

## PHYSICAL TRAINING

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"The first wealth is health."

—*R. W. Emerson.*

Some good people object to Physical Training; they are usually of the order of the lady who wrote the following to a teacher:

"Miss Brown:—You must stop teaching my Lizzie fysical torture, she needs yet reading and figors wit sums more as that, if I want her to do jumpin, I kin make her jump."

### WHY WE SHOULD GIVE OUR CHILDREN PHYSICAL TRAINING.

BY

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ONE hundred years ago the population of New England was scattered in small villages and isolated farms along the shores and on the hillsides. It was largely of Puritan English stock, the toughest and most vigorous which the world has ever known. Some were fishermen or sailors, most were farmers. The harvest was abundant, but was gathered only after hard labor. The forest had to be cleared, stones removed and piled in walls, buildings had to be erected. This work was practically universal. There were endless chores for boy and girl. Woodpile, barn, garden, and farm furnished more physical training than the boy desired. Dairy, kitchen, and household cares strengthened the muscles of the girl, enlarged her lungs, and ensured health and vigor.

Pleasures and recreations were simple. Fishing and hunting, sugar making and huskings, musters and road-mending, are fair examples. The struggle was severe. Many infants died; only the strongest survived. Men died from hardship or exposure. Women became morbid or insane from monotony, repression, and overwork. But the weariness was mostly muscular. The strain fell on the heavier, lower, and stronger nervous centres. Of brain exhaustion there was little danger. Such a life of rude, strenuous, muscular effort, mostly in the open air, resulted in a tough, sturdy, vigorous race. Life was far from ideal. But the picture has its lights as well as its shadows.

Let us glance at present conditions. In 1790 one-thirtieth of our population lived in towns or cities of over 8000 inhabitants; in 1880

nearly one-quarter. Let us freely grant what many would deny, that the city may be as healthy a dwelling-place for adults of the upper classes as the country. What of the tenement districts of the very poor? Where are the children of the middle class to play in the open air? The yard is hardly as large as the parlor. The street is dangerous. They may walk in the boulevard or the park, provided these are accessible, and they will keep off the grass. This is surely a very poor substitute for free range of the field and forest of the farm.

A second and more important fact is that most of us, as fast as we can, are exchanging a life of muscular effort in the open air for a sedentary life of brain labor indoors. The farms are being deserted; office, desk, and store are crowded. We avoid manual labor, if we do not despise it. This tendency will surely continue.

The hurry and worry, the crowding and competition, the longing for luxury, the boundless opportunities of the day, have vastly increased the strain of modern life. And this strain bears heaviest on the youngest, most complex, and least stable centres of our nervous system.

The revolution in our modes of life disturbs the balance and working of all our organs. Our energy and vigor, in one word our vitality, depend ultimately on the health and strength of stomach, heart, lung, and kidney, far more than upon the extent of our learning or even the discipline of the intellect. These absolutely essential vital organs owe their development and present power to the demands and stimuli of the muscular system. It was sensation and motion, not thought or learning, which laid the foundation of the brain and stimulated the development of all its centres. Our internal vital organs can and will respond to all reasonable demands of our muscular system. It is an inherited habit. When they arose, muscle and not brain was on the throne of the body. Compare the effect of an hour's walk or other muscular exercise on heart, lungs, digestion, and assimilation, with that of an hour's study or thought at the desk or in the office. Our vital organs require these customary motor stimuli to maintain them in a healthy condition. Without them, as in sedentary life, they degenerate and invite, if they do not produce, disease. One-third of the weight of our bodies was not put into muscular tissue with the intention that only a few ounces of muscle in throat and fingers should be used with any regularity. Dr. Baxter, in his report of the Provost-Marshal-General's bureau, tells us that nearly three-quarters of all teachers examined as to their fitness for military service in the war of the rebellion were rejected as unfit; of physicians and clergymen, two-thirds; of laborers, farmers, and fishermen, one-third or even less. He tells us that there is a steady increase of disease as we ascend the so-called social scale from the man who works with his heavy muscles only to those who rely on cerebral to the practical exclusion of muscular work. Even if, as Dr. Baxter thinks, the profession is the refuge of the weak and not the cause of

their weakness, the child of the professional man is likely to inherit a low tone of vitality.

As the muscles are less used, and the sensory portion of the nervous system gains the upper hand, so to speak, over the motor, a hypersensitiveness to discomfort and pain results. This tends to produce timidity and hesitation, and is an important element in hysteria and other forms of nervous disease, as well as a symptom of general weakness. "Health," says a great physiologist, "comes in through the muscles, and flies out through the nerves." Sedentary life and excessive brain labor are fruitful occasions or causes of disease. These conditions have resulted in similar, perhaps more marked, effects in our American women. What well-bred woman of to-day ever thinks of using the heavy muscles of trunk, shoulder, or thigh? The fathers and mothers have sinned, and too frequently the children's teeth are set on edge.

The decrease in the use of the heavy muscles reacts upon the digestive and assimilative powers. The sedentary man craves concentrated and easily digestible food. He eats a large amount of lean meat, cannot tolerate fat, and dislikes vegetables. He takes into his system more albumen than the body can use. The excess of albumen throws a heavy strain upon the kidneys, and Bright's disease and other evils follow. The kind and amount of food and the lack of exercise result in constipation. Nervous dyspepsia, twin-root of almost any conceivable evil, is likely to follow. We regard the bill of fare of our sturdy ancestors with horror. Pork and beans, pies and doughnuts, are not milk for babes. But is such a ration as sore an evil as a digestive system which cannot digest anything more refractory than tea and educator crackers?

Two classes of children demand especial attention to-day. First, the children of the business and professional classes. Second, the brighter and more ambitious children of every class. Both these classes will probably enter business or professional life. A sound and vigorous body and a tough nervous system are absolutely essential to their life and success. These the farm used to furnish. What is our system of education doing to ensure this to the rising generation in village, town, or city? The child begins going to school younger, and the school year is almost three times as long as it was one hundred years ago. We are now planning summer schools to keep him busy and to take him off our hands for the rest of the year. The school-room is properly warmed and ventilated, fitted with fine desks and all appliances for instruction. Books, paper, and pencils are furnished in abundance. All this is excellent. What are we doing for the physical health and welfare, for the body of the child? Our chief efforts are directed to make him sit still as long as possible. "But," you say, "keep the child under favorable surroundings, and health and growth will come of themselves without our thought or effort." Is this true?

The human body is a very complex structure of many parts and systems. Health and vigor depend upon a symmetrical, well-balanced growth and development of all its organs, especially of the neglected vital organs. The weakest part ought in some way to be made as strong as the rest. Different organs and systems develop successively to a certain extent. Every organ has three stages of growth. During the first stage it is incapable of any work. Growth is its whole business. During the second stage growth is still the chief business, but proceeds regularly and in a healthy manner only when stimulated by the right amount of suitable exercise. In the third stage the organ is approaching maturity, and is benefited by more severe training and testing. During the second stage of growth a suitable amount of exercise, neither too much nor too little, is absolutely essential. The real business of the educator is to discover what organ requires exercise during every successive year of the child's life, and then to furnish exercise suited in amount and kind to the needs of that organ.

The great defect of the systems of education planned and arranged by students of adult psychology is that they neglect the fact that the child is not an adult; and that they leave out of account Nature and her laws of growth. The material progress, success, and wealth of the present century are due largely to the fact that we have learned to take nature into partnership with us, and to allow her to do our heavy work. Rivers, coal, a few gallons of oil or gasoline, do the work of an army of horses or men without weariness. Why do we refuse to take nature into partnership with us in educating our children and youth?

We all know that the chief, if not the only business, of the young child is to grow. All that the Bible ever tells us of the childhood of its mighty men and heroes is usually the fact that the child grew and waxed strong. A little more growth in childhood may mean a man or woman far above the average. A well grown, well developed, perfectly healthy man or woman is many times as effective, and probably worth tenfold as much as one who has attained somewhere near the full amount and use of power. Growth must furnish all the material which is to be shaped in the processes of future development. Growth during childhood depends upon suitable exercise. What are home and school doing to promote growth?

When a child needs food, it feels hungry; when it needs water, it feels thirsty. We respect these cravings of the child. We recognize that they are natural and healthy. We supply the need. When the muscular system hungers and thirsts for exercise, when the child is restless and cannot sit still, we have to do with a similar healthy, natural, physiological craving. The exercise is evidently needed to stimulate and maintain a healthy growth. We ought to respect the craving and furnish the exercise.

The child in kindergarten is eager to see, to feel, to handle. His sensory organs crave exercise, and we satisfy the craving. He enters

school at six. He is so restless that it is almost impossible to keep him quiet. We succeed after a mighty struggle. We busy him with language and number work after the schemes laid down by the wise men who forgot to assign or leave any time for physical exercise. The mental powers crave very little exercise at this age. Study and thought do them very little good, and if prolonged considerable harm. The child makes slow progress. We lose the opportunity, offered by nature and urged by the craving for movement, to stimulate bodily growth. This loss can never be made good; the opportunity does not return.

During the years between six and ten the playground is the most important means of educating the child. Here he runs and jumps, and uses his heavy muscles freely and vigorously. The use of so much muscular tissue stimulates heart and lungs and all the vital organs, on whose full growth life and vigor depend. It maintains or improves the appetite and digestive power so that the large needs of the body for nutriment are well and fully supplied. The child grows.

The use of the heavy muscles stimulates the growth and development of the fundamental nervous centres in the brain. It strengthens them so that they can resist hysteria and nervous weakness or collapse. All these modern diseases and ills can and must be prevented by fortifying the child in the primary and intermediate grades, or even in the kindergarten. This is nature's time for strengthening these centres and accomplishing this grand result.

The game has its mental value and use. It rouses the sense organs, and focuses the attention, the first lesson in training the will. The child must size up the situation and grasp the opportunity instantly and once for all. He cannot "stand shivering on the brink of action," as the adult so frequently does. He must act on his own initiative. There is no one to constantly tell him what to do, or more frequently, what not to do. He becomes ingenious and resourceful, and attains skill and strategy. He forgets himself, and loses shyness in the game. On the playground he learns far more than the rudiments of the science of success in life. Waterloo was won at Eton, more on the playground than in the schoolroom.

On the playground the child learns to get on with his fellows, no easy lesson in these days of small families. He learns self-reliance, self-control, fair play, and many other fundamental virtues. No wonder that "the boy without a playground is father to the man without a job." Here too the earliest and often the strongest friendships are formed which brighten his whole life. No half-hour at the desk can give at this age so many and so valuable returns as the one spent on the playground.

Watch children at play and you will see that periods of vigorous exercise alternate frequently with those of rest or entire change. The child evidently tires quickly. The eighth year has been called the "fatigue year." If this is true of the muscles used in play, it must be

true to a greater extent of the far more immature and easily fatigued centres of thought and intelligence in the brain. One result of the book-work and confinement in the lower grades is "brain-fag" and lasting aversion to books and study.

Is play or some form of physical training of any less importance to the boy and girl in the grammar grades? The tenth year in the life of the girl, and the eleventh of the boy, are years of very slow increase in both height and weight. The year of rest and economy is followed by a period of three or four years of rapid increase in height. Acceleration of growth in girth and weight usually begins a year or more later.

Growth is always an expensive process. It demands the combustion of a large amount of material to add a little to the weight. Growth in height is especially expensive. It begins in the bones. These increase in length; and all the muscles, nerves, and arteries must be correspondingly lengthened and adjusted to the new conditions. These additions and changes demand a large amount of food, and result in the production of much waste. The food must be digested and the waste removed by organs in the trunk. But this is growing far less rapidly than the legs and arms. Relatively to the length of the body, the length and girth of the trunk are smaller now than at any other time in life. Similar proportions in the adult would be symptoms of weakness, if not of disease. It is a trying time, a period of weakness and of feeble resistance and endurance.

This is the beginning of the critical period of puberty. Now comes a metamorphosis almost as marked as the change of the caterpillar into the butterfly. Almost every organ in the body is affected, if not greatly changed. The changes in the girl are probably more profound than in the boy. They occur earlier, before we expect them. They are accomplished in a briefer time, and hence are more rapid. Her pubertal period is far more likely to be stormy, and her rate of morbidity is considerably higher. Her future health and happiness, if not her life, depend upon the successful completion of this metamorphosis during the trying period of rapid increase in height. Slight injuries or defects may now be easily remedied which, if neglected, will result in temporary or permanent weakness or invalidism.

The rapid growth in height and the profound changes in the vital organs involve much destruction of nutriment and of tissue. If this waste is not rapidly and completely removed, it poisons the blood, depresses the nervous system, produces disinclination to exercise or effort, reduces the appetite and the assimilative powers. Headache, loss or disorder of appetite, pallor, nervousness, and general weakness follow. The best authorities find that, while the death rate during this period is very low, the amount of chronic disorder and weakness is greater than at any other time during life.

The waste will not be removed until it has been thoroughly oxi-

dized by an abundant supply of air taken into the blood through the lungs. Hence the most important question concerning a boy or girl during this period is not: How large is the brain? but, how great is the lung capacity? Whether this is as large as it should be in the average boy we do not know. We may safely take it for granted that it is not excessive. The girl at this time has the same weight and height as the boy, or a little more. She needs as much oxygen as he, perhaps even more. The average girl at this age has for each pound of weight hardly more than three-fourths of the lung capacity of the boy of the same age. At no period of her life does her lung capacity increase so rapidly under suitable gymnastic exercise, as Anderson has proved. This quick response to exercise is proof positive of its need. Gilbert observed that during the pubertal period dull pupils of all ages had a smaller lung capacity than bright ones. Many a girl during this period is dull and falls behind in her studies, not for lack of application or effort, but for lack of sufficient oxygen in her lungs and exercise in the open air. This is cruelty.

About this time the girl's brother joins a baseball nine, while she frequently ceases her outdoor games altogether. Sometimes she still plays a game of tag, but is usually ashamed of this relic of childhood. She is very fortunate if she is not continually warned by teacher, mother or aunt, that running, jumping, and romping are more befitting a tom-boy than a young lady. She gives up the play habit and forgets the art just when she most needs them both. The man or woman who would discover or invent attractive games furnishing convenient and suitable exercise for girls of this age would be the greatest of public benefactors. The critical period of the girl's life is between ten and fifteen, not later as most of us have supposed.

We have said very little about the boy. He needs the exercise just as much as the girl, and he usually gets it. But there is the shy boy, the bookish boy, the boy who does not know or care to play. All these require physical training of some sort. If they will not play, they must be made to join classes in gymnastics.

Some one has said that play is food, but that gymnastics are medicine. This is an exaggeration with a good grain of truth in it. For the earlier grades play is better than gymnastics. But as the boy and girl grow older they need the gymnastic training to correct defects of action and posture, to give complete control of the muscles, and to train the muscles or motor nerve centres to grace and precision of action. Hence in the high school gymnastics are of great importance, while play and athletics should not be neglected. Also, the more of the play element we can bring into our gymnastics, the greater will be the results of the exercise.

The trained athlete not only has a greater reserve of strength and power, but he uses his energy with far greater economy. He makes no useless movements, and wastes no energy in friction. His joy in his work and his confidence keep him calm and ward off worry. It is

a pleasure to watch him work or to work with him. But this power cannot be attained by one-half hour's exercise each week. That is about as useful as to attempt to fatten a man by giving him one small meal each day. If health, strength, power, and efficiency are worth anything, it is worth our while to spend a little time on them. It is profitable to the town or city to spend a little money on physical training in all the grades. At present in every spasm of economy the teacher of physical training, and there is rarely more than one, is the first to be discharged, and the teacher of music follows. The wise old Greeks knew that physical culture and music were the most important parts of the education of every citizen. If our schools are to be institutions of power and efficiency as well as of learning, we cannot afford to neglect physical culture and training. If our homes are to be nurseries of heroes, we must see to it that the child plays well and cultivates his body as well as his mind. Learning will not suffer because the brain is housed in a powerful and healthy body. The state will be richer and safer because it has a healthy and vigorous race of fathers, mothers, and citizens.

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## FAULTY POSITIONS IN THE GROWING CHILD AND HOW TO CORRECT THEM.

BY

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**T**HERE can be no doubt that the harmful influence of faulty posture upon the development of the young is too imperfectly understood or at least is too generally disregarded.

In the majority of cases where the lack of symmetry is marked the cause can be directly traced to faulty posture in standing, sitting, or sleeping, together with a muscular development lacking the power to resist the uneven strain forced upon it by the changed conditions. It is also true that where these faulty habits of posture are detected in the early stages, the correction is comparatively simple, but when the bad habits are continued year after year, and the different muscles have accommodated themselves to the abnormal positions, and the brain centres have been falsely trained as to what constitutes erect posture, it is a work of years even to approach a correction.

Some of the most common and the most harmful habits of posture into which young people, particularly young girls, are liable to fall are:

1. Standing on one foot with the other extended to the side in such a way as to lift one hip higher than the other, to preserve the equilib-



rium of the body; the head and shoulders must assume an unnatural position and the symmetry of the entire figure is destroyed.

2. Standing with the weight over the heels, dropping the chest, allowing the shoulders to droop forward thus making the shoulder-blades unduly prominent; as a result of these changes the hips move forward, bringing the abdomen into prominence and the head loses its natural poise.

3. Sitting habitually upon one foot, or sitting at a desk with one arm on the desk and the other in the lap will also produce a difference in the level of the shoulders and hips.

I have chosen to mention these well-known bad habits because, being so very common, they oftentimes pass unnoticed or are not recognized as important factors in destroying the symmetry of the body or, owing to a concentration of interest in other directions, are entirely disregarded. The youth who aspires to a position on the football team is much more concerned about his ability to "stoop low" than his ability to stand erect. The young woman intent only upon becoming the best basketball player in college is in danger of becoming careless as to good carriage, while those who care only for study and actually dislike exercise of all kinds, are apt to ask the question, "What is the use so long as one is well?" No one would reason in this way regarding the growth of a plant, a tree, or even an animal. The single fact that lack of symmetry is contrary to the normal development of the human form, not to mention the awkward walk and the stilted movements of the individual who has not full control of his body, should appeal to all as a sufficient reason why attention should be given to the posture of the growing child. Nature has decreed that we may not all be beautiful but, barring actual deformity, and the effect of disease, with a little care at the proper time, we may have erect and symmetrical figures, and with this will come grace and a pleasing presence, which no one will deny are valuable possessions apart from their hygienic worth.

The limits of this article will only permit a simple description of what constitutes a good standing position, and a few general hints as to the most direct method of training the individual out of his bad habits of posture.

Seen from the side, a person standing in the correct position will show the lobe of the ear, the point of the shoulder, the crest of the hip, and the instep in a straight line, and the weight of the body will be carried over the arch of the foot. The easiest method of putting the body into this position is to *stretch upward*. As a help in directing the stretch, a book may be held a little higher than the actual height of the individual and he be encouraged to try to touch it with the crown of his head, then raise the book higher and let the effort be made to touch the object by rising on the toes, taking care that when the heels are lowered again they touch the floor very lightly. After one has practised this exercise several times, it will only be necessary for him

to make the effort to stand and walk as tall as possible, and the result will tend to bring him into correct position. If parents and teachers will encourage this "standing and walking as tall as possible," they will be able to do much toward overcoming the tendency to "slouch," or to "lop on one foot."

Hanging by the hands, with the feet stretched downward, and the head thrown backward, is also a good straightening exercise.

For the child who has a tendency to flat chest, encourage games of ball similar to the old game of scrabble, where a ball is thrown high in air and all endeavor to catch it as it comes down; as a result the head will be thrown backward and the chest elevated and rounded forward.

Breathing exercises, with the hands on the chest, then breathing with hands on the sides, at the height of the lowest rib, will also help to increase the chest capacity in all directions.

These exercises are very simple, very well known, and very easily performed, but when used faithfully, and when each relapse into the old position is quickly corrected, they will prove beneficial.

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## PHYSICAL TRAINING OF YOUNG CHILDREN.

BY

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**I**NSTINCTIVE gymnastics is, from the hygienic point of view, the best adapted to the regular development of the child. It is not liable to any of the objections we have brought against gymnastics with apparatus. It cannot deform the body, for it is made up of spontaneous movements, and conformed to the natural office of each limb. It does not localize the work in a particular region of the body, for all the limbs are instinctively invited to take their quota of exercise; and it does not seduce the child into efforts touching upon the limits of his strength. Instinct also invites him to the kind of work which is best adapted to his particular aptitudes for resisting fatigue. He has a natural disposition to perform light but frequently recurring acts, quick motions, which put him out of breath, while exercises with apparatus rather exact slow and intense efforts that bring on local fatigue. Now, all observers have noticed the wonderful facility with which a child recovers his breath, and his impatience of local fatigue. Finally, natural exercise, being the satisfaction of a want, is by that very fact a pleasure; and joy shines in the face of the child who is playing freely.

The partisans of artificial gymnastics object to this method that it does not give in mature age the great muscular force, the capacity

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to bear fatigue, and the refined dexterity of movements—the various athletic and acrobatic qualities, in short, that should result from a complete physical education; and they assume that these superior qualities of the picked man, to be given the fullest vigor, should be cultivated from a tender age. They fall into the mistake, which is too often made in physical education, of not distinguishing between methods of development and perfecting processes. The physical education of the child, up to his fifteenth year, should have for its sole object to favor the growth of the body in all directions, particularly in height and weight; the perfecting of the structure of the organs, and the training of them by methodical exercise to a more complete performance, should come later on. The fourteenth year will be early enough to begin more energetic motions for hardening the flesh and developing the muscles. Till that age, physical education should especially aim to remove from the child all influences that may be in the way of the free expansion and growth of the body. Among these harmful influences are two of opposite character that produce nearly identical results—want of exercise, which makes the child emaciated, and excess of work, which stunts him.

This important distinction between developing and perfecting hygiene is well understood and observed by horse-trainers. They give colts nourishing food, free air, and room to gambol; and do not begin training them for work till they have acquired bodily growth and substance.

If natural gymnastics is enough for the animal, we may conclude from analogy that it would be amply sufficient for the child, if he had the conditions of space and time that are indispensable to the satisfaction of the instinct that impels him to exercise. When, then, the social conditions to which the child is subjected do not permit him to indulge in instinctive exercise, gymnastic methods as like as possible to those which instinct suggests should be sought for him.

The form of exercise that comes nearest to natural exercise is playing. It is nothing else than a more or less methodical regulation of the instinctive emotions, such as every living being is prone to execute spontaneously when he feels the stress of the want of exercise. It may be called a natural exercise, for we see the young of every species of animals playing with one another, and may even observe their parents inciting them to play. The teaching of games, which we find in all countries and ages, originates, we may suppose, in this tendency of the living being to educate his progeny physically by exciting him to enjoy himself in motion. Play, in the progress of civilization, has taken various forms, and has been subjected to methods that tend more and more to introduce into it an artificial element. Hence, sport has been developed from games; the exercises called sports are in general simply games that have taken a more methodical form, permitting a greater display of muscular force, exacting more complicated motions and a longer apprenticeship. It is

sometimes hard to draw a clear line between sport and play. Fencing, equitation, and canoeing are varieties of sport. Cricket is as much a play for children as an exercise of sport; in short, in the hygienic view, sports are half-way between gymnastics and play, and are therefore more suitable to youth than to children.

Games give the form of gymnastics most congenial to the conditions of social life, for they are at the same time hygienic and recreative, and are as well adapted to the physical requirements of the child as to his moral needs. Physically regarded, they demand neither very intense efforts nor localized muscular contractions. Even the most complicated of them call out nothing more than combinations of simple movements and natural attitudes; while gymnastics necessitates abnormal combinations in the association of the muscles, with movements which the child, having never practised, has to learn laboriously. Play presents no difficulties comparable to those offered by gymnastics. If the child has not yet become adept in the game, he will play badly and lose his part; but he will play, and will at least gain the physical advantages of exercise. But when he is dealing with the abnormal motions or "turns" of gymnastics, if he has not yet learned the way of executing them, or acquired the knack, which it often takes a long time to gain, he only makes a pretence of exercising, and his effort is limited to a fruitless tentative, without any effective activity.

Besides the support of reason and observation, the method of exercise by playing has the sanction of acquired facts. It was the only children's gymnastics at the beginning of the last century, and even now some nations have no other settled method of physical exercise. The English have never taken to gymnastics with apparatus; and the Belgians, after having tried it, are abandoning it and returning to play. No one can question the excellence of the results of the English method; the vigor and endurance of English youth are universally recognized, and their school-games constitute their whole gymnastics.

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## PHYSICAL CULTURE FOR GIRLS.

BY

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**C**ULTURE of the body is as necessary as culture of the mind, and it is fitting that as precious a jewel as the mind should have a strong and perfect casket.

Health is not simply the absence of disease, but the perfect condition and harmonious action of all parts of the organism, and the object of physical culture is to develop it to the highest degree.

How can that be accomplished? As no chain is stronger than its