BUILDING VITALITY

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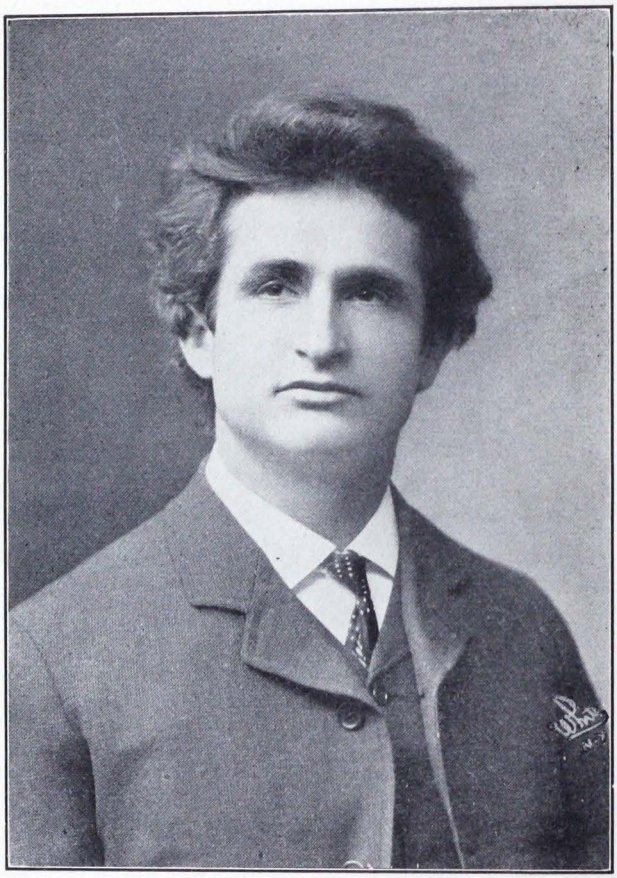

Pernarr Macfadden

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COMPILED AND EDITED BY

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CONTENTS.

PAGE.

Preface 9

CHAPTER I.

What is Vital Power? 13

CHAPTER II.

Vital Power Depends on Functional Vigor 19

CHAPTER III.

Blood and Vitality 27

CHAPTER IV.

Organs of Digestion, Circulation and Respiration 33

CHAPTER V.

How a Powerful Stomach May be Acquired 43

CHAPTER VI.
The Heart Made Powerful 49

CHAPTER VII.
Pure Air of the Utmost Importance.... 63

CHAPTER VIII.
Perfect Ventilation 69

CHAPTER IX.
Erroneous Methods of Breathing..... 77

CHAPTER X.
Deep Breathing Exercises 83

CHAPTER XI.
Breathing and Muscular Exercises Combined 91

CHAPTER XII.
Sun and Air Baths Vitalize Body..... 97

CHAPTER XIII.
Blood-purifying Organs 105

CHAPTER XIV.
Restful Sleep Builds Vital Vigor.....115

CHAPTER XV.
Mental Attitude an Important Factor..133

CHAPTER XVI.
Dry Friction Bath 137

CHAPTER XVII.
Importance of Frequent Bathing.....147

CHAPTER XVIII.
Aids to Physical Fitness.....159

CHAPTER XIX.
Increasing the Strength of Babies 169

CHAPTER XX.
An Old Apostle of Physical Culture, Leo Tolstoy 177

CHAPTER XXI.
Influence of Muscular on Mental Power 187

CHAPTER XXII.
To Live One Hundred Years.....195

CHAPTER XXIII.
The Need of an Athletic Awakening...205

ELEMENTS OF FOOD—APPENDIX.

SECTION I.
Wheat and Wheat Preparations.....217

SECTION II.
Oats and Other Grains 221

SECTION III.
Vegetables 227

SECTION IV.
Dairy Products 233

SECTION V.
Fruits, Berries, etc. 237

SECTION VI.
Meats 243

SECTION VII.
Nuts 247

SECTION VIII.
Fish 253

BUILDING VITALITY.

THE FOLLOWING PAGES, UP TO AND INCLUDING THE CHAPTER ON THE IMPORTANCE OF FREQUENT BATHING, ARE TAKEN FROM MR. BERNARR MACFADDEN'S NOTABLE WORK, "BUILDING OF VITAL POWER," COPYRIGHT 1904. HIS FELICITOUS PREFACE IS SUBJOINED AS OUR INTRODUCTION.

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 ardent wish of the author.

CHAPTER I.

WHAT IS VITAL POWER?

"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 more than the power of endurance! It is, more than the power of edurance! 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 dis-

ease. 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, bold-

est, 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 advance 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 essential a portion of it as are nourishing food, pure air and water.

The systems of exercises that I present 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 assimi-

lative 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.

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 another chapter. 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 broaden-

ing 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 car-

ried 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 frequent 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 de-

pends 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 the 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 ex-

halation 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.

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 digested 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 intestines 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.

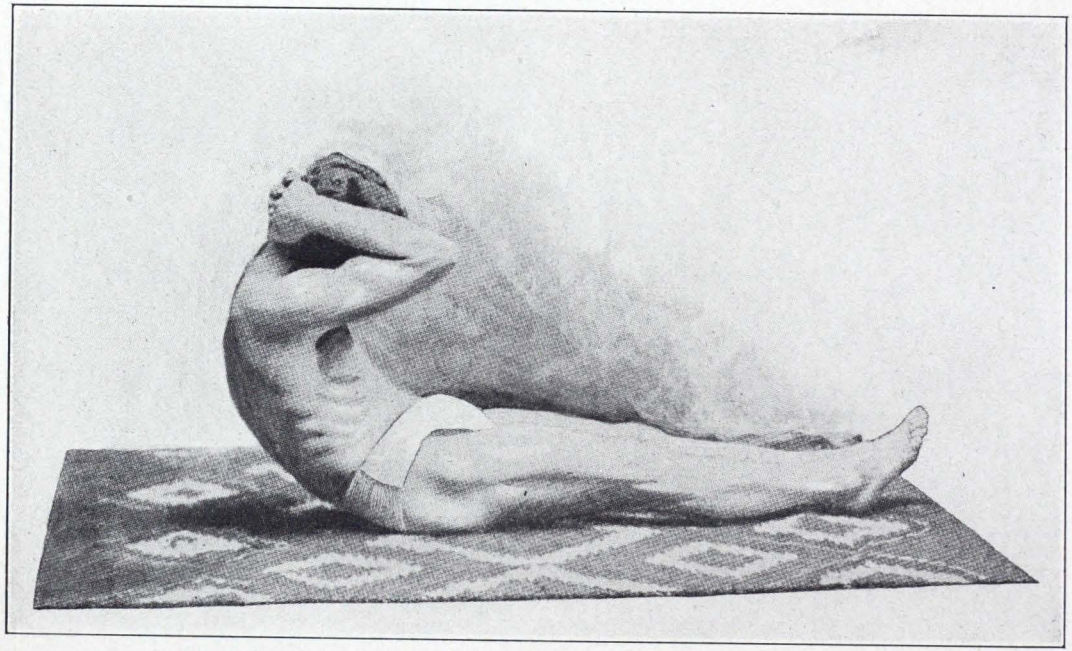
It is a principle of physical training that the vigorous and continued movement of voluntary muscles forces the involuntary muscles to take more than their accustomed share of nourishment and exercise. Thus, by actively employing the voluntary muscles in the region of the waist-line, you strengthen the 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.

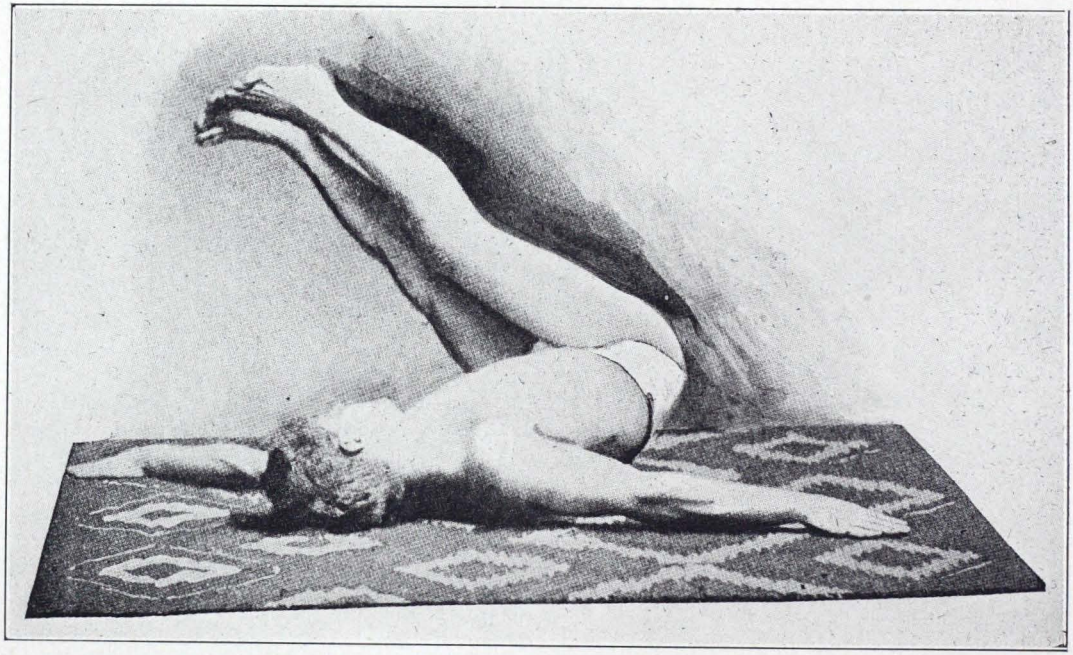
While following these suggestions do not lose sight of the importance of another means of strengthening the muscles of the stomach and the small intestine. I refer to percussion. Tap the front and sides of the abdomen with the open hands or the fingers. Strike lightly and smartly, going over the entire 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.



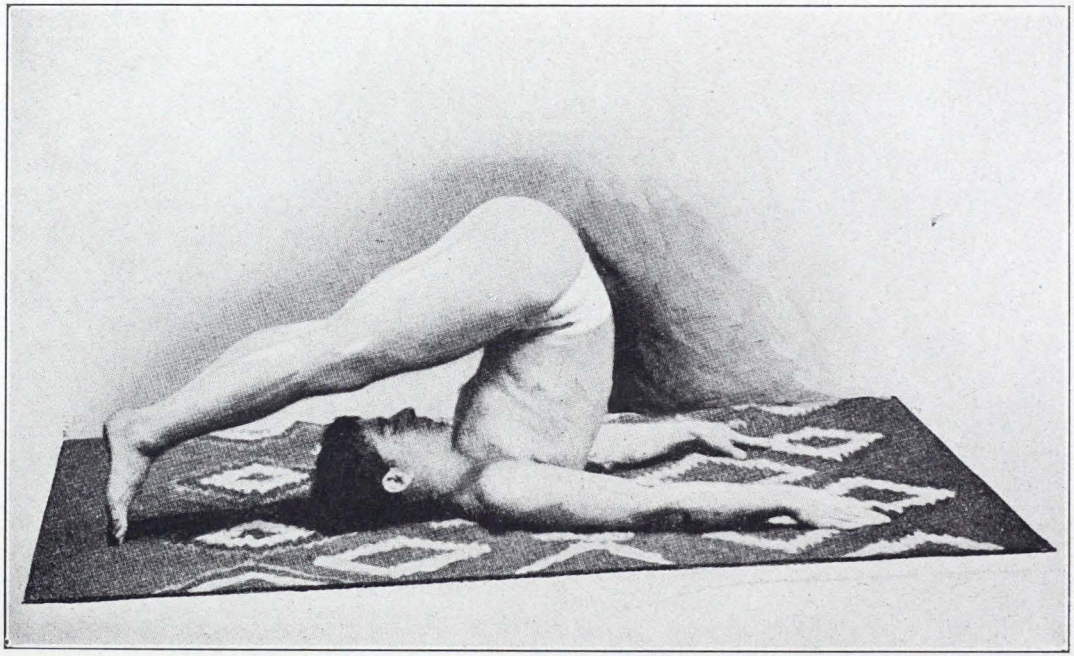
EXERCISE I.

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.



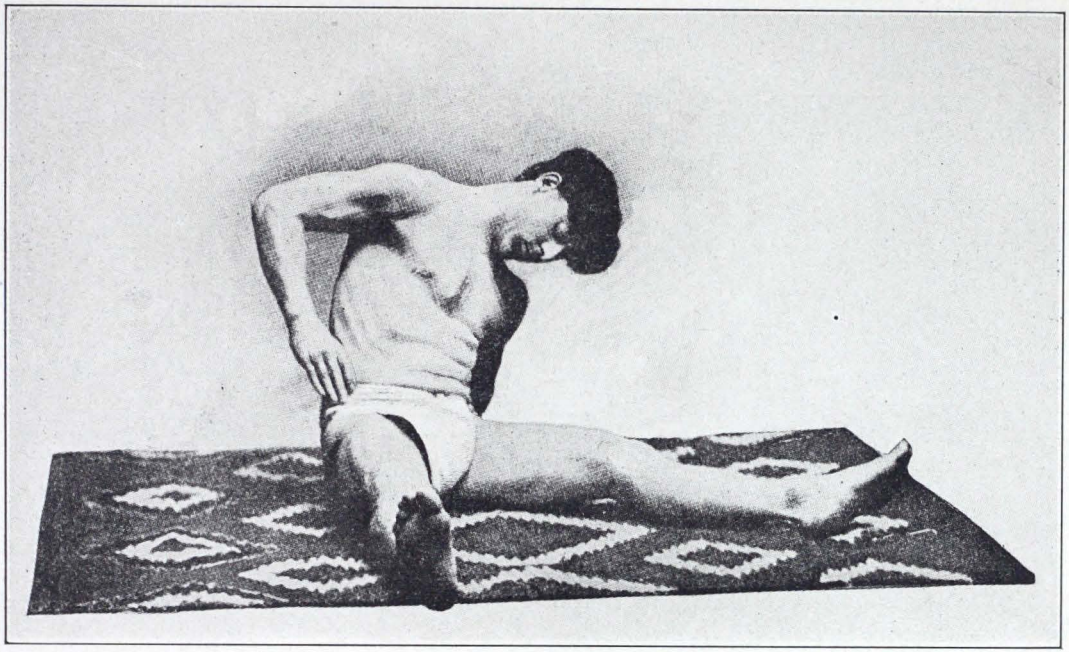
EXERCISE 2.

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.



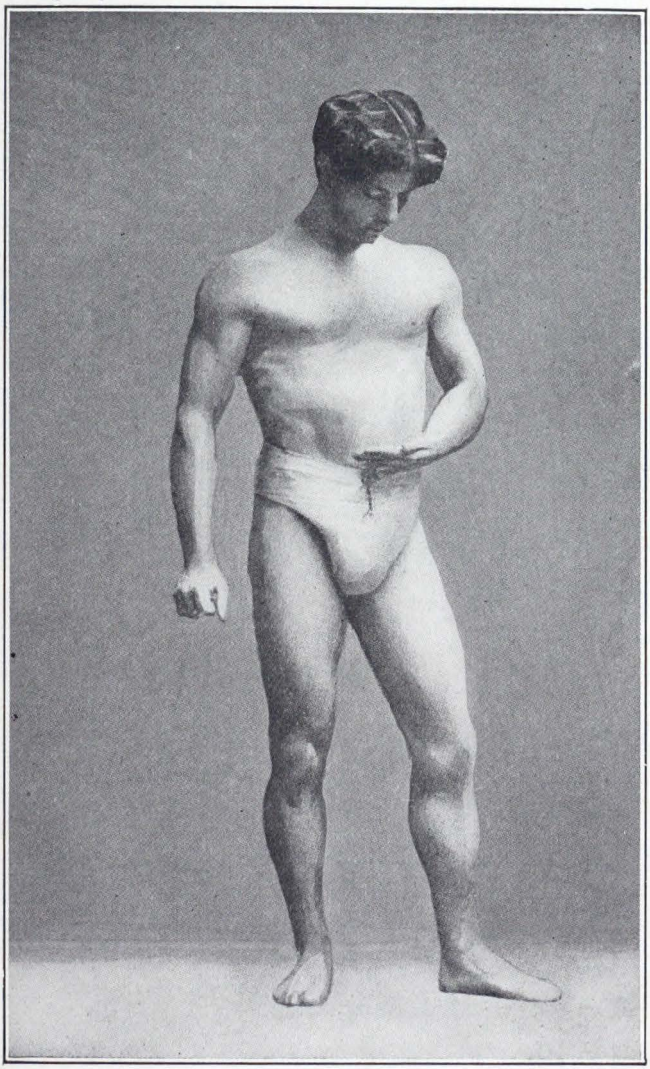
Exercise 3.

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 4.

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.



Exercise 5.

CHAPTER VI.

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 an 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 every one 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

overstrains 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, rub-

bing 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 through every minute capillary of the entire body, and it will also greatly increase 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 defined 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 took 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 qual-

ity 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,

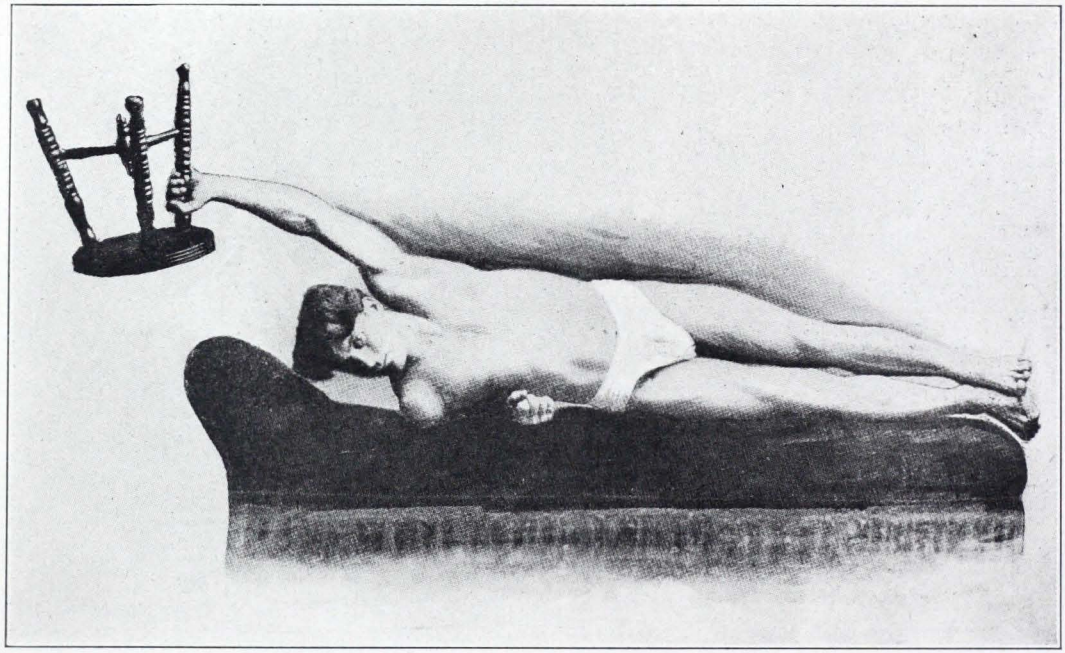
and other means of building up general vigor are of value, an appropriate diet is also of great importance. The greatest possible care must be used to avoid overloading the stomach. This does not by any means suggest the necessity of starving, or eating so little that you will be poorly nourished, but 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 on 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.

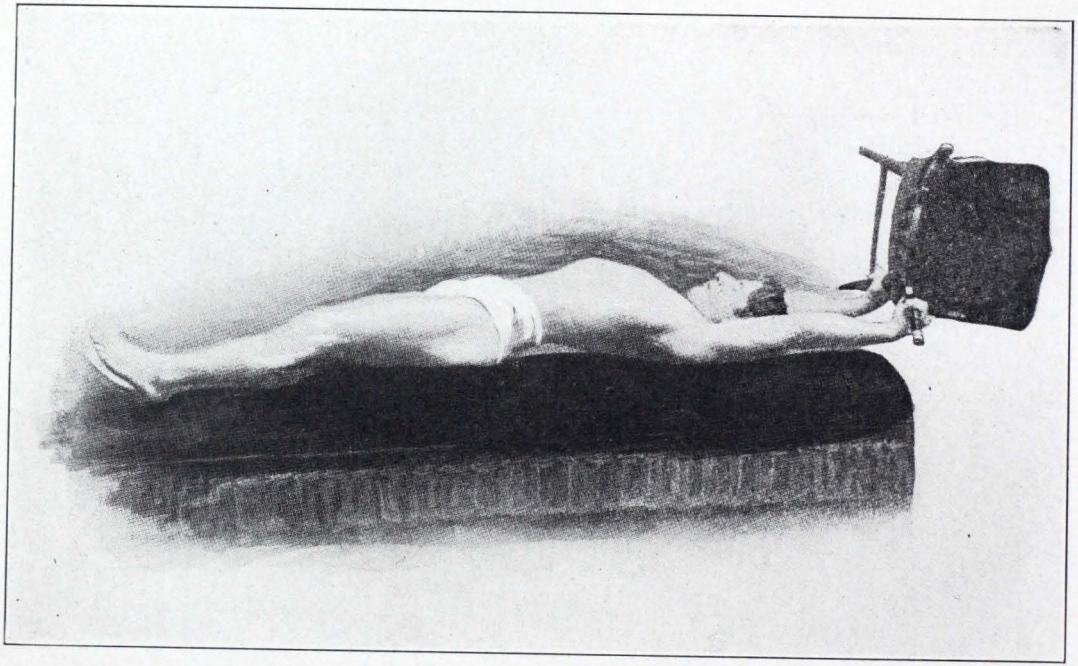
Remember always, that the exercises which compel you to take the greatest gulps of air without causing distress to the heart, are those that are most beneficial to this organ.

EXERCISE I.—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.



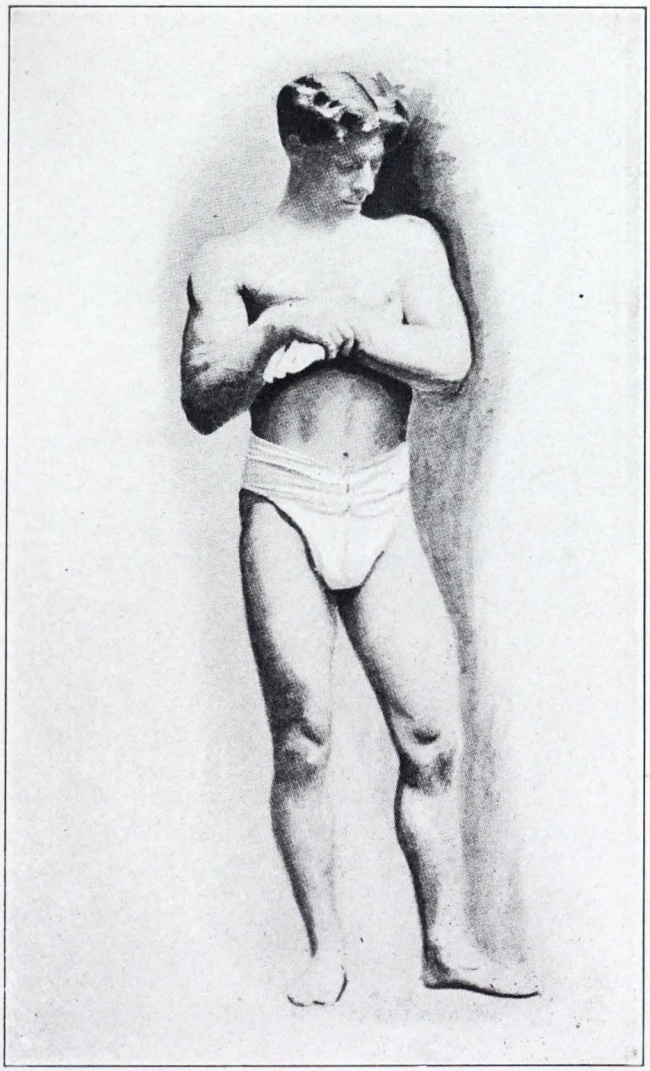
Exercise I.

Exercise 2. 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 2.

Exercise 3. 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 3.

CHAPTER VII.

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 Univer-

sity 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 ren-

dered 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 VIII.

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.

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 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.

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 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 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 believe 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 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.

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 someone 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, 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 IX.

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 of 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 insidiously 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 re-

cesses 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.

Chapter X.

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 begin-

ning 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, was 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 after pages if I felt that they would be of use in convincing my readers that the kind of breathing usually practiced 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.

EXERCISE.—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.

EXERCISES.—Draw in all the air you possibly can, expanding first in the region of the abdomen, drawing back the shoulders. 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 exercises. The air should come to the lowest part of the lungs, and this can be accomplished only when the principal expansion begins in the abdominal region.

Chapter XI.

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 mus-*

cular 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. 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. 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.

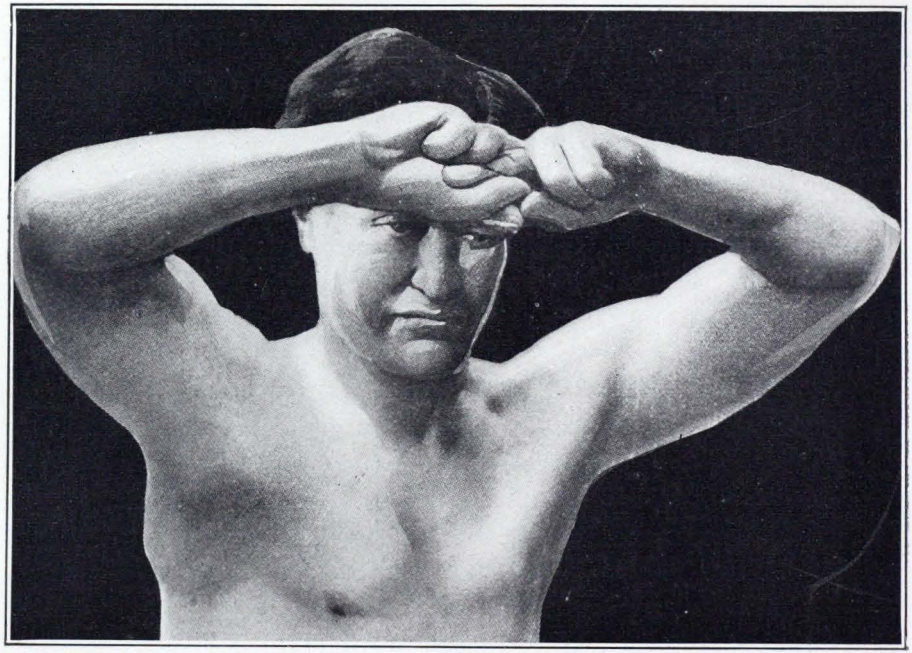
In correcting round shoulders especial attention should be given to developing the muscles of the back between the shoulders, and if bothered with this unsightly

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 in Exercise 1, and then as far back as you can.

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.



Exercise 4.

CHAPTER XII.

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 quan-

tity 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 XIII.

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 a previous chapter 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 networks, 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, 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? We have previously 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 mus-

cular 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 XIV.

RESTFUL SLEEP BUILDS 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 desirous 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 unconsciousness 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.

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, ordinarily 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 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 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 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 explained elsewhere two correct positions that my readers may find it of advantage to test.

Compare the apparent ease where only the bolster is used with that of a sleeper whose head is buried in pillows. Anyone 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 need 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 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 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 frequent 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 pratically 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

physical 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 especially 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 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 XV.

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 occa-

sion, 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 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. Com-

pare 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 XVI.

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 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 thoroughly 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, 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 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 started on a rather rough regime, 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.

"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 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 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.

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 es-

sential, but dry friction baths of some 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 immediately 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 character, 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.

EXERCISE I.—Grasp the towel 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.)

EXERCISE II.—Grasp the towel and pull it back and forth over the central portions

of the back and shoulder. Same exercise with position reversed. (Upper arm and shoulder.)

EXERCISE III.—Pull the towel back and forth from the neck to the edge of right shoulder. Same exercise with towel over left shoulder. (Exercises central back portion of upper arm.)

EXERCISE IV.—Rub back and forth along the back, from immediately under the arm-pits down to the calves of the legs.

EXERCISE V.—Same as previous one. This develops shoulders, chest, biceps and back.

EXERCISE VI.—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.)

EXERCISE VII.—Wrap the towel around one hand, 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.)

EXERCISE VIII.—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.)

EXERCISE IX.—Bring towel back and forth, 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.)

EXERCISE X.—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.)

Chapter XVII.

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 body 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 increase 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 to-day 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 XVIII.

AIDS TO PHYSICAL FITNESS.

BY EUSTACE H. MILES,

Author of "Avenues to Health," "The Training of the Body," etc.

The author of this article is one of the best known health-building experts in the English-speaking world. What is more, he is a splendid example of the benefit of his own teaching. He has demonstrated this very emphatically in holding the tennis championship for several years. We are satisfied our readers will be pleased to learn something of his views.

The ideal of a simple life, to my mind, is not a return to Nature, as it is commonly supposed. People too often adopt the erroneous idea that the country belongs to God and the city to the Devil. Of course, it is better to be healthy and morally fit in the country than diseased and immoral in town. But better still is it for a man to be able to lead a full social life in the city, with all its disadvantages and dangers, and

come out "on top," in perfect condition of mind and body.

A rural existence is all very well in its way, but it can hardly be considered the highest form of civilized life. The man who can stand the strain of city life, with its duties and amusements, has gone much further up the scale of evolution. The game of life is very much like the game of golf. A man who drives his ball and sees a bunker ahead begins by thinking the obstacle a nuisance, and wishes it out of the way; but after he has knocked against the bunker pretty often the time comes when he gets his ball over. Then he feels a stronger and a better man, glorying in his superiority to the obstacle.

So it is with the impediments and "bunkers" of city and social life. They are tests of strength; and the man who surmounts them is more worthy than he who avoids them by going round the corner. The perfectly fit man should be able to live in almost any environment without personal damage. If he has passed the ordeal of the city he can go down to the country easily enough and master it; but the countryman

who comes to town would often go to wreck.

So I would never advise men to cut themselves adrift from civilization or to isolate themselves from society. What we really want is a rule of life which may be adapted to people who wish to go through the ordinary duties and pleasures of their social state, and even to perform with impunity those duties and indulge in those pleasures, which they know to be harmful.

The city clerk, for instance, has to pass perhaps eight hours of his day, in a close, ill-ventilated room. That, of course, is an unhealthy condition to live in. On the other hand, the society man has to go to luncheon parties, to afternoon teas, to big dinners, theatres, receptions, and so on. He finds he cannot escape from the majority of these things without losing social caste; yet he knows perfectly well that the life is bad for his physical, mental, and moral health. Well, what is he going to do to keep fit in spite of all? How shall he lead a simple life?

As far as I have worked out the problem by personal experiment, the answer may be called the law of equivalents. It is a kind

of give and take. If you lose in one thing, you must make up on another. To the society man I say, "It is perfectly understood that your position in life requires you to dine at other people's houses; to eat too much in the evening, and generally unwholesome food; to attend to numerous social functions damaging to your nerves and moral tone. Very well, then you must balance all that time when you are not master of your own actions by strictly disciplining yourself when you are at perfect liberty to do what you like.

Between the hours of six and twelve in the morning, you must lead a simple life. You would do well to go entirely without food until your midday lunch, when, having given your body a complete rest, you may afford to indulge without positive harm in a luncheon party with your friends, if such is the requirement of your social life. Between those hours of six and twelve you must rest your mind also by quiet work or exercise, and must get a store of self-respect by developing your character and ideas in the privacy of your own house. If you are going to have a big dinner in the evening

you must knock off your big luncheon, or at least avoid the abomination of afternoon tea.

Then you must make a sort of comparative catalogue of the things which you find harmful to you; and there, again, you must be regulated according to the "law of equivalents," if you like to call it so. For instance, you may know that wine disagrees with you, and that a meat diet arouses your passions and upsets your moral balance. In that case you must decide which is most harmful, or which you least prefer to go without.

If you go without meat—I have not tasted it for eight years—you will probably find that you can take a glass of wine or two without much bad effect.

The mistake people make is that if they deny themselves some of the "good cheer" of life they put themselves on a pedestal and demand the admiration of their fellows. As a matter of fact, they have nothing to be proud of except a knowledge of what agrees or disagrees with them. Asceticism is not a sign of strength, but of weakness. If I could swill gallons of beer and eat great

quantities of flesh, like our Saxon forefathers, I should be a much "stronger" man in being able to master such a diet. But then we are not like our Saxon forefathers, and it is as well to recognize the fact.

Now, the same law of give and take applies as well to the city clerk, as to the society man. If he spends eight hours of his day in a room, where he cannot have the window open because the majority decides against it; where the surroundings are sombre and depressing, his work fagging and uninteresting; he must make up for that disadvantage by leading an entirely different life from the time he gets up to the time he goes to his office, and from the time he leaves it until he goes to bed.

If from six till nine he is filling his lungs with good air and his brain with new ideas, he will not be overcome by the atmosphere or depression during office hours. He need say nothing about those private hours to his fellow clerks. There is no need to let them see that he is any different from themselves, and yet he will be different, because healthier and happier. And so when he goes to lunch he need not "lose caste" be-

cause he has a Welsh rarebit, instead of a heavy meal.

It is quite possible to keep oneself in perfect condition, to be quite "fit," with very little exercise and open air, and while leading the sedentary life of a literary man. I get scarcely any exercise except when I play a tennis match; yet I am always in good form, and always ready to play at a day's notice. To take the place of exercise I have a number of little rules, "tricks" you may like to call them, chiefly consisting of certain elements of diet and exercises of breathing.

The sedentary man gets tired and languid, because his system becomes clogged. Remove the things that clog, and you don't feel tired. That's what I do with my little "tricks." I may say that I lead a strenuous life—at any rate, not a lazy one. I write, on an average, forty or fifty letters a day, and get through a lot of other literary work. I should simply go to pieces if I lived such a sedentary life on ordinary lines.

But by going without food from six in the morning till half-past one, by accumulating a reserve force of mental and bodily

rest, by lying on my back on Sundays, when I write or read in bed, by making sacrifices of things I don't care two pence about, by putting myself on the simplest diet, when I have my own time to myself, I am not only able to keep on working with perfect freshness, but to indulge at times in lunches and dinners, with people, who bore me, and generally to play my part in society, without parading my private habits under other people's noses.

People may ask what have diet and breathing exercises to do with a simple life, as it affects the mental and moral welfare of the individual? The answer is an easy one. Ill-health generally means immorality, uncontrolled passions, temper, or nerves. I say, with absolute confidence, based not only on my personal experience, but also on the statements of many friends, who have followed one of my schemes of diet, that if one avoids various kinds of food, and disciplines one's self upon a very simple diet, suited to one's particular circumstances and environment, one gets one's body and brain under absolute control. One becomes master of the machine.

Simple food enables one to live the simple life, partly, because it is a great saving in expense, and therefore the stress and struggle for existence are diminished. A friend of mine, for instance, who has adopted my ideas, tells me that he saves a solid $500 a year; yet nobody in his social set sees any change whatever in his mode of life. This saving of money relieves him of financial anxiety, and he has the additional satisfaction of finding himself a healthier, happier, and morally better man.

These little rules of give and take, of compensating yourself here for what you lose there, of practising a little ascetism in private, because you find it difficult to do just as you please in public, of giving up the things you don't much care about in order to enjoy the things you prefer, make up a philosophy of life not too difficult for every one to follow—in whatever circle of society he may live—and it results in physical and mental "fitness" well worth the trouble involved.

CHAPTER XIX.

INCREASING THE STRENGTH OF BABIES.

BY BERNARR MACFADDEN.

"Remember, 'tis not the ancients or their sons
That are the nation's hope, but they of lips
Bedewed with mothers' milk, whose feet as yet
Bear not the burdens of the bodies which,
In coming day, shall be the State's strong ramparts."
—*Burbridge.*

The assertion that physical culture is of distinctive benefit almost from birth to death, will be questioned only by those who are not familiar with its possibilities. But even they who are ignorant of its methods and principles, will not deny that the limited muscular powers of a newly born baby can only be developed by proper and constant exercise. Physical culture, whether for infants or adults, consists not of haphazard movements of the limbs and body,

but of exercises, each of which is for the purpose of strengthening a specific muscle or group of muscles. In the case of babies the system is modified to meet the special needs of their gelatinous muscles, soft bones, and relatively weak ligaments. So that the most timid of parents can use it without fear of its harming their little ones. Exercise is the first law of babyhood, and if the instinct of the youngster in this regard is directed into the right channels, so much the better for it, its parents and those who are to come after it.

As has been intimated and thanks to Nature, the desire for activity in a child is too strong to be curbed. By kicking and squirming and swinging his arms he gradually secures enough strength to crawl. After indulging in the delight of this new-found freedom for a while, and after repeated endeavors in the art of balancing, sufficient strength and skill are acquired to walk. Every child practices physical culture, and in the proportion that children are encouraged in their natural desire for exercise, so will they improve in health, strength, and symmetry and beauty of body. Even the

ultra prudish could hardly fail to admire a nude little one of the type in question, which, clad only in its innocence, is a combination of the physically perfect and the untainted morally.

There are but few children between the ages of say, one and eight or ten years, who do not possess well-shaped bodies. They have nothing else to do but to play, and there is no better physical culture than active play. If you have a child who is not able to find companions of its own age, ready and willing to run, wrestle, jump, push and pull, it is your duty to become a child yourself, and thus give its little body the exercise so necessary to its development. When we see a healthy, well-kept child, we usually comment on its beauty, but the fact that the beauty disappears long before maturity rarely causes comment. Yet this passing of physical charms should not be. It is one of the terribly destructive results of the abnormal conditions connected with education and our environments.

Let it be repeated that all the lower animals increase in physical perfection up to maturity, and there is no reason in the world

why it should not be the same with human beings.

Do not forget that the less clothing worn by a child the faster will he acquire size, strength and symmetry. Of course he should be sufficiently dressed as to insure that his body be kept fairly but not unnaturally warm. Clothing that weighs on the child, hampering its movements and crushing all its desire for exercise, is responsible for many maladies, and for the deplorable lack of physical beauty in infancy and in later life.

There is no occasion to fear colds if the child is allowed to breathe fresh, pure air and is not overfed. Neglect in this regard is also responsible for a number of the diseases that attack children.

Following out the theory that in order to develop strength in a child it must be given every encouragement to the end of its using its muscular powers, we give a series of exercises with this chapter, the result of which will astound any parent who will give them a fair trial for one or two months.

Of course all these exercises should be

considered in the light of play by the child. They should be one big romp from beginning to end. Unquestionably the exertion incidental to giving the baby this romp will be of benefit to the adult participants in it also.

For the sake of precaution we will take for granted that your child is weak. Begin slowly. Do not under any circumstances handle it in a way which apparently causes pain or discomfort.

The less clothes worn by the child in this romp, or physical culture treatment—for such it really is—the better will be the results. And for heaven's sake do not starve its little lungs. Open the windows wide. Thousands of children are annually laid away in their graves for the need of a sufficiency of pure air.

After you have played with the child for awhile and warmed its body by accelerating the circulation, no amount of fresh, pure air will give it a cold.

Whatever you do, avoid making these exercises anything resembling work for the little one. Let them be a pleasure for yourself as well as for your pupil from first to

last. If you are a man, take off your coat, roll up your sleeves and "go at it" with zest, with energy, with hearty enjoyment. If you are a woman, remove your corsets, and do likewise.

After you have developed enough strength in the child to enable it to endure a considerable amount of wholesome exertion, there will be very little need of other means of exercise for the parent who treats an infant to a daily lesson in physical culture. Especially is this so if you free yourself from the ridiculous fear of fresh air, and so open the windows while the exercises are being given. Every part of these movements must be sacrifiecd to the play element.

Do not try to give them in their regular order—give them in "any old way" just so that you can learn each one thoroughly and do not miss it during the "romp."

Always cease the moment the child shows signs of fatigue.

The best guide in this connection is to continue until the child sees no more fun in it—until the pleasure of the romp has

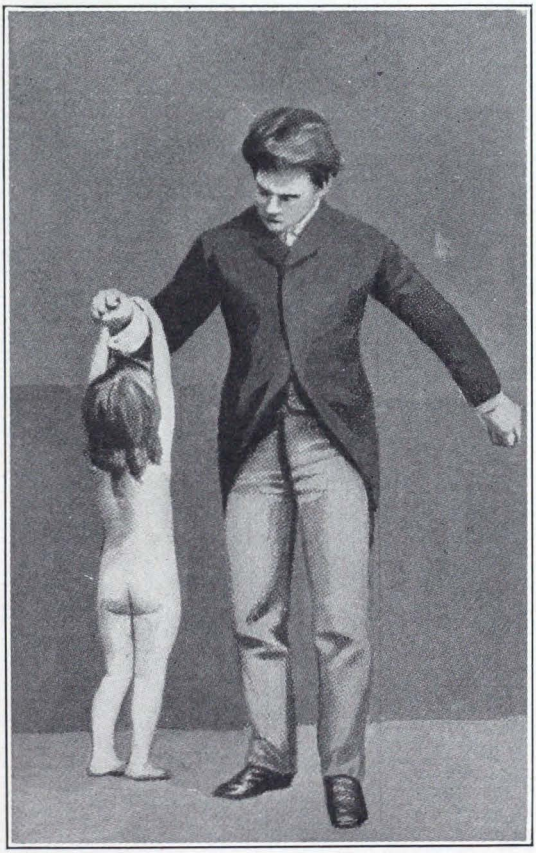
been exhausted. Then, if it is bed time and it does not greatly desire to go to bed immediately, or if it wakes before morning after all this vigorous work, there is something radically wrong with the youngster.

Exercise 1. Raise the child high in the air several times from this position. This will expand and develop the muscles around the chest.

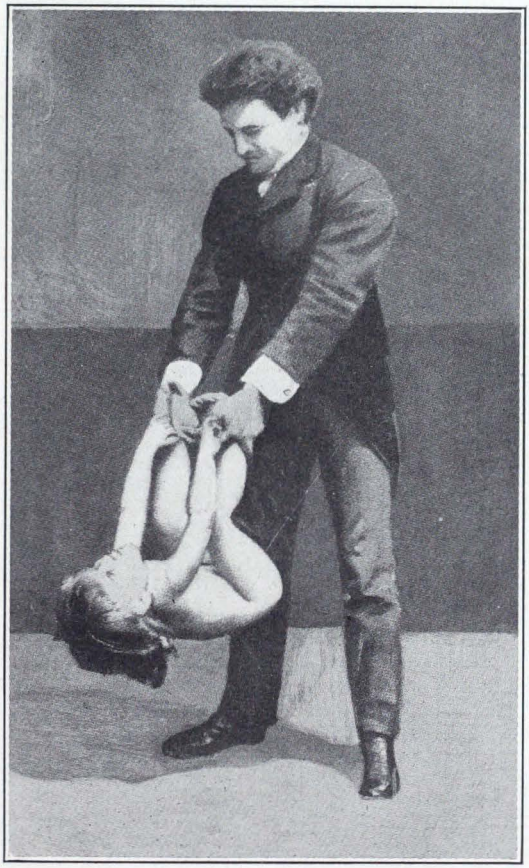
EXERCISE I.

EXERCISE 2. Raise the child as per illustration. Now while holding him in this position, bring his hands together, then far out to the side again. Variation—Move right hand forward and left hand away from you, then vice versa. This exercise is also excellent for expanding the chest and developing the muscles in that region of the body.

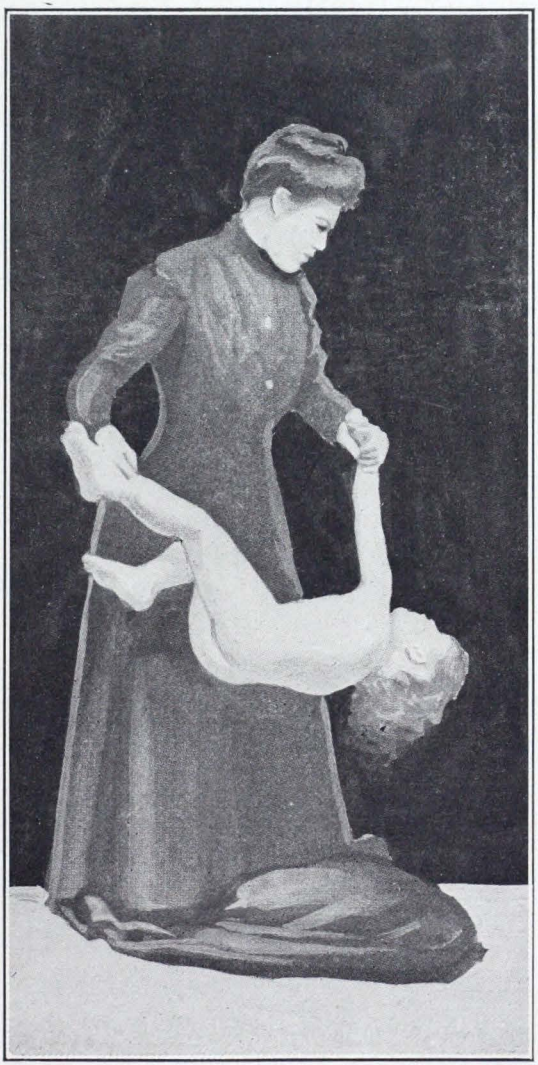
Exercise 3. Instruct the child to clasp its hands tightly over your arm, then raise it off the floor several times. Especially good for strengthening the hands, arms and chest.



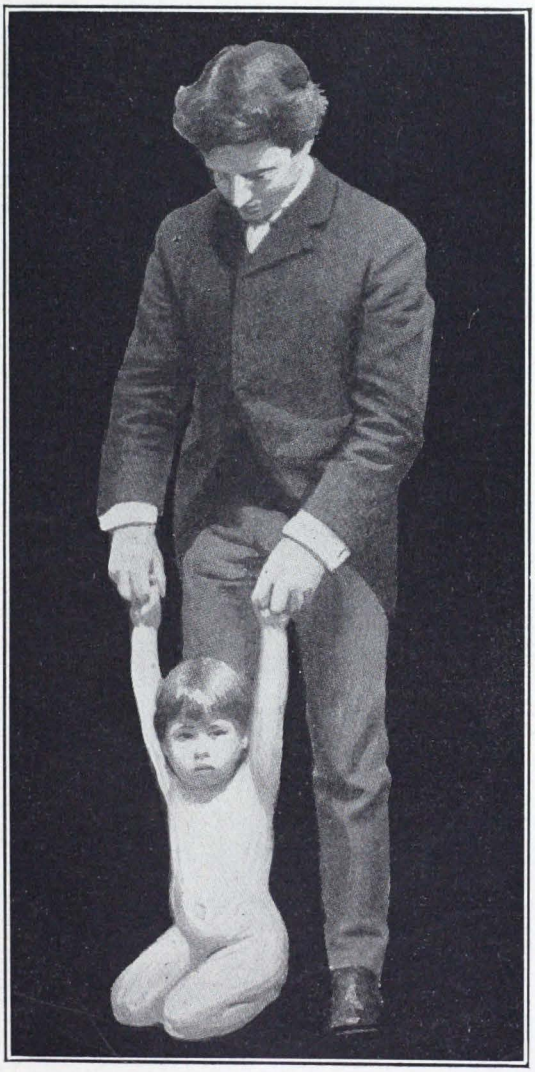
EXERCISE 4. Grasp its feet in such a manner that it can catch hold of your two thumbs with its hands, then raise and swing it back and forth. For strengthening the legs, hips, back and arms.



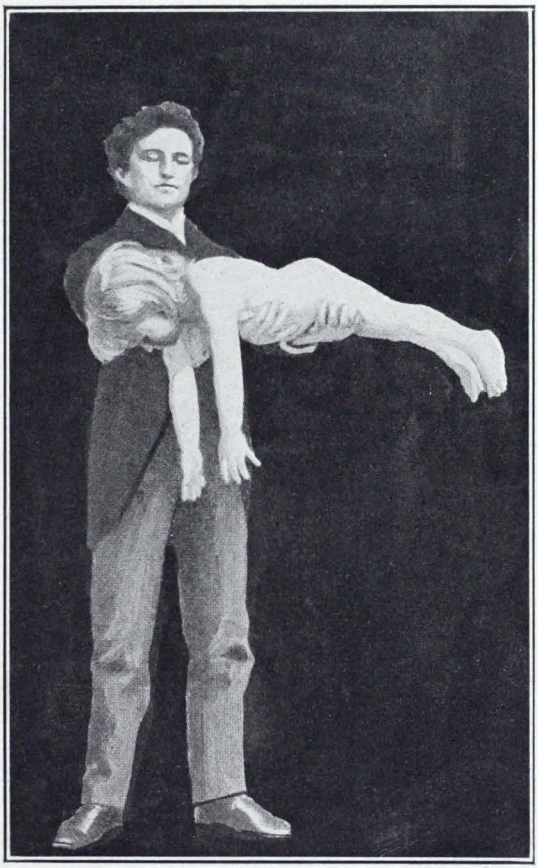
EXERCISE 5. Grasp it by wrist and one leg, lift and lower it several times. Then lift it by both hands and one leg—both legs and one hand. Be very careful in this exercise, as it is rather rough handling unless the child is strong.



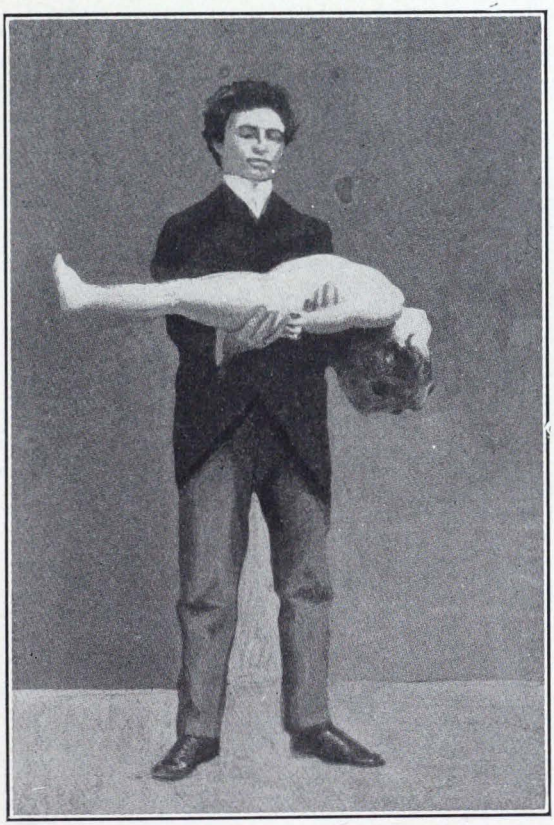
EXERCISE 6. Clasp its hand lightly. Now try to induce it to raise its body with just as little assistance on your part as possible. Have the child continue until it acquires the impression that it is work. Then cease. For strengthening the legs.



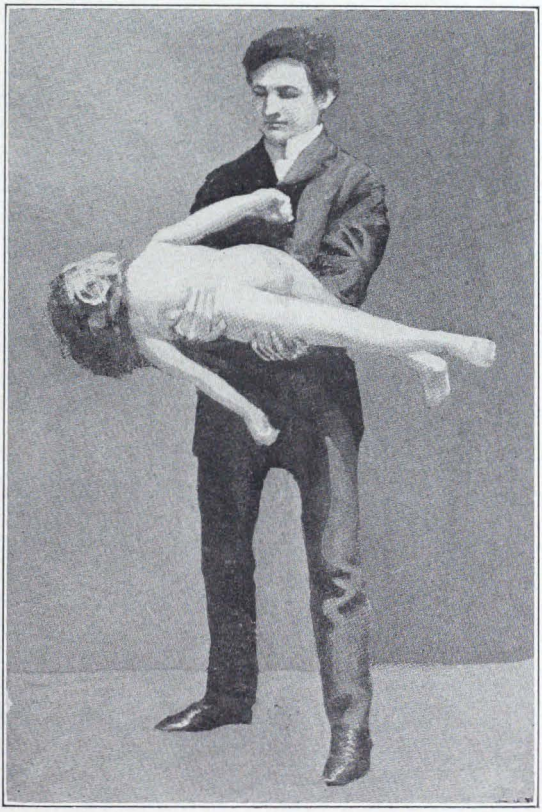
Exercise 7. Raise the child with hands under abdomen as per illustration, and induce it, if possible, to hold its body straight for a short time. The closer the hands are together, the more difficult will be the exercise. For strengthening the back and hips.



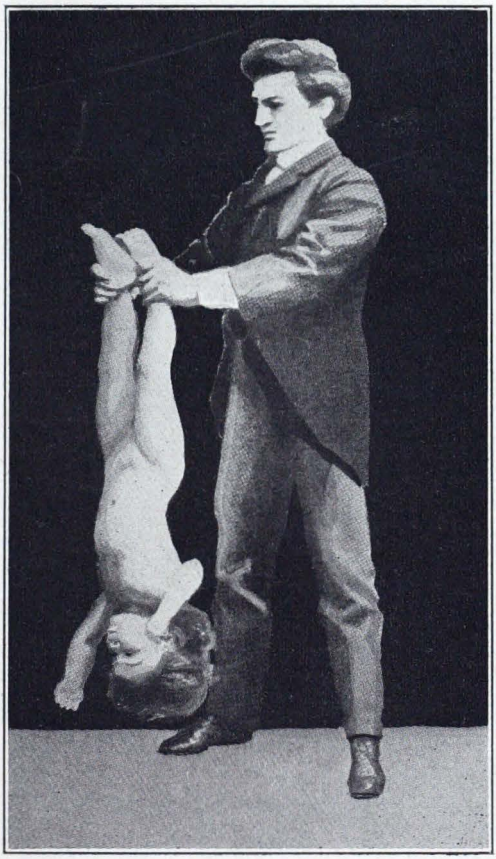
Exercise 8. Raise the child with hands under the back as per illustration. Coax it to straighten its body if possible. The nearer the hands are held together the more difficult the movement. For strengthening the abdominal muscles.



Exercise 9. Raise the child with hands under its side. First under one side, then the other. For strengthening muscles on sides of hips and waist.



Exercise 10. Raise the child by grasping both ankles as per illustration. While holding it in this position bring feet together, then far outward. Also move one leg forward and the other towards you, then vice versa. For muscles of legs, hips and waist.



Exercise 11. Raise child by one leg, grasping ankle as per illustration. Raise and lower it a few times and then same with the other leg. For strengthening legs and hips.

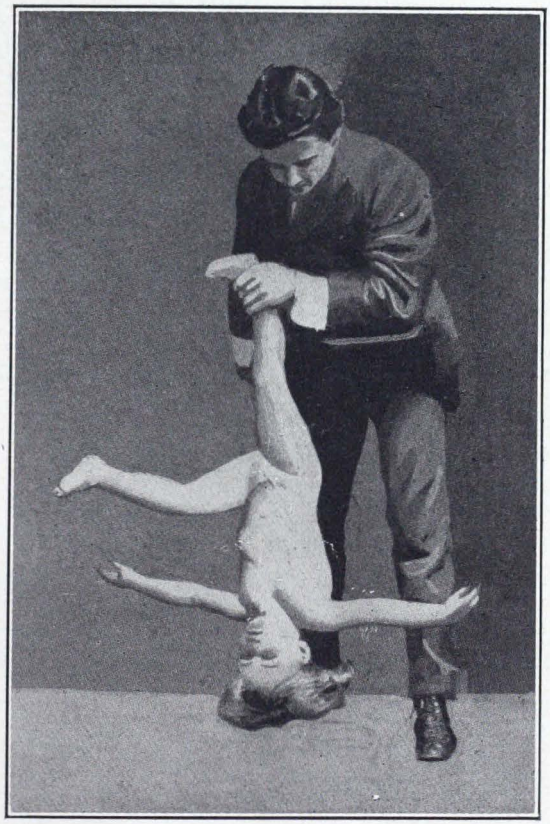


Illustration showing Special Exercise.

Chapter XX.

An Old Apostle of Physical Culture.

Count Leo Tolstoy, Hale and Hearty Thanks to the Simple Life, Celebrates His Eightieth Birthday.

BY IVAN STANOVITCH.

The man who is recognized as "the best known and most generally recognized living author," to quote the words of a famous Englishman, and who is furthermore, a typical physical culturist, has just passed his eightieth birthday. He is Count Leo Tolstoy, and the tremendous influence which he has exercised, not only upon Russian political and national life, but upon the world at large, is a striking tribute to those principles upon which his physical existence is based. These principles are identically those which are taught by this magazine.

Tolstoy was born in 1828, in the village of Yasnaya Polyana, Russia, and the estate

which he now owns, begins a few yards away from the spot where he first saw the light of the sun. He was first a pupil in private schools; next he had a term at Kazan University. A tour of Western Europe, which followed his graduation, completed his education. He served for three years in the Crimean War, married Sofia Andreyevna, of Moscow, in 1862, and has been the father of thirteen children. It was not long after his marriage that he began to preach and live those methods of the simple life which have not only made him famous the world throughout, but have in addition, left their impress for all time on the race.

Before Tolstoy decided that the only life worth leading was that based on physical culture, he had tested most of the systems and beliefs and theories by which man has ever tried to attain mental and physical happiness. To use his own words, "I had tried and tested science and modern culture (so-called), and had turned from them with a feeling not many degrees removed from repulsion, because of the inability of the first to solve the really important problems of life, and because of the hollowness and

falseness and blunders of the second." He also came to the conclusion that no small portion of the troubles which afflict humanity, outside of disease, had their source in the selfishness bred of that which we are pleased to call the "higher civilization." So it was that he decided to live out the simple life, not merely as a matter of personal well-being but on the score of the example that he could thus set others.

Tolstoy, like every other physical culturist who is worthy of the name, gave evidence that the rules which governed his bodily life, made for mental activity and wholesomeness. In his case, this activity bore much literary fruit, which in turn did much for the betterment of the Russian peasants, in the first place, and for the good of humanity in the second. As one writer puts it: "It will not be disputed that the influence of the aim and life of this man upon the individuals of all classes, has reached from the hut of the humblest, up to the very throne of the august Czar. But for the insistent teachings of Tolstoy, in all probability, the Russian monarch would not have called the first Hague Conference. Thanks to Tol-

stoy's courageous and persistent writings, the petrified ritual of the Russian church has shown signs of softening. It is due largely to Tolstoy's condemnation of great wealth improperly used, that some of Russia's wealthy citizens are now devoting themselves to philanthropic activities. And it has been because of Tolstoy, that attention is now being paid to hygienic affairs in Russia, to which that country has heretofore been a stranger. He has not only taught the people how to think, but he has taught them how to live. *He has taught them the religion of the bath, of plain diet, of cleanliness, of fresh air and many more needful and wholesome things."*

Those who know of the Russian peasant in his usual environments, will understand the difficulty as well as the pressing need of this part of the great reformer's labors. Under the conditions which are the rule in Russia, the *moujik*—the small farmer or peasant—is a stranger to the first laws of ordinary hygiene. His food is of the worst; he drinks vodka, the native brandy, to excess; during the winter, and for a good part of the summer, the doors and the windows

of his hovel are never opened; and as a consequence he and his wife and children are frequently victims of all kinds of opthalmic and pulmonary diseases; in short, his filthiness of person has been almost proverbial.

Tolstoy, by bringing these lamentable facts before the public through the medium of his books, caused something like a wave of reform to sweep over the land-owners who were responsible for many of the evils. Such evils, while not altogether abated, were nevertheless lessened by the "fierce white light" thrown on them by the Tolstoy literature. The peasants themselves felt the influences which the author brought to bear on them. They began to realize that no man had the right to treat them like brute beasts, were he landlord or noble. They began to get an inkling of the things due them by the inalienable rights of Nature, these including the necessities of life such as nourishing food; properly constructed homes, no matter how humble, and an escape from the drudgery which kills a man mentally and physically. In other words, Tolstoy taught thousands, even millions, of his unfortunate countrymen their right to

demand those things and affairs of mental and physical hygiene without which life is a misery and a mockery. In doing this, he proved the truth and the power of the physical culture principles which were within him.

The events which resulted from his efforts are of such recent occurrence that a mere allusion to them will be sufficient in this connection. But there are not wanting those who aver that the changes which have been sweeping over Russia, in regard to the condition of her people, are the more or less direct outcome of Tolstoy's teachings. The Duma; the return of a large portion of the land that has been owned by the Czar to the people; the recognition of peasant rights, which have been ignored for centuries; the propaganda against the bureaucracy; the general awakening of the national conscience and much more of the same nature, are among the things credited to Tolstoy and his books and labors. When we reflect that Tolstoy himself, at least as we know him and his works, would scarcely have been possible without the physical culture principles which have made him that which

he is, we must admit that the science has powers and possibilities which are not usually recognized by the multitude. Indeed, many of its sincere adherents do not understand its potentiality in this respect.

Among the more notable of Tolstoy's efforts in behalf of his countrymen outside of his books, are the organization of peasant schools on a new and sensible basis, the system used including physical as well as mental training; co-operation in the editing and improvement of cheap popular publications (and in this latter instance the influence of his physical culture bent is seen by reason of a good many of the publications having to do with hygienic affairs); the organization of relief for the starving in Middle Russia; his renunciation of the protection afforded him by the copyright laws because "he and his belong to the people"; and his plays, all of which are aimed at some of the abuses in public administration. His attacks on certain phases of church life in Russia led to his excommunication in 1901, and incidentally, the church authorities forbade the people to take part in the recent celebration of his eightieth birthday. That this

order was generally disobeyed, is now a matter of history. The crowds which attended the festivities at his estate were as enormous as they were enthusiastic.

Tolstoy is a big, heavily built man, "with long arms hanging loosely at his sides," to use the words of one who saw him on his natal day. He also has small, keen gray eyes; a nose which is wide and powerful; lips of the Slavic type, being somewhat thick; a head with a noble forehead; broad shoulders, slightly stooped from literary work; and a matted, gray-white beard. A certain attractiveness or magnetism radiates from him—a sign, by the way, of the consistent physical culturist. Somebody has said of Tolstoy that "his face is that of a man who, while absolutely unshakeable in his convictions, sees things as they are, and is under no delusion whatsoever as to his power to change them, except at the expense of constant effort."

The whole scheme of his existence is that of the "simple life." And while he does not force his beliefs on any one, even the close members of his family, yet he proves the possibilities of that life through the medium

of example. He seeks to show, especially to his poverty stricken and hard working fellow-countrymen, that happiness does not depend on clothes or surroundings, but rather on health and education and the contentment which these bring in their train. One of his favorite axioms is that "A bath at dawn, the plough by day, and a book by night," are the things which make for lasting happiness. In other words, that the fact that one is engaged in hard manual labor, should not prevent him from enjoying the good which arises from that labor added to an observance of the rules of hygiene and the delights of mental culture.

So it is that Count Leo Tolstoy wears the peasant costume, which consists of trousers, blouse and belt. A rough shirt, with a rolling collar, forms the rest of his dress. He also wears stockings which have been knitted by his wife, and shoes made by the village cobbler. Usually he is to be seen bareheaded when in the open air, but sometimes he wears a peasant cap or a silk skull cap.

He exercises constantly, his favorite pastimes being walking and riding. He is also a good swimmer and a crack fencer. In

spite of his advanced age he is possessed of a wonderful degree of endurance, as the young folk who sometimes accompany him on his walks, can testify.

Tolstoy is practically a vegetarian, and he does not hesitate to attribute much of his mental acumen to this fact. In a climate like that which is the rule in Russia for a good many months in the year, fatty foods are essentials, and in order to supply this demand of Nature's, the Russian peasant is apt to use foul foods. Tolstoy has done a lot of reformatory work in this respect, teaching the ignorant that the food needed by them in the winter, can be obtained in a cheap and cleanly form. He is a great advocate of the use of vegetable oils, by the way.

"Do unto others as you would have them do to you," is the rule of this great physical culturist's life. It is the natural outcome of the principles by which his daily existence is shaped. For physical culture brings about that condition of mind and body, which leads one to think kindly of one's neighbor and not altogether of one's self.

Chapter XXI

Influence of Muscular on Mental Power.

BY HARRY NELSON JENNINGS.

It is related of the Duke of Wellington that once, while watching the boys engaged in their sports on the playground at Eton, he made the remark, "It was there that the battle of Waterloo was won." And no one comparing the burly, robust Englishman with the pretty but effeminate soldiery of France can choose but to believe that he was in the right. In England very great attention is paid to the physical development of its youth, and in France very little, and the result is very clearly shown in the armies of the two countries.

To have a good body and a sound constitution is the first and most essential element to success. The leaders in all departments of life have almost invariably been strong men, physically as well as mentally.

Of course, there are some notable exceptions to this rule; for example, blind Milton; Pascal, who was an invalid at eighteen; Pope, also an invalid and a hunchback; Julius Cæsar, who never planned a great battle without having an attack of epilepsy; and the great Aristotle, who, though having the body of a pigmy, possessed the intellect of a giant. But these are only the exceptions which prove the rule. The fundamental principle is unshaken, that it is the men who possess the good, finely-developed bodies who win the laurels in the struggles of life. This is true of men in all walks of life. It applies to the merchant as well as to the farmer, to the bank clerk and to the policeman, the student and the athlete.

We need not, and could not, all be Sandows or Jeffries, but each should work for that degree of muscular development which will enable him to carry out his life work most successfully. Again I say that it is all-important that a person have a healthy and well-developed body, and, if a man aims to be a leader, this is almost indispensable. Horace Mann says: "I am

certain I could have performed twice the labor, both better and with greater ease to myself, had I known as much of the laws of health and life at twenty-one as I do now. In college I was taught all about the motions of the planets, as carefully as though they would have been in danger of getting off the track if I had not known how to trace their orbits; but about my own organization, and the conditions indispensable to the healthful functions of my own body, I was left in profound ignorance. The consequence was, I broke down at the beginning of my second college year, and have never had a well day since. Whatever labor I have since been able to do, I have done it all on credit instead of capital —a most ruinous way, either in regard to health or money. For the past twenty-five years, so far as it regards health, I have been put, from day to day, on my good behavior; and during the whole of this period; as an Hibernian would say, if I had lived as other folks do for a month, I should have died in a fortnight." Such is the testimony of one of the best educators America has produced.

Until lately muscular development has been despised as associated chiefly with rowdyism, and the aim has been to develop the mind to the almost total neglect of the body. But the people are beginning to awake to the fact that the body, as well as the mind, has rights that are bound to be respected, if the best results are to be secured, and if a man is brutal and quarrelsome it is not the fault of his athletic training, but it is the nature of the man. Perhaps the pale, sickly student, who spends his night hours that should be given to rest in poring over his studies for the succeeding day, will win the most of the honors at school, but the tough, sinewy, athletic fellow, who devotes a portion of his time to sport and needful rest, will, other things being equal, achieve the greater success in after life. A comparatively weak mind with a Herculean frame will achieve greater results than a giant mind with a shattered constitution. A great deal is said about the danger arising from athletic sports, and, indeed, there is a certain amount of risk in them all, from the danger of a sprained ankle at tennis, to the change of a

black eye at boxing, but we do not wish this to degenerate into a spoon-feeding age, and while the horror of these good people who set up a great cry when a profesional pugilist gets a lungful of wind thumped out of him, or a sturdy boy of eighteen or twenty suffers a bruised knee or a sprained ankle on the gridiron, may be something very beautiful, yet it will be a bad day for the country when a black eye or a sprained knee constitutes martyrdom.

What we want is a continuance of that self-reliance which make our men stand firm in battle, and hold out in the trenches before the enemy and uphold the honor of their country, without a thought of wavering on account of their own discomforts. To improve and cherish this national self-reliance, individual trouble and struggles are necessary. When small dangers have been faced without flinching, greater ones come easier, and all I can say is, that if our sons are to be wrapped up in cotton wool for fear of getting their precious persons injured, or losing a little blood, the sooner we throw up the national sponge the better.

The effect of the culture of the body is best seen in the ancient Greeks and Romans, with whom it was a part of the regular school routine. It was not confined to the athletes of the day alone, but orators, poets, philosophers and statesmen strengthened both mind and muscle by indulging in abundant athletic exercises. It is related of Cicero that he once found himself a victim of dyspepsia, and, instead of consulting the physicians, he gave his attention to the gymnasium, and at the end of two years he emerged as strong and robust as ever.

The result of physical culture is seen by comparing our own statesmen with those of England. The public men of England, as a rule, are much healthier and longer lived than those of the United States, which is probably entirely due to the physical exercises in which they indulge. The public men of America are too ambitious. They live too fast. The desire to outstrip others in the race for fame leads them to overwork the mind to the almost total neglect of the body, thus in time seriously impairing both intellect and constitution. Very few of our statesmen or other public men live to an

advanced age, but break down from overwork in what should be the prime of life, and the rare exceptions are found to be men who have given the laws of health that attention which is required to preserve a sound and healthy constitution. In England all this is different, as physical education receives almost, if not quite, as much attention as mental, and riding, walking, boat racing and other sports are really a part of the course at her schools and colleges. The benefit of all this is very plainly seen in the history of her people. That the splendid empires which England has founded in every quarter of the globe have had their origin largely in the football contests at Eton, the boat races on the Thames, and the cricket matches on her downs and heaths, who can doubt?

That Americans, when put to the test, are superior to the British has been shown in many ways, from Revolutionary times to the present day, when her champions in nearly all fields of sport fall easy victims to our countrymen who have thoroughly-developed muscles and undaunted bravery. And what a few men can do, surely we can

all do in a greater or less degree. There is no reason why our nation should not lead all others physically, as she now does mentally. Then our beloved country would become, in fact as well as in name, the grandest, noblest and most powerful nation that ever existed.

Chapter XXII.

To Live One Hundred Years.

BY WILLIAM BASH.

The common idea is, that longevity depends entirely on inherited constitution. The man whose father and mother, grandparents and great-grandparents attained a high average age is supposed to have a much better chance of long life than one whose forefathers have been short-lived. Probably, there is much truth in this idea; but it is not improbable, and the point seems worth careful study, that longevity is affected indirectly rather than directly by inheritance. It may well be that the descendant of long-lived folk is apt to be long-lived, not solely or chiefly because he inherits constitutional peculiarities tending to length of life, but because he inherits qualities leading to temperance and abstin-

ence, by which life is prolonged, or even simply because temperance and abstinence have been encouraged during his youth by example and by precept.

THE CASE OF LOUIS CORNARO.

Considering the question of longevity from this point of view, the case of Louis Cornaro, which has always been thought most instructive, becomes full also of encouragement.

In the first place, it must be remembered that Cornaro (who was born at Venice about the year 1467) was a man of weak constitution. Moreover, from the age of 18 to that of 35 he pursued courses that would have seriously taxed the strongest constitution. Life at 35 was a burden to him because of the disorders brought on by riotous living and indulgence in every kind of excess. The next five years were passed in almost unremitting suffering. He was told by his physicians, when 40 years old, that nothing could prolong his life for more than two or three years, but that such life as remained to him might be

less painful than the years he had recently lived if he would adopt more temperate habits. If ever there was a case where inherited constitution and an intemperate life threatened an early death, this was one. But, as events befell, it turned out that if ever there was a case where the life-preserving effects of wise regimen and abstemious habits were demonstrated, Cornaro's must be cited as especially significant.

At the age of 40, Cornaro began gradually to reduce the quantity of food, both liquid and solid, which he took each day, till at length he only took what nature absolutely required. He tells us that at first he found this severe regimen very disagreeable, and confesses that he "relapsed from time to time to the flesh-pots of Egypt." But by resuming his efforts after each failure, he succeeded in less than a year in adopting permanently a spare and moderate system. By this time he was already restored to perfect health. But thus far he had only followed the counsels of the physicians somewhat more steadily than they expected, or than is usual in such cases, and therefore with unexpected good results.

It was after he had recovered his health that he went on to those experiments by which he seemed to show how life may be extended far beyond the Psalmist's allowance.

From Temperance he proceeded to abstemiousness. Undeterred by the doubts of his physicians as to the wisdom of such a course, he diminished his daily allowance of food until at last the yolk of an egg sufficed him for a meal. Throughout the time when he was thus reducing his allowance of food his health and spirits kept improving. Nay, he tells us that even his enjoyment in eating had increased; for he says he could now get more pleasure from a small meal of dry bread than he had ever obtained in the days of his excesses from the most exquisite dainties of the table. As regards regimen, Cornaro simply "avoided extremes of heat and cold, over-fatigue, late hours, sexual excesses and all violent passions of the mind;" he took modest exercise in the open air; and his chief pleasures were those obtained from literary and artistic study, from the contemplation of fine scenery, noble buildings, beautiful

combinations of color, and sweet music.

When Cornaro was within two years of fourscore, his diet was regulated, in quality and quantity, as follows: In four meals he took each day twelve ounces in all of solid food, consisting of bread (stale, of course, for he was not weak-minded), light meat, yolk of egg and soup; of liquid food, other than pure water, he took fourteen ounces of light wine. Thus his solid food, equally divided among four meals, amounted to only three ounces per meal, while he took per meal about three and one-half ounces, or as nearly as possible one-third of a tumberful of claret or some other wine of the kind.

It must be noted, however, that this extreme abstemiousness, as well as the special nature of the food, solid and liquid, consumed by Cornaro, must be regarded as actually essential parts of his experience so far as longevity is concerned. We may reasonably attribute his exceeding sensitiveness in regard to food to peculiarities of constitution. He tells us that his medical friends, deeming his allowance too small, urged him to add two ounces daily

to his solid, and as many to his liquid food, a change which he adopted for a while, but had presently to discontinue, because his vivacity was destroyed, and he was becoming peevish and melancholy. But this, while it shows that Cornaro was exceptionally sensitive and had probably a very weak constitution, only strengthens the evidence which his case supplies as to the advantage of temperance and even abstemiousness. If one so weak could live the life of a very strong and hearty man merely by reducing his food to what many would call "starvation point," what resources there must be in an abstemious life for those of strong constitutions who shorten their lives by what most men call simply full and generous living.

At the age of 83, Cornaro wrote his treatise, "The Advantages of a Temperate Life," adding later three other discourses on the same subject. His fourth and last discourse, which appeared in a letter addressed to Barbaro, Patriarch of Aquileia, was written at the age of 95. In this he says "he finds himself in possession of health and vigor, and in perfect command

of all his faculties." According to some accounts, Cornaro lived to the age of 104, which Addison seems to have believed, for he says that "having passed his hundredth year, Cornaro died without pain or agony, and like one who falls asleep." But comparing Cornaro's remarks in his discourses with the best information we have up to the time of his death, which appears to have occured in 1566, it would seem that he was either in his 99th or 100th year when he died.

How much Cornaro's abstemious and ascetic ways must have had to do with his remarkable vitality may be inferred from the fact that having, when 70 years old, met with a terrible accident, by which his head and body were battered and a leg and an arm dislocated, he recovered—though the physicians had pronounced his injuries fatal—almost without medical treatment, and without any feverish symptoms.

THE CASE OF THOMAS WOOD.

In passing, I may mention the case of Thomas Wood, known as "the abstemious

miller," who, though he did not attain to remarkable old age, yet illustrated the advantage of such a system as Cornaro's for persons whose vitality has been reduced by gross living. Wood had grown excessively corpulent, and was suffering from a number of ailments, including rheumatism and frequent attacks of gout. He had read Cornaro's treatise, "A Sure Means of Prolonging Life."

Gradually adopting the system there recommended, he soon found "his health established, his spirits lively, his sleep no longer disturbed by frightful dreams, and his strength and muscles so far improved that he could carry a weight of a quarter of a ton at the age of 50, whereas at 30 he had not been able even to move so much." He lost 150 pounds of his weight; but the exact amount is not known, and he was superstitiously unwilling to be weighed. Unfortunately, he was not content to follow Cornaro's experience, but tried absurd extremes of abstinence, absolutely going without liquid food altogether during the last sixteen years of his life.

His case, then, only shows what a burden

is taken from the system when the quantity of food is reduced even far below what is commonly regarded as a moderate amount; he did not join, as he hoped, the ranks of the centenarians, though all who had known him as a corpulent and gouty epileptic at 44, regarded it as almost a miracle that he had lived a strong and hearty man from that till his 64th year.

As a matter of fact, the experience of Cornaro, while it proves that men may hope to live a hundred years if they save their system from the burden of over-feeding, by no means proves that by exceeding abstemiousness only can men attain what we ought to regard as the true limit of life, instead of dying prematurely at threescore years and ten, or perhaps at four score years.

An able physician once said: "In all my experience I have never known but one man who really died a natural death;" and he went on to explain that a man can only be said to die a natural death when he dies all at once, when the organs on which circulation, respiration, and nutrition depend, all fail about the same time; whereas one

man dies because circulation fails; another because the respiratory organs give out; and yet another because stomach, liver, kidneys or bowels become unequal to their work. In fine, the secret of longevity lies in the attainment of a natural life to be brought to an end by a natural death; and nearly every man, did he give his vital powers fair chances, would find that, like

The wonderful one-hoss shay,
He was built in such a logical way
As to run a hundred years to a day,
And then, of a sudden to pass away.

CHAPTER XXIII.

THE NEED OF AN ATHLETIC AWAKENING.

BY JAMES J. JEFFRIES.

The following statements by James J. Jeffries, undefeated heavy-weight pugilistic champion of the world, were obtained by a representative of "Physical Culture," at Blaney's Lincoln Square Theatre, New York City. The article embodies the gist of several talks with Jeffries. It was written in his own language and under his personal dictation, and when in its completed form was handed to him, for his criticism. After reading it carefully over and expressing his satisfaction he attached his signature to it.

The dressing-room at the Lincoln Square Theatre was shared by Jeffries and his sparring partner, Sam Berger. To see these two superbly built modern gladiators stripped to the "buff" was a sight worth remembering. They were magnificent proofs of the possibilities of physical culture as applied to the development of the human form. The person who has met Jeffries feels that anyhow he has met a "man," even if there be some objection to pugilism, considered as a profession. And this

feeling doubtless arises from the ideal physical condition which is his because of his practice of the principles of physical culture.

Unless we propose to become a nation of weaklings, it is about time that we woke up, athletically speaking. Many of the so-called conveniences of to-day are too convenient to be good for us. They keep people from using their minds and their muscles. Now we all know what happens to a man or a machine that doesn't get enough work: both of them go rusty. That's the trouble with thousands of men and women of our great nation, they are rusting because of the manner in which life is made too easy for them.

Especially is this true of life in our big cities, where nearly every want is anticipated and where you needn't exert yourself to get anything for yourself as long as you have a dollar in your pocket. This is all right in a way, but it is a condition that robs people of most of the exercise that is needed to keep them healthy.

To illustrate what I mean, take the transportation facilities of a city like New York

and see the effect that they have on the walking habits of the citizens. In the metropolis, you can go within a block or two of anywhere by street car, "L" or subway, for a nickel. What is the result? Why, pretty nearly every one rides where they ought to walk. The less you use your legs the less you want to use them, and so the average New Yorker looks upon a tramp of a few blocks as a real hardship. Instead of walking, he will hop into a car or dive into the Subway to get to an office or store that he could throw a stone into if he had normal biceps—which he usually hasn't, chiefly for the reason given.

Now one bad habit breeds another. So it is that the inhabitants of a big city are victims to a whole lot of unhygienic customs, which are mainly due to their not taking a proper amount of exercise, by which I mean, walking in particular. Thus, exercise as we all know, keeps up the temperature of the body. Want of it makes us shiver or get chilled under circumstances that shouldn't affect a healthy person in the slightest. Now, because the average citizen does not take the exercise that he needs, he

has to have cars, offices and flats heated to an unhealthy degree. More than that, he shuts up his living rooms—especially at night—to "keep out the draughts," the result being that for a good many hours of the day he breathes air that is not fit to be taken into human lungs. As pure air is, to my mind, one of the essentials of health, this kind of thing works all kinds of mischief, including the spread and continuance of the Great White Plague—consumption. If Mr. Bernarr Macfadden had done nothing else in his career of usefulness than protest against the evils of improper ventilation in offices and houses, he would be deserving of all praise, for I believe that the latter is responsible for a big percentage of the physical ills that occur in all of our large towns and cities.

I want to speak strongly about this matter. It is this horror of exercise and fresh air that is the curse of every city. It is just this that keeps our hospitals filled and the undertakers busy. It has been impressed on me more than ever since professional engagements have taken me away from my ranch life into towns again. Once on a time

I did not notice it so much. Now it's different.

So my advice to those who would be healthy is: sleep with your windows open at night. If you have plenty of bed-clothes, no ill effects will follow, even in the coldest and windiest of weather, and you'll be surprised to know how fresh you will feel in the morning. For the athlete the open window is as necessary as his training. In fact he cannot get into condition unless his lungs are supplied with all the pure air they need for every hour in the twenty-four. It is my positive belief that at least sixty per cent. —I should be safer in saying seventy-five per cent., perhaps—of the sickness of the average city could be averted if people took the trouble to see to it that they got all the fresh air and a good part of the exercise that their systems needed. But they don't. Men, women and children are all in the same boat. They shrink from "cold," they ride when they ought to walk, and that's the reason that there is so much sickness and so many doctors' bills.

I think that parents are to blame for many of the unhealthy habits that are formed by

young people. If a father were to insist that his boy, or a mother that her girl, took the exercise that both require, there would be fewer weaklings among the population today. But they don't, mainly through mistaken kindness. Take the average youth, who has left school and who is going to business. He is due at his store or office at, say, eight o'clock. He is allowed to remain in bed until seven. That means that he has about half an hour to wash, dress and gobble down his breakfast. Then he dashes into the nearest car or subway, and goes on his way downtown in an atmosphere that is poisoned by the shut-in breaths of scores of others situated like himself. If the conductor leaves a ventilator or a door open, there is a "kick" because of the draught. It is no wonder that the lad reaches business in a dopy condition, for he has been inhaling poison during his trip. Then comes the day spent in a badly ventilated office or store, a lunch of some indigestible food usually bolted, and finally the return journey home in the foul car. It is no wonder that the boy tries to restore his "all gone" feeling at the end of the day by a resort to alcohol

or by going for so-called pleasure that will, at a dangerous price, give him the stimulation that his body craves.

What chance has a boy like this? Before he is twenty-one he will be weak and sickly, unfitted for life in general and marriage in particular. Unluckily for the nation, it is this class of youths that seem to rush into matrimony more than others. A sickly body breeds a sickly sentimentality, you know, and the big death rate of babies tells the rest of the story.

My advice to parents who have sons, or, for that matter, daughters, who have to go to business, is: *make* the young folk get up an hour or so earlier in the morning. This will let them dress without worrying about being late, enable them to properly masticate their food and give them time to *walk to their places of business.* I wish I could give the emphasis that I want to this question of walking. Walking is one of the greatest medicines there is in the world—the best tonic and the finest of health preservers. Remember that I am speaking as an authority on the subject. I believe that the physical development with which I am

blessed is in a great measure due to my having always been a great walker. The exercise has an effect for good on every muscle, every nerve, every organ of the body. Therefore, if you don't walk, you are deliberately neglecting to give your body the exercise that it needs to keep it in health and you have nobody but yourself to blame if you fall sick or become an old man before you are a young one.

Just a final word on this subject. I know that in a big city there are occasions when you must ride, when you might prefer to walk. In such a case, don't crowd into a car—no matter how cold the weather may be. If you can do so, stand on the platform, or if that is not possible, insist on having the ventilation that is due you, even if you have to open a window. You may be grumbled at, or be called a "fresh air fiend," but never mind that. Your health is of more consequence than the remarks of sickly soreheads.

As to the other things that go to the making of health and physical development I can only advise temperance in eating and the shunning of alcohol in any form. Now,

I don't pretend to be a teetotal crank. But I'm now speaking of the means that people should take who want to be athletic—which is the same thing as saying that they shall be the perfectly formed beings that Nature intended them to be. Opinions differ as to the results of alcohol on the human system —that is, doctors' opinions. But I need hardly say that the man who is in training for an athletic event or a fight, cuts out drink in any form. And as a trainer knows exactly what is the very best for the man who is training, I leave you to draw your own conclusions about "booze."

The same remark applies to tobacco, especially cigarettes. One of the saddest sights that I have seen during my present trip is the way in which young men and boys seem to be infatuated with the "coffin nails." If I had my way, I'd make it a State Prison offence for anybody to sell these damnable things. Nearly every cigarette smoker "inhales," that is, he takes the smoke into his lungs, and hence the harm that they work. They poison the body and they wreck the nerves.

Another thing that is a requisite to a fine

development is that you eat slowly and chew your food thoroughly. I never knew a successful fighter yet who gobbled his meals. If you don't masticate as you ought to, good bye to hopes of being anything but a middle-class man. The quick-lunch counter is the cemetery of physical perfection.

Most cities have now facilities for the athletically inclined. I mean public gymnasiums, playgrounds, athletic associations and so forth. By all means take advantage of them, but remember that the good that these institutions will do you isn't of much value unless you try to lead a healthy life, as many hours of the day as possible. A boy or young man who doesn't walk when he has the chance, or who rushes his meals and himself in the way that I have described, can hardly hope to offset the harm that he thus does himself, by an hour or so spent in the gymnasium in the evening or by a ball game once a week. Physical training, like charity, should begin at home.

The finest sport or exercise, apart from walking, is, to my mind, that of boxing. Of course, I may be a bit prejudiced in its favor, but for all that I stick to my beliefs.

My advice to every father in the country is—teach your boy to box. You will never regret it, for a whole lot of reasons, and the youngster will grow up to be a better man in every way. Now I don't want the readers of PHYSICAL CULTURE to think that I mean that every boy should be a prize-fighter, but I do hold that a knowledge of the "manly art" makes a youth self-reliant, teaches him to keep his temper, and inspires in him a feeling of self-respect and confidence. It is an asset to any boy, no matter what his calling or disposition may be. He will never abuse his knowledge if he has been properly taught. A good boxer is never a bully.

The gloves give exercise to mind and body. With the ordinary apparatus of the gymnasium, you pull, haul, lift or do similar stunts. You know just what is going to happen, and there is no need of your using your mental faculties. But when you face a man with boxing-gloves on, your brains and your body are alike put to the test. And besides that, the wonderful diversity of attack and defense keeps you on the go all the time. At the end of a lively bout, you feel

that all your senses have been exercised, and if you haven't learned somewhat about sizing up a man and anticipating what he is about to do before he does it, why, all I can say is that you have missed a good deal of your lesson.

Yes, boxing is the king of athletic sports.

ELEMENTS OF FOOD-APPENDIX.

(By Bernarr Macfadden.)

SECTION I.

WHEAT AND WHEAT PREPARATIONS.

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fiber.	Starch. Fat, etc.
Entire Grain	10.4	1.9	12.5	1.8	73.4
Cracked	10.1	1.6	11.1	1.7	75.5
Farina	10.9	.4	11.0	.4	77.3
Flaked	8.7	2.2	13.4	1.8	73.9
Germs	10.4	1.1	10.5	.9	77.1
Glutens	8.9	1.2	13.6	1.3	75.0
Shredded	8.1	2.1	10.5	1.7	77.6
Macaroni	10.3	1.3	13.4	..	75.0
Noodles	10.7	1.0	11.7	.4	76.2
Spaghetti	10.6	.6	12.1	.4	76.3
Vermicelli	11.0	4.1	10.9	..	74.0

Wheat is considered one of the most valuable food elements which is now used. It is admitted by hygienists everywhere to contain in almost perfect proportion the exact elements needed to nourish the body under ordinary circumstances. In a previous chapter I have called attention to the deficiency of white flour as a food, but the whole grain, no matter how prepared, is a food that can be highly commended. The outer cover, which is nothing more than

waste product, is a valuable stimulant to the bowels, and if the food elements into which wheat enters are always allowed to include this outer covering, the suffering from digestive troubles would materially lessen in a short time. Hot bread made from white flour is about the most indigestible and non-nutritious substance one can possibly eat. It is composed largely of starch, and even those elements which are essential to the nourishment of the body cannot be properly liquefied because of the tendency of this starchy substance to form into a ball and thus resist the influence of the digestive juices. The habit of eating hot biscuit, and other hot breads made from white flour, has unquestionably caused thousands to fill premature graves. They continue such a diet until a diseased condition has been produced, and then proceed to take poisonous drugs to cure the disease. It is really remarkable how so many people succeed in existing so long as they do under the abnormal influences of such an unnatural diet. Food into which white flour enters can be made far more palatable by substituting a high grade of whole-wheat flour,

and under these circumstances it would become a most nourishing food, and if the reader is desirous of building health, the very first steps that should be taken for the accomplishment of this object should be the use of flour made of the whole grain of wheat in all foods in which white flour is needed. The influence of a change of this character will produce upon health and strength will be noticed almost immediately. Not only will the body be more thoroughly nourished, but the work of digestion will be carried on more perfectly, and there will be but little liability of suffering from that common complaint, constipation.

SECTION II.

OATS AND OTHER GRAINS.

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fiber.	Starch, Fat, etc.
Barley	10.9	2.4	12.4	2.7	71.6
Buckwheat Flour	13.6	.9	6.4	.4	78.7
Corn	10.9	1.5	10.5	2.1	75.0
Ceraline	10.3	.7	9.6	.4	79.0
Hominy	11.8	.3	8.3	.9	78.7
Parched Corn	5.2	2.6	11.5	...	80.7
Oats, Rolled	7.8	1.9	16.5	1.0	72.8
Pop Corn	10.3	.7	9.6	.4	79.0
Rice	12.4	.4	7.4	.2	79.6
Rye	11.6	1.9	10.6	1.7	74.2

Next to wheat, oats are probably the most valuable food of this character. They are very rich in nitrogenous substances, and also contain large quantities of fat which makes them very valuable as a food for producing energy and adding fatty tissue. Though oats are a valuable food on account of their richness, they require a great deal of mas-

tication in order to be properly digested, and the use of this food in the form of oatmeal—which is swallowed with little or no chewing—cannot be commended; in fact oatmeal, on account of its being eaten in the form of mush, makes a very poor food, and by far the larger quantity of this food passes through the body without being digested.

Rolled oats, or the whole oat grain, with the straw-like covering removed, furnishes a very valuable food if not overcooked and if thoroughly masticated. It requires considerable mastication to thoroughly bring these food elements into a liquid, but when this is done they furnish a food very valuable in nourishment for every part of the body. Persons who are inclined to be thin, if they will use some oat-food product which is appetizing, will very frequently find that this one change in their diet will produce an increase in weight.

Corn will also be found a very valuable food. Much of our stock on farms throughout the country receive but little else than this one article and are usually able to thrive and grow fat upon it.

Corn is very valuable as a fattening food, and is of course a great energy-producer. Corn can be eaten in the form of bread and hominy with satisfactory results, and corn cakes are not by any means as objectionable as the white-flour product that often adheres to your stomach like glue. Cornmeal mush cannot, however, be recommended. It is of course imperfectly cooked and imperfectly masticated, and under these circumstances the entire work of digestion must be performed by the stomach and intestines. If mush is subjected to the same mastication that is required for crackers and foods of this dry character, it would be digested with ease, but as usually eaten its nourishing qualities are mostly lost.

Though rice is largely used in this country, the amount is comparatively insignificant as compared to that used in China, India, Japan and other Eastern countries. In many parts of China it is almost their sole article of food. This one fact would show that it must furnish very valuable food elements. Though it is slightly deficient in muscle-building elements, it contains

large quantities of starch, and hence is valuable for producing energy and adding fatty tissues to the body. It may be prepared in various ways and is appetizing under almost any circumstances. It should, however, never be cooked until it becomes mushy. It is far more easily digested, and furnishes far more nourishment when cooked only to that point where each grain is separate and distinct. As it contains a large quantity of starch, which is partly digested in the mouth, the necessity for thorough mastication cannot be too strongly emphasized.

Barley, rye and buckwheat are all valuable foods when they are enjoyed by the appetite. Buckwheat cakes can hardly be commended, as they are, as a rule, hurriedly swallowed and prepared by a process which causes them to be very difficult to digest. Rye bread, when properly made, is nourishing and can be commended. It is so much superior to white bread as a food that whenever whole wheat bread cannot be secured, it should be used in preference to white bread. Numerous restaurants which do not keep Graham bread have a supply of rye.

Barley is often used in soups and is nourishing, and if thoroughly masticated will be found valuable.

SECTION III.

VEGETABLES.

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fiber.	Starch, Fat, etc.
Artichokes	79.5	1.0	2.6	.8	16.1
Asparagus	94.0	.7	1.8	.8	2.7
Beans, butter, fresh	58.9	2.0	9.4	...	29.7
Beans, Lima, fresh	68.5	1.7	7.1	1.7	21.0
Beans, string, fresh	89.2	.8	2.3	1.9	5.8
Beans, dried	12.6	3.5	22.5	4.4	57.0
Beans, frijoles, New Mex.	7.5	4.2	21.9	...	66.4
Beans, Lima, dried	10.4	4.1	18.1	...	67.4
Beets	87.5	1.1	1.6	.9	9.9
Cabbage	91.5	1.0	1.6	1.1	4.8
Carrots	88.2	1.0	1.1	1.1	8.6
Cauliflower	92.3	.7	1.8	1.0	4.2
Celery	94.5	1.0	1.1	...	3.4
Collards	87.1	1.5	4.5	...	6.9
Corn	75.4	.7	3.1	.5	20.3
Cucumbers	95.4	.5	.8	.7	2.6
Eggplant	92.9	.5	1.2	.8	4.6
Greens, dandelion	81.4	4.6	2.4	...	11.6
Greens, turnip salad	86.7	2.2	4.2	...	6.9

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fiber.	Starch, Fat, etc.
Kohl-rabi	91.1	1.3	2.0	1.3	4.3
Leeks	91.8	.7	1.2	...	6.3
Lentils	8.4	5.7	25.7	...	60.2
Lettuce	94.7	.9	1.2	.7	2.5
Mushrooms	88.1	1.2	3.5	.8	6.4
Okra	90.2	.6	1.6	3.4	4.2
Onions, fresh	87.6	.6	1.6	.8	9.4
Onions, green, New Mex.	87.1	.6	1.0	...	11.3
Parsnips	83.0	1.4	1.6	2.5	11.5
Peas, dried	9.5	2.9	24.6	4.5	58.5
Peas, green	74.6	1.0	7.0	1.7	15.7
Peas, Cowpeas, dried	13.0	3.4	21.4	4.1	58.1
Peas, Cowpeas, green	65.9	1.4	9.4	...	23.3
Potatoes, raw or fresh	78.3	1.0	2.2	.4	18.1
Potatoes, evaporated	7.1	3.1	8.5	...	81.3
Potatoes, Sweet, raw or fresh	69.0	1.1	1.8	1.3	26.8
Pumpkins	93.1	.6	1.0	1.2	4.1
Radishes	91.8	1.0	1.3	.7	5.2
Rhubarb	94.4	.7	.6	1.1	3.2
Rutabagas	88.9	1.1	1.3	1.2	7.5
Sauerkraut	88.8	5.2	1.7	...	4.3
Spinach, fresh	92.3	2.1	2.1	.9	2.6
Squash	88.3	.8	1.4	.8	8.7
Tomatoes, fresh	94.3	.5	.9	.6	3.7
Turnips	89.6	.8	1.3	1.3	7.0

No matter what diet one may adopt, a

certain amount of green vegetable food can always be used to advantage. Though many of the vegetables are not particularly rich in nourishing elements, still they contain waste matter which is very valuable in its influence over the alimentary canal. Such foods act as a scavenger throughout the entire digestive tract, and many cases of seriout illness can be avoided by regular use of different vegetables.

Lettuce is one of the most valuable nerve foods that can be secured. On many occasions when I have been all "unstrung" from hard training or through other straining work, a meal in which lettuce was plentifully supplied has in a short time entirely disposed of the trouble. It is a most valuable aid wherever one is at all annoyed by insomnia. If the last meal consists of as much lettuce as you may desire to eat, with whole wheat bread and butter, there will be little trouble in wooing the unconsciousness of slumber. The digestibility of lettuce is influenced very greatly by the dressing used with it, wherefore I advise that an equal quantity of lemon juice and olive oil be used, with salt to taste. This should

be stirred with a fork for three or four minutes until thoroughly combined. A dressing of this character will be found to be not only wholesome in itself, but will make the lettuce very appetizing.

Onions are recommended by many as of especial value as a scavenger for the digestive tract, and are unquestionably of value in this way. They can be eaten cooked or raw, though their value as scavenger is much greater if they are eaten raw.

Cabbage is far more wholesome and easily digested when eaten raw than when cooked.

Celery is considered by many to be especially valuable as brain food, though there is little in the chemical analysis to support such conclusion. There is no doubt, however, that it is a food of value if relished. It would be well to remember that nearly all vegetables that can be relished when eaten raw, have a tonic influence upon the stomach and other digestive organs. They tend to cleanse and purify.

Potatoes are used now almost everywhere. Their nourishing value lies mostly in their starchy elements. They furnish energy, but

are, of course, very deficient in those elements for supplying new tissue for brain and muscles. Wherever potatoes are daily used as a food, meat, beans or some other food element rich in nitrogenous substances should be added.

Sweet potatoes will be found much more rich in fattening elements, and are more relished by many than the ordinary potato.

Tomatoes will be found valuable food although they are usually more appetizing and more easily digested when eaten raw than when cooked. When eaten in this manner, the same dressing previously mentioned for lettuce can be used with them.

Beans, peas and lentils, as will be noted by the analysis, contain a very large percentage of muscle-making elements. They furnish those elements so necessary in properly nourishing the body in almost equal proportion to that furnished by lean meat, and are considered by many to be far superior to animal food for building strength. There is no question as to their great value in this particular way. If one has hard muscular work to do, or is training for a high degree of muscular development, food of

this character is very keenly relished. They seem to supply the necessary elements that are craved by the organs of assimilation under these circumstances. One can perform hard work with food of this character much more satisfactorily than upon a meat diet, though as stated before, in another chapter, while the stimulative character of meat causes it to build, perhaps, more immediate strength than food of this character, it will not by any means furnish the endurance, the ability to continue on and on, to the same extent as do these valuable elements. These foods can be prepared in whatever manner is considered the most appetizing, but they should be eaten very slowly. Because of their richness in the elements required to nourish the body, very naturally they are more difficult of digestion than the ordinary foods, and thorough mastication will aid in making this process of digestion far more easy.

SECTION IV.

DAIRY PRODUCTS.

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fat.
Butter	11.0	3.0	1.0	85.0
Buttermilk	91.0	.7	3.0	5.3
Cheese, American	31.6	3.4	28.8	36.2
" Cheddar	27.4	4.0	27.7	40.9
" Cheshire	37.1	4.4	26.9	31.6
" Cottage	72.0	1.8	20.9	5.3
" Dutch	35.2	10.0	37.1	17.7
" Fromage de Brie	60.2	1.5	15.9	22.4
" Full Cream	34.2	3.8	25.9	36.1
" Limburger	42.1	5.1	23.0	29.8
" Neuchatel	50.0	2.4	18.7	28.9
" Pineapple	23.0	5.6	29.9	41.5
" Skimmed Milk	45.7	4.2	31.5	18.6
" Swiss	31.4	4.8	27.6	36.2
Koumiss	89.3	.4	2.8	7.5
Milk, Condensed, Sweetened	26.9	1.9	8.8	62.4
Milk, Unsweetened	68.2	1.7	9.6	20.5
" Skimmed	90.5	.7	3.4	5.4
" Whole	87.0	.7	3.3	9.0
Whey	93.0	.7	1.0	5.3

Milk and products derived from it furnish a large part of the food used in the

civilized world. As a rule it is a most satisfactory food, though when one is inclined to be of a bilious temperament it cannot be commended. In fact, if one uses milk or foods produced from it too freely, it will very often cause a bilious condition. This result can, however, be obviated if milk is boiled before drinking, or if sipped or eaten very slowly. Though the boiling of milk usually makes it more difficult of digestion, it usually becomes a more wholesome drink under this influence, as the microbes, should there be any present, are naturally destroyed by the extreme heat.

If careful attention is given to the necessity for masticating milk, just as you would solid foods, that is by using it with some food that requires a certain amount of mastication, or actually retaining it in the mouth a sufficient length of time to slightly mix it with saliva, but little difficulty will be found in properly digesting and assimilating it. Milk should never under any circumstances be swallowed just as you would water. Of course if the stomach is in a thoroughly normal condition it will always be digested satisfactorily, but if there is the

slightest inclination to disease or weakness of any kind, there may be difficulty.

Buttermilk is a superior summer drink, as the acid which it contains is quite similar in its influence to the acid found in fruits. Cream, as will be noticed, is very rich in fats, and if one is inclined to be thin, and will strengthen his digestive organs so they can digest such a rich food, he can easily gain considerable weight by its use. It is, however, mere folly to attempt to digest this without preparation, as it will simply create disturbances if the digestive organs are unable to assimilate foods of this character.

Cheese is a very valuable food and is very rich in nourishment for the muscles, brain, and vital functions of the body. On account of its richness it is naturally very difficult to digest, though the assimilating organs are usually prepared to digest it if an actual need exists for the elements it contains and if properly masticated it will usually be digested without disturbances of any character. Of course those brands of cheese, the flavor of which has been produced by age, can hardly be commended. Cheese to be

perfectly wholesome and easily digested, should be as fresh as possible.

Butter is a milk product which is used everywhere, and is, of course, a valuable energy-producing food. It is usually added to white bread, a food which already has an over-supply of starch and other fattening elements, and under these circumstances it certainly cannot be commended. Where the system is in need of nourishment of this character, however, and it is eaten in a manner which makes it palatable, there is no objection to it.

Condensed milk is another product which is used a great deal, and if properly prepared there should be no great objection to it, though, of course, it is in no way equal to the fresh product, and should never be used if fresh milk can be secured. Much of its nourishing elements is naturally destroyed in the condensing process.

SECTION V.

FRUITS, BERRIES, ETC.

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fiber.	Starch, Fat, etc.
Apples	84.6	.3	.4	1.2	13.5
Apricots	85.0	.5	1.1	...	13.4
Bananas	75.3	.8	1.3	1.0	21.6
Blackberries	86.3	.5	1.3	2.5	9.4
Cherries	80.9	.6	1.0	.2	17.3
Currants	85.0	.7	1.5	...	12.8
Cranberries	88.9	.2	.4	1.5	9.0
Figs, fresh	79.1	.6	1.5	...	18.8
Grapes	77.4	.5	1.3	4.3	16.5
Huckleberries	81.9	.3	.6	...	17.2
Lemons	89.3	.5	1.0	1.1	8.1
Muskmelons	89.5	.6	.6	2.1	7.2
Nectarines	82.9	.6	.6	...	15.9
Oranges	86.9	.5	.8	...	11.8
Pears	84.4	.4	.6	2.7	11.9
Persimmons	66.1	.9	.8	1.8	30.4
Pineapple	89.3	.3	.4	.4	9.6
Plums	78.4	.5	1.0	...	20.1
Pomegranates	76.8	.6	1.5	2.7	18.4
Prunes	79.6	.6	.9	...	18.9
Raspberries, red	85.8	.6	1.0	2.9	9.7
Raspberries, black	84.1	.6	1.7	...	13.6
Strawberries	90.4	.6	1.0	1.4	6.6
Watermelons	92.4	.3	.4	...	6.9
Whortleberries	82.4	.4	.7	3.2	13.3

Fruits of all kinds form not only a delicious addition to our diet, but are valuable in many ways. They are naturally deficient in actual nourishment, but the water which they contain is absolutely pure and is easily assimilated and used to advantage by the system. Most fruits also have acid properties which are valuable in assisting the digestive process. This is especially true when there is any inclination to a liver trouble or biliousness of any kind. Many serious illnesses can be avoided by the judicious use of fruits, and unquestionably they are valuable in the cure of various diseases.

The "grape cure" has become famous throughout the world, as diseases of all kinds have been cured radically and thoroughly by the simple use of grapes as an exclusive diet for a considerable length of time. Grapes are very rich in starch and sugar, as will be noted, and really a valuable food and remarkably easy of digestion. When the stomach is so weak as to be unable to digest the simplest food elements, grapes will in nearly every case be found to digest without the slighest irritation. Of course in eating grapes the most satisfactory

method is to pick and eat them from the vines. This is, of course, difficult for most of my readers, but if care is taken to secure them well ripened, their effects when eaten at home are nearly equal to that secured when picking them from the vine.

The apple is probably the most used of all fruits, and their flavor varies very greatly. Some have a very sweet flavor and contain little acid. Others are well supplied with this acid element, which is a very valuable tonic to many stomachs. Apples are usually better eaten raw, and are more easily digested in this condition, provided they are thoroughly masticated. Of course there are some very delicate stomachs which find difficulty in digesting raw apples, but where such condition has been produced it is usually ample evidence that nourishment of this character is not needed by the system, or else it is evidence that the digestive organs need to be rested by frequent short fasts or a long fast.

The unfermented juice of the apple makes a very valuable drink and can be most highly recommended. A bilious condition together with numerous other ailments, will

in many instances entirely disappear if one will drink all the cider that may be desired. I remember quite well an experience in my own life where cider proved a very valuable aid in recovering normal weight after a dietetic experiment which had weakened my digestive organs and greatly depreciated my general strength.

I had been following out an experiment for two or three months, and though my knowledge at that time of diet was rather limited, I fully believed that my conclusions were correct, and I adhered to my determination to prove this with too much zeal. One evening I felt very weak, and concluded to test my pulse beat, and was amazed to find that it had decreased to thirty-five to the minute. It seemed to me impossible that it could be so low, and I tested it several times before being convinced.

On the realization of my condition, which was emphasized not only by the low pulse beat but its faintness, I concluded to immediately begin a normal diet. In my condition at that time this was not easily done, as my digestion was so weakened that

it could hardly digest anything of importance, and for several days I found that my strength and weight had increased but little, although the pulse beat had largely improved. On one occasion, I attempted to eat a hearty meal, and found that only a few morsels could be eaten, and a few moments later, on eating some apples rich in acids, I noticed their immediate beneficial effect. I concluded that if some apple cider could be had it would probably help me greatly in the work of digesting. Some especially pure apple juice was immediately procured, and almost from that date I began to gain weight at the rate of almost a pound per day, and six weeks after that time I had gained thirty pounds. The gain was not caused by the medicinal influence of cider. The fact was simply that I needed the acids in the fruit juice to assist the digestive process. This personal experience will no doubt emphasize the importance of the use of apples; and whenever convenient and appetizing, they should always be made a part of your diet. They are very valuable as a remedy for constipation, and in fact nearly all fruits are valuable in this respect, though blackberries

have been considered otherwise by numerous hygienic authorities.

In selection of satisfactory fruits you should let your taste largely guide you. The tendency in the use of fruits is usually to swallow them rather hurriedly as they are easily masticated. This tendency should be resisted, and mastication continued in every case until the food is actually reduced to liquid and swallowing is involuntary.

SECTION VI.

MEATS.

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fat.
Chicken	74.8	1.1	21.6	2.5
Eggs	73.7	1.0	14.8	10.5
Frogs' Legs	83.7	1.0	15.1	.2
Goose, Young	46.7	.8	16.3	36.2
Loin of Beef, Lean	67.0	1.0	19.3	12.7
Loin of Beef, Fat	54.7	.9	16.8	27.6
Lamb, Lean	72.3	1.4	23.6	2.7
Lamb, Fat	54.6	.9	17.1	27.4
Mutton, Lean	67.4	1.1	19 [illegible]	12.4
Mutton, Fat	55.0	0.9	17.0	27.1
Pork, Lean	60.0	1.3	24.3	14.4
Pork, Fat	13.8	.2	4.1	81.9
Turkey	55.5	1.0	20.6	22.9
Veal, Lean	72.1	1.1	21.2	5.6
Veal, Medium, Fat	66.0	1.0	19.0	14.0

There is unquestionably much to be learned as to the proper diet of man. Experiments heretofore have been made simply by a few individuals here and there. No really concerted efforts of importance have been made to determine the value of different food elements. Though I am in-

clined to favor a vegetable diet, as stated before, it would be difficult for the average individual at the present time to entirely avoid meat, unless he were prepared to secure a variety of grains, fruits and nuts to furnish nourishment necessary for the highest degree of physical health.

Beef is generally considered to be the most wholesome meat, though chicken and fowl of all kinds can be commended. In the preparation of beef, broiling or roasting is usually found superior to boiling or frying. When meat is boiled a large amount of the nourishment is very often extracted in the boiling process; and when fried, the lard or butter unquestionably makes it much more difficult to digest.

Pork of any kind can hardly be commended. It is a meat that is usually difficult to digest, and often contains microbes that are seriously inimical to health.

Some maintain that ham and bacon, in passing through the preservative process, become more wholesome as food because the microbes have been destroyed in this process. Though there may be some truth in the claim, any process that tends to preserve

meat or food of any character from fermentation seriously lessens its value as a food. Not only is it more difficult to digest, but those elements that can be digested and used by the system, are very greatly lessened. Under these circumstances it would be advisable to entirely avoid pork of any kind whenever any other elements which will nourish the body can be secured.

Rabbits and squirrels, and meat foods of this character—game—are usually more wholesome than beef for the reason that these animals are running wild and are in every case in perfect condition.

Kidneys, hearts and other internal organs are not usually considered entirely wholesome and should be avoided.

Veal and all other immature meats cannot be commended.

Of all animal foods eggs are probably the best. They seem to furnish all the necessary nourishment, being rich in the elements that feed the body, and if fresh are not so inclined towards the production of impurities as meat.

SECTION VII.

NUTS.

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fiber.	Starch, Fat, etc.
Almonds	4.8	2.0	21.0	2.0	54.9	14.3
Beechnuts	4.0	3.5	21.9	...	57.4	13.2
"Biotes" (acorns)	4.1	2.4	8.1	...	37.4	48.0
Brazil Nuts	5.3	3.9	17.0	...	66.8	7.0
Butternuts	4.4	2.9	27.9	...	61.2	3.5
Chestnuts, fresh	45.0	1.3	6.2	1.8	5.4	40.3
Chestnuts, dried	5.9	2.2	10.7	2.7	7.0	71.5
Cocoanuts	14.1	1.7	5.7	...	50.6	27.9
Cocoanut, prepared	3.5	1.3	6.3	...	57.4	31.5
Filberts	3.7	2.4	15.6	...	65.3	13.0
Hickory Nuts	3.7	2.1	15.4	...	67.4	11.4
Lichi Nuts	17.9	1.5	2.9	...	.2	77.5
Peanuts	9.2	2.0	25.8	2.5	38.6	21.9
Pecans, polished	3.0	1.5	11.0	...	71.2	13.3
Pecans, unpolished	2.7	1.9	9.6	...	70.5	15.3
PINE NUTS:—						
Pignolias	6.4	3.4	33.9	...	49.4	6.9
Piniones	3.8	2.8	6.5	...	60.7	26.2
Piñon	3.4	2.8	14.6	...	61.9	17.3
Pinus Sabiniana	5.1	4.7	28.1	...	53.7	8.4
PISTACHIOS:—						
First Quality	4.2	3.2	22.3	...	54.0	16.3
Second Quality	4.3	3.0	22.8	...	54.9	14.9

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fiber.	Starch, Fat, etc.
Walnuts, California	2.5	1.7	18.4	1.4	64.4	11.6
Walnut, California, black ...	2.5	1.9	27.6	1.7	56.3	10.0
Walnuts, California, soft shell..	2.5	1.4	16.6	2.6	63.4	13.5
Malted Nuts	2.6	2.2	23.7	...	27.6	43.9

About the richest food that can be found in all the products used by man is unquestionably nut meats. It is a general impression that these foods are very difficult to digest, and in fact the average individual will warn you against their use for the reason that they are almost sure to cause indigestion. When they are eaten as is usual, this result occurs in many instances. Most any other food element, if eaten in the same way, would produce similar results. The general opinion is that nuts are a delicacy which should not be indulged during a meal, but at odd times whenever the appetite may desire them. As stated in a previous chapter, this habit of "piecing" between meals is productive of evil results in every case, and it applies with equal if not more force to rich food like that furnished by nut meats.

Nuts should be eaten during the meal just the same as any other food, and the necessity for thorough mastication cannot be too strongly emphasized. Every mouthful should be chewed until it is an actual liquid, and if this is followed in every case, and the nuts are eaten as a part of your meal and at the time you are usually in the habit of eating, there will be little or no difficulty in digesting them.

The enormous activity manifested by those animals that live almost exclusively on nuts is ample evidence of their nourishing qualities. For instance, take a squirrel which has been able to secure an ample store of nuts; you will find him usually fat and sleek and capable of activity which hardly a single animal can equal. He will jump from tree to tree when the distance is as great as or greater than the longest leap ever made by man. If they are being pursued it is not at all infrequent for them to jump from the top of a high tree to the ground, light on their feet, and run away, apparently not in the least affected by leaping from such a great height.

I am personally acquainted with a man

who subsisted for many months exclusively on a nut and fruit diet, and he maintained that it was satisfactory in every respect. He stated that his usual habit was to eat twice a day, and the first part of his meal was usually a half-pound of shelled pecans or walnuts, after which he would eat whatever fruit he might desire. He stated that though when beginning this diet he was suffering from a complication of complaints, that it was continued but a short time before all these weaknesses disappeared absolutely.

The analyses furnished herewith indicate percentage of the various elements which these nuts contain. In all analyses previous to this I have combined the starch and fats as they are practically for similar purposes, though all hygienists claim that fat is more easily assimilated than starch or sugar. Nuts contain such a large quantity of pure fat or oil, whichever it may be termed, that I have separated it from the starch that my readers may see how rich nuts are in this particular element. The average reader will no doubt be surprised upon perusing this list, to note the large quantity of muscle-making elements furnished by peanuts.

They are also very rich in fats and consequently are a very valuable food to nourish the body under conditions of hard mental or physical work.

Of course in selecting nuts for your own particular use it is well for you to consult your appetite entirely, though if you are aware of the different elements of these different nuts, and also realizing your particular needs, this will unquestionably to a certain extent influence your appetite.

SECTION VIII.

FISH.

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fat.
Alewife	74.4	1.5	19.2	4.9
Bass	76.7	1.2	20.4	1.7
Black Fish	79.1	1.1	18.5	1.3
Bluefish	78.5	1.3	19.0	1.2
Buffalo Fish	78.6	1.2	17.9	2.3
Butter Fish	70.0	1.2	17.8	11.0
Cat Fish	64.1	.9	14.4	20.6
Ciscoe	74.0	1.1	18.1	6.8
Cod	82.6	1.2	15.8	.4
Cusk	82.0	.9	16.9	.2
Eels	71.6	1.0	18.3	9.1
Flounders	84.2	1.3	13.9	.6
Haddock	81.7	1.2	16.8	.3
Hake	83.1	1.0	15.2	.7
Halibut	75.4	1.0	18.4	5.2
Herring	72.5	1.5	18.9	7.1
Kingfish	79.2	1.2	18.7	.9
Lampreys	71.1	.7	14.9	13.3
Mackerel	73.4	1.2	18.3	7.1
Mullet	74.9	1.2	19.3	4.6
Muskellunge	76.3	1.6	19.6	2.5
Perch	75.7	1.2	19.1	4.0
Pickerel	79.8	1.1	18.6	.5
Pike	80.8	1.1	17.3	.8

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fat.
Pollock	76.0	1.5	21.7	.8
Pompano	72.8	1.0	18.7	7.5
Porgy	75.0	1.4	18.5	5.1
Red Grouper	79.5	1.1	18.8	.6
Red Snapper	78.5	1.3	19.2	1.0
Salmon	64.6	1.4	21.2	12.8
Shad	70.6	1.3	18.6	9.5
Sheepshead	75.6	1.2	19.5	3.7
Skate	82.2	1.1	15.3	1.4
Smelt	79.2	1.7	17.3	1.8
Spanish Mackerel	68.1	1.5	21.0	9.4
Sturgeon	78.7	1.4	18.0	1.9
Tomcod	81.5	1.0	17.1	.4
Trout	77.8	1.2	18.9	2.1
Turbot	71.4	1.3	12.9	14.4
Weakfish	79.0	1.2	17.4	2.4
Whitefish	69.8	1.6	22.1	6.5
SHELL FISH:—				
Clams	85.8	2.6	8.6	3.0
Crabs	77.1	3.1	16.6	3.2
Crayfish	81.2	1.3	16.0	1.5
Lobster	79.2	2.2	16.4	2.2
Mussels	84.2	1.9	8.7	5.2
Oysters	86.9	2.0	6.2	4.9
Scallops	80.3	1.4	14.8	3.5
Terrapin	74.5	1.0	21.0	3.5
Turtle	79.8	1.2	18.5	.5

Fish is generally considered to be a very

valuable food for the brain. This is an error. It is far less valuable as a brain food than numerous others. In fact it would be well to remember that what is food for the brain is also food for the muscles; the same elements which form the cells in the muscles also form the cells in the brain. The same food elements which furnish the power for muscular effort also furnish the power for brain work, therefore any food which is rich in the nitrogenous and fattening elements would naturally be advantageous as brain food.

Oysters are probably eaten more than any other sea food, and an impression has somehow been gained that they are very valuable in nourishing the muscular and nervous system. You will note in the table that their nourishing elements of this character are less than any other fish.

Fish is a food which can be recommended very often when meat does not seem to produce satisfactory results. Fish, if fresh, seems to be more easily digested and less liable to produce impurities. This of course does not apply to all cases, but it is not by any means so hearty a food as beef, and its

nourishing qualities, in many instances, are nearly equal.

Analyses.	Water.	Mineral.	Nitrogenous (Muscle).	Fat.
Gelatin	13.6	2.1	84.2	.1
Cottolene	..	...	...	100.0
Oleomargarine	9.5	6.3	1.2	83.0
Candy	..	...	...	96.0
Honey	18.2	.2	.4	81.2
Molasses Cane	25.1	3.2	2.4	69.3
EGGS:—				
Uncooked	73.7	1.0	14.8	10.5
Boiled, Whole	73.2	.8	14.0	12.0
" White	86.2	.6	13.0	.2
" Yolks	49.5	1.1	16.1	33.3