of difference between them and the bare foot, but no matter how nicely a shoe may fit, it always interferes to a certain extent with the free circulation of the blood and hence its power for evil.

Now, I do not want my enthusiastic readers to attempt forthwith to walk from ten to fifteen miles each day, for benefit cannot be derived from essaying this extreme distance at first. Be satisfied at the

outset with four or five miles. Try first of all to acquire a proper position before you attempt to cover much distance. In fact, it would be well to avoid trying to see how far you can walk. It is not really distance, but *increased vital power* that you are endeavoring to acquire. This is the only result that is of any special importance at the moment.

If one is inclined to be too fleshy or "soft," long walks will naturally reduce the weight. If you are too thin they will increase your appetite, and in time increase your weight, though, during the first week or two, if they are regularly taken, your avoirdupois may be reduced slightly, yet very quickly thereafter a decided gain may be looked for.

It is proof of the great value of walking that athletes everywhere, no matter for what event they may be preparing, always make it a part of their training. They do this because it builds vital power. Such added vitality enables them to increase the vigor of the muscles that they expect to use most in their contests.

Then, too, it is well to note that walking keeps one young. It delays senility. It drives out old age cells, and makes every part of you throb with life and health and strength. One of the youngest old men that I ever saw in my life was a professional walker

who claimed that he made a habit of walking from fifteen to twenty miles a day, and although a man of nearly 60 years he had the complexion of a sixteen-year-old girl, and did not look more than 35.

It is always an advantage to have some destination in view. When you start out, select some place that you would like to reach. Wandering aimlessly here and there is never of very great benefit as an exercise, though undoubtedly it is pleasurable. If you are walking in the country, select a town a few miles away and although there may be nothing of interest there that you desire to see, yet you will have the satisfaction of knowing that you have a definite destination.

From the illustrations in this chapter it will be quite evident that I do not believe in hampering oneself with clothing. The less clothing you wear while walking the greater will be the incidental benefits. In fact, if I could walk in the suit that is worn by the average African savage I would much prefer to do so. Unfortunately, this is carrying our ideas of freedom of dress to extremes, and we have to compromise, remembering, however, that the air, as it comes in contact with the skin, is a tonic of no small value.

Above all things, one should remember that regularity of breathing is of special importance. If you

are unable to regulate your breathing satisfactorily, you might adopt the plan of inhaling during a certain number of steps, say six or eight, and then exhaling while you count a similar number.

CHAPTER VI.

VAST IMPORTANCE OF WATER.

THREE-FOURTHS OF BODY COMPOSED OF WATER—IMPORTANT INTERNAL CLEANSING AGENT—RENDERS MINERALS SOLUBLE WITHIN THE BODY—CARRIES AWAY EFFETE MATTER—SOME ADVICE BASED ON MY OWN EXPERIENCE.

All the fluids of the body have their part in its important functional processes, and in order that they may properly do so it is absolutely essential that they assume a proper consistency. They must not be too thick or too thin. Their condition in this respect depends largely upon the amount of water supplied to them. If this water is deficient in quantity, or impure, disorders of all kinds are very easily acquired.

Not only is an abnormal condition produced by neglect in this way, but under such circumstances it is far more difficult to develop the external muscular system.

Usually the desire for water will accurately indicate how much is needed by the body. The power of the body, however, to adapt itself to conditions of all kinds whether normal or abnormal, is remarkable.

Habit has a wonderful influence, and it is an easy matter to become gradually accustomed to drinking less and less water. If for some reason you are not supplied regularly with pure water, you will usually lose the desire for it. This is a good proof that the desire for the fluid, after all, depends very greatly upon habit. So, too, if you are not engaged in some active muscular labor that is inducive of copious perspiration, you are far more liable to lose this longing for water. Of course, under conditions of vigorous exercise, the action of the pores is greatly accelerated, and considerably more water is required than under ordinary circumstances.

You should remember that three-fourths of the body is composed of water. Science tells us that every part of the body, except the bones, is practically in a fluid state. This fluid is composed of minute cells, and each cell is absorbing and eliminating a certain amount of water at all times. Dead, effete matter, or cells, are carried away, as before mentioned, by the blood. Now the proper consistency of the blood depends upon the quantity of water supplied to it.

Water is a valuable external cleansing agent, but it is a hundred times more important as a means of internal purification. Imagine the vast interior sur-

face of all the internal organs! It is probably fifty times greater than the external surface of the body, and it is only when one is supplied with a normal quantity of water that this cleansing process can be thoroughly accomplished.

Those occupied in mental pursuits are more especially liable to lose the water drinking habit. They become absorbed in their occupations, and if water is not near at hand, they gradually find themselves drinking less day by day. It is only when extremely hot weather appears and induces copious perspiration that they drink water freely.

If you have lost the desire for water by ignoring thirst, you must try to recover it. Do not force water on yourself, but keep it near at hand and take a few swallows at frequent intervals. If you will give this hint attention, you will gradually acquire a normal thirst. It is a good idea to cultivate the plan of drinking a glass of water on rising and one or two on retiring at night.

You must realize to the utmost the necessity of using the purest of water. Such water is that which falls as rain, but usually well water, if not contaminated by poisonous drainage, will be found perfectly wholesome. Water that has been distilled and aerated is always a most satisfactory drink. But

ordinarily, one can depend upon his sense of taste to guard his health. Pure water is entirely tasteless. If there are elements within it that give it a distinct taste the water is not pure. If the water has no taste, it will usually be found to be pure or very nearly so.

My readers must not gain the impression that in thus emphasizing the great importance of drinking water, I mean that a large quantity of it should be habitually imbibed. You can easily drink too much water. Simply acquire a habit of drinking freely to the extent of your ordinary desire, though if you are taking less than three to six pints per day, you may immediately conclude that you are not using a sufficient quantity, and should take means of encouraging a thirst in the way indicated. One should use ordinarily, the above stated quantity of water in twenty-four hours.

CHAPTER VII.

INCREASING DIGESTIVE AND ASSIMILATIVE POWER.

THE QUESTION OF DIET—GENERAL REGIME FOR INCREASING DIGESTIVE AND ASSIMILATIVE POWER—VARIETY OF FOOD TO BE DESIRED—NORMAL APPETITE A PROPER GUIDE—CONSIDERATION OF RAW FOOD AND VEGETARIAN DIET—RAW FOODS POSSESS ABUNDANCE OF LIVING CELLS—COOKED FOOD RENDERS CELLS DEAD—VALUE OF NATURAL DIET—MEAT DISCUSSED.

"There is far more harm done by taking too much food than there is by taking too little, and it is only in very exceptional cases that injury results from the latter cause; whereas an enormous amount of discomfort, disorder and disease, and even curtailment of life, arises from excessive eating."—*Dr. N. E. Yorke-Davies.*

The question of diet is of primary importance to every student desirous of acquiring a strong and beautiful body. His careful attention must be given to it at the very outset of his endeavors to attain a high degree of physical development.

The following questions will suggest themselves to him. What shall I eat? What kind of food and what quantity will best nourish the body? What foods will give me the greatest strength, and enable me to speedily build up properly distributed muscular tissue?

These are important questions and call for careful consideration. The average individual who has been

able to maintain an ordinary degree of health through life, notwithstanding the dietetic evils against which his functional system has constantly contended, usually seeks to "make fun" of you when you talk of dieting. He will tell you that he has lived on "ordinary" foods all his life, that he is healthy, and that his parents were healthy before him.

"Don't bother with diet. Eat plain, wholesome foods, and don't be led into a lot of foolish experiments by cranks," is the advice that will frequently be given you. Your friends may be more considerate and kindly in their remarks, but your near, dear relatives will have no scruples about your feelings. They will not hesitate to tell you candidly that you are a fool and that you must be going crazy indeed. And not infrequently, although you may be convinced beyond all possible doubt that you are right, you will remain in the "old ruts" merely to avoid the irritation of being constantly nagged by those with whom you live.

Now I intend to discuss diet from an absolutely unprejudiced viewpoint. I would like my readers to be familiar with every phase of this subject. I will try to consider the several advantages that are supposed to accrue from adopting various diets, and will draw impartial conclusions therefrom.

First of all, what is the object of food? You will answer, to nourish the body, that it may at all times be maintained in the highest degree of health and strength. How can we determine what are the best foods to nourish the body? The most convincing method would be to compare the results that follow the use of each of the various dietary systems. I must admit, however, that such comparisons are exceedingly difficult to make.

The human organs of digestion must possess most wonderful powers. No species of the lower animal world could exist on such a variety of foods as does man.

No lower animal could abuse his organs of digestion as do many human beings and still be able to maintain life. An ostrich is said to have a strong stomach, but it would soon turn up its toes if it were compelled to live on the abominable mixtures that human beings swallow. And it is these remarkable powers of our digestive organs that make it possible for them to secure a certain amount of nourishment from almost any food furnished them.

Following our suggested line of reasoning, that the object of food is to nourish the body, then that food which most perfectly performs this purpose will undoubtedly be the most preferable. This neces-

sarily brings us to a consideration of the varying conditions and needs of the body. At one time a certain article of food is demanded. At other times another seems the best. Desirable food, therefore, is that which supplies the body with the particular elements of nourishment needed at a given period.

Therefore, with this fact fully considered, we cannot say that any one kind of food is always the best.

Variety in food, to a limited extent, is to be desired so long as wholesomeness is maintained. If we were to confine our diet to two or three articles of food, they would, after a time, cease to be appetizing. But, even under such conditions, a short fast would soon cause the appetite to return with renewed vigor.

If certain articles of food are adapted to nourishing the body at certain times, how then is the physical culture student to be guided?

Here is shown a very wise provision of Nature. That food which is most needed at a particular time is always craved by the appetite. The normal appetite is a safe and certain guide in this regard.

Although theories of this nature are undoubtedly of interest, those advanced by individuals who favor the various methods of diet would, no doubt, be considered of far more importance.

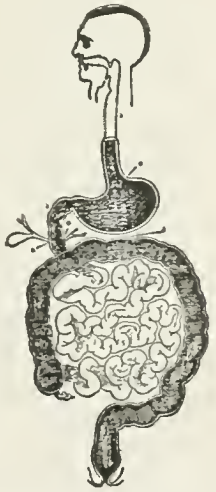
What are the advantages of these unusual dieta-

ries over the ordinary cooked food as used by the average individual? Although there is, perhaps, a vast variety of dietaries advised by persons who have closely studied these subjects, the systems of especial interest besides the usual mixed diet, are, no doubt,

(1) Vegetarianism.

(2) Natural or Uncooked Diet.

Now what is a vegetarian diet? Wherein does it differ from ordinary diet, and what advantages, if any, does it offer to the average person?



Entire alimentary canal where the digestive processes are carried on.

Before answering this query I would like to call attention to the digestive process. The illustration here presented shows the entire alimentary canal.

The changes that take place in the food in the process of digestion really begin in the mouth. This indicates very clearly the importance of thorough mastication. For the more thoroughly the food is ground by the teeth and mixed with the saliva, the better it is prepared for the stomach and intestinal digestion.

The absorption of food also begins in the mouth, and continues almost throughout the entire alimen-

tary canal, though the process is carried on mostly in the stomach and the small intestine.

After the entrance of the food into the stomach the digestive fluids gradually permeate it, and with the aid of the churning motion of the organ, induce changes that slowly bring the contents to a state where the particular elements of nourishment needed by the body at the time are assimilated by the latter.

Now all that is absorbed from the contents of the alimentary canal is "nourishment." All that cannot be used is "waste." It is a most wise provision of Nature, which gives these delicately constructed organs the power of choosing the particular food elements needed.

But the "waste" is also of importance as it gives a requisite bulk to the food and it facilitates the peristaltic action of the bowels so necessary to the regularity of the excretory processes.

Now some foods contain stimulating substances, in addition to the nourishment and harmless waste. A stimulant is always an element harmful to the body. The organs with which it comes in contact recognize it as a poison and every effort is made to eliminate it.

Foods therefore contain both

(1) Nourishment, and

(2) Waste.

They may be

(1) Non-stimulating, or

(2) Stimulating.

They may be

(1) Digested normally, or

(2) Digestion may be made more difficult by elaborate mixtures or prolonged preparation of the food.

Now the ordinary diet of the average person contains, in addition to the foods providing sufficient nourishment and waste, many elements that by improper preparation are made difficult to digest, and yet others that are stimulating in their influence. Meat, for instance, contains a considerable amount of impure foreign matter, which acts as a stimulant to the functional system. In an extremely mild way it is similar to alcohol in its influence. Hot biscuit, rolls, and bread made from bolted white flour, besides being deprived of valuable nutritive qualities necessary for the making of bone and muscle, are always difficult to digest.

Therefore, the ordinary mixed diet is the cause of much waste of functional strength. Much nervous energy is required to eliminate the foreign and impure matter in the meat. Much energy is also wasted in digesting unwholesome and improperly cooked foods.

There are two classes of vegetarians, those who use milk and eggs, and those who absolutely refrain from every food of an animal nature. In recommending a vegetarian diet to one accustomed to meat, I would suggest that one used by the first named of the classes. Not that I believe that we cannot be properly nourished without the aid of cows and hens, but for those accustomed to the ordinary diet, a sudden change therefrom to a strictly vegetarian menu is rather severe. It would be well to note, however, that milk and eggs if used when fresh, do not contain the same impure elements that give to meat its stimulating and poisonous qualities.

Now a properly arranged vegetarian diet contains nourishment and waste. There is no stimulating food in it. It supplies the body with all needed replenishment, and contains only sufficient waste to enable the eliminating organs to properly perform their duties.

I must admit that many who call themselves vegetarians seem to be poorly nourished. Often they look weak and wan and thin. But so do thousands of people who are not vegetarians! You can suffer from mal-nutrition on a vegetarian diet as easily as on a mixed diet if you do not eat the proper kinds of food. The great trouble with the men who were

courageous enough heretofore to break away from the meat superstition was, that they did not have a sufficient knowledge of dietetics to select a rational diet. But with the advent of physical culture into this field, a diet has been formulated that supplies every element of nourishment needed by the body.

If one leaves meat out of his dietary he must use those foods that will furnish lacking elements of nourishment. Whenever you find a vegetarian who does not look healthy, you can depend upon it with absolute certainty that either he is not eating the necessary substitutes for meat, or else he is not taking the exercise essential to maintaining the body in perfect condition.

Now let us turn to the natural or uncooked diet. What are its advantages over the vegetarian or the ordinary mixed diet?

Every physical culture student who knows anything of physiology understands that no simple or detached elements can ever serve the body as food. In other words, they must be taken in the form of chemical combinations such as we find in vegetable or animal foods. A chemist can take a grain of wheat for example, analyze it in his laboratory, and supply you with its exact elements. But these elements in this state would be useless as food. When animal and

vegetable substances are reduced to their elementary constituents they lose their food value. A grain of wheat contains, in almost perfect proportions, the elements that are needed to maintain life and health and strength, but if it goes through the process that brings it back to its original elements it becomes valueless as a food.

There are certain changes in our food stuffs which Nature has made provision to carry on in the body. If these processes could not be done better by our digestive organs than by the stove, we would not have been given the former. Many of the imperfect changes that take place in food in the process of cooking, would take place in a proper way in our bodies if it was eaten by us in a natural state.

Now the advantage of natural foods over cooked foods lies in the fact that they contain more life-giving, nourishing elements. *The process of cooking destroys the life of the cells of the food.* This fact should be thoroughly understood by every one of my readers. To be sure, authorities maintain that food is far more easily digested when cooked. This conclusion has not been proven by any means. And even admitting that uncooked food requires a longer time to digest, would not the increased amount of nourishment obtained be worth far more than the extra ef-

forts called for on the part of the digestive processes?

Fruit and vegetables are made up of living cells in the same manner as are our bodies. These cells contain the vitality, the life of the plant.

Cooking makes it necessary for you to increase the quantity eaten in order to secure the needed amount of nourishment. Cooked food contains far more waste matter than does uncooked food. This additional waste must be eliminated by the functional system. More energy, therefore, is required in order to dispose of cooked than uncooked foods.

Those who advocate the ordinary cooked diet will naturally point to the athletic world in order to prove the truth of the theory that such diet is superior to the uncooked.

Such evidence certainly seems conclusive at first thought, and deserves very careful consideration. We admit that nearly all successful athletes of whom we have accurate records live on the ordinary foods. When training they, of course, avoid many articles known to be difficult to digest, or to be deficient in nourishing qualities, but beef, chicken, mutton chops and so forth make up a large portion of their dietary.

The average athletic trainer considers these articles of food essential in building the highest degree of muscular endurance and vigor.

Now, in the face of these plain facts, how can I maintain that the ordinary food, cooked according to the accepted standards, is not all that can be desired?

To digress for a moment let me ask my readers to remember that nearly all of those who adopt a vegetarian or natural diet have been induced to do so because of ill health. And those who make such a change are often termed peculiar, and "cranky." But you can well afford to be "cranky" if such change enables you to pass from weakness to strength.

I have shown that foods consist of nourishment and waste. I maintain that in natural, uncooked foods there is less waste than in those cooked. There is far less foreign matter, or impurities. The absorbent glands, when in a normal condition, take up only those elements needed to nourish the body, but when the bowels are crowded with indigestible and unwholesome foods, abnormal conditions are created and impurities are frequently absorbed into the system. This becomes necessary in order more quickly to eliminate them. Alcohol, for instance, is very readily taken up and distributed throughout the entire body. Every organ of the body recognizes it as a poison, and assists in the work of speedy elimination.

Natural, uncooked foods contain no stimulating elements, no undue waste, while their life cells are maintained in all their natural, healthy, vitalizing building qualities. They are not injured and devitalized by cooking. They are not made difficult to digest by prolonged and unwholesome preparation. They contain all the nourishment needed in order to maintain the strength of the body with a minimum of waste. The amount of nourishment in food is decreased, and the amount of waste increased, when it is prepared on the cook stove.

But let us turn again to the athlete. Why have not our celebrated athletes given a diet of this character a trial? This first reason is, because such a suggestion has never been brought to their attention. The average athlete possesses an innate high degree of vital strength. Few of them have turned to training methods in order to regain health and strength, and the necessity for any particular diet has therefore never been especially emphasized as far as they were concerned.

Athletes will recognize the superiority of natural foods when they are defeated by those who use them. In the past, they have maintained their supremacy while following the ordinary mixed diet, because they have competed with men who have lived in the same

way. So far, we only have two startling instances in the athletic world of the advantages of uncooked foods over the ordinary vegetarian and mixed diet. One of such to which I refer was a hundred and twenty-five mile race that took place in Germany. It was won by an athlete who had lived almost exclusively upon uncooked foods for several years. In competition with him were nineteen vegetarians and twelve meat eaters. He beat the best meat eater by more than eight hours, and the best vegetarian by more than two hours. In this case, the advantages of natural foods were very clearly demonstrated.

The second instance is recent and is that of a three-hundred and sixty-five mile walk by four Cornell College athletes, three of whom were meat eaters and one a physical culturist and raw food advocate. On the third day of this severe trial of physical endurance, one of the meat eaters dropped from the killing pace, on the fifth day another and the third one of the party followed soon after. H. F. Porter, the young athlete who had lived on a diet of raw eggs, milk, fruit and other sustaining uncooked food, was the only one who succeeded in coming in at the finish. And, what is more remarkable, from the healthful exercise that such a long walk affords and from the foods that went to supply the needs of the increased

demands of the body, this young athlete actually gained in weight during the contest.

Now, I do not maintain for a moment that one cannot acquire a high degree of health on the ordinary diet used in nearly every household, provided care be used in avoiding indigestible and unwholesome foods and made dishes. Many men and women have lived to a great age, who all their lives have been accustomed to the use of cooked foods. But it must be remembered that the average individual of to-day, especially he who lives in the city, is housed under debilitating conditions, and gets little exercise and fresh air, cannot compare himself to his parents or grandparents who lived, more or less, out in the open, and obtained plenty of exercise besides being free from the enervating, wasting conditions that confront us in this present age.

I do not wish my readers to think that they must necessarily live on natural foods at the expense of isolating themselves from their friends and relatives. If it is difficult to obtain and use natural foods, it may be better for you to live as do others of your family, provided that you exercise and bathe regularly, and breathe plenty of fresh air at all times.

Remember that a mixed diet contains a little more waste and is somewhat more stimulating than other

diets, and that a cooked vegetarian diet contains a little more waste than a natural diet. Therefore, the mixed and cooked vegetarian diets require a little more functional effort on the part of the body than the natural diet. Your digestive organs have to work somewhat harder. Illness or the effort of Nature to cleanse the body of impurities that have accumulated through foods of the mixed type, may sometimes result, but you may perhaps remain as well and healthy in early adult life as you would if using the natural diet, especially if considerable vital strength is possessed by you.

Athletic ability means the possession of muscular strength. Such strength cannot be acquired and maintained without the development of muscles by regular and prolonged use. It matters not what diet you may adopt, your muscles must be used in order to acquire that strength essential for successful competition in difficult athletic contests. This, to a certain extent, explains why one who adopts the natural diet is not able to enter the athletic arena immediately and defeat every athlete who may attempt to compete with him.

In order to develop strength there must first be a call or need for it, and though the influence of diet is unquestionably of great importance, yet in the early

years of adult life, when one is in possession of all the vigor, vitality and energy that come with a good inheritance and an active life, no matter what diet may be adopted, the assimilative organs will usually manage to extract from the food used the nourishment essential to the well-being of the system.

The more vigorous your body is, the more digestive power you possess. The absorbent apparatus of those in vigorous health can take up the required nourishment from almost any wholesome and nourishing article of food. The strong athlete can be well nourished, can be brought to a condition that is essential to success on almost any diet that contains the elements needed to nourish the body, provided he does not stuff his stomach beyond its digestive capabilities.

But more nervous energy will be essential in digesting the ordinary diet. There will be less remaining to be exerted in muscular strength. Yet in early youth this may be so slight as to be hardly worth noticing. The effects of our ill habits of diet are generally evidenced in rapid decay and weakening after middle age.

The ordinary athlete is supposed to be in his prime at from twenty-two to twenty-eight years of age. When he reaches thirty his best work has been done.

There is rarely any chance for him beyond that age. This condition results from the use of stimulants and cooked foods. The digestive and other internal organs lose their greatest vigor. They have been overworked, and although the normal adult should be at his best at thirty-five, and should maintain this condition for at least fifteen years thereafter, it is a well known fact that but few athletes possess the strength essential in winning important contests after they have passed the age of thirty.

I firmly believe that *natural foods,* although they may not be capable of very greatly improving an athlete much beyond his ordinary attainable strength at an early age of, say, twenty-five, *will yet enable him to continue improving up to thirty and even thirty-five,* and will assist him to retain such superior condition for many years thereafter.

The advantages of natural foods lie in the ease with which the internal functional system is able to transform them into the nourishment that is needed in order to strengthen and beautify the body. *They should enable you to remain young nearly all your life.* They are capable of building the highest degree of physical vigor, and they will greatly assist you in maintaining it.

I firmly believe that the athletes of the future will

live on uncooked foods. Every athlete who will give a properly arranged diet of this kind a trial will find that his health is better, and in time he will notice a decided increase in strength and endurance.

Of course, all this must not be expected at once. You may not notice a very great improvement in a month or two, though a decided difference should be apparent in six months. You must remember that your entire body has been constructed of elements furnished by cooked foods and that the call for nourishment made by the functional system during all your life has been met by them. Now, if you suddenly change your diet, you will not notice a very rapid transformation in your condition. It is a very slow process. Every individual cell in your body must be changed, must be made over, by the new food before any manifest improvement can be noticed.

A patient suffering from cancer sees an indication of his trouble in some part of his body, and imagines that the disease is confined thereto. The surgeon's knife removes the outward signs and the patient believes that he is cured. But in a short time the trouble appears in another part, thus proving that the entire body was permeated with cancerous poisons.

Your body is what your blood makes it. When

you begin to furnish foods that make richer and better blood, there is a gradual metamorphosis. Slowly, day by day, month by month, every cell of your body is renewed, re-shapen so to speak. It has been said that the body changes throughout its entirety every seven years. But it is certain that this change takes place much more often. Yet the process of rebuilding your body is not one that can be hastened.

CHAPTER VIII.

HOW A POWERFUL STOMACH MAY BE ACQUIRED.

STOMACH OF VAST IMPORTANCE IN BUILDING OF VITAL POWER—DIGESTION A MUSCULAR PROCESS—PERFECT DIGESTION DEPENDENT UPON POWERFUL STOMACH MUSCLES — IMPORTANCE OF EXERCISES THAT STRENGTHEN THE STOMACH AND SMALL INTESTINE—PERCUSSION FOR THE ABDOMINAL REGION ILLUSTRATED.

No advantage to your vital power is to be gained by any method of exercise that does not provide abundant work for strengthening the muscles of the stomach and the small intestine.

As has been pointed out, all repair to the tissues of the body comes through the nutritive matter carried to the cells by the blood. Now, nourishment cannot enter the blood until it has been chemically prepared in the stomach and in the small intestine with the aid of the juices that are secreted in those two organs. Yet it is not enough that the juices flow around the food. The food must be worked through the stomach and intestine, so that its mixing with the gastric and intestinal juices may be most thorough. It is not until this has been done

that all of the available nutrition can be extracted from the chyme and chyle.

This, then, shows the necessity of a mechanical process, which is furnished by the involuntary muscles of the stomach and of the small intestine. You will note that I have written *involuntary muscles.* The muscles that have to do directly with the work of digestion are not like the muscles in the arm for instance, which we can cause to contract by a conscious effort of the will. The involuntary muscles that control the workings of the digestive organs do so without the slightest conscious direction of our will. They go on working whether we are wide awake or sound asleep, and in each instance we are not conscious of their efforts.

The involuntary muscles of the stomach, controlled by the nerves of the sympathetic system, set up a churning movement that goes on and on, from the instant that food enters the organ until the last morsel of it has been expelled. Without this churning there could be no proper admixture of the gastric juice and the food.

And the same state of affairs prevails in the small intestine. In this instance the movement is controlled by a long series of ring-like muscles that alternately contract and relax, forcing the partially di-

gested food along through the intestine and mixing the bile and pancreatic juice with it. Thus the food is digested by involuntary muscular movement in the stomach and small intestine in addition to the chemical action that takes place within them.

It is apparent, then, that, without this muscular action, digestion could not be anything like complete. It is just as apparent that, if the power of these involuntary muscles is less than it should be normally, just so much is the digestive ability of the body lessened. And with the power of digestion weakened, it follows logically that the vital power of the human being must be less than normal. In other words, if you are not in a condition of perfect health, you are perilously near illness. And the amount and extent of your illness will greatly depend upon the extent to which the involuntary muscles of your digestive system are below normal strength.

For this reason one of the first steps in increasing vital power must be the strengthening of the muscles of the stomach and of the small intestine. What is the natural way of increasing the strength of a muscle? Exercise, of course; there isn't a sane man alive who will attempt to controvert this statement.

Perhaps you will find a stumbling block in the fact that the muscles of the stomach and of the small in-

testines are *involuntary*. How can muscles be benefited by exercise when they are not governed by any conscious effort of the will? It may even occur to you that the only real way of exercising the muscles of the stomach and of the intestines is to give them more and more food, thus forcing them to increased effort.

But this would be a conclusion both wrong and harmful. In the abdomen there are a great many muscles of the voluntary kind—those that are thoroughly under the control of the will. This you can prove for yourself by breathing deeply and rapidly and forcing your abdomen to rise and fall just as you wish it to. It is possible, even, to make these abdominal muscles move while breathing is practically suspended.

It is a principle of physical training that the vigorous and continued movement of voluntary muscles forces the involuntary muscles to take more than their accustomed share of nourishment and exercise. Thus, by actively employing the voluntary muscles in the region of the waist-line, you strengthen the involuntary muscles and in so doing you increase the digestive functional power; and you thus make directly and rapidly for augmentation of vital power.

A little investigation and thought will show you

what forms of exercises are needed for furthering the strength of the involuntary muscles of the stomach and of the small intestine. Any movement of the abdomen that is quick enough and vigorous enough to constitute exercise, answers the purpose. The exercises suggested by the illustrations in this chapter provide work that will be almost immediately advantageous.

While following these suggestions do not lose sight of the importance of another means of strengthening the muscles of the stomach and the small intestine. I refer to percussion. Tap the front and sides of the abdomen with the open hands or the fingers. Strike lightly and smartly, going over the entire external surface. Do not do this in a lackadaisical way, but with vim and thoroughness. At the same time avoid striking too heavily. The aim of percussion is to harden, not to bruise, the delicate muscles and it furthermore stimulates and quickens the flow of the blood in the abdominal region. Naturally, it would be unwise to attempt percussion when the stomach is filled.

Exercise 1. Recline flat on the back with the hands behind the head. Now gradually rise to a sitting position. If you cannot keep your feet on the floor, put them under a sofa or bureau. After assuming a sitting position, bend far forward, return to former position reclining on the back. Continue the exercise until tired.

Exercise 2. Lie on back, with hands at sides as shown in the illustration, with the legs straight upward in a vertical position, hands far to each side. Now let both legs come to the left as far as you can without losing your balance, as shown in photograph, then to the right as far as you can. Continue the exercise back and forth until slightly tired.

Exercise 3. Lie flat on the back. Now raise the legs, keeping the knees straight and bringing them over the head, and touch the toes back of the head, as shown in the photograph. Assume the original position and continue the exercise until slightly fatigued. Great care should be used in the beginning to avoid any possibility of a strain. This is an especially advantageous exercise for stirring up the entire internal vital system.

Exercise 4. Seat yourself on the floor with the legs far outward as shown in the illustration. Now bend as far as you can towards the left, as shown in photograph. Same exercise as far as you can over to the right. Continue the movement back and forth until tired.

Exercise 5. This photograph illustrates a valuable method of strengthening the stomach and vital organs. Make the muscles of the abdomen rigid, and strike with the edge of the hand as shown in the illustration. Begin at the lower part of the abdomen, and strike every part on both sides up to the nipples. This may be a difficult exercise at first, and it may be necessary for you to strike with the open hand for a while until the tissues are sufficiently hardened to be benefited by this vigorous treatment. This exercise will be found especially advantageous, and should be taken once or twice daily for five or ten minutes.

CHAPTER IX.

THE HEART MADE POWERFUL.

HEART ONE MASS OF MUSCULAR TISSUE—DEFINED AS A GREAT MUSCLE—HEART NEEDS EXERCISE SAME AS OTHER ORGANS OF BODY—DISEASE OF HEART—HOW CAUSED—STRENGTHENING THE HEART—THE ABSOLUTE NECESSITY OF THIS AS AN AID TO VITALITY—THE POWER OF A VERY WEAK HEART MAY BE BUILT UP—RIGHT BREATHING THE BEST TONIC OF ALL.

"The heart, like any other muscle, owes its vigor to the activity of respiration. The exceptional muscular strength of insects is no doubt due to the fact that they respire from nearly every part of their bodies. Individuals with organic heart disease enjoy the best health when they are able to live in open-air life."—*Albert Abrams, M. D.*

"I can't endure very much exercise," sighs some poor fellow. "I have a weak heart. In fact, I don't really exercise at all — I don't dare to."

And the truth is that he does not do much of anything that enables him to taste the real pleasures of living. Too many men and women who believe that they have weak hearts live on and on, always dreading to act as other and happier people do, always trying to stave off the death that they believe to be inevitable if anything like exertion is undertaken by them.

Now, how do you go about strengthening the weak

muscles of the arm or of the leg? You exercise them and so, from being soft, flabby and all but useless, they become hard, firm and enduring. The heart itself may be defined as a great muscle; it is one mass of muscular tissue; it is composed of a great number of constituent muscles, and everyone of these is capable of being strengthened and hardened so as to resist all ordinary strains. Thus the organ may be made to do its work in the manner that Nature intended it to.

Heart disease!

This is one of the most harrowing of all complaints. The average victim of heart disease goes through life with a sentence hanging over his head. He feels like a condemned man. He knows not what moment he may be called to the other world. The thought of death is constantly with him.

Medical science offers but little relief and can give the sufferer but little hope. All remedial agents used by physicians, at the best afford only temporary relief from the painful and dangerous symptoms that appear from time to time. Various strong drugs are prescribed, but after all, the most famous medical men candidly admit that there is no cure for heart disease. You can prolong your earthly existence by taking watchful care of yourself, but the sword of

death hangs over your head; it cannot be removed and is liable to descend upon you at any moment.

The writer does not care to controvert the theories of those supposed to be experts on the subject, but his experience has taught him beyond all possible doubt, that the heart and the great arteries connected with it can be strengthened, and made more vigorous in every respect, by the same methods that increase the general vigor of the internal functional and muscular systems.

Medical men frequently condemn athletics; they maintain that the exercise often over-strains the heart; but it will be well to note that in nearly every instance where overstrain of this character is observed, the victim has suddenly changed his habits from one extreme to the other, from activity to entire inactivity, though he continues to eat the same quantity of food. The strain, therefore, instead of being caused by the over-use of the external muscular system, is really caused by the overwork of the stomach and other blood-making organs. Investigation will usually prove that it is not the hard training, but the sedentary life and the extremely heavy eating which follows the cessation of training that causes the heart troubles of athletes.

There are many diseases of the heart, but those

most usual are: Overgrowth, Dilatation, Fatty Degeneration, Inflammation, Valvular Disease, Palpitation, Angina Pectoris and Aneurism.

It would be impossible to describe accurately in this short chapter the various symptoms manifested in the different diseases classed as heart troubles, but rarely is there any special difficulty in realizing their presence, if serious. Each of the several diseases mentioned is accompanied by symptoms that usually indicate its character, though in many instances they differ only in minor details. As the treatment to be described is intended to remedy the abnormal condition that is the cause of the disease by building up the strength of the entire internal functional system, the character of the disease, as manifested in declared symptoms, is of but little importance.

Some of the following symptoms accompany and indicate various affections of the heart: Palpitation; heavy beating of the heart; ringing in the ears; spots before the eyes; dizziness; slight, feeble pulse, which is greatly increased on very slight exertion; shortness of breath; occasional pain in the region of the heart; attacks of faintness; irregular beating of the heart; inability to lie on the left side without pain; noises in the ear; rubbing sounds heard on listening to the

heart. Congestion of the stomach; bloody and sometimes highly-colored urine; paroxysms of pain in the heart, which are frequently so great as to make tense and rigid every part of the body. Dropsy and apoplexy are also sometimes demonstrated.

The causes of heart disease are various. Any influence inclining to weaken the functional system will affect the organ. Dissipation, overwork, use of stimulants, excesses in eating and drinking, can be classed as the most frequent of the causes. The victims of heart disease are usually heavy eaters. Remember that it is more likely to be overwork of the internal functional system than of the external muscular system that induces this trouble. The process of blood-making practically begins in the stomach. When conditions are such that the blood is not of proper quality, if the stomach is constantly overloaded, or indigestible combinations and unwholesome foods are eaten, maladies of some sort are bound to follow, and if the heart is not especially strong it may be the first organ to suffer.

It is not within the province of physical culture treatment to attempt to advise where serious and painful paroxysms of the heart are manifested, but the writer firmly believes that usually where such symptoms do appear, the application of cold, wet

cloths to the affected parts would be a far safer and more beneficial method of treating the patient, than is the reckless introduction into the circulation of the strong poisons that are so frequently used. No physician can dare to predict with absolute certainty the effect of a powerful drug. The heart cannot be stimulated unless it has sufficient vital strength to awaken to the danger of the presence of poisonous elements in its tissues. You may be able to spur on an exhausted horse, but you will find that, when he has gone to his farthest limit, no amount of spurring will affect him. The heart is, to a certain extent, similar. The properties of all heart stimulants are poisonous to an extreme degree, and if the organ has sufficient vital strength to be aroused to greatly increased activity because of their presence, it certainly has sufficient strength to continue to maintain life.

The first object to be continually kept in view in remedying a chronic weakness of the heart is to keep the circulatory system in a clearly normal condition, so that the work of pumping the blood throughout the entire body may be lightened as much as possible. Cold applications, massage, rubbing and kneading the various parts of the body will be found of advantage. Cold water is an especially

valuable assistant in accelerating the external circulation. Where or whenever it comes in contact with the body the tissues contract, thus forcing the blood contained therein toward the heart; and when this tissue relaxes, new blood flows into it.

If you are not accustomed to the use of cold water it is your imperative duty to begin to be so at once. Do not, however, go from one extreme to the other. Begin by using water of a moderate temperature, bathing the entire body with a sponge or wet cloth. Or, if your condition is very serious, you need bathe only a part of the body at a time. But gradually, day by day, lower the temperature of the water, though care must be exercised at all times that it is not so cold that you cannot quickly recuperate from its effects with a feeling of warmth. About the safest and most comfortable method of bathing is to take your exercise first, then a dry friction bath, using two soft bristle brushes or a very rough towel, rubbing the body thoroughly all over until the cuticle is quite pink from the accelerated circulation excited by the friction. Following this, water of a decidedly cool temperature can be used and enjoyed.

Exercise is another agent that will assist vastly in circulating the blood throughout every minute capillary of the entire body, and it will also greatly in-

crease the activity of all the depurating organs. The skin, kidneys, lungs and bowels will perform their work of eliminating the impurities far more effectively if you exercise regularly than if you lead an inactive life.

Understand, I am far from advising excessive exercise for a weak heart, or for a strong one, either, for that matter. But there is no question whatever that exercises that are selected and employed with care and common sense, will render anyone's heart stronger. It is a fact, well-known to both physicians and experienced physical trainers, that any "disease" of the heart that has not progressed to an incurable stage can in time be cured, if the right sorts and amounts of exercise are used. And the heart that is not diseased in the least, but is merely not as strong as it ought to be, can be put in the full prime of condition. In both cases the means are the same—judicious exercise.

When one is conscious of having a very weak heart, he must exercise with constant watchfulness at first. Palpitation or distress of the heart, and shortness of breath, are signs that must be accepted as danger signals. The warnings indicate that the exercises must be made less severe until the heart has been distinctly strengthened. But he who has no clearly de-

fined heart trouble, can go right ahead with his exercises until Nature warns him to be more careful—a warning that will not come unless the work be carried to the point of abuse. Fatigue, in every instance, is an indication that enough exercise has been obtained for the time being.

As is indicated by the quotation at the head of this chapter, the heart receives the most vigor from the act of breathing. The muscles of the heart are of the involuntary kind. Constant deep breathing, by purifying the blood more rapidly in the lungs, and by increasing the whole functional vigor, gives the heart more work to do by increasing the rapidity with which the blood is circulated. This additional amount of "pumping" of blood by the heart gives the muscles of the latter more work to do—more exercise, that is; which, if it be carried to a reasonable limit, renders its muscles stronger and sounder. Hence it follows that the heart is better able to perform its work.

The simplest of all exercises for the heart is that of standing in the outer, pure air and breathing deeply. Surely no individual can fear that his heart is too weak to endure the strain of continued deep breathing. Yet, this is the essence of heart exercise, and the more strenuous exercises are valuable only

from the fact that they compel continued profound inhalations and the coincident passage of great quantities of life-giving oxygen into the system.

Many patients suffering from heart trouble are actually condemned to die because of the physician's fear of exercise. Now the truth is, that none have ever recovered without a certain amount of exercise. It is absolutely essential to build up the nervous, muscular and functional systems. Supply the body with a better quality of blood, build up superior powers in the stomach and in the nervous system, and the heart is naturally affected thereby. Slowly but surely it will increase in strength and at length become normal.

It is well, however, to remember the necessity of extreme care in taking exercises while suffering from a trouble of this nature. Violent exercises of every kind should be avoided entirely until all symptoms of the disease have disappeared. Light, easy movements, such as moderate walking, and swinging of the arms in various ways, will be found of special advantage. You may also exercise with a chest weight for developing the muscles of the walls of the upper portion of the trunk; this, if accompanied by deep breathing, is especially recommended.

Several exercises that I illustrate herewith, can

always be used to advantage. They are intended to bring into action the large muscles located near the heart, and in every instance will be of great benefit. They will often produce immediate relief if an uncomfortable feeling is noticed in the organ.

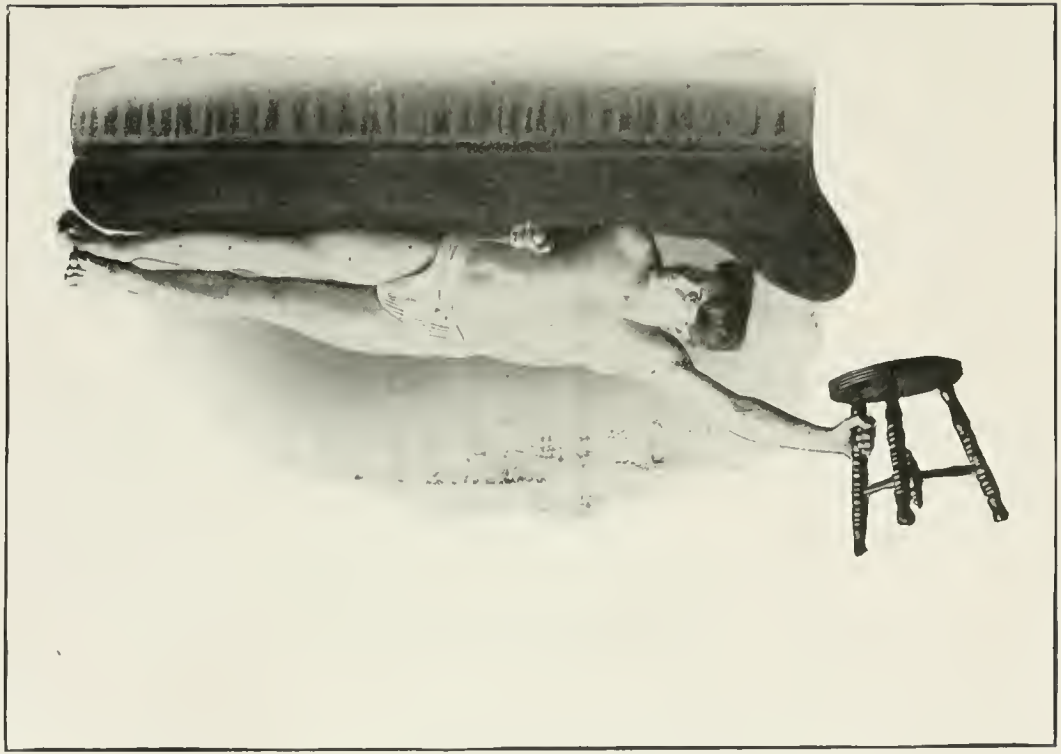
Though exercise, massage, cold bathing, and other means of building up general vigor are of value, an appropriate diet is also of great importance. The greatest possible care must be used to avoid overloading the stomach. This does not by any means suggest the necessity of starving, or eating so little that you will be poorly nourished, but your diet should be so regulated that the digestion will go on in a harmonious and satisfactory manner. Avoid eating too heartily of meats. Stimulating drinks of all kinds should be tabooed. Even tea and coffee should be avoided. Two meals per day will be found better than three; though, if you are eating three, and apparently digest them without difficulty, there should be no especial necessity for a change. Pure distilled water should be kept at hand at all times, and should be used freely. Every morsel of food should be chewed to a practical liquid before swallowing. Never drink at meal times. Be sure that several hours elapse between your last meal and the time you retire.

The friction bath and cold bath can be taken in the morning or evening, whichever is most convenient.

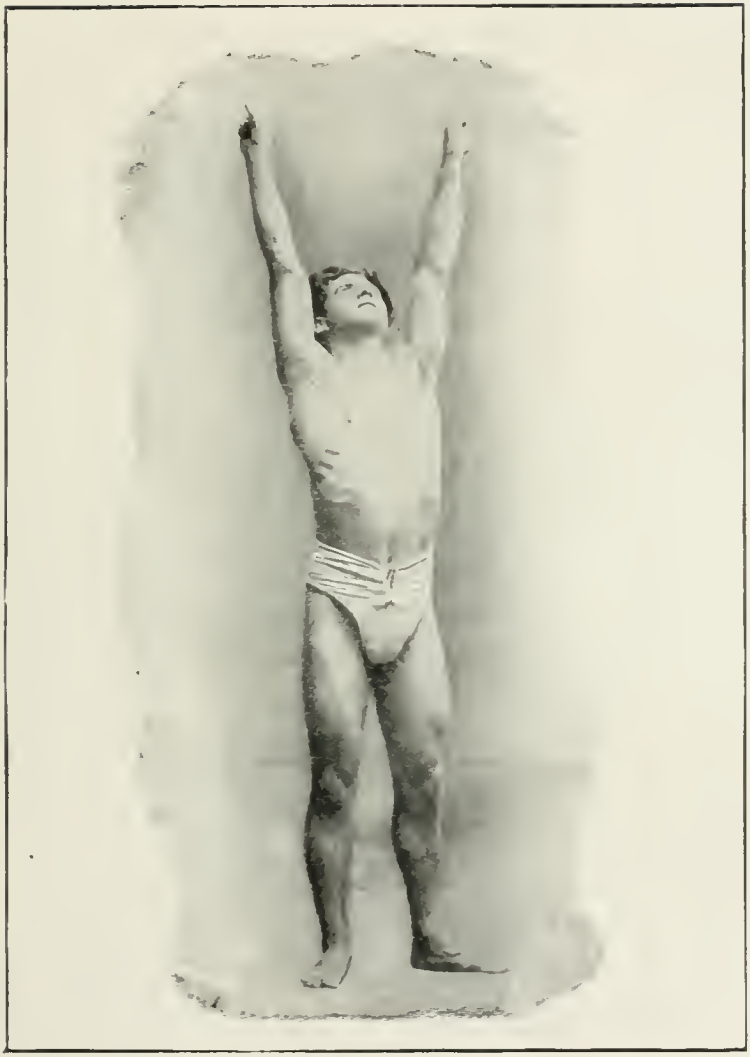
In some few cases where serious digestive disorders accompany heart disease, fasting one day out of three will hasten a recovery. The uncooked food diet will undoubtedly bring about a more speedy cure, but health may be regained while using the ordinary diet if it be confined to wholesome foods, and if the hygienic means for attaining general health as here suggested are rigorously followed.

Remember always, that the exercises which compel you to take the greatest gulps of air without causing distress to the heart, are those that are most beneficial to this organ.

Exercise 1. Recline on sofa with your head near the edge. Now secure a small stool or light weight of any kind and extend the arm far over the head, with the elbows rigid, as shown in the illustration. Next, keeping the elbows rigid, bring the arm up in a perpendicular position. Repeat the exercise until tired.



Exercise 2. This exercise, to be of the best advantage, should be taken with an exerciser pulling from overhead. The handles of the exerciser should be grasped, as shown in the illustration, with hands high over head and then brought downward to the sides with elbows rigid. Repeat the exercise until tired. Take same exercise, bringing the arms forward and downward, with arms rigid, until tired. This is especially valuable to sufferers from heart trouble.



Exercise 3. Recline on a sofa with head near the edge, as shown in the illustration. Now grasp a chair or a weight of some kind in the two hands, and bring it upward until directly over the head, keeping the elbows rigid during the movements. Repeat the exercise until muscles tire.

Exercise 4. Grasp the left wrist with the right hand as shown in the illustration. Now beginning with the bony framework of the chest, press inward with the left forearm as hard as you can without discomfort. Continue this exercise, going over every part of the bony framework of chest and abdomen. This exercise is for strengthening the bony framework of the chest, and for strengthening and accelerating the circulation of all the vital organs contained therein.

Exercise 5. The importance of assuming a proper position at all times, whether sitting or standing, should be thoroughly understood. The position here shown is one that can be especially recommended. The shoulders should be back, the abdomen should not be drawn in as is commonly recommended. It should be relaxed and perfectly free to move outward and inward as the breath is inhaled and exhaled. Study the position here shown and try to acquire a proper position at all times.

CHAPTER X.

DEVELOPING GREAT LUNG POWER.

THE GREAT NEED OF STRONG LUNGS—POOR LUNG CAPACITY OF AVERAGE PERSON—WHAT IS CORRECT NORMAL EXPANSION?—DEEP BREATHING DEVELOPS A FINE CHEST.

Strong and capacious lungs are needed in order that we may acquire the regular and almost unconscious habit of taking in great quantities of air at the moment of inspiration. And such lungs result from deep breathing, in proportion to the purity of the air inhaled.

A grown-up male of average bodily development has usually in his lungs about two hundred cubic inches of air. An ordinary inspiration, such as is made by people unversed in taking care of their bodies accounts for about thirty cubic inches of air. But inflate the lungs as much as you possibly can, and you draw in some one hundred and thirty cubic inches of air, or one hundred inches more than you do with a "quiet" breath. Now, when you inhale but thirty cubic inches of air and exhale it quietly, only that same quantity leaves your lungs. But a strong ex-

piration of air will force out about one hundred cubic inches more than you breathed in.

It will be seen then that a forced expiration, by expelling more air than would leave the lungs by a "quiet" expiration, will relieve the lungs of some hundred cubic inches of more or less impure air that would otherwise linger in them to your harm. And as the ordinary quantity of air that belongs in the lungs must be made up at the next inspiration, pure air takes the place of the impure that has been gotten rid of by the forced expiration, and the blood throughout the body is much benefited thereby.

Now, bear in mind at all times, when considering the act and the benefits of breathing, that the lungs, once air is driven from them, will refill themselves automatically. Thus, if you can increase the capacity of your lungs, you *must* take in more air thereafter when you breathe; you cannot help taking more air into larger lungs, for the increased amount of room is there and Nature will see to it that more air is taken in.

Strengthening the lungs and increasing their capacity for air are accomplished by one and the same means — the studied practice of deep breathing in the open air. Fill your lungs as deeply as you can, and you cause the ribs to rise and to bulge forward. The

intercostal muscles facilitate this expansion of the chest, one rib being pulled upward and driven forward by the same movement of the rib above it. The diaphragm does its share by rising and forcing the lungs to expand outward. The ribs are obliged to accommodate themselves to the movement. The intercostal muscles become stronger (through this constant exercise) and the costal cartilages are forced to stretch in order to accommodate this new demand on their expansion. In time, by repeated exercise, the cartilages permit of great increase in size of the cavity in which the lungs rest. And the lungs, both on account of the work of their own muscles and of that of the greater amount of chest space in which they lie, become larger and more enduring.

Thus, through deep breathing conducted as an exercise, the lungs become larger, have more space in which to move and expand, and have furthermore a greater air capacity. Such capacity, once it is created, must be filled. With better developed lungs you must breathe more air, and with more air passing through the delicate membranes of the organs the blood must become purer. The heart is benefited, as was described in the preceding chapter, and indeed the effect for good extends to the remotest tissues of the body.

There is no more interesting experiment for one who is training his body to do its full duty than to make full, deep and proper breathing an important part of the work, and take measurements of the chest from time to time. It is surprising how quickly results for the better are noted. And he who is attaining a proper chest development has started on the road to abounding health.

When walking, always do so with the shoulders well back and the chin confidently up. *Never* walk with such a poise of the body that the chest can be at all compressed. Cultivate the expansion of the chest at all times, and you will be richly repaid for the effort.

CHAPTER XI.

PURE AIR OF THE UTMOST IMPORTANCE.

PURE AIR PREVENTIVE OF CONSUMPTION—HEALING POWER OF AIR—PURE AIR CONSIDERED AS A FOOD—ERRONEOUS IMPRESSIONS REGARDING NIGHT AIR—FOOLS FEAR DRAUGHTS—IMPURE AIR POISONOUS.

"Lung gymnastics should be systematically practised three or four times daily in the open air, or before an open window. The deepest inspiration is to be repeated several dozen times with the arms in full extension above the head and brought to the thighs with expiration. . . . Perseverance in these exercises, with avoidance of cramped, stooping postures in sitting, will accomplish much in developing lung power, even in those whose bones seem rigid. Diaphragm exercises as practised in singing are excellent — in fact, short singing exercises, which often interest the patient more than simple gymnastics, are of service."—*William Gilman Thompson, M.D.* (On Tuberculosis.)

The foregoing is the expressed opinion of Professor Thompson, of Cornell University Medical College, and represents the attitude to which the persistent advance of physical culture has brought our leading medical men. Professor Thompson's advice is given for the benefit of those who are suffering from the wasting disease of consumption. If air is a great remedy in building up the lungs in tuberculosis, it is obvious that air must be a mighty preventive of the same disease. It can be confidently asserted that the only specific for lung troubles is pure air and plenty of it.

Air is essential to all life. It is also necessary to the manifestation of force of all kinds. Nearly all machinery, for example, is actuated by steam. Steam is generated with the aid of fire and fire cannot exist without oxygen. Air is furthermore a food that is necessary to animal life everywhere and at all times.

Science tells us that this body on which we live and call the earth, whirling through space, is surrounded by a shell of air from one hundred to two hundred miles thick. Roughly speaking, the earth and the air which surrounds it, may be compared to an orange —the skin of the fruit representing the air and its meat the earth. That illustrates about the proper proportions. The earth is supposed to be something like eight thousand miles in diameter. Therefore, the depth of air is insignificant in comparison with the earth itself.

Although everyone is aware that air has weight, but few realize that it is this weight which enables it to penetrate every part of the earth's surface. You exhaust the air in a bottle and then open it, and the air will rush in with a tremendous report. If the air is removed and the bottle is not strong, the external atmospheric pressure will crush it.

Science tells us that the human body withstands a

pressure of about fourteen tons and were it not for the presence of internal air pressing outwards, we would be crushed to atoms.

The importance of air is illustrated in the case of persons who exhibit a liability to fainting. There is an instinctive cry for more air. The bystanders realize its necessity for the fainting person.

There are at the present time many very grave errors existing in reference to air. For instance, it is not by any means an old-time grandmother idea that damp night air should be feared. You will find this fear everywhere, in the city and in the country —in fact in all civilized communities. There is an idea that damp air will create disease of some sort. And those very same people who fear such air will go home and shut it up in their rooms and breathe it over and over again, heat it until it is comparatively dry and imagine that when thus fouled by being breathed and re-breathed, it is superior to the pure outside atmosphere.

But, my friends, I think that about the biggest fool of all is the man who is everlastingly afraid of a draught. I never could see the difference between a draught and the wind. You go out into the open at any time when the air is stirring and you come in contact with a draught, yet you fear no ensuing harm.

I have been searching for draughts all my life. I believe in air in motion, I believe in draughts, which, circulating freely, cleanses, purifies, invigorates and strengthens. No matter where I may be, I always ventilate my sleeping room so that I may secure pure air in every sense of the word, and I always sleep in a draught. I am not satisfied until the wind is blowing in my face, and I want to say that I have followed this policy for the last fifteen years. Ever since I have believed in having pure air and have been searching for it, I have had very few colds. And whenever I have had a cold I could always trace it to overeating, overwork, an impure atmosphere, or some other hygienic evil.

Now, air of ordinary purity contains but a very small percentage of carbonic-acid gas, which is the principal atmospheric poison. As you all know, carbonic-acid gas is exhaled from the lungs of all animals, and it is taken up by plants which use carbonic-acid gas just as we do oxygen. I believe that the percentage of carbonic-acid gas is about four parts in ten thousand, in nominally pure air; but in the case of confined air which has become devitalized or poisoned by repeated breathing, it rises to at least ten parts or more in ten thousand. They tell us that at this point it becomes dangerous. that in any event you

suffer from incipient asphyxiation and that you are rendered liable to acquire disease. Of course, while you are actively engaged in some muscular exercise, you use far more oxygen and your lungs exhale a proportionately increased quantity of carbonic-acid gas.

CHAPTER XII.

PERFECT VENTILATION.

AVERAGE HOME STAGNANT WITH FOUL AIR—DIFFICULTY OF FINDING OPEN WINDOWS IN HOMES—CONVEYANCES FOUL WITH POISONOUS AIR—AERATED ROOMS—ILLUSTRATED SUGGESTIONS FOR PERFECT VENTILATION.

"The tissues are continually feeding on the life giving oxygen. . . . In fact, the life of the tissues is dependent upon a continual succession of oxidations and deoxidations."—*Albert F. Blaisdell, M.D.*

You go into the average homes of to-day and I venture to say that there is not five per cent., and in some cities not one per cent., of such that are supplied with a sufficient quantity of pure air. For instance, in our physical culture restaurants, it would be absolutely impossible for us to ventilate them as we should like to do because we would not have any customers in winter. This fear of moving fresh air, of a draught, is everywhere. It would be only the most enthusiastic physical culturists who would patronize a restaurant that was properly ventilated.

All through the last cold winter I slept with my windows open; not two or three inches, but as far as I could get them open, and I have two windows on each side of the bed. The wind blew directly on and

over me, and I am far better able to do my work because I have pure oxygen to breathe. My offices are not ventilated in this thorough manner, because I don't believe I could find enough physical culture enthusiasts to work for me in such an office as I desire. But the time is not far distant when every office and every house will be so ventilated that fresh air will be supplied plentifully. We have no right to breathe air that is not as pure as the outside atmosphere.

FIGURE 1. Showing how a small iron single bed or divan can be placed out of the window in order to secure the advantage of sleeping out-of-doors without leaving your room. The bed should extend about a foot and a half out of the window. If it extends much farther than this, there is, of course, a liability of the foot raising and landing one on the ground. If living in a thickly populated district, an awning can be placed over the window, or a large umbrella can be fixed over the bed to obscure the view of the curious.

Then, too, consider the temperature of the average home. We find it running up to 70 and sometimes to 80 degrees,—absolutely torrid atmospheres. Also, if the atmosphere outside is at zero, and you go from such a house into the cold air, you experience a change of 80 degrees in temperature, and I tell you that such a radical change is injurious in the extreme.

Go along the streets of New York City, or of any other city on a fairly cold day, and look for an open

window. You will have a difficult task. It will be extremely difficult to find one.

That shows you how little the ordinary human being appreciates the value of, or the necessity for, pure air.

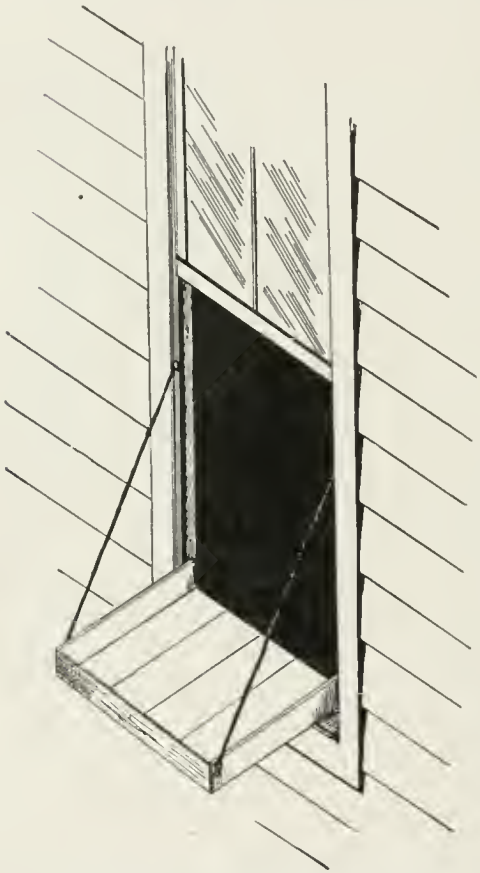


FIGURE 2. Showing platform built out from a window on which a mattress can be placed for making a bed. A bed or divan can be raised to a similar height on the inside. A similar method to that described in the previous illustration can be used to obscure the view of the curious.

There is something else in reference to the heating of your living rooms that is understood but little by the average individual. For instance, your body adapts itself to the particular heat to which it has been accustomed. If you live in rooms of a temperature of 70 degrees, your body will regulate its supply of caloric so as to make you comfortable. If the temperature is 50, 60 or 80 degrees, exactly the

same condition prevails. In other words, it is largely a matter of habit as to how much heat you need in order to keep warm.

One recent winter, merely for experimental purposes, I wore a summer suit with no underwear. I am glad that it wasn't a particularly cold winter, but

FIGURE 3. Showing one method of ventilating the room to insure a purity of air about equal to the outside atmosphere.

I must say that I became so inured to wearing these clothes that I hardly noticed the cold after the first month of the experience, though when I went out at first, it felt as though I had no clothes on whatsoever. It seemed as if the wind blew right onto my body, and I was badly tempted to "back out." Later, however, I became accustomed to it. Now I do not be-

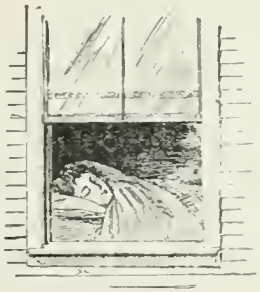
lieve that such extreme experiments are necessary, for they are not comfortable, at least in their preliminary stages. Yet they show that excessive clothing is merely a habit and that most of our winter garments are superfluities.

We should all remember that air is fit to breathe but once only. Not only do we exhale carbonic-acid

FIGURE 4. Another method of ventilating a room to insure absolute purity of the air.

gas but organic matter and micro-organisms are also given off by the lungs. Science tells us that even air of average purity contains a goodly percentage of micro-organism to every one hundred cubic feet of air; and in enclosed rooms, where the air has become vitiated from breathing and re-breathing, they are increased a thousand fold.

And still they talk about contagious diseases. In all our public conveyances we have signs, "Don't spit on the floor," because the sputum dries and you are supposed to acquire the particular disease of the individual who has offended in this respect. Yet you board an average street car and there are thousands and millions of these micro-organisms, which you breathe in by the hundreds with every breath. If you could possibly contract disease through their medium, I don't believe that there would be a healthy man remaining in a big city within twenty-four hours.



Showing another method of securing pure air. Widely open the window and sleep as near to it as possible. Do not adopt this extreme method too suddenly.

When you go into a smoking room you get a vivid illustration of how air is breathed over and over again, you see it curling around; in some instances it is so thick you cannot see it curl, and you realize that every particle of the smoke-laden atmosphere has been in some one's mouth, and in some one's lungs, over and over again. It is so with the air in every closed room. Such apartments contain millions of micro-organisms and you are breathing and re-breathing them constantly.

You would not desire to wash in water which some-

one else has already used. Why should you wish to breathe the air that someone else has already breathed, and which has thus become poisoned? I hate to go to the theatre for the reason that I have to breathe someone else's breath, and sometimes it doesn't smell very good at that!

The average gas light of twenty candle power will use as much air as three or four men, therefore, if you have a light of this kind, you must be supplied with an added proportion of air.

I do not say that anyone not accustomed to living as I do should go to extremes without due preparation. But gradually acquire the habit of living in a room where the air freely circulates. Don't be afraid of draughts. I say that draughts are a delusion. I have asked a number of physicians to explain to me why a draught was so pernicious, and have never had a satisfactory explanation. Some will say that a draught is a current of cold air in a warm room. That is about the most satisfactory explanation I could get, and it was never satisfactory to me, because very warm rooms are too warm anyway.

The average American who goes to England will almost freeze to death. I have heard Englishmen complain of the heat at 65 degrees, simply because they are accustomed to cool air. I have said that the

body can become habituated to almost any temperature. If you have been accustomed to 70 degrees, and change gradually and slowly to a temperature of 60, you will be just as comfortable. If you have been used to living in a temperature of 60, and lower it by easy stages to 50 degrees, you will find yourself quite as much at your ease as you were before.

I admit that in cold rooms, you may rightly add somewhat to your clothing, but it is a thousand times better to do that and breathe fresh air, than it is to heat your room by hermetically sealing it and so breathe the same air over and over again.

Of course it will take the air in a large room much longer to become vitiated than that in a small room. You take a small room of, say, about twelve by fifteen feet, and in order to keep the air in it of satisfactory purity, it ought to be renewed absolutely every half hour. And I think that the safest way of insuring atmospheric purity is to raise your windows as high as you can, especially during sleeping hours.

I remember, not long ago, hearing a story about an Italian family, or rather several families who lived in a tenement. They all occupied one room, not especially large. There were five families, one in each corner, while the fifth family camped out in the center of the room. Now, this is no exaggeration,

for you will find conditions identical with this in New York City. And I understand they got along with comparative satisfaction until the family in the center began to take in boarders and then there was an objection raised. I don't blame them for objecting, for I venture to say that on cold days every window of the room was shut as tightly as possible.

CHAPTER XIII.

ERRONEOUS METHODS OF BREATHING.

"QUIET" BREATHING USED BY WEAKLINGS—AN ABOMINATION—DOES NOT PURIFY ALL OF BLOOD SENT TO LUNGS—OTHER COMMON ERRORS IN REGARD TO BREATHING.

Of course, the greatest error in breathing consists in taking into the lungs and thus sending throughout the body, air that is not nearly as pure as Nature can make it. And the second error that is equally common, is the taking of "quiet" breaths—that is, inhalations that do not cause every portion of the structure of the lungs to be permeated by air.

Even those who believe that they are making an effort to get pure air into their systems are liable to error. The beginner in physical culture, if he has any faith in the teachings of that science, will begin his novitiate by getting more and more out-of-doors. But most people are compelled, through the necessities of their occupation, to spend many hours a day in-doors. How about the purity of the air that they breathe?

It may be that the factory floor, or the office, or the work room is aired frequently. That is not enough.

They must be aired *all* of the time. It is not wise to spend a moment in any place where the out-door air is not circulating freely. Bear in mind that it is not alone through your breathing that the pure air in a room becomes impure. The burning of stoves, gas, kerosene lamps, candles or lanterns makes the air foul also.

Breathing in a confined room renders the air foul by converting the life-giving oxygen into the asphyxiating carbonic-acid gas. Your body is giving off vapory emanations which, even though slight, befoul the air nevertheless. You may be reading or working by the aid of a lamp, and the combustion that goes on in it is making the air more and more foul. In order to keep warm you have a radiator, heater, stove or grate going, each of which is taking oxygen out of the air.

Now, with all these ways of befouling the air in operation at once, what are you doing to renew the pure air that is being polluted? Are you content with the notion that the room was aired thoroughly a little while ago? If so, pause to reflect that the air does not remain pure when there are so many means present of replacing its oxygen with carbonic-acid gas. Are the windows open enough to let in all the needed pure air and to provide for the escape of the

impure air? If not, you are certainly and insiduously poisoning yourself.

Throw open the windows then, as much or as little as need be, but have them open. Let in the pure air every moment that you are in the room. Breathe in, drink in, every waking and sleeping moment, the uncontaminated atmosphere that God made for you — not the vile vapor that you are creating around you by your breathing, your bodily emanations, your lights and your fires.

Quiet, gentle, half-inspired breaths are the rule, but they are an abomination. Every breath taken should be so full and so far-reaching that it goes to the uttermost recesses of the lungs. The lungs are filled with impure venous blood that needs purification by oxygen. And the blood, even after it has been made pure, needs oxygen to carry back to all the tissues of the body.

Take a quiet, half breath, and you do not reach all of the impure blood that has been poured into your lungs. Such of the blood as has not been made pure returns to the heart, and in this impure — toxic — state it is pumped throughout the system again. Even the tissues of the healthiest lungs suffer by the passage of blood that enters them and leaves them in an impure state, depositing as it goes, a portion of

poisonous matter. A result of this deposit is that the lung tissues become diseased as a matter of course.

Start with a normal pair of lungs, and breathe deeply of pure air all through your life, and tuberculosis, or any other pulmonary disease, becomes an impossibility.

Another very common error in breathing is standing or sitting in stooped or cramped positions. Such attitudes prevent the taking of long, deep breaths. If the shoulders are allowed to bend forward, and the chin to droop, the lungs cannot expand as they should. Experiment a little with the shoulders and chin thus placed and you will appreciate the harmfulness of the position to the full.

Many inquire if holding the breath is to be commended? Theoretically, a very strong argument can be put forward deprecating the act. If it is held for, say, four or five seconds, while two or three movements are made, no harm can possibly be produced. You are compelled to hold your breath for a few moments in almost any kind of strenuous athletic work, such as lifting, or wrestling, or in any exercises where you are occasionally required to make a supreme effort. For instance, when lifting a heavy weight, all the muscles are flexed, and it is difficult and unnatural to breathe at the

moment. A swimmer is compelled to hold his breath while diving, and even in ordinary swimming, where the head is kept above water, he is compelled to breathe only at certain intervals. Pearl divers are said to be as fine specimens of physical manhood as can be seen anywhere, and they can easily hold their breath from four to five minutes.

One of the healthiest and best preserved fifty-year-old men I ever saw, claimed that he cured himself of consumption when past the age of twenty by counting when walking in the open air, how many steps he could take while holding his breath. He stated that he finally developed such remarkable powers in this way that he could easily walk an ordinary city block without breathing. Although he was fifty years of age, he did not look to be over thirty-five. He was engaged in the banking business and in this capacity had to discharge exacting duties.

I do not advocate the habit of holding the breath to the extent described in this case, but I believe that while making special movements that bring into play the chest muscles, a deep, full breath retained for a few moments will tend to force the air into every cell of the lungs, and thereby expand the chest and be of general benefit.

Showing the natural position of the body in the region of the chest and abdomen after breath is exhaled.

Showing the position of the body after normal inhalation. Compare pictures carefully and you will notice that the principal expansion takes place at and above the waist line. These photos indicate the normal movement of external walls of abdomen and chest in proper breathing. Study this carefully and learn how to breathe properly

CHAPTER XIV.

DEEP BREATHING EXERCISES.

AIR STARVATION—CONSUMPTION IN A GREAT MANY INSTANCES CAUSED BY LACK OF PURE AIR—FRESH AIR TREATMENT FOR CONSUMPTION—INVALIDS DEPRIVED OF FRESH AIR—ABSOLUTE NECESSITY OF DEEP BREATHING—PROPER METHODS OF BREATHING PLAINLY ILLUSTRATED.

"The Japanese eat fresh air with even more gusto than they do food. The *samurai* of old, rose in the morning to pass out into the open air, there to take a number of deep breaths. The time of the morning chosen was just as the sun was coming up."—*H. Irving Hancock,* in "Japanese Physical Training."

Think, for a moment, of the diseases that are caused by air starvation—by absolute starving for the want of pure air. Look at that terrible disease, consumption. I believe that consumption is largely caused by persons breathing foul and poisonous air. And all through its phases, from its beginning to death, it is aided and abetted by the breathing of bad air.

The blood, in order to be purified, must be supplied with oxygen. This cannot be done unless you have pure air. The members of the medical profession in New York, through the medium of their principal society, have made an announcement that pleases me most heartily. They state that no drugs or medicines of any kind can cure consumption—the very

statement that I have been making in my magazine ever since its inception — and I believe the time is not far distant when every medical society in this country will make almost the same assertion in reference to practically every disease. Furthermore, the society I have quoted stated that air in unlimited quantities, with proper exercise and a proper diet, were the only means that could cure consumption. The fresh air treatment is practically the only treatment for consumption that is accomplishing anything of special value at the present time. It is being adopted all over the country. Thousands of poor consumptive victims are being cured by living and sleeping in the open air.

And do not forget that an invalid always needs much more thorough ventilation than does the healthy person. Yet if you go into the bed-chamber or the living-rooms of the average sick person you will find, in many cases, that the windows are tightly closed. The sufferer seems to be afraid of air, fresh air, and doctors will buy oxygen by the cylinder and make the patient inhale it when they could just as well have opened the windows and secured this vigor-building element from the outdoor air.

I remember the first night I slept out-of-doors. It was in the winter a number of years ago. I was

about forty miles north of New York City. During the night it snowed two or three inches, but I did not know it until morning. The most pleasing experience about sleeping in the open is that you awaken in an instant, feel rested, and ready for your work. The outdoor air seems to afford you better rest. You not only breathe fresh air, but it gives you pleasure to be able to look up and see the sky above you.

I do not advise that one begin exposure of this kind without preparation. Slowly inure yourself to sleeping under the sky canopy.

I do not know what I would not give, what sacrifice I would not make, if I could impress upon every living member of humanity, the absolute imperativeness of deep breathing. One who has learned to breathe properly, marvels that any human being can be found who will ignore in the least the importance of this far-reaching aid to physical development. *Take my word for it, if you will, that life takes on a wholly new and vastly brighter aspect once you have become possessed of the habit of breathing deeply the purest air that you can find.*

I do not know how to say more on this immensely important subject. I would write added pages and pages if I felt that they would be of use in convincing my readers, that the kind of breathing usually prac-

ticed to-day is harmful to health in the highest degree, and that physical salvation can and must result from breathing in the right way.

Ever since I first began writing on physical culture, I have tried unceasingly to emphasize in the strongest possible manner, the great importance of learning how to breathe properly, and the value of acquiring a habit while in the open air, of frequently inhaling deep, full breaths. It is impossible to impress too strongly upon the physical culture student the necessity of so doing. If you are breathing improperly you cannot expect rewards of any consequence in physical development.

And when I speak of deep breathing, I mean literally deep breathing. That is, I mean that the air should be brought down into the lowest parts of the lungs. The movement should be in the abdominal region, as shown in the illustrations in another chapter. There is no need of any movement of note in the bony framework of the chest walls. This part of the body was not made to expand, unless a very deep, full breath is inhaled.

But when one breathes in the superficial way, that is, breathes from the upper chest, as most corseted young women do, the lower part of the lungs will remain unused. The air stagnates there, and thus

hardly half of the lungs are given the action required for the perfect performance of their functional processes. No one can breathe in a shallow manner from the upper part of the chest only and possess perfect health.

When breathing properly, every one of the minute cells of the lungs is inflated to its fullest extent. The bulk of the impurities gathered up by the blood as it circulates through the body is eliminated through the lungs.

It is needless to emphasize the value of pure blood. Every reader of this volume thoroughly realizes its importance. Every part of the body, the bones, nerves, tissues, are first created and then maintained in strength and health by the blood. If this blood is pure, and rich in those elements essential to the building of a vigorous condition, the functional processes of the body will be properly performed.

Let me also again warn my readers against the baneful habit, recommended by many athletes, of holding the abdomen drawn in as far as possible at all times in walking or standing. This is unnatural and injurious. It interferes with the digestive process, as well as with free and natural breathing. The abdominal wall should be relaxed and allowed perfect freedom to expand and contract with the downward

and upward movements of the diaphragm essential to proper breathing.

In filling the lungs to their greatest capacity while taking breathing exercises, it is always well to first force out all the air you possibly can, and this requires you to draw in the abdomen as far as possible, but, under ordinary circumstances, the abdominal wall should not be made tense and rigid, or held in.

There is one breathing exercise illustrated in this chapter that can be practised with great benefit, and can be combined with the full expansion of the lungs, the necessity for which I once more desire to emphasize.

Exhale all the breath that you can, drawing in the abdomen and forcing out as much air as possible. Make two or three attempts to force out still more and then begin to inhale. (See next photo.)

Draw in all the air you possibly can, expanding first in the region of the abdomen, drawing back the shoulders as shown in the illustration. You will frequently see athletes inhale a full breath, drawing in abdomen at the same time, and attempt to force the chest out as much as possible. This is not the proper method of taking deep breathing exercise. The air should come to the lowest part of lungs, and this can be accomplished only when the principal expansion begins in the abdominal region.

CHAPTER XV.

THE USE OF LUNG TESTERS.

VARIOUS DEVICES THAT HAVE BEEN INVENTED—ALL POSSESS SOME MERIT—HOW AN INEXPENSIVE SPIROMETER CAN BE MADE AT HOME—TWO HOME-MADE SPIROMETERS ILLUSTRATED.

"When I was born I drew in the common air, and fell upon the earth, which is of like nature."— *Wisdom of Solomon.*

Most men and women of to-day know but little about breathing. They breathe in an automatic and indifferent manner, just as they perform many other of life's duties.

There is a joy, an exhilaration in breathing unlike any other of the joys of life. To learn how to breathe, is to get the best that there is in life. A happy man or woman always breathes naturally. Full, deep breaths and happiness are closely connected. The blood must be purified of all those foreign elements which dull and deaden the body, if one expects to enjoy that degree of health which is essential to happiness.

Deep breathing means that every part of the lungs is brought into active use, every air cell is assisting in the process of cleansing the blood of impurities.

Shallow breathing means that only the upper part of the lungs is being actively used. Those who breathe indifferently only half live. They cannot wholly live, for they only live in proportion to the air cells of the lungs that are being used by them.

Various devices have been invented for the purpose of measuring lung capacity, and for developing the strength of the organs. About the only advantage that they possess in common is, that one becomes more interested in adding to the capacity of the lungs. Apparatus of any kind serves but little purpose beyond enabling you to test your actual improvement day by day.

An abnormal lung capacity does not possess any advantages. In fact, you can over-exercise the lungs, just as you can over-exercise the muscles of the arms. I knew an athlete on one occasion, who made such extraordinary endeavors of this character that he seriously stretched or strained the tissue of the lungs. Years ago, when I first became interested in the study of breathing, I practised the exercises in such an enthusiastic manner that I slightly injured the lung tissues, though an entire avoidance of the exercises for a time enabled me to completely recover.

It should be remembered that there is very little

danger of results of this nature. One must indeed be abnormally enthusiastic to thus harm himself.

The best time to take breathing exercises is while walking in the open air. The active exercise naturally induces a certain amount of full, deep breathing and it is then much less difficult to draw in a copious natural breath.

Though the first device herein presented can be used for breathing exercises, it should always be used out-of-doors, or else in a very thoroughly ventilated room. It accomplishes its intended purpose when it induces you to practice deep breathing, and is used simply as a means of measuring your improvement from time to time.

The following articles are required to make the first device illustrated. If your lung capacity is large, secure two bottles of one and one-half or two gallons in size. If your lung capacity is very moderate, a gallon bottle will do. A piece of rubber tubing, five feet in length, with an opening of about one-quarter of an inch. A large rubber tube, about eighteen inches or two feet in length, capable of stretching over the necks of the bottles. A slip of white cloth or surgeon's adhesive plaster for pasting on the outside of the upper bottle to provide a means of measurement.

After having secured the above articles, take one of the bottles to a glazier and have the bottom part of it cut off, or else cut a hole of sufficient size to admit the small tubing. Now take the two bottles and fasten them on the wall as shown in second illustration, tacking a strap around the neck, and around the upper part of each bottle. The bottle with the hole in the bottom should be placed at the top. Next place one end of a large piece of hose over the neck of the lower bottle. Now force the small hose in through the free end of the large hose until it reaches the upper end of the lower inverted bottle. Then pass the small hose up through the neck of the upper bottle, and force the large hose over the neck. The device should then look

ILLUSTRATION No. 1. Secure two bottles from one to two gallons in size, according to the capacity of your lungs.

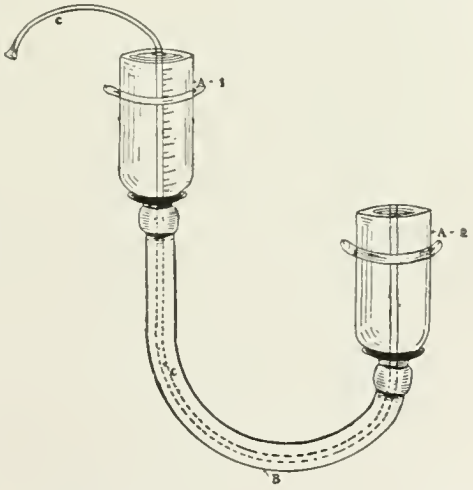


ILLUSTRATION No. 2. A 1 and A 2 large bottles. B, large rubber tubing. C, narrow rubber tubing into which the air is blown. Line drawing of the lung tester, dotted lines showing how the inner tube extends from the top of the lower bottle down through the large tube and out the upper bottle.

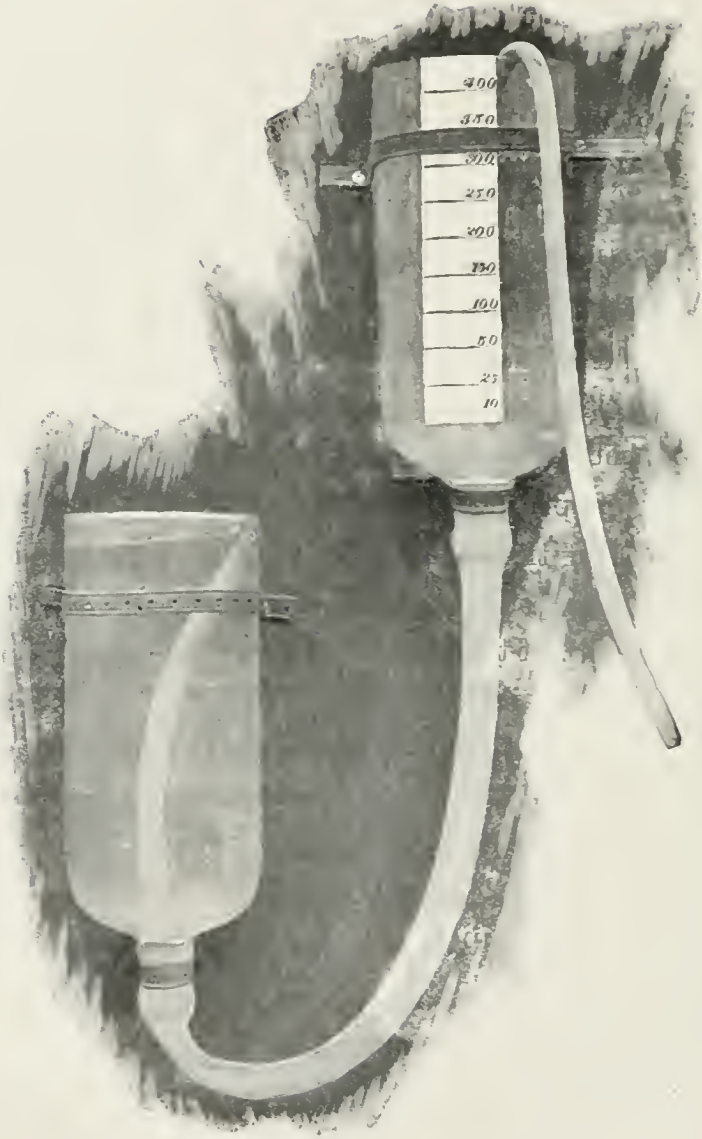


ILLUSTRATION No. 3. As one of the lung testers appears when ready for use.

something like the illustration. After pouring in water until it has reached the full swell of the upper bottle, you are ready to mark down the measurement in cubic inches. Be sure that the water reaches the bottom of the slip of cloth or paper which you have pasted on the bottle for marking.

If you have any way of weighing the water, it is an easy matter to ascertain the number of pounds contained in the bottle and then placing the total number of cubic inches up at the top; after which, you can divide it as often as you please. But if this method can not be used put down your figures as follows: A quart of water contains 57.6 cubic inches. Pour a quart of water in the bottle and mark down on your measure at the point which the water reaches 57.6. Put in another quart and mark 115.2; another quart, marking 172.8, and continue on in this manner. Of course, each quart can be divided into halves and quarters and tenths, if desired, that you may get the exact number of cubic inches you are able to blow.

After having completed your measurement data, remove from the bottle the exact amount of water poured in for measuring purposes. Now fully fill the lungs, and with one breath blow slowly all that you can into the small tubing. The water will be gradually forced upward into the upper bottle and

the number of cubic inches noted on the measure will give you the amount of air that you can expel from your lungs.

In order to secure a perfect spirometer, all you need is to invent some method that will enable you to measure the quantity of air that you expel. In making the second device here illustrated, provide yourself with two large tin cans that will hold from a gallon and a half to two gallons. One should be less in diameter than the other, and the narrow can should fit snugly within the other. The narrow can should be open at one end and closed at the other. At the closed end should be a little opening with a thin spout, as shown in illustration No. 4. These cans or buckets can sometimes be bought at a hardware store, but any tinsmith will make them for a very small sum of money.

If your lung capacity is large, the cans should be made to hold from a gallon and a half to two gallons. If small, cans of a gallon or a little more will be sufficiently large.

Illustration No. 4 shows the two cans necessary to make the apparatus. The can on the right is of the lesser diameter and shows the small spout attached. To complete your device, purchase two or three feet of small rubber tubing that will fit

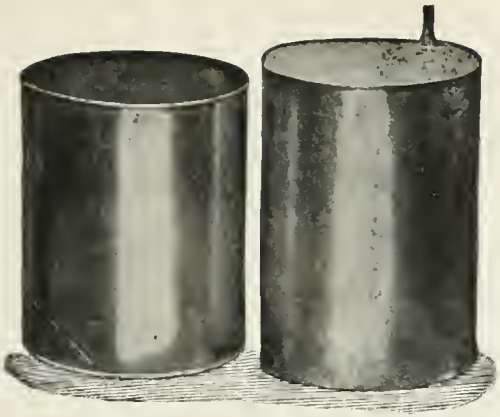


ILLUSTRATION No. 4. Showing the two tin cans that are needed to make the rung tester, the taller can being slightly less in diameter than the other, and containing one open end and one closed end, being supplied with tin spout as shown. The can with the larger diameter has one closed and one open end.

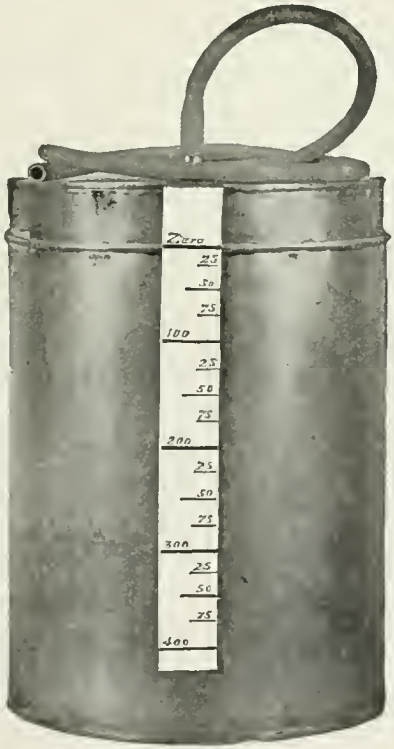


ILLUSTRATION No. 5. Showing the device ready for use, with measuring rule.

tightly over the spout. Now fill the can of the larger diameter about three-quarters full of water. Place the can with the spout to which the rubber tubing is attached, inside of the larger can. You will then have a device such as appears in illustration No. 5, which shows the lung tester ready for use, with a rubber tube coiled on top of the can. You will notice, however, that this lung tester in illustration No. 5 is provided with a measuring rule. If you have no method of measuring such as is described in the foregoing, you can provide your spirometer with a measuring device in the following manner:

Procure some surgeon's adhesive tape, or some thickly woven white cloth on which you can use a pen. Now paste this cloth or tape around a narrow piece of cardboard of nearly the entire length of the taller can, such as is here shown in the illustration No. 5. This cloth should be slightly longer than the smaller piece of cardboard around which it is pasted. The free end of this cloth should be fastened with glue, or in some other way tightly secured to the top of the can with the spout, as is shown in the illustration. You are thus provided with a measuring rule which will rise and fall with the can attached to the tube, as the air is blown in or escapes from the can.

Now, if you have no method of measuring the num-

ber of cubic inches contained in the inner can, you can arrange your measuring rule in the following manner: Place the taller can in which the nozzle or spout is fastened upside down on a table. Be careful to let the nozzle extend over the edge of the table, stop it up and pour in water to the depth of about half an inch. Secure a quart measure that is absolutely accurate. Now place a long slip of stiff paper on the inside of the can containing the water, extending from the bottom to the top. Just at the top of the water make a mark on this paper with a lead pencil. Next carefully pour a quart of water into the can. Then, with lead pencil, mark on the paper the exact point where the water comes after having poured in a full quart. There are, as said, 57.6 cubic inches in a quart of water. You will thus be able to place at this line the figures 57.6. Put in an-

ILLUSTRATION No. 6. Showing the device in use. Upper can has been blown up to limit.

other quart and mark down twice 57.6, equalling 115.2, add still another and mark it three times 57.6, equalling 172.8. Continue until your can is very nearly full.

Next take out your paper and transfer this data to your measuring rule. For instance, turn the paper upside down, placing the first mark you have made at the top of the larger can where we have zero in illustration No. 5. Your next line would record 57.6. Now, if you will pick up the rubber tube and blow into the can until it so raises that the line recording 57.6 has reached the top of the lower can, you will then have blown 57.6 cubic inches of air into the device.

Now you can take your rule and subdivide the spaces originally marked off as often as you choose. Between each line you can make from four to ten divisions if you desire. This is especially necessary as you reach the larger numbers, in order to accurately indicate the amount of air exhaled.

CHAPTER XVI.

BREATHING AND MUSCULAR EXERCISES COMBINED.

DEEP REGULAR BREATHING NECESSARY IN MUSCULAR EXERCISE—LESS FATIGUE IN MUSCULAR EXERTION—EXERCISES TEAR DOWN OLD TISSUE AND DEAD CELLS—DEMAND FOR OXYGEN TO REBUILD AND REPAIR—SOME COMBINED BREATHING AND MUSCULAR EXERCISES ILLUSTRATED.

Do not for a moment suppose that deep breathing is to be practiced only as a brief spell of exercise each day. Breathe deeply all the time, for the more you do so, the longer you will live and the better will be the health that you will enjoy.

Still, it is during the use of specific exercises that one naturally pays the most attention to the subject of deep breathing. At such times, the mind is concentrated on the subject through the medium of the work.

The first thing that you ought to do when rising in the morning is to go to an open window — or, best of all, right out-of-doors — and there take in a great number of full, deep respirations.

It is possible, and not only that but necessary, to combine deep breathing with all muscular exercise. When you begin such exercise, be sure to assume a

correct standing position, with chin well up and the chest given every opportunity to expand, and breathe deeply and regularly for at least three full minutes. Do not slight this way of beginning your muscular exercise. Do not get any notion into your head that it is unnecessary. *It is highly necessary.* Deep breathing as a preliminary, wonderfully increases the value of the time devoted to muscular work. Also pay heed to your work, in order that you may go through all of the movements with vim, accuracy and precision, but at the same time remember to *keep on breathing deeply* all the time that the muscles are being brought into play.

As often as you stop the muscular work, remember to continue the deep breathing. Your fatigue will disappear the more quickly if you do this. And always bear in mind that the active employment of the muscles creates a demand for more oxygen in the blood.

Then too, an increase in the respirations supplies the blood with more oxygen to consume the used-up cells; quickened action of the heart hurries the blood on its building-up of tissue mission through the body. Also the living and healthy cells absorb much oxygen from the blood and thrive on it.

As has been repeatedly said, it is important to

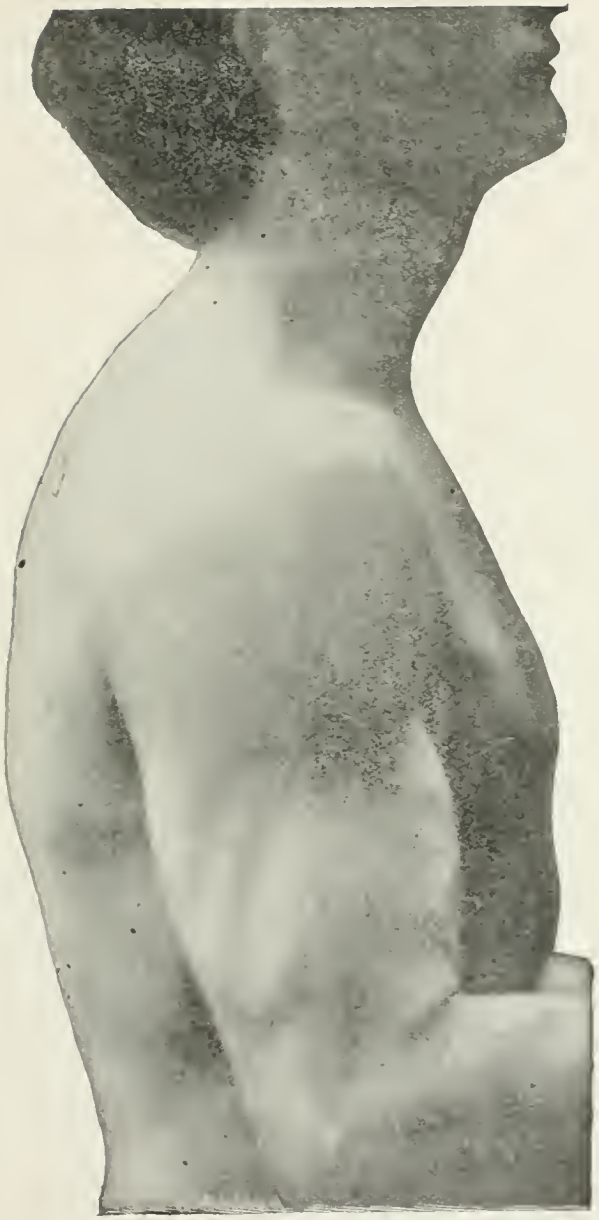
stand at an open window or out-of-doors and begin and finish your exercises with the deepest and fullest breathing that you possibly can. If the movements have been at all energetic, there is an abundance of tissue in the body that needs building-up or removal, and the great inrush of oxygen carries on this vital work swiftly. If you are in a perspiration and intend to bathe, it is an excellent idea to breathe deeply and cool off somewhat before you come in contact with the water.

A final word of caution under this head:

Never become so absorbed in your muscular work that you forget to do it to the constant accompaniment of full, regular, deep breathing!

Several exercises are included in this chapter that will be found valuable if combined with full deep breathing, though every exercise is most beneficial when so combined.

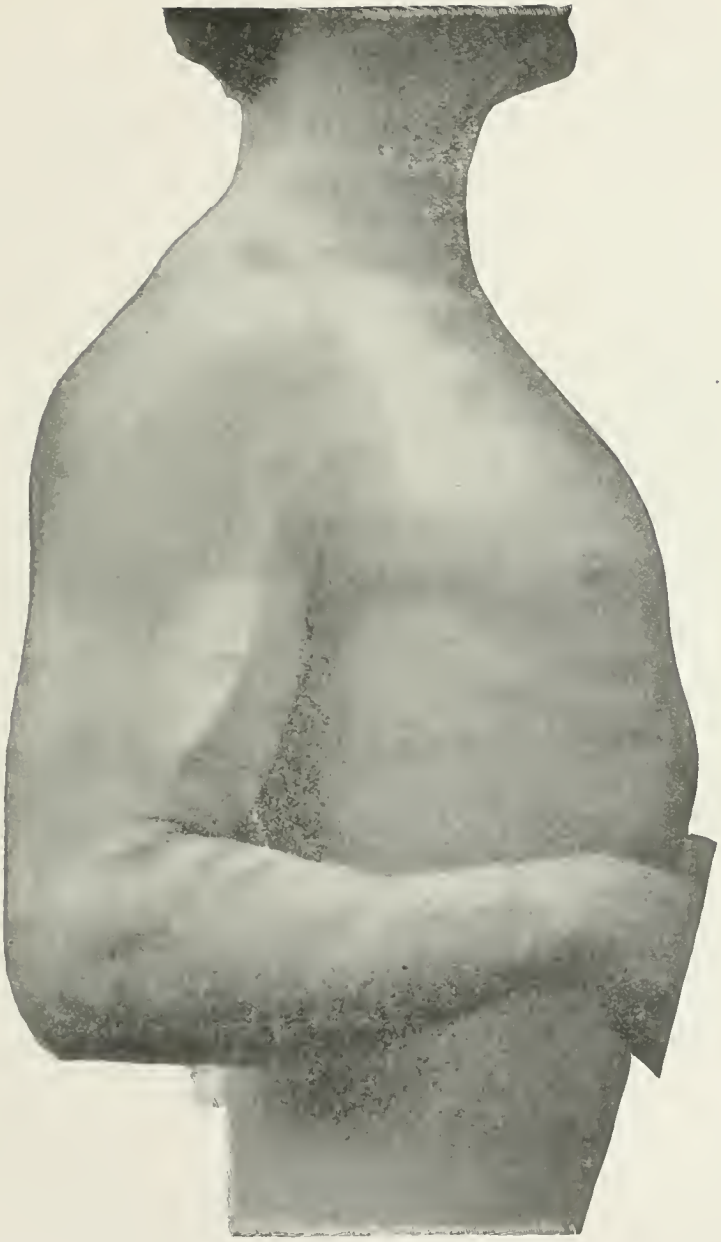
Exercise 1. Bring the shoulders as far forward as you can, as shown in the illustration. After bringing them as far forward as possible, make two or three attempts to force them still further forward. Inhale deeply and fully at frequent intervals while taking this exercise. Always continue until the muscles tire. This is for the pectoralis or breast muscles, and to assist in expanding chest.



Exercise 2. Bring the shoulders as far back as you possibly can, as shown in illustration. Make two or three attempts to bring them still further back. Inhale deeply and fully at frequent intervals while taking this exercise. Always continue the exercise until the muscles tire.

In correcting round shoulders especial attention should be given to developing the muscles of the back between the shoulders, and if bothered with this unsightly deformity this exercise should be taken at least two or three times per day, each time thoroughly tiring the muscles.

Exercise 3. Bring the shoulders far forward, as shown in Exercise 1, and then far back as you can, as shown in illustration.



Exercise 4. Bring hands in front of you on level with stomach. Now form second finger of each hand like a hook. Then, hooking one finger into the other, bring hands upward slowly to position illustrated in opposite photograph, all the time endeavoring to loosen fingers by pulling outward vigorously. From this position try to get hands as far back of head as possible, still continuing efforts to loosen fingers.

Inhale a full, deep breath as the arms go back, exhale as they come forward. Repeat the same exercise with each finger of the hands. This will assist in expanding the chest and enable you to secure a grip like steel.

CHAPTER XVII.

SUN AND AIR BATHS VITALIZE BODY.

THE AIR BATH AND ITS VALUE—SKIN A BREATHING ORGAN—DEMANDS AIR SAME AS LUNGS—ALSO IMPORTANT ELIMINATING ORGAN—BREATHES OUT IMPURITIES—EXHILARATING EFFECT OF BATH—A GUARANTEE AGAINST COLDS AND COUGHS.

Did you ever take an air or sun bath?

There are many people who have devoted much time to their physical training, and who are yet strangers to this luxury.

An air bath is a tonic beyond the conception of those who have not indulged in one. By an air bath I don't mean an accidental one of a few moments' duration. I mean a good, long, deliberate bath of air taken under the most favorable conditions. You are aware, now, why the internal tissues need the life-giving oxygen of the air, but have you ever thought that the skin needs it also? *The skin requires air just as much as the lungs do.* Nor can the body as a whole, develop its fullest amount of vitality until you acquire the habit of giving the skin its ablutions of air regularly, freely and ungrudgingly.

Doubtless there are many of my readers who will

wonder just how the skin should be given an air bath. The directions are simple enough.

First of all, select a spot where there is sure to be a good supply of the purest air obtainable. If you take the bath in-doors have the windows wide open. Of course, in the coldest weather you must use your judgment as to just how far to open the windows. If you can be comfortable while taking an air bath with the windows wide open at zero temperature, so much more will your health be benefited.

Take off every article of clothing. Don't retain the smallest kind of a garment, for if you do, you are getting but a partial air bath. Partial air baths give but partial benefits.

If the temperature is mild enough, and you don't care to take some active exercise, sit down and read. If there is any task about the room that you would like to perform, do it. The bath will go on while you are attending to other things. Two enthusiastic friends can even play cards, checkers, chess, or some similar game, and all the while the body is benefiting greatly and grandly by the bath.

One of the best times for taking the air bath is while going through forms of muscular exercise, and while resting between them. Thus the air bath can be combined with muscular work and deep breathing.

The torpor engendered by sleep is dissipated without shock, every organ is aroused and prepared for its work if the air bath is taken immediately after rising. It is a valuable means of hardening the constitution without the least danger to the individual.

As to the proper length of an air bath, half an hour is a very moderate duration, unless the air that comes into the room be unusually crisp and keen. A bath of this character can not last too long; you will be richly repaid if they are considerably extended. And do not seek to limit the number of such baths.

Take one as often as you can; two or three every day will do you no harm. In addition to the bath in the morning, it is a first-class plan to acquire the habit of taking one whenever you are reading, or moving about the room.

Air baths out-of-doors, either in the day or at night, soon become a positive luxury if you happen to be so situated that you can indulge in them. Those of my readers who are camping in lonely spots, or who are living on farms where it is possible to roam about without clothing, can experience a new source of delight and increased health.

The good that the air bath does is two-fold. It must be remembered that the skin is one of the eliminating organs of the body, for at all times vapor is

passing through the pores. Sometimes this vapor is condensed, as in perspiration. This vapor or moisture is laden with rank impurities that cause serious harm if allowed to remain or be re-absorbed into the body. In the coldest weather of winter, as well as in the hottest days of summer, this vapor is leaving the body. The only difference in this respect between winter and summer is in the quantity of vapor that is thus passed. The beneficent quality of the air bath is due to its evaporating the exuding impurities which otherwise, would clog the pores of the skin and so induce a variety of maladies.

When the air bath is taken, there is no hampering clothing in the way to hinder the needed work of evaporation.

Air baths have a wonderful value, too, in inuring the skin to exposure. The devotee of such baths will find himself in very little danger of taking cold; and the last vestige of his foolish dread of draughts will disappear. He will instead, learn to welcome draughts of cool air, and will reap from them the utmost benefit.

Baths of this character will not only strengthen the skin but are invaluable in nervous troubles of every type. They so invigorate the entire nervous system

that a cure for nervousness is secured in a very short time by their adoption.

But little attention has been paid, heretofore, to the immense value of the action of the sun's rays when coming into direct contact with the body. Put a plant in the dark, or smother it with some covering so that the sun cannot reach it, and it will at once begin to wither and die. And yet, we human beings swathe ourselves in clothes through which the sun can never reach our bodies. The wonder of it is that we can develop into men and women under such artificial conditions. The average boy or girl who grows up in the city generally has a pale, waxen appearance. The vital power, the vim and action that characterizes the ambitious country boy who, through sheer virility, pushes his way upward, is wanting in many of the city children. To a great extent the town boy's condition is due to a lack of strength-imparting sunshine.

The value of the sun's rays as a curative agent in nervous troubles is becoming recognized now more and more by leading medical authorities throughout the country. Almost every large hospital and sanitarium has installed commodious quarters where patients may take this healing bath during certain hours of the day.

A sun bath can be taken in the same manner as that

advised for an air bath. In fact, the greatest amount of good is derived when the two life-giving baths are taken at one and the same time. A sun bath, however, should not last more than fifteen minutes in the beginning. The skin is apt to become burned, causing a considerable amount of discomfort. Accustom yourself gradually to the effects of the rays of the sun and, with the added habit of taking air baths, you will soon be the possessor of a well-tanned, healthy looking skin, strong enough to endure any change or condition of weather.

CHAPTER XVIII.

THE DEPURATING AND BLOOD PURIFYING ORGANS.

IMPORTANCE OF THE SKIN, KIDNEYS, LOWER BOWEL AND LUNGS—THE PART THEY PLAY IN CARRYING OFF WASTE PRODUCTS—PURE BLOOD DEPENDS UPON PERFECT WORKING OF THE FUNCTIONAL PROCESSES.

It is a curious but necessary provision of Nature, that the blood, besides carrying the digested nourishment and the life-giving oxygen to all portions of the body, also removes all of the waste, poisonous products from the system. And from the very nature of our physical organization, the blood is the only agent that can be employed in this dual capacity.

It has been explained in Chapter IV. how the blood is revitalized by the addition of digested nourishment —in other words, how the blood is made over again.

It must be understood, of course, that each of the organs has a circulatory system of its own. Now, impure blood is brought into the kidneys through a channel known as the renal artery. This artery subdivides, and the subdivision is carried on and on, until every portion of the kidneys is supplied with arterial blood. From the branches of the arteries the blood passes into capillaries, which are the minute

channels that exist between arteries and veins. But in the kidneys, instead of a single there is a double system of capillaries. These capillaries exist in numerous plexuses or net-works, and before the blood can pass into the renal vein, it must flow through the capillary membranes and thus on through the entire and complicated system of these minute vessels.

Now the blood contains a surplus of water, and in solution, many waste matters, the most important of which is a substance called urea. While passing through the capillaries the blood is filtered; the surplus water and the solids that it holds in solution are absorbed through the thin membranes, and are passed on to the ureters, while the blood thus purified, enters the roots of the venous system that empties into the renal vein. In this manner, the blood that has been ridded of its waste products is returned to the general circulation.

The ureter is a tube that carries the urine — the surplus water and its dissolved waste products — down to the urinary bladder, where it is stored until ejected from the latter.

Yet not all of the surplus moisture can be carried off by the kidneys. The skin has its share to do. If the skin be not active in its work of excreting surplus moisture then that much more is forced upon the

kidneys, and the latter organs, when overworked, become weakened and diseased.

The skin has three purposes. It protects the delicate tissues of the outer surfaces of the body; it acts as an organ of sense (touch) and it excretes moisture. It is with this last of its functions that we have now to do.

There are, in reality, two skins, the inner, or true skin, and the outer skin, or epidermis. The true skin is highly sensitive, and is richly supplied with blood vessels and with nerves, is highly active at all times, and requires incessant repair of its tissues by the blood. In it there are two kinds of glands, the sweat glands and the sebaceous. It is in the sebaceous glands that the hair has its origin.

Closely in touch with the blood vessels everywhere in the true skin, are the sweat glands. From these the surplus moisture and its dissolved impurities are filtered and absorbed. As they fill with this waste moisture and its dissolved contents, they empty themselves upon the outer surface of the epidermis.

Under ordinary circumstances this moisture is not visible, and is then called insensible perspiration. But when, on account of unusual muscular exertion or increase of external or internal heat the sweat glands are very actively worked, the perspiration

exudes in visible drops. In either case the perspiration is evaporated and removed by the air, and thus, the depurating work that the kidneys did not do, is performed by the skin.

It is clear, then, why exercise and deep breathing, by hastening the flow of the blood and sending more oxygen through the body to assist in the removal of waste matter, aid in getting rid of impurities through the urine and the sweat.

As has been explained in Chapter IV. a great deal of the waste matter of the body is exhaled from the lungs every time that an expiration takes place.

But what of the waste matter left after the food has been digested, and what of the food swallowed but not digested? In Chapter IV. we have followed the course of the food through the stomach and the small intestine. By the time that the food is out of the small intestine the nourishment has been pretty thoroughly extracted from it. From the small intestine the food residue is passed into the large intestine, or colon, often known as the lower bowel. This intestine is divided, for convenience of description, into three parts, the ascending, the transverse and the descending colon. The shape of the colon is something like that of a horseshoe, with the arch, or transverse colon uppermost. All the way along the colon the

food residue is forced or passed on, by the continued contractions of the involuntary muscles of the intestine. Whether or no a small amount of digestion takes place in the colon is a question that physiologists have not yet decided. But the food residue, in the form of fæces, passes on until, from the lower end of the descending colon, it is expelled through the rectum.

As in the case of the kidneys and the skin, exercise aids in the expulsion of waste matter through the colon. But exercises that strongly affect the abdominal region, build up the strength of the involuntary muscles of the colon, and thus aid in the expulsion of waste by this channel.

It is to be borne in mind, always, that, as has been shown, the expulsion of waste matters through the depurating organs is identical with the purification of the blood. For this reason, the liver, having a circulatory system of its own, is, outside of its other important duties, a depurating organ of no mean rank.

It is a truism that it would be utter folly to consider vital power apart from the possession of a high state of functional vigor.

The value of the latter to human life cannot be overestimated. External muscular strength and

vigor are useful and are worth far more than the efforts essential to acquire it. It serves to beautify the body and invest it with the power of moving quickly, gracefully and easily. It enables you to perform wonderful feats of strength and agility. But this *external* strength is really of minor value when compared with *internal vital strength,* though the development of the former in nearly all cases assists in building up the latter. Therefore, true physical culture first of all, gives attention to increasing the powers of those great vital organs which control the functional process that build and maintain life, health and strength.

Your arms and legs which contain a large portion of external muscular strength can be amputated and you will still live, but remove any one of the vital organs and death will quickly ensue.

This very emphatically illustrates to you the value of strength in these organs. They are necessary to your existence. You need them every instant of your life.

The end of the important vital functions which they perform is the maintenance of bodily health in a satisfactory condition. Weak vital organs always mean poor health. As a rule when strength of the external muscular system is possessed, the internal

organs are strong to a similar degree. This however does not necessarily follow in every case. If you were to develop certain parts of the body and allow other parts to become weak from inaction, it would not follow that the vital organs would become stronger.

Poorly developed and weak external muscles may, in some instances, cause some amount of suffering, but your experiences in this respect would be of small importance compared to what you would have to endure if the vital centers were afflicted with similar weakness.

Let us distinctly remember that every process of the body which tends to keep you in a normal condition, which is inclined to make your spirits buoyant or your mind clear, depends entirely upon the harmonious working of the internal functional system, and this cannot be obtained until every organ possesses normal strength.

For instance, let us take the stomach, the organ in which the blood-making process first begins. Many thousands of human beings suffer daily martyrdom because of chronic weakness of the stomach. Famous physicians have remarked that nearly all disease begins in the stomach.

Now, going into this process of blood-making, we

find that the absorbent glands perform important offices. These glands are freely supplied to the wall of the stomach, and in fact to the entire alimentary canal. They take up from the food the elements of nourishment which the body needs to repair its constant waste.

I have no intention of worrying my reader with unnecessary detail in reference to the physiological processes connected with the making of blood. This is a study in itself, and to those who may desire a further familiarity with them, I would advise the reading of some standard work on physiology. I merely mention these few facts in connection with blood-making in order to assist in impressing on you the great importance of internal functional vigor.

Now, after the liquid which is later to be made into blood is taken up by the absorbent glands, the next important organ which receives it is the heart which works continually from birth until death. The importance of strength and the disastrous results of weakness in this organ will therefore be made manifest. And the heart is the prime factor in the scheme of blood circulation.

This very brief description of the process of blood-making and circulation should assist in indicating the vast importance of internal functional strength.

The stomach and all the important organs located in the vital centers must be vigorous, must possess normal strength, or severe suffering will ensue.

Fine rich blood, free from impurities, is necessary to the strength of every organ of the body. It is to the body that which food is to the stomach. It furnishes those elements essential in repairing waste, in replacing dead, worn-out tissue. It also furnishes the means by which this worn-out tissue is brought to the depurating organs to be expelled. Every minute cell that composes your body, is made from blood. Can anything more emphatically prove the necessity for having your blood as pure as possible?

CHAPTER XIX.

CLOTHING.

PERVERTED IDEAS IN REGARD TO CLOTHING—DRESS FOR COMFORT—MINIMUM OF CLOTHING DESIRABLE AT ALL TIMES—COLD BENEFICIAL—AIR MUST REACH SKIN—MY OWN EXPERIENCE.

On few subjects do more fallacious ideas exist than on that of clothing. The tendency during the past fifty years was toward the wearing of wool garments next to the skin. As the heat of summer came on many sensible people discarded woollen underwear, but a great many more who thought themselves very wise indeed, merely shed the heavy flannels of winter for lighter woollen wear and prided themselves on their so doing.

But with the first touch of frost in the fall air, every man and woman resumed the heavy flannels, nor were these put off again until the following summer.

Nowadays, nearly all of us have heard that wool should never be worn next to the skin, and a good many of us are fortunate enough to believe it. But even to-day there is a tendency to dress too warmly.

The truth is that a minimum of clothing is desir-

able at all times. In the coldest weather one should wear but just enough clothing to insure the possession of a reasonable degree of animal heat. This does not mean that we should be quite warm; far from it. Write the following down as a golden rule of health:

Cold is beneficial, provided that its use is never carried to extremes. Do not freeze the body, but keep it cool. Let the air get at the surface of the skin. In winter wear no more than enough clothing to maintain the ordinary degree of animal heat; in summer wear no more clothing than convention requires.

In summer and winter alike, make it a point to wear pure linen next to the skin. If you cannot afford this fabric, you will find that cotton is the most satisfactory substitute. Never wear wool — let the wise-acres warn you as they will of the foolhardiness of daring to go without heavy flannels. I often wonder how much of that spring "tired feeling" is due to the wearing of heavy flannels for month after month.

Have all your clothing so made that as much air as possible can reach the skin of all parts of the body. Don't be afraid of air — even of winter air. It is a life-saver, and a *cleanser*.

Wear thin cotton or lisle foot-gear — never wool or silk. Your hat should have some provision for ventilation, for the air should reach your scalp freely

if your hair is to be healthy. Go bare-footed in summer when you can. When you must use foot-covering in summer, acquire the sandal habit.

Be cautious about the wearing of an overcoat. A top-coat is preferable to a heavy ulster. There are many bright and comparatively warm days in winter when neither top-coat nor overcoat are needed. And when such a garment is not wanted, it is always better to do without it.

Make sure that there is always plenty of looseness and freedom at the neck. Men who wear high, tight collars, and women who permit themselves to fasten stocks about the throat, are denying themselves a certain amount of health that might easily be theirs if they would permit more air to get in at the tops of their upper garments. And the habit of covering the neck heavily and closely, is the cause of most of the scrawny necks that are such frequent and uncomely spectacles. The well-rounded, graceful neck belongs to the man or woman who does not exclude the air from it.

By way of experiment I have worn summer underclothing and outer clothing all through a winter, and without an overcoat of any kind — and was comfortable. I am aware that many people say: "Oh,

he is an athlete, and can do as he pleases with his health."

To such carpers my invariable answer is:

I transformed myself from a sickly boy into an athlete by a strict observance of all of the easily ascertained laws that govern true health. Just because I am strong and healthy, I do not knowingly violate any law that makes for health.

CHAPTER XX.

RESTFUL SLEEP POWERFUL MEANS OF BUILDING VITAL VIGOR.

PERFECT NOURISHMENT OF BODY TAKES PLACE DURING SLEEPING HOURS—ASSIMILATION GREATEST BEFORE MIDNIGHT—SUGGESTIONS ON HOW TO SLEEP RESTFULLY—CAUSE OF INSOMNIA—HOW TREATED AND CURED.

"Sleep, balmy sleep,
That knits up the raveled sleeve of care."
—Shakespeare.

One of the most certain means of restoring vitality that has been exhausted by excessive fatigue or by unusual drains on the system, the nerves or the mental faculties, is restful sleep. Good, sound slumber recuperates the body to a wonderful degree. At such times when all the bodily functions are in a quiescent state, the processes of assimilation take place best. It may be well to note that these processes perform their most effective work during the hours before midnight. After that, the circulation of the blood is not as good as before owing to the fact that the general vitality is lessened from thence on, until four or five o'clock in the morning. Oxygen is also consumed in larger quantities before the midnight hour. For those of my readers, then, who are desir-

ous of acquiring a large supply of vital power and a perfectly nourished body, it is recommended that they acquire a habit of going to bed early and obtain at least eight hours of sleep.

The statement that one can live longer without food than he can without rest, may be doubted by the average person. In one sense, sleep is really a food. It feeds or rather gives the body an opportunity to feed upon itself. It induces that thorough mental and physical relaxation which is really the means of renewing life, energy and power. You may go to bed with the pangs of hunger ever so acute, but during sleep they will nearly always disappear. In some mysterious manner that no physiologist has ever explained, the body finds food within itself. During the hours of rest, the functional processes have somehow renewed your energies and have added to your general strength. Absolute relaxation is necessary to proper recuperation. It must be admitted that many are unable to completely relax. Their nerves are always on "edge." There is a stiffness, a tenseness about them which, even during sleep, manifests itself by the manner in which they unconsciously grasp at the bed clothing. They awake to often find themselves lying rigid, every muscle and nerve in a tense condition. To rest properly, to woo the uncon-

sciousness of slumber, you must absolutely relax every muscle, every nerve, every voluntary power of the body. You must learn to "let go." Let the body hang limp and as nearly relaxed as possible. De-energize every part. This may require considerable time. You may not be able to acquire the habit in the first few attempts. It will take persistent endeavors. But do not despair, for you are bound to conquer in the end if your attempts are continuous.

Don't grip the bed clothes while endeavoring to sleep. Relax every part of the body absolutely.

Remember that it is impossible to rest if your nervous system is on a continuous jump, for after all, the nerves, more than the muscles, need rest. You should lie calm and peaceful with every part of the body entirely relaxed. If it seems difficult to acquire this attitude, take note of the following: Raise your arm and then suddenly let it fall unrestrained by any directing effort of your will. Raise both arms and allow them to fall in the like manner. Raise both legs and do likewise. After this, try and continue the feeling of "giving away," as far as all parts of your body are concerned.

There is a proper way to rest exactly as there is a proper way to exercise. Nature, of course, ordi-

narily teaches us all this through our instincts, but modern civilization often perverts our normal instincts and we must therefore cultivate habits that the wild animals practice without effort.

A bed is only a means to an end, and it is not so much the bed itself that we have to consider as the manner of sleeping in it. How to get the best rest, the most refreshing sleep; that is the great question. The good or ill effects of one's sleep depend very much upon the position taken and maintained during repose. Very few people assume a correct posture when sleeping, and a still less number have sufficient control of themselves to retain any position they choose during slumber. One need not have a bed at all, and yet may get a most comfortable sleep; while another, on a luxurious, downy cot, will awake with bones aching and in a tired condition. It will be evident then, that a position taken in sleep and maintained for hours may be either highly beneficial or absolutely harmful. We would not have so many short women and men if, when they were children, they had been taught to lie correctly in bed. It is during sleep that the growth of the individual takes place, not in the waking hours. It is vitally necessary then that every care and help shall be given Nature, to the end of securing straight, well-formed bodies.

A soft bed is enervating, not restful. The body sinks into the debilitating bedding while the circulation is interfered with and the skin is unable to throw off its impurities in a natural way, for it should be remembered that breathing is done through the pores as well as through the lungs. In such a bed in which the body sinks too deeply the tissues and muscles become flabby and weak, and the effect of any exercises that may have been taken during the day in the hope of building up the strength, are duly neutralized.

In the same way pillows are enervating, unhealthful and unrestful. The head sinks into the soft and smothering cushions; the breathing is thus rendered imperfect; the muscles of the neck are really strained instead of being rested. Yet, that is the position assumed by millions nightly. The flesh of the face, instead of being untouched and impassive through the night, is always half covered, and the pressure upon it even by the soft pillows throws it out of shape, and causes unnatural folds that in time form into wrinkles. As has been said, it is during sleep that Nature is building and the body is growing, or repair is going on. To assist this work there

When sleeping on your back use no pillow or else a very low one.

is nothing so good as a moderately hard bed with no pillows or very small ones.

It is custom that has given us the bolster and pillow. They are a legacy and an absurdity of bygone times, when people were less enlightened than they are supposed to be now, and when physical culture was not the popular study with high and low alike, that it is to-day. Customs die hard and, of course the elimination of these harmful sleeping appliances is a very slow one.

Physiologists are still unable to state positively whether the brain is congested or anæmic during sleep, but it has been conclusively demonstrated that the lower the head the deeper is the sleep; and the more it is raised, the lighter it is. A person sleeping in a sitting position is more easily awakened than one who is reclining.

It is urged by those accustomed to many pillows that they never could sleep without them; but it seems so to them simply because no determined effort is ever made to try the other method. Naturally, if one has used several pillows for years, it will take a persistent trial of some months to prove that doing without them is beneficial. Many, women especially, suffer from constant headaches which are due to high pillows. A number of instances have come

Illustration shows good position to assume in sleeping. Though if a brain worker, and head is inclined to be feverish, the warm hand will aggravate this condition and the position illustrated below will be preferable.

within my observation where pillows have been forbidden by the physician or very low ones made of corn-straw substituted for those of feathers or down, and the headaches have totally disappeared.

I do not by any means maintain that there is only one correct way of sleeping. There are several satisfactory positions and each reader can find out what is best for him after having absorbed certain principles applying to the subject. I have illustrated on this page two correct positions that my readers may find it of advantage to test.

Another good position to assume during sleep. Right arm behind, bent, and wrist under waist.

Compare the apparent ease where only the bolster is used with that of a sleeper whose head is buried in pillows. Any-

one wishing to try the experiment of abandoning pillows should do so by degrees. If accustomed to two pillows and bolster, as many are, begin by discarding one pillow only, or, if needs be, get one that is half the size. After a month or two put that away, and a little later use only the half pillow, until finally you come to the bolster alone. If that is too high, have a smaller one or discard it altogether, and simply have the mattress raised a trifle at the head of the bed.

Observe the ease of the position in which there are neither pillows nor bolster, and the mattress is given only a slight pitch upward at the head. The body is at perfect rest, fully extended and graceful; there is just sufficient "give" in the mattress for the shoulder. The one hand placed beneath the cheek helps to keep the body straight and comfortable. It is a question what to do with the arms in sleep, as everyone has found out perhaps. If one arm is deliberately lain upon, it is apt to stop the circulation, and to cause that sometimes painful sensation known as "pins and needles." When the arms are placed downward in front of the body, it is necessary to place the body in a very peculiar angle. It has been advised that the most restful position during sleep, that is, that in which one will be less disturbed by dreams and awake

most refreshed in the morning, is the opposite of that which has been maintained by the body for the greater part of the day. If a person while awake has been reaching upward a great deal, and so keeping the body extended to the full, it will be found that greater restfulness will be secured by taking a reverse position while in bed. There is then some excuse for doubling up the body a part of the time during sleep. Or, on the other hand, if one has been cramped up over a table or desk all the day, the greatest good will be obtained by extending the body to the full and lying as prone as possible. There are any number of niceties of posture to be taken, and each person must find out that which best suits his individual needs.

Theoretically one of the best positions for sleeping is lying on the right side, the arm under and back of you, or bend the arm at elbow with the wrist crossing the body under the waist.

Under ordinary circumstances one can usually sleep comfortably while reclining on the back; but no matter what position may be assumed, it is not desirable to cultivate the habit of sleeping only in that one position. It is necessary to change frequently to rest properly. A sound sleeper, resting comfortably, as a matter of fact, will change the position several times during the night without waking.

If you sleep on your back you should not use any pillow at all or else a very thin one of straw. If inclined to suffer from heart trouble, be careful not to sleep on the left side too much. This position sometimes has a tendency to aggravate this malady. Sleeping on the right side is also inclined to assist in the digestion of food as it places the pyloric opening of the stomach on the lower side of the body, and hence facilitates the passage of undigested food from the stomach to the intestines.

There is a tendency to right-sideness in most individuals. It is true that during sleep assimilation is most active. Circulation is equalized, the work of the vital organs is lessened, and it may be that this right side position is, considering everything, the best.

While on the subject of resting, it might not be out of place to call your attention to other matters that relate to it that will assist in bringing about the high degree of physical perfection, which, I take it for granted, each of my students is desirous of possessing.

On retiring at night it is well to arrange the windows so that proper ventilation may be secured. You must be plentifully supplied with fresh, pure air. If you are afraid of draughts, you must try and annihilate that superstition and cultivate the fresh air

habit. If not accustomed to sleeping with wide-open windows, do not adopt extreme measures at once. Gradually accustom yourself to breathing pure outside air that at all times should be allowed the freest access to your sleeping rooms. Remember that the more nearly you breathe what is practically the outside atmosphere, the faster you will be able to build physical health.

Do not cover too heavily while in bed. Use only sufficient covering to maintain warmth and no more. You can cover lightly on first retiring if you so desire, keeping other spreads near at hand, and, if during the night you feel cold, add more. I know many are inclined to use more than are essential to comfort in the first part of the evening, for fear of becoming cold before morning. This is a serious mistake. Use only that amount of bed clothes which is requisite to comfort at any time.

Do not breathe through your mouth. Mouth breathers usually snore and if you wish to break yourself of this disagreeable habit begin to cultivate breathing through the nose. By keeping in mind the necessity for so doing, you will acquire the habit of breathing properly while asleep. If you have extreme difficulty in breaking the mouth-breathing habit, a device can be worn that will prevent your

Showing how the mouth-breathing habit may be broken by tying a handkerchief over the mouth.

opening your mouth during sleep, or else a towel or handkerchief can be used for a similar purpose.

Breathing through the mouth is ordinarily induced by catarrhal trouble, which must first be cured. Though catarrh is an exceedingly difficult disease to eradicate, an observance of the rules of health will usually accomplish a cure.

The foregoing will generally conduce to good, sound sleep, though sleeplessness or insomnia has become so exceedingly prevalent among us because of

One method of breaking mouth-breathing habit. A handkerchief should be folded and passed under the chin, tying it at the top of the head, to keep the jaw from dropping, which in turn will prevent snoring.

artificial conditions and habits, that it may be well to enter somewhat into details regarding its causes and remedy.

Insomnia is one of the most nerve-harrowing complaints that afflict humanity. Though it is not of itself dangerous, it often accompanies or indicates serious diseases. Some medical men claim that it frequently precedes insanity, others, that it alone is sufficient to induce serious mental derangements.

The human brain must have repose. It demands rest as imperatively as does any other part of the body, and when, night after night, the sufferer tosses and tumbles feverishly, unable to obtain the desired unconsciousness, his mentality is obviously endangered.

Sleeplessness, whether transient or chronic, is in nearly every case induced by nervous disorders, which are usually the result of easily ascertained causes and which can be remedied in nearly every instance by simple natural methods of cure.

Such disorders are brought on by overwork, either mental, muscular, or functional. An abnormal condition of the nerves can be produced by eating too heartily, and by working too hard either with muscles or with brain. Extreme mental activity will induce insomnia. Want of exercise, sedentary habits, and the internal functional derangements produced by these are frequently contributory causes. The excessive use of alcoholic and other stimulants will

often result in a nervous derangement that is accompanied by insomnia.

But probably the most frequent cause of chronic insomnia is the habit of depending on a drug of some kind to induce sleep. This is a most pernicious habit and should be rigorously avoided.

When the disease appears at infrequent intervals, and when of transient duration, it can usually be quickly remedied. But where it has become chronic, and annoys one night after night, it requires constitutional treatment. The entire nervous system must be strengthened by general physical culture methods.

If the trouble is not chronic, some one of the following remedies will be found effective. First of all, remember the necessity for thorough ventilation. Many suffer from sleeplessness when breathing confined foul air. Be sure that your windows are wide open and that you are practically breathing the outside atmosphere.

Never under any circumstances wear the same clothing at night that is worn during the day. A vast amount of impurities are eliminated from the skin, especially when the body is active during the waking hours. A great amount of this naturally adheres to the clothing, therefore it is essential that a complete change be made. Some extreme phys-

ical culturists sleep without night clothing of any kind, simply depending upon the covers for warmth. To those who can conveniently and comfortably adopt this method, it is to be highly recommended. The air coming in contact with the skin always has a wholesome influence, provided that it is not productive of severe discomfort.

Drink a glass or two of water and take from twenty to twenty-five deep abdominal breathing exercises just before retiring.

Sometimes your mind is occupied with something so extremely interesting that you are unable to secure slumber. If so, try to divert your thoughts into another channel. Think of something that is commonplace or belongs to your daily duties.

But no matter what method you adopt, do not make the ridiculous mistake of worrying about your inability to sleep. DEVELOP A "DON'T CARE" ATTITUDE. Try to make yourself realize that you don't care whether you sleep or not. Be calm, satisfied and restful. You can really secure a vast deal of rest without sleep if you only can develop this mental attitude. If you can make yourself believe that it is of little importance whether you sleep or not, you will often lose consciousness immediately.

But if all this seems to be without results, then rise

from your bed and rub your body all over with a rough towel or with your open hands. Walk around your room without clothing for a while and then go back to bed and try again, remembering at the same time that every moment spent in worrying about your inability to sleep is energy wasted. Even if this does not accomplish the desired result, take some mild exercise, then another air bath, followed by a cold bath, or, if preferred, a rub down with a wet towel or a sponge.

If sleep does not then follow, the complaint is either chronic in character or else some very exciting influences are at work within you.

The above advice applies more especially to those who have only occasional attacks of insomnia, though in many chronic cases the same methods will be found efficacious.

In the treatment of chronic insomnia, special attention must be given to the diet. The greatest possible care should be taken to avoid overeating and the use of indigestible foods. Green salads of all kinds can be especially advised, and for the last meal of the day, one made of onions and lettuce, served with a French dressing of oil and lemon juice or vinegar, can be particularly recommended. There seems to be some peculiar property in green salad, and es-

pecially in lettuce and onions, that calms the nerves.

Pure water should be kept ready at hand and be very freely used. A habit should be acquired of drinking from one to two glassfuls just before retiring. Long walks in the open air with deep breathing exercises are especially commended. Exercises that build vital strength are also advised.

Be sure to remember that drugs, though they may give temporary relief, will in the end so shatter your nervous system that your ailment will gradually grow worse until it becomes incurable.

CHAPTER XXI.

MENTAL ATTITUDE AN IMPORTANT FACTOR.

THE MENTAL ATTITUDE THAT MAKES FOR HEALTH—REST, RELAXATION AND RECUPERATION—HAPPINESS AS CONTAGIOUS AS DISEASE—DON'T BE A CHRONIC GRUMBLER.

Your mental attitude is of vast importance. Happiness is as contagious as disease. The "blues" can be easily induced by a vivid imagination, regardless of your physical condition. No matter what troubles may have harassed you during the day, when the time for retiring arrives, put them aside. FORGET THEM! Try to induce a satisfactory mental attitude! Think of pleasant things! If you have been irritated, do your best to dispel all remembrance of it. Of course, this will be very difficult at times, but remember that many of our troubles are largely imaginary. We "make mountains of molehills." To prove the truth of this, recall many of the worries of your past life. How you will smile at the great importance that you attached to certain events that once, as you thought, seriously marred your happiness, but now seem trivial in the extreme.

A satisfactory mental attitude at bedtime is most

desirable in order to rest thoroughly and thus secure all the benefit that sleep brings. Remember also that worrying over minor troubles is often a habit. Some men are sour, and cross and cranky all through life. They never know what it is to feel emotions of a pleasant kind, yet rarely are they suffering from a disease. They need some one to shake them out of their pitiful condition. You can grow old and cross and crabbed in your twenties, if you are inclined to develop characteristics of this kind. A great many murky minded individuals will pass the most beautiful sunset unnoticed, or else they will see in it predictions of unpleasant weather on the morrow.

"Some people, like the bee, seem to find honey in every flower, while others, like the spider, carry only poison away. One finds happiness everywhere and on every occasion, while another seems to be continually returning from a funeral."

DON'T BE A CHRONIC GRUMBLER! Cultivate the happy faculty of getting as much out of life as you can. Remember that your life after all is of your own making. Your conditions financially or otherwise, will have but little to do with the result. You, yourself, make happiness or misery according to your mental attitude toward yourself and people in general. Of course, I realize that some appear to

be, and have some cause for complaint on the score of bad luck, but those who struggle on with undefiled ideals and unswerving principles will in every case reach a satisfactory goal in the end. Happiness *must* and *will* be yours if you determine to secure it. It is simply a matter of time, and requires nothing but continuous resolute effort to bring it within your grasp.

If, in spite of all your attempts, your thoughts are gloomy at bedtime, recall the various happy incidents of your life, think of all the brightness that the future has in store for you. Say over and over to yourself that you have every cause to be happy. Compare your condition to that of others who are in circumstances far worse than your own. All this will, or should, help to bring you a feeling of satisfaction. You may have some cause for worry, but a little consideration will convince you that there are thousands of others who have far more reason for unhappiness than yourself.

After you have done your best to bring into being the proper mental attitude, you may consider the more material features essential to your physical and likewise your mental health.

CHAPTER XXII.

DRY FRICTION BATH.

WONDERFULLY EXHILARATING SKIN TONIC—VAST IMPORTANCE OF POSSESSING AN ACTIVE SKIN—APPEARANCE OF A CONSTANTLY GROOMED HORSE—VIBRATES WITH NERVOUS VITALITY—SKIN OF AVERAGE PERSON LEADEN AND DEAD—HOW FRICTION BATH IS TAKEN.

Heretofore I have commented at some length on the necessity of maintaining a clean skin and a

Grasp the towel as shown in the illustration, and pull it quickly back and forth over the neck and shoulders, rubbing from the upper part of the neck to the shoulders, on a level with the central portions of the upper arms. (Exercises the triceps muscles of the upper arms.)

healthy condition of its thousands upon thousands of little pores. On various occasions I have advised my readers in regard to dry friction baths, but until now no attempt has been made to give detailed instructions as to how these baths may be taken.

I intend that this chapter shall fully and thor-

Grasp the towel as shown in illustration, pulling it back and forth over the central portions of the back and shoulder as illustrated. Same exercise with position reversed. (Upper arm and shoulder.)

oughly fill the need that may have been felt by my readers in their desire to comprehend to the utmost not only the methods of taking such baths, but the advantages that accrue from them.

It is nearly ten years since I had my attention first called to the benefits to be obtained from friction of

the skin with a dry towel or soft bristle brush. Knowing of my interest in physical culture, a man in his seventies called upon me for the purpose of discussing the value of friction as a remedial agent. He did not appear to be more than fifty or fifty-five,

Pull the towel back and forth as shown in illustration, from the neck to the edge of shoulder. Same exercise with towel over left shoulder. (Exercises central back portion of upper arm.)

and though his face was not full and round, it had the healthy color that betokened a well-nourished body. He told me the story of his first experience with the friction bath as nearly as I can remember it, thus:

"When I was about twenty years of age, I was

given up to die from consumption. My physician, relatives and friends said they were sorry, but that there was really no hope for me. Nothing more could be done; I had to die. Well, fortunately, I had a will of my own, and when they seemed so positive that there was no hope for recovery I made

Rubbing back and forth along the back, from immediately under the arm-pits down to the calves of the legs.

up my mind that I wouldn't die, and so began searching around for some method to bring about recovery. I didn't have the slightest idea as to what this method might be, but I was determined that I would find some means to bring back my health and strength.

"In searching for a cure, I somehow acquired the idea that the skin was the great eliminating organ of the body. The more I thought of this theory the more convinced I became of its truth, and finally I concluded to adopt some method of awakening the functional processes of the skin to greater activity.

"Well, I did not know what to do, and I may have

Same as previous illustration. This exercises shoulders, chest, biceps and back.

started on a rather rough régime, but I went out and bought a horse brush!

"Remember, I was determined to get well. I took that horse brush home and tried to brush my delicate skin. You can readily imagine my headway in the beginning. I could hardly touch my body with the

stiff bristles of this brush, but somehow or other I had faith in this remedy. Day by day I was able to apply the brush a little more vigorously over the entire surface of my body. My skin finally became accustomed to the rough treatment, and I spent several minutes each day in going all over my body with the stiff bristles.

This illustrates method of rubbing the arm. Rub the forearm back and forth, and then straighten the limb and rub the upper arm. Use the towel until the skin tingles from the friction. (Exercises triceps and biceps.)

"Well, I improved gradually at first. By the time I got so that I could use the horse brush vigorously I felt a great deal stronger, and it was not many months before I was a well man. I am satisfied that

I cured myself of consumption with that horse brush."

This old man showed me the skin of his body in various parts, and it was as smooth and soft as velvet. It was the most emphatic exemplification of the benefits of the dry friction bath that I have had presented to me. It was a lesson of very great value. Here

Wrap the towel around one hand as shown in the illustration, grasping it immediately below with the other hand. Now rub the chest upward and downward from the neck down, and also the abdomen. (Exercises shoulders and upper arms.)

was a consumptive, given up to die by physicians and friends, who cured himself by this one means alone.

In order to be well and strong, not only must you have a clean skin, but you must have an active skin.

Your skin must be alive! The skin really breathes; it absorbs oxygen and throws off impurities, just as do the lungs.

Note the difference between a horse that is curried and brushed daily and one that is given but little attention in this way. One looks sleek and fat and happy, if well fed, while the other usually appears

Showing position to be assumed in rubbing the inside of the leg. Bring the towel back and forth over the leg at the extreme upper part of the inside upper leg; rub the leg down to the ankle. Same exercise with position reversed. (For muscles of the forward part of the shoulders and biceps of the upper arms.)

to be in a far from satisfactory condition. Nowhere is the value of currying more recognized than in the United States cavalry. Many troop commanders insist upon grooming for three-quarters of an hour in

the morning and the same length of time in the afternoon. When out on frontier scouting expeditions, it has been invariably found that the commander who insisted most rigorously on the grooming of his horses, headed the most effective troops. Well-groomed horses could stand anything that their riders could go through.

Position to be assumed in rubbing the outer side ot the leg. Bring towel back and forth, as shown in the illustration, rubbing the leg from the hips down to the ankle, on the outer side of the right leg. Same exercise with position reversed. (Exercises shoulders and chest.)

The pores of many persons manifest but little activity. They wear very heavy clothing, the air rarely comes in contact with the skin, and circulation and the functional processes are therefore performed very

poorly. The skin becomes rough and coarse, almost like sandpaper to the touch, or moist and clammy, almost dead. A perfectly healthy skin is smooth and soft like satin, and in order to acquire and maintain the surface of the body in this condition not only is a proper diet essential, but dry friction baths of some

Showing how forward portion of the leg can be rubbed. Bring the towel back and forth, rubbing the forward part of the leg from the extreme upper part down to the ankle. Same exercise with the other leg. (For muscles of the back part of shoulder and back part of upper arm.)

kind must be regularly taken. Perfectly pure blood depends largely upon open and active pores. Many diseases can be avoided if you have an active skin to assist the depurating organs of the body.

The best time to take a friction bath is imme-

diately on arising. If you take any exercise it should precede not follow the bath. The various ways of using the towel, which will enable one to thoroughly rub every part of the body, are illustrated in this chapter. The average individual will imagine that he can rub himself all over without instructions of this char-

Showing how the back part of the leg can be rubbed. Bring the towel back and forth, gradually allowing it to descend until it has reached the ankle. (For muscles of fore part of shoulder and biceps.)

acter, and no doubt, to a certain extent, this is true; but if the friction bath is taken as herewith described, and its effects compared with the ordinary rubbing that is done without any definite knowledge of the subject, one will very quickly learn the value of thoroughness in this connection.

Not only do the methods that I have advised thoroughly awaken every part of the surface of the body, but they exercise nearly all the muscles of the arms, chest, and the back between the shoulders. In fact, if one will vigorously go through all these various motions, he will usually experience a certain amount of fatigue. In the description under each of the illustrations of this chapter I refer to the muscles that are exercised and developed by the movements shown. The friction bath can be taken with the ordinary Turkish or a friction towel. Care should be taken to secure good towels, as the cheap kind tear easily. Soft bristle brushes can be used, though one cannot secure quite as much exercise while using them as with the towels. It is advisable to follow the friction bath with a cold bath. The latter can be taken with a wet towel or wet sponge, or, if desired, immersion in a tub can take the place of these.

CHAPTER XXIII.

IMPORTANCE OF FREQUENT BATHING.

VITAL POWER INCREASED BY PROPER BATHING—THE TRUE OBJECT OF BATHING—ACCELERATES THE ACTION OF THE SKIN AND FUNCTIONAL AND MUSCULAR SYSTEMS—WARM BATHS NEEDED ONLY FOR KEEPING THE BODY PERFECTLY CLEAN AND WHOLESOME—COLD BATH A RARE TONIC—VALUE OF PLUNGE AND SHOWER BATHS—PROPER TIME TO TAKE BATH.

"Remember, a healthy skin means a great deal toward a healthy body."—*H. Rippon Seymour.*

It would be difficult to estimate the value of a clean skin in maintaining health. You cannot enjoy exhilarating health and vital power and be dirty. Cleanliness is more than a part of health. IT IS HEALTH. Cleanliness must be the rule not only externally but internally also. The object of every health-building canon is to cleanse the body. Air purifies and cleanses the blood as it comes in contact with it in the various minute air cells of the lungs.

Water taken internally makes all the fluids of the body assume a proper consistency, and thereby assists in the internal cleansing process.

Exercise is a marvelous cleansing agent. I once more lay stress on this fact. Exercise and you in-

crease the activity of every part of the functional system, and the blood, as it rushes along through arteries and capillaries, not only performs its duties in a thorough fashion, but is cleansed of much of its impurities by the increased activity of the eliminating organs brought about by vigorous muscular movement.

There are many who bathe regularly and frequently who are not clean. How few realize that the internal surface of all the various arteries, glands and organs of the body is perhaps fifty times greater than the exterior surface of the body. To be clean means that every part of this internal surface must be free from filth and foreign matter. The average human being in this age of hearty eating and excessive clothing must bathe frequently in order to be clean, inwardly and outwardly.

The true object of bathing is not only to remove the dirt from the exterior surface of the body, but to accelerate the action of the pores, and thus enable the interior organs to properly and effectively perform their functional processes.

The bathing habits of individuals as well as households differ very materially. In some homes, the taking of a bath is an unusual event. In country districts where bath tubs are unknown, one or two baths

during the winter season will often represent the total efforts in this direction.

Although you may be able to avoid bathing and enjoy a moderate degree of health, you will undoubtedly be stronger, healthier and cleaner if the bath is frequently used.

Let us carefully consider the effects of bathing. We have hot, tepid and cold baths. The cold bath is usually taken without soap, and is not especially cleansing. It is like surf bathing, a valuable tonic. It brings the blood to the surface of the skin and is generally exhilarating. It should be used with care. To some it is very beneficial, while to others, if the circulation is poor, it is far from advantageous. If not very strong, you should begin with almost tepid water. Each day the water can be made a little colder. The cold bath, to be productive of the most benefit, must be followed almost immediately by a feeling of warmth and exhilaration. If you cannot thus recuperate, the bath has been too cold, and it should be used warmer on the next occasion.

In order to be productive of all possible benefits, a cold bath should follow a dry friction bath of the entire body, the latter being preceded by some vigorous exercise that will bring all the muscles of the body into thorough activity. If a cold bath is taken

after the circulation and the functional and muscular systems have been thus awakened, it is then not only beneficial, but thoroughly enjoyable as well.

There are various ways of taking cold baths, but probably the safest method of beginning is to use a wet towel or a sponge. If you wish to be still more careful, you can merely dip the hands in cold water and rub them all over the body. The shock from this is mild indeed, and to recuperate from it is not difficult. After trying this a few days, a wet towel can be used, and then later, you can secure a large sponge and use the cold water still more freely.

Some take a plunge into a bath tub of cold water. This is a very vigorous method and can hardly be recommended, unless a great deal of vital strength is possessed by the bather.

Never take a cold bath when you are chilly or unless the idea of it seems actually pleasurable. Though one may shiver at the thought of a cold "tub" upon rising from a warm bed, some active exercise such as I described and preceding it, will often make you actually yearn for and thoroughly enjoy it.

Cold water is a powerful stimulant to the exterior circulation. When it is first applied, it drives the blood inward and onward in its course toward the

heart. New blood soon rushes back to the surface and so the circulation is greatly accelerated.

Exposure is often said to produce a cold, and the same means can usually be used to cure it. In other words, one can bring about a very quick recovery from a cold by using some means of inducing greatly increased activity of the pores. I have on an occasion, adopted what many would term a very dangerous method of curing a cold. I would stand or lie for a long time in a cold draught without clothing. I know that the average individual would be afraid of pneumonia under the like circumstances, but exposure of this kind induces extraordinary activity of the purifying processes of the pores of the skin, and of the circulation. The combination was highly curative. The cause of consumption and numerous other diseases is a dead, inactive skin, and cold bathing is unquestionably one of the most powerful means of bringing about a normal condition of the skin.

Surf bathing is both a remedial agent and a tonic. It is invaluable in curing skin diseases. I would advise those of my readers who live near the sea shore to take a daily dip in the surf. A great advantage in bathing of this kind is the fact that one gets the added benefit of sun and air.

The more clothing you wear, the less you exercise,

and the more you eat, the more frequently the use of hot baths will be necessary. They are powerful exterior cleansing agents. They open the pores, draw a vast quantity of blood to the surface of the body, and induce activity of the secreting glands which pour their impurities out through the pores. If you follow the ordinary habits of life, a hot bath with the free use of soap not too strongly impregnated with alkali, from one to three times per week is undoubtedly beneficial. The best soap to use is that made of vegetable oil. Pure castile soap can be recommended. Soap will, to a certain extent, extract the oil from the skin, and the more alkali that it contains the more such result will be noticed. Oil makes heat and is a valuable emollient; it keeps the skin soft and velvety to the touch and in appearance, and if it is removed too freely by frequent soapings, injury may result to the cuticle.

The necessity for hot baths must be determined, however, by your habits and needs. If you are what is termed "a high liver," and do not exercise much, you will have to use hot baths very frequently in order to maintain even exterior cleanliness. When you feel sticky, you can then be sure that it is time to bathe, though it is far better to anticipate this condition.

Hot baths are likely to be relaxing, and in excess are certainly debilitating. If you are not very strong they should be taken with the greatest care. In many cases they are capable of working more harm than are cold baths.

The tepid bath makes for cleanliness, though this is about the only purpose that it serves. It has but little effect upon the exterior circulation, and accelerates the action of the pores only to the extent of the power exerted by the rubbing and drying of the skin.

The shower is probably the most exhilarating of all forms of the bath. It is used almost universally in gymnasiums, and those in the habit of attending such institutions and taking it, and the exercise that precedes it, are loud in their praise of its value. I have heard hundreds of comments upon the remarkable change that is noticed after half an hour of exercise followed by a shower bath. For gymnasium use, the shower is at first usually hot or moderately warm for the purpose of washing off the perspiration and impurities that may have exuded from the pores while exercising; but following this, the water is used as cold as it runs from the pipes.

The more one is in the habit of bathing, the more impurities will be eliminated from the pores. If

you do not bathe quite frequently, there is a possibility that they will accumulate in such quantities in the system as to cause some serious disease. A Dr. Robertson of Chicago has asserted that while baths unquestionably attract a very large quantity of the blood to the surface, there are practically no impurities eliminated from the pores of the skin. I am inclined to believe that this assertion is considered false by nearly every member of his own profession. If you inhale the odor that often arises from perspiration when one is not in good health, you will have positive proof that impurities are eliminated through it. He is unquestionably right in his assertion that a soap of strong alkali will remove too much oil from the skin, but it is not at all necessary to use soap of this character. High grade vegetable soap contains but very little alkali.

The danger of pneumonia from a bath may occur to those who indulge in bodily ablutions "once in a year whether they need a bath or not," but those who bathe regularly will be in very little danger from the disease, because of their cleanly habits.

Too much hot bathing is unquestionably debilitating, and there may be a few people who are bathed out of the world according to this doctor's assertion. But where there is one who dies from the use of

water, there are probably thousands who do so because of filth-clogged pores and deadened natural activities due to the need of frequent baths.

If all were as clean as Dr. Page, who is well known to physical culturists, states that he and his patients are, through the use of proper foods, undoubtedly there would be but little use for hot baths. But those who follow the ordinary habits of civilized life of today would, I think, find difficulty in thoroughly cleansing the body with tepid water without soap, a method which Dr. Page advocates.

Let each and every individual consider this subject carefully for himself, and form habits that will bring about the highest degree of health and strength in his own particular case. What each one should desire is internal and external cleanliness. You want a wholesome, clean, strong body, and you should make every possible effort to acquire it.

If you can live clean dietetically, wear clothing of light weight, thus securing the benefit of almost a continual air bath, and make free use of towels and soft brushes for friction of the body, you may be able to keep sweet without much use of water. But living so close to Nature is very difficult for the average individual in this civilized age. Therefore, you must do the best you can. Personally, I usually take

a cold bath with a wet towel immediately after my exercise in the morning, and one or two hot baths during the week, just before retiring at night. In the matter of hot baths, I allow my inclination to indicate their need. I have no regular days for taking them.

I am very much inclined to believe that the personal method which I have indicated, would be applicable to the average individual who desires to possess abounding, exhilarating health.

CHAPTER XXIV.

STRENGTHENING THE KIDNEYS.

VAST IMPORTANCE OF THE KIDNEYS—DISEASES OF KIDNEYS—HOW CAUSED—TOBACCO, ALCOHOL AND STIMULATING DIET PRINCIPAL FACTORS IN DESTROYING THE POWER OF KIDNEYS—GENERAL TREATMENT—EXERCISES FOR STRENGTHENING THESE IMPORTANT ORGANS.

A man or woman weak in the kidneys is like a board with a knot in it. With any severe strain away goes the whole fabric; it becomes broken and useless.

Vitality of the kidneys must be maintained. These very useful organs must be watched with the most jealous care. It is their work to carry off the greater part of the waste fluids of the body. Much solid waste matter, too, in the form of very small particles, is eliminated in the fluid ejected by the kidneys.

Now, the kidneys may be given proper hardiness combined with muscular flexibility, just as easily as may the biceps. Note that I say *proper* hardiness. The kidneys are delicate organs that need strengthening. Yet how many, even among athletes in training, ever give a thought to the strength of these or-

gans. The kidneys are there, and they appear to be doing their work properly. Is that all the thought that need be given them until they complain through the medium of disease? No! Most emphatically no! The kidneys need care no matter how healthy they are, and by proper care they can be strengthened. But how?

First, in the way of gentle exercise by massage. Stand erect, with the hands resting just back of the hips and over the kidneys. Massage strongly upward and downward, applying the heel of each hand over one of the kidneys. Continue this for one or two full minutes every time that you exercise.

Follow this up by kneading over the kidneys for about the same length of time. Clench the hands and apply the knuckles of the fingers over the region of the kidneys. Start with the fists close to the spine, and knead forward over the organs, stopping only when you have reached the sides of the trunk just under the lowest ribs. Then knead backward again, and repeat this movement several times.

Then follow up the kneading by striking over the same surfaces with the tips of the fingers, continuing this percussion, in the forward movements, until you touch the abdomen. Then go backward and forward again.

In all of these impacts touch gently, briskly and firmly, but not too severely, for the kidneys are quickly susceptible to discomfort. Gradually, however, it will be found possible to increase the rigor of the impact without causing any discomfort. Then you will know that you have succeeded in developing strong and sound kidneys.

Diseases of the kidneys are everywhere prevalent in civilized communities. Advanced Bright's disease is considered incurable by many members of the medical profession. In fact, when the disease is too far developed, but little hope can be offered by *any* method of treatment. When one considers the dietetic habits of the average person, it is not by any means surprising that so many suffer from this disease. In character it is very insidious. Sometimes its presence may not be recognized for a long period. In chronic Bright's disease, the kidneys totally lose their ability to perform their duty. This malady is far more common than is supposed.

The symptoms of acute Bright's disease are mostly a pain in the region of the kidneys, frequent urination, suppression of urine, urine very dark, and dirty color, and dropsical swellings in various parts of the body. If the disease has become chronic, the bodily strength gradually decreases. Bronchitis, watery

diarrhœa, pleurisy, enlargement of the heart, and frequent headaches often accompany Bright's disease in its advanced stages.

Congestion of the kidneys is usually indicated by the urine being either very abundant and very pale, or else scanty and highly colored. Hemorrhages are indicated by bloody urine.

Acute diseases of the kidneys, coming under the head of congestion, inflammation and hemorrhage, may in some cases be the result of an accident, or may be accompanied by some other disease. Inflammation of the kidneys is not infrequently a complication with scarlet fever, measles, diphtheria, and diseases of this character. The most common cause, however, is the free use of alcoholic beverages, whiskey, beer, wine, hard cider, etc.

Stimulating and improper foods also have much to do with inducing the disease. The use of alcoholic liquors and excessive feeding are evils that are closely associated with it. Alcoholic liquors, unless used to excess, always stimulate the appetite and incline one to eat too freely. This is equally true of all meats, very highly seasoned dishes, and other articles which, if one desires to continuously enjoy normal health, should be religiously avoided.

Persistent neglect to drink a sufficient quantity of

pure water, and the lack of exercise, are also very prominent causes of the ailment. The circulation becomes sluggish, and the activity of the depurating organs is greatly lessened when one follows a sedentary occupation. Smoking is another incitement of kidney trouble, and when the patient is addicted to this habit the disease is far harder to cure. Wearing too heavy clothing and persistent neglect of regular bathing lessen the activity of the excretory organs of the skin. This adds to the work of the kidneys, and unquestionably makes them more liable to some form or the other of disease.

One of the first methods to adopt in treating the acute manifestations of diseases of the kidneys should be the application of very hot cloths to the small of the back. The flushing treatment must be used to thoroughly cleanse the lower bowel of all impurities, and following this, the patient should be wrapped in warm blankets to induce copious perspiration. Large quantities of the purest distilled water should be drunk daily. If this cannot be secured, pure rain water will do as well.

In the acute stages of the disease, absolutely no food should be allowed until the inflammation, congestion or hemorrhage has subsided.

In the treatment of chronic Bright's disease, every

possible endeavor must be made to build up the body to the highest state of attainable vigor. Mild exercises of all kinds that tend to accelerate the circulation are advised. In addition to the massage, kneading and percussion as already described, exercises that call for the turning and twisting of the trunk, and bending of the body, should be employed. But in the case of these, care should be taken that the work is not severe enough to cause pain in the region of the kidneys themselves. Remember that much harm will be done by *straining* weak kidneys. Deep breathing in the open air and long walks can be taken with the greatest possible benefit.

Frequent fasts of from two to seven days in duration are absolutely essential if a speedy recovery is desired. Between fasting periods only two meals a day should be eaten, and pure water should be kept at hand at all times and used freely between meals.

Drink no liquid at meal times. Avoid absolutely all stimulating drinks such as tea, coffee, and alcohol. Meats, spices, and every article of food that would be inclined to stimulate the appetite or make one overeat, must be strictly avoided.

Tobacco must be tabooed if a complete cure is to be expected.

Live in the open air as much as you can. Ventilate

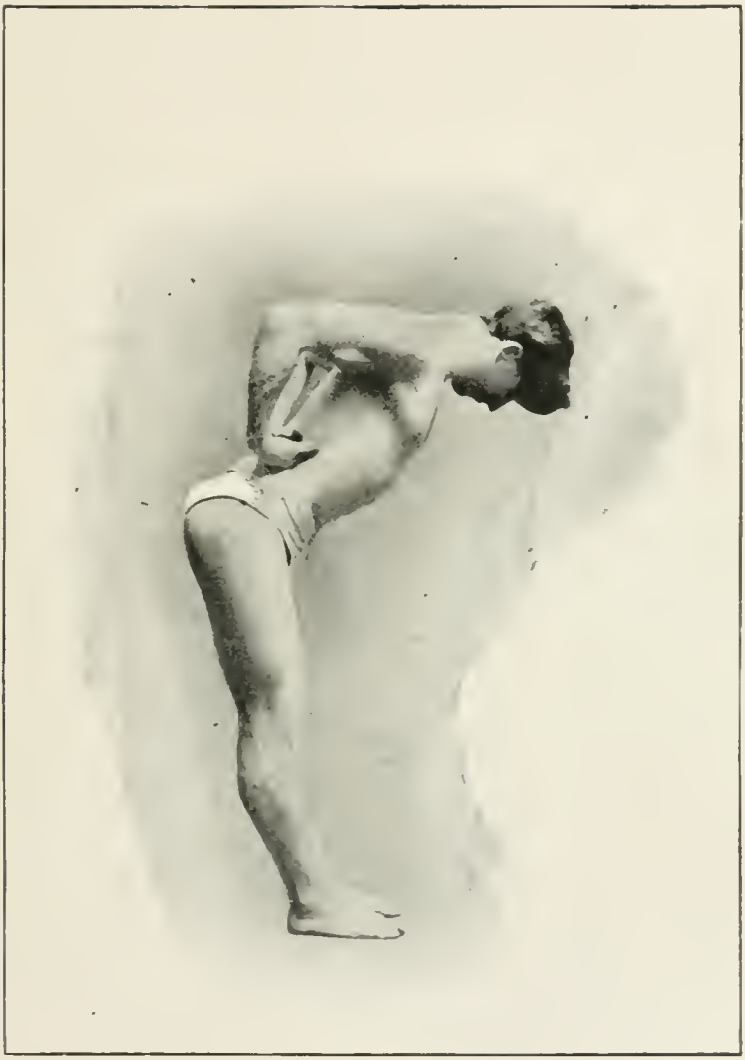
your sleeping room very thoroughly. During fasting periods, if your circulation is very poor, and feet are cold at night, use a hot-water bottle to maintain warmth.

Special endeavors should be made to keep all the depurating organs extremely active. If the bowels are not regular, laxative foods must be used to bring about such a condition. In case this cannot be done immediately, use the colon flushing treatment at intervals of from one to three days, to secure thorough cleansing of this main sewer of the body.

A thorough friction bath, taken with brushes, or a very rough towel, such as has been described, should immediately follow the exercises that are to be used at rising in the morning, provided that the patient is fairly strong. Wipe the body off with a cold wet towel directly after the dry friction bath.

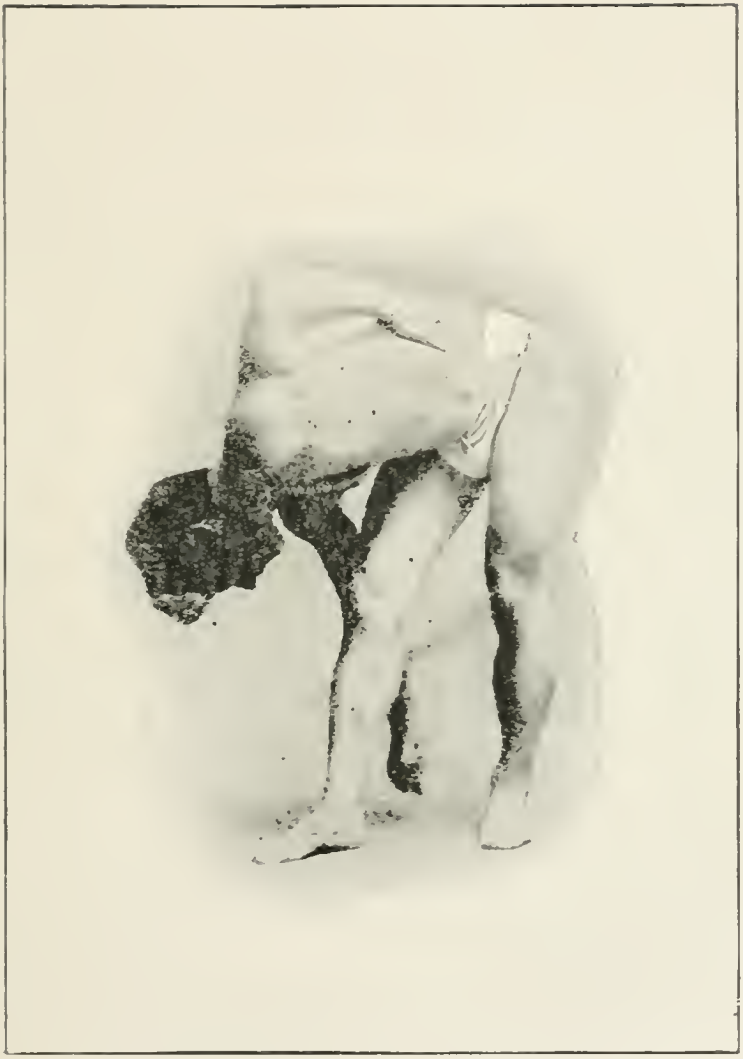
Even Bright's disease can be cured in nearly every case by these methods. It should be remembered, however, that the most remarkable effects can be secured almost immediately from an absolute fast, drinking water to the extent of your desires during its continuance. The inflammation subsides, and improvement is forthwith induced, if the fasting is adopted in connection with the other régime advised.

Exercise 1. Place the partially closed hands against the part of the body near the waist line, as shown in opposite illustration. Now move the hands back and forth, pressing inwardly as vigorously as you can without discomfort. Take this exercise from the backbone outward and also downward.



Exercise 2. Strike the sides of the hands against the back from the hips upward as far as you can reach, being careful to strike every part. If the tissue is not strong enough to take this exercise in the beginning, you can use the open hand.

Exercise 3. From an erect position, right foot in front, bend over forward and over to the right, pressing inward with the left hand in the region of the kidneys as shown in illustration. Same exercise with position reversed.



CHAPTER XXV.

CONSTIPATION DESTROYS VITALITY.

CONSTIPATION ONE OF THE GREATEST FOES TO ABUNDANT VITALITY—SYMPTOMS OF THE TROUBLE—CAUSES THAT LEAD UP TO IT—INACTIVE HABIT OF LIFE PRIMARY CAUSE—DIET, CATHARTICS AND USE OF CORSET FREQUENT FACTORS.

"Constipation occurs at any age, but is most common after middle life, when less exercise is taken, and increases with advancing years, when the vital processes in general are less active. It is ten times more common in women than in men."—*William Gilman Thompson, M.D.*

There is hardly a family of average size but has at least one member who is afflicted so seriously with constipation that the trouble takes on a tragic aspect. Those who are apparently healthy are often victims to the excruciating torments of constipation. They "suffer agonies," yet can see "no reason why they should."

Constipation is caused by violations of the most ordinary rules of hygienic and dietetic right living. There is no need for constipation to exist; it is cured, principally, by removing its cause, and with the further aid of a common sense following of physical culture laws.

In nearly all cases the symptoms are very much

alike, the main difference being one of relative infrequency of evacuation. Some people are subject only to occasional attacks of constipation, which may last from one or two days to as many weeks. Others are victims of chronic constipation which, in nearly every case, is the direct outgrowth of what are at first only occasional attacks of the ailment.

The general symptoms are: Infrequent or entire absence of movement of the bowels without artificial aid; inactive condition of the kidneys; dry, rough and sallow skin; tongue coated; breath foul; mind depressed. Added to these are, not infrequently, palpitation of the heart, headache, neuralgia or some kind of fever, nervousness and hysteria.

Extreme nervous derangements, indeed, are so frequently associated with constipation that for this reason, if for no other, the most decisive measures should be taken to promptly insure the regularity of the action of the bowels. There are to-day thousands and thousands of women—nervous wrecks—whose troubles can all be traced to constipation, neglected, or else treated with the purgatives that relieve for a while, but which invariably make the malady more deep-seated in the end.

Food may be ever so wholesome when eaten, but if the bowels do not treat it with proper activity it

becomes as poisonous and, in some cases, more poisonous, and will produce more injury than food which is in a bad condition when eaten, but that is properly excreted from the body. Normal activity of the bowels must be maintained if one expects to remain in a healthy physical condition. One of the first signs of oncoming disease is inactivity of the bowels.

Constipation carries in its train a sometimes long-delayed but nevertheless inevitable and absolute break-down of the health. Once that the health is lost by constipation there is no regaining it until the primal ailment has been cured. For, in addition to the long list of other evils that constipation breeds, there is a failure of the nutritive processes of the system. If the waste matters are not removed from the body, the nourishing of the tissues must all but come to a full stop.

Under prevailing circumstances, numerous influences tend to bring about this complaint, but one of the most common of such is an inactive habit of life. If you take absolutely no exercise, if you sit all day in close, hot rooms, ride about in carriages or public conveyances whenever compelled to leave your home, it is a difficult matter to avoid acquiring this complaint. Under such circumstances the circula-

tion is usually very sluggish. It cannot capably and properly perform its functional duties and the inactivity of the alimentary canal naturally follows.

A diet highly concentrated, or one in which the food is extremely rich or super-cooked, also has a great tendency to produce this trouble. Tea, coffee, tobacco and beer are always contributory causes. When white bread is made a large part of the dietary, constipation is certain. When the outer shell of the wheat and the bran has been removed, it becomes a doughy mass and it is a very difficult matter for the digestive juices to penetrate it. The writer knows of a great many instances where the use of white bread has been the sole cause of this trouble, which almost immediately disappeared when a change was made to whole meal bread.

Another very serious cause is also the use of cathartics. These of course relieve the trouble for the time being, but gradually the nervous power of the digestive organs is lessened, and if the use of these poisons is continued the doses have to be constantly increased and ultimately they lose their influence. When the organs are dull and deadened, in fact almost paralyzed by drugs, one is indeed in a serious condition, and it often takes a long course of dieting and exercise to bring about recovery. Neg-

lect to evacuate the bowels when the desire to do so is experienced is a common cause of constipation. This neglect in many instances causes the contents of the bowels to be forced back from the rectum, and the desire to disappear. When the evacutory prompting is felt it should be followed by immediate obedience. Such obedience should be recognized as a grave duty. It is also important to cultivate regularity of habits of this kind. In some cases, by long neglect, the bowels get into such an abnormally sluggish condition that the need of relieving them is never indicated in the usual way.

The corset, too, has a very baneful influence, as it prevents proper development of the muscles of the waist and abdomen, which Nature intended as prominent factors in a normal evacuation of the bowels. The corset also interferes with the circulation of the blood.

A certain amount of fluids is necessary to the normal action of any part of the body, but more especially of the bowels, and so the free drinking of water is an essential if you wish to escape constipation.

William Gilman Thompson, M. D., professor of medicine in the Cornell University Medical College, declares as follows concerning the malady:

"Dietetic errors cause constipation through (a) insufficient or too highly concentrated food; (b) certain foods and astringent beverages — milk, tea and claret are proverbially constipating; (c) indigestible food; (d) obstructions from over-eating of coarse food; (e) irregularities in time of meals, hasty mastication, etc.; (f) the drinking of too little water. The latter is a very common cause of constipation, because the digestive fluids are thereby lessened in volume and are less thoroughly mixed with the food in the alimentary canal, and the lower bowel becomes so dry that friction prevents the onward movement of the fæces."

Putting aside insufficient food as a cause—since underfeeding is but rarely encountered — and observing that milk may be drunk freely by many people without causing constipation, it will be noted that the highest medical opinion ascribes constipation to bad dieting and the use of too little water. Add to this the lack of suitable exercise and we are in full possession of the causes that are to be remedied or removed.

CHAPTER XXVI.

HOW TO REMEDY CONSTIPATION.

NATURAL METHODS ONLY METHODS THAT CAN RELIEVE —COMBINATION OF DIET, EXERCISE AND PHYSICAL UPBUILDING UNFAILING METHOD OF CURE—PILLS AND CATHARTICS INTERFERE WITH RECOVERY—AGGRAVATE TROUBLE—COLON FLUSHING A SUBSTITUTE.

"The removal of the cause is a matter of the first importance. Cathartics should be avoided, if possible."—*A. A. Stevens, M.D.*

Is there a remedy for constipation? I answer unhesitatingly, "Yes!"

Is there a rapid remedy? This depends upon the severity of the case. It is a safe rule to observe in the healing of the sick, that the longer the malady has lasted the longer must the sufferer work for the cure. But the most obstinate case of constipation should yield to natural methods of cure in an encouragingly short space of time.

Is the cure that I propose an unfailing one? To this I will reply that, after many years of experience in the healing of the body, I have never known my method to fail. But you must not take up the treatment for two or three days, then begin to doubt, and soon go back to cathartics, dietetic sins and lack of exercise.

There are several methods for treating this annoying trouble, but probably the best is a combination of diet, exercise and general physical up-building. The trio will not only act in a remedial manner, but will, at the same time, further the general constitutional vigor and thereby vastly increase the nervous and vital powers.

Give yourself a little time to bring about a natural, normal condition. If you have been in the habit of taking pills or cathartics in any form, throw them aside immediately. If immediate action be necessary you can flush the colon. But this, too, should be avoided if not absolutely requisite.

What you want is normal action of the bowels, brought about without artificial aid, which at the best is a source of danger or, in any event, of great annoyance. If, however, you have to make use of the flushing method, gradually discontinue its use. Flush say twice the first week, and thereafter extend the intervals between the operations.

As soon as the bowels begin to manifest a tendency to act by themselves, you can cease the flushing at once.

Living on fruit juices alone for from one to three days, is always the best means of beginning the natural treatment. After this, eat only twice a day and

chew every morsel of food to a practical liquid before swallowing it.

If you think the uncooked diet of nuts and fruits and vegetables is too great an ordeal for you to attempt, eat plain foods, green vegetables, salads, dried beans and peas that have been cooked by the simmering process.

Use the purest olive oil very freely. Though it may seem distasteful at first, such oil makes almost any article of food more appetizing, and its free use has a decidedly beneficial effect in the treatment of constipation. Also eat whole wheat bread and wheat products that have not been marred by excessive cooking.

In fact, the whole wheat itself, if allowed to soak over night, simmered until it has attained a proper degree of softness and eaten as part of a meal, is an admirable assistant to a cure. Have pure water at hand at all times and try to drink a glass of it every hour or two during the day.

And when you have "thought over" this remark about drinking sufficient water, think it over again and again. Remember that the small and large intestine—the latter, the colon, especially—may have so little fluid in them that the fæces—the waste matter that you are trying to evacuate — require vigorous

efforts with every muscular contraction of the intestine as the latter seeks to rid itself of them. Moreover, when the colon is in this dry, parched condition, what little fluid there is in the fæces is taken from them in order to lubricate the inner membrane of the organ. This leaves the fæces still more dry with each inch of progress through the colon, and finally they become so "caked" and stony that, somewhere near the end of the intestine they stop altogether.

If this fearful condition is reached, agonies indescribable are suffered. Every hour increases the trouble. There is a frantic desire to evacuate; but it seems as if the effort would result in the rending of the rectum. At this stage there is no relief possible, except through the undignified and unpleasant process of "unpacking." Yet this condition of "dry pack" could have been obviated by the presence of sufficient fluid in the intestines.

Indeed, some of my readers have assured me that the drinking of a sufficiency of water has been found by them all that was needed to keep the bowels in regular action. But I imagine that they have forgotten to add that they are in the habit of exercising and eating proper foods.

CHAPTER XXVII.

EXERCISES FOR REMEDYING CONSTIPATION.

EXERCISES THAT INCREASE GENERAL FUNCTIONAL VIGOR —EXERCISES FOR LOCAL TREATMENT—GENERAL DIRECTIONS THAT WILL HELP IN REMEDYING TROUBLE.

Those whose faith in exercise is of recent birth, whose enthusiasm for muscular exertion is based almost wholly on the good results they have noted in others, and who are as yet ignorant of its true physiological value, are too prone to attach great weight to "local" or "special" exercises. And they often use them to the total exclusion of other forms of exercise that are intended for the upbuilding of functional vitality.

Constipation is due to a break in the functional powers. Hence, as a part of its cure, functional vigor must be restored by a system of *general* exercises designed for that purpose. The local, or special exercises are to be used only as a part of the day's muscle-making work.

Bear this in mind always; you can secure relief from your malady most rapidly by following all the rules, and by practicing all the exercises, that apply

to general functional vigor. And this is the only effective way of obtaining a permanent recovery.

Regular, systematic, physical exercises, tending to build up the muscular system, should be adopted; added thereto, long walks and deep breathing exercises will be found to be greatly to your advantage. Do not under any circumstances constrict the body at the waist line. Allow the most perfect freedom of action in that region.

As to the special or local exercises, Nature has pointed the way unerringly. When you are trying, painfully and with little or no success to evacuate, what form of muscular exertion do you instinctively employ at such a time? Almost without realizing it you bend forward, as if trying to press your chest upon your knees, and often in thus doing you carry the trunk to one side or the other of the legs. In whatever way you bend, you are certain to be trying to compress the abdomen—to drive it back.

Now, these movements are made instinctively at the moment of suffering, and therefore they are the right ones. What you are trying to do with the aid of your contortions is to compel the muscles of the intestines to contract and relax alternately, thus forcing along the fæces toward the point of ejectment. When the constipation is not too severe, the movements aid

you in obtaining relief. But they should not only be made when you are endeavoring to bring about an evacuation but, in addition, should be carried out per-

FIG. 1.

sistently and regularly at other times for the purpose of strengthening the intestinal muscles and increasing the regularity and activity of their contractions.

Twice a day, in connection with your regular exercises, recline on the back and bring the right leg up as far as you can, lock the hands over the knee and press it against the body as strongly as possible, as in Fig. 1. Then repeat same exercise with the left leg. Alternate with right and left leg in this exercise and continue until fairly tired.

FIG. 2.

After this, take the following exercise while

seated in a chair. Bend forward as far as you can, pressing your body against your right leg, as in Fig. 2. Then repeat the exercise with the body pressed against the left leg. Continue until slightly tired. Never strain at stool. When this becomes necessary, simply bend forward and press the body against the right and left leg, alternating from one to the other, and you will find that the desired effect will be produced.

Always have your room thoroughly ventilated. Try to get into the habit of drinking a glass of water before retiring and on arising in the morning.

Be sure to secure from seven to nine hours sleep, and take a cold bath every day upon arising if you can inure yourself to it. If you can stand a cold sitz bath, take it after rubbing the body thoroughly with a rough towel. This will be found to be of considerable advantage in assisting you towards recovery.

CHAPTER XXVIII.

SUMMING UP OF RESULTS.

WHAT RESULTS HAVE BEEN GAINED?—ROOM FOR IMPROVEMENT—TESTING INCREASED LUNG POWER—TESTING HEART, POWER OF STOMACH—WELL-REGULATED BOWELS, SOUND KIDNEYS, STEADY NERVES, POWERFUL MUSCLES.

"The *respiratory* capacity, or as John Hutchinson called it, the *vital* capacity, etc. . . . It was found by Hutchinson, from whom most of our information on this subject is derived, that at a temperature of 60° F. 225 cubic inches is the average vital or respiratory capacity of a healthy person five feet seven inches in height."—*Kirkes' Physiology.*

It is natural for one who is working earnestly at the problem of supplying himself with the highest type of vital and functional power, to wonder how well he is succeeding as he perseveres with his new régime from day to day. It also requires courage and persistency to keep at hard work in this line, and to exercise all the mental faculties in trying to improve upon the régime, if there be at hand no accepted method or data to help him to determine how much good is being accomplished by his new system of living.

Fortunately, the tests relative to the beneficent nature of the exercises, etc., that I am advocating, are

so abundant, easy of discovery and application that I will refer only to the more important of them. The reader will have to think out the remainder of them and decide for himself just how to put them in operation. This will require some pondering, but I want my readers to learn to think for themselves. The man who cannot do so decisively and satisfactorily, will never be a success as a physical culturist.

The reference to Hutchinson's belief that breathing is the most important test of vital power, as printed at the head of this chapter, points the way to the grandest of all tests. How do you breathe? Have you learned to do so rightly? When you take air into your lungs can you feel the whole fabric of those organs moving in rhythm to the inspiration? Have you learned to *know* that the deep inhalation is reaching every uttermost cell in your lungs?

Having satisfied yourself that you are breathing properly, go to a spirometer and make the actual test of your respiratory capacity. If you can easily register 225 cubic inches or more, you will know that you are able to breathe in a proper quantity of air at an inspiration. Having learned that you *can* do it, *do* it as often in the day as you can remember to. Bear in mind that if you are under five feet seven inches

in height you may be satisfied for a while with a respiratory capacity of a little less than 225 cubic inches; if you are over the height mentioned, add a few cubic inches to the least registry with which you are willing to be satisfied.

But, having convinced yourself that your capacity is 225 cubic inches, do not rest content with that standard. Remember that while I do not advise abnormal development in any direction, breathing is one of the powers that no man, woman or child is ever likely to develop abnormally. *The greater your respiratory capacity, the greater your whole vital tone.*

Make the spirometer test as often as you please—indeed the oftener the better. Many city-dwellers will know where to find and use a spirometer in a public place at the expense of a trifle. If you haven't such an opportunity, buy an instrument, or make one according to the directions that are furnished in this volume. But don't have anything to do with a spirometer that is not graded with reasonable accuracy.

Now, how about your heart? Can you endure more muscular exertion, and with less distress, than you did a while ago? Watch the heart's action closely. If there is anything about it that you are

unable to understand, it will pay you to go to a reliable physician, or better still to a competent physical culturist. But you should be able to judge for yourself in regard to the organ by noting the increased comfort in and around it, during and after brisk muscular exertion. Studying the fulness, speed and regularity of your pulse will furnish you with many indications of how your heart is progressing.

And how about your stomach? Are you sure that, at last, you are eating the right kinds of foods and none other? If you are able to digest such without discomfort, and if your appetite is good without being abnormal, you have excellent reasons for believing that the vitality of your digestive apparatus is on the mend. But how about the assimilation of the food in your system? Have you reached that point in improvement where you notice that repeated and steady exercise is gradually hardening all of your surface muscles? If so, your assimilative capacity is progressing toward perfection, for, without proper nourishment there would be no obvious and steady improvement in the quality of the tissues of the body.

And your bowels? Are they regular, and do the stools exhibit a normal appearance and quantity once more? This is an important test, and one that should be watched closely. If there is not gradual

improvement along these lines, then you must pay more and more heed to the advice that I have given you concerning the cure of constipation. Until your body is able to dispose of all its waste matter properly and fully there is not sufficient improvement in the general vitality — *for vitality means the quickening and increasing of all the functional powers!*

As to your kidneys, if they have been out of order you know whether there has been any change for the better in their condition. In regard to your skin, has it become satiny, yet firm and elastic? Note this very particularly, and satisfy yourself also as to whether it is just as clear, and, in places, just as rosy as it ought to be. Be very careful to observe whether you perspire freely when making unusual exertions in ordinary temperatures. The skin that does not throw off a due proportion of moisture is not working in perfect harmony with the system. If you are aware that you perspire less freely than is usual with healthy people, do not rest content until you have remedied the condition.

Your nerves? Note whether they are gradually increasing in steadiness. Are you less "fidgety" than formerly? Do you go to sleep more readily, sleep more soundly, and do you awake with a sense

of greater refreshment? Never be satisfied until you know that your nerves are improving in strength and tone—*for remember, always, that they are the Master Organs that dominate and regulate the efficiency of the body's tasks.*

Your muscles? Have you a stronger grip, better arms, a more powerful back? Do your legs sustain you more thoroughly than they did? Are you able to stand the ordinary test of a five-mile walk without fatigue? The muscular condition is a reliable index of the general vitality. Yet this does not mean that you should seek to acquire huge muscles by any process of forcing. The seeker after bodily perfection will do well to secure vitality as preliminary to all else. The biceps and the other muscles that one loves to exhibit in a highly developed state, can be acquired when the basic bodily conditions have been obtained in their best forms.

Do not neglect to very frequently make all possible tests of increased vitality. Not only will the success demonstrated by the results encourage you to persevere in the right path, but such patient study of your condition will unfold to you a priceless wealth of new knowledge concerning your healthy body.

CHAPTER XXIX.

GENERAL RÉGIME FOR DAILY PRACTICE.

I now give a brief synopsis of the advice tendered you in this book, putting it in the form of a daily régime.

Select from the exercises suggested, those particular movements that are apparently of special value in your individual case in remedying the defective organs of your body, or building functional or muscular strength wherever it is most needed.

If you simply desire to accelerate the circulation throughout the entire muscular and functional system and build general vital power, the breathing exercises and those illustrated in Chapter VII. can be recommended.

If you are weak and are just beginning the exercises, rest when the slightest feeling of fatigue is noticed. If you are fairly strong, each exercise can be continued until the muscles are somewhat tired. The exercises should be taken in a room with the windows wide open and with as little clothing on as possible.

Cultivate the fresh air habit. Leave the windows

of your sleeping room wide open at all times. The colder the air, the harder you will have to work to induce a feeling of warmth on the external surface of the body.

If you are working hard at manual labor, the exercises which demand the use of the same muscles as are employed in your work should be omitted.

Follow the morning exercises with a dry friction bath. This can be taken as illustrated with a dry rough towel, which should be rubbed back and forth over every part until the skin is pink from the increased amount of blood brought to the surface by the friction. If desired, soft bristle brushes can be used instead of the towel, to equal advantage.

After this take a cold sponge bath. Have the water as cool as you can bear it and still be able to recuperate with a feeling of warmth.

Two or three evenings during the week, a hot bath should be taken before retiring, and in every instance the exercises should precede it.

Unless working very hard at manual labor, two meals a day should be sufficient, though many working men are able to thrive better on two meals each day than on three. If you do take three meals a day, be careful not to eat more than you can comfortably digest. I do not by any means wish to convey the

impression that you cannot improve by eating three meals a day. I advise the two-meal plan to guard against the liability of overeating. Select the diet that, according to your ideas, is best suited to your individual needs.

Acquire the habit of drinking one or two glasses of water before or after exercise, before retiring and on arising in the morning. Although I advise that you drink freely of water, I do not by any means recommend that you imbibe vast quantities. You can overload your stomach with water to disadvantage.

Ordinarily you should drink from three to six pints of water each twenty-four hours, though if you perspire freely, the quantity required greatly increases.

Masticate every morsel of your food until it is practically a liquid. Avoid all liquids during meal times, unless especially thirsty, if so, satisfy yourself, but remember not to use liquids to assist you in swallowing food that you have failed to thoroughly masticate. If accustomed to a drink while eating, and it seems difficult to break yourself of the habit, you can use cocoa or a cup of hot milk after finishing the meal, drinking it very slowly.

The exercises can be taken in the evening before retiring, if preferred, instead of in the morning, though

ordinarily it is advisable to take a few movements on arising. They will thoroughly awaken and prepare you for the day's work.

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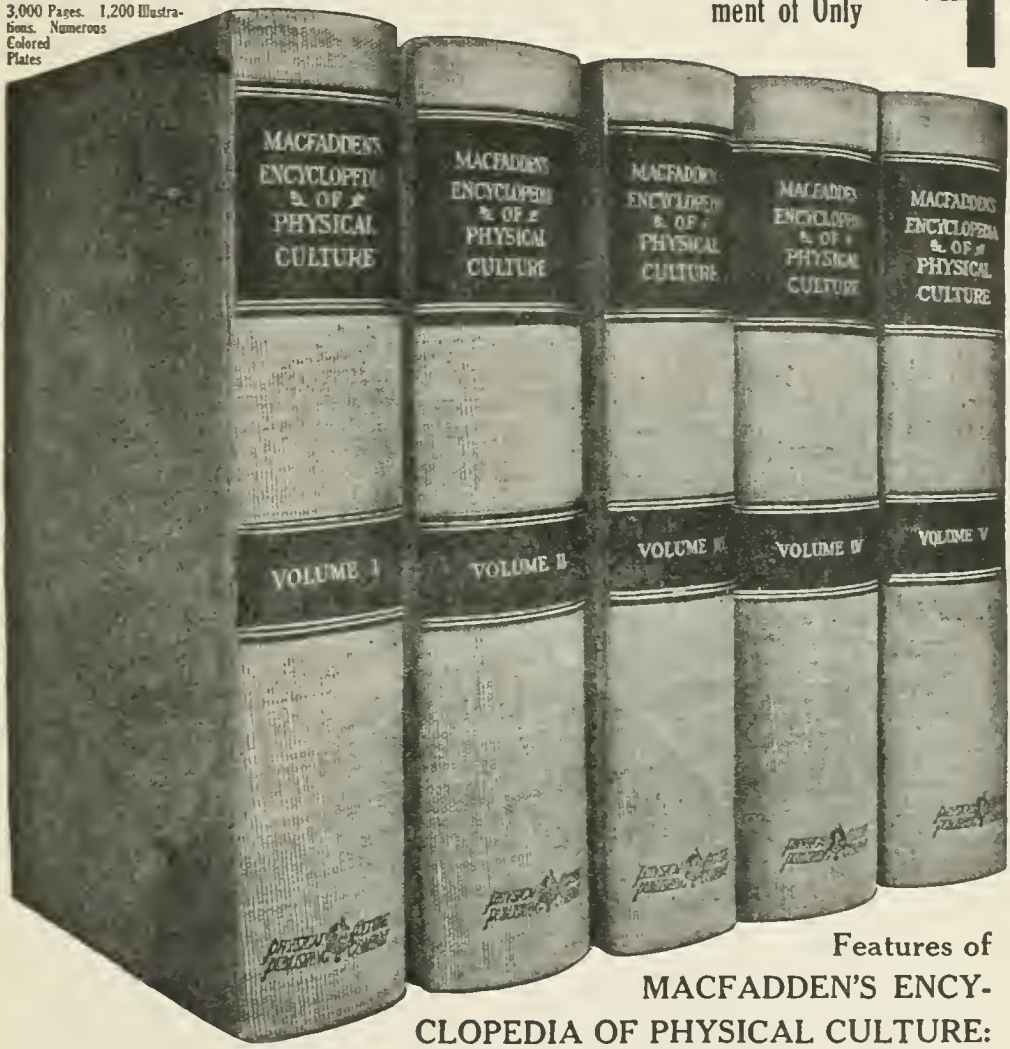

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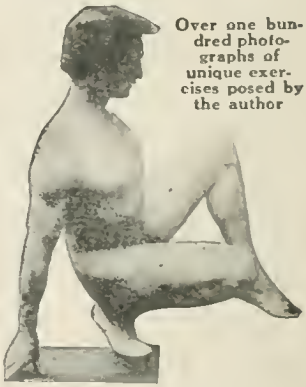

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