

*Intoxication.*—Give an emetic. If the skin is cold and pulse feeble, apply heat and friction.

*Sunstroke.*—Lay down in shade. Apply continuously ice or cold to the entire surface of the body. Ice pack behind ears and about head.

*Epilepsy.*—Lay the person down and keep him from injuring himself.

*Fainting.*—Lay down with head lower than body—apply smelling salts to nose and sprinkle cold water on face.

*Opium Poisoning.*—Empty the stomach. Keep the patient walking, slapping with a towel. Keep him awake.

*Lightning, or Electric Shock.* treat as in resuscitation for drowning.

*Venomous Insect Stings.*—Alcoholic solution of menthol.

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## WHAT EXERCISE WILL DO FOR THE BODY

By MARY TAYLOR BISSELL, M. D.

When we ask what exercise can do for the human body we put into the word exercise a very definite meaning. We do not mean for instance the occasional walk that a girl may take on the beach, or the single riding or fencing or gymnasium lesson that she takes once or twice a month. The meaning of the word involves the idea of repeated practice,—something, whatever it may be, that we do once and again and again, possibly for pleasure only, but generally with the additional idea of perfecting ourselves in the practice. And it is only when these muscular movements are repeated and practiced that we can dignify them by the name of exercise, or demand of them any results, either in skill or strength or agility or general bodily vigor. So we shall be understood here as speaking of the regular practice of muscular movements in some fashion or another, and muscular movements which, either through design or accident, bring into play a large part of the body, and do it systematically; for the need of repetition is as necessary in educating the body as in training the mind. If we want to impress anything upon the brain, that thing has got to be repeated until the impression has sunk in; and if you want to make any definite impression upon these thousands of muscle fibres and train the coördinating power of all these nerve centres, and improve the conformation of the skeleton, and develop the capacity of all the organs, you will have to keep at it until the physical impression lightly made today, repeated tomorrow, has at last become an indelible memory, and the habit of the body. "What can you promise that systematic exercise will do for me?" ask a young girl of fifteen, seeking for some definite answer as to results. Well, it will simply make you more of a woman in every sense than you could possibly be without it. It will do this by improving every organ you use in movement; it will supple all your joints so that grace and ease will belong to them; it will make fatigue less frequent, and breathlessness uncommon; it will give you a bigger chest and more supple limbs and some force in your arms; it will clear away the fog in your brain, and the dyspepsia in your stomach, and bring you a rose for your cheek; and when your example has been followed by the

girls of one or two or more generations, it will give the world an idea what a noble creation a physically developed woman can be. Only it must be genuine exercise, and it must be systematic, otherwise the body will forget its cunning, and the lesson will not have been learned.

The way that exercise can actually change the structures of the body, so that they will be different not only as to power, but to touch and appearance and intimate constitution, is well seen in an exercised muscle.

A muscle that is exercised has evidently been profoundly changed in its qualities,—its fibres have become firmer and harder; it has lost its superfluous fat; it is evidently less liable to fatigue than before its training; it does not suffer the pains common to unused muscles after exertion. It has become, in fact, not only a more enduring instrument, but one much more competent to execute our pleasure; it is swifter and more graceful because more exact in its execution of our commands. Exactly what has gone on in its interior we do not see, but we know by certain experiments that by its exertions it has helped to throw off waste products in the body, burning them up by its internal heat, and so helping to free the body of these hindrances, and that its activity has also quickened the circulation and the respiration, so that heart and lungs are engaged simultaneously in eliminating worn-out material and bringing new to refresh the body.

The feeling of fatigue from which delicate persons suffer greatly, after even slight exertion, is probably better endured by one who exercises constantly, because, among other reasons, the nerve which supplies the muscle has become hardened by the repeated contractions of the muscle, so that its covering is rendered more resistant to pressure, and it becomes less sensitive to the buffetings of the muscle-bed in which it lies.

Since we see this process of improvement gradually going on in an external muscle under exercise, there is no reason why we should doubt that the same results are brought about in the internal organs and structures that we have learned are largely composed of muscle; and experience shows us that exercise does actually strengthen the muscle of the heart so that its contractions become more energetic with its increasing firmness of fibre, and it performs its work more vigorously, and at the same time more easily, than when it was less strong.

A soft and flabby heart muscle, such as sometimes occur after a long illness, is indeed in no better condition to work wisely than is the rest of a convalescent's body, which is trembling with weakness, and unable to direct its steps. The nerves that should control such a heart are evidently sharers in its weakness, and so are unable to guide it with a steady hand. Tonics and nutrition are what these convalescents need for the body in general; and for girls as well as for their elders, exercise is the tonic that the heart requires in health, under which it gains the steady control and the muscular power that the body requires for perfect development.

Breathlessness, that disagreeable foe to exertion, is always lessened by exercise, for two or three reasons. In all unusual exertion the heart pumps blood so quickly to the lungs as oftentimes to embarrass them; being unaccustomed to the sudden demand for more air, they are confused, as we may say, and hardly know how to adjust their machinery to

the demand. And besides that fact, they have been unaccustomed to make use of their whole territory, many of their air-cells being under ordinary circumstances quite unexpanded and idle. It is this confusion that we call breathlessness; and like similar unexpected incidents elsewhere in life, if we can only know of it beforehand we can be prepared for the emergency, and avert the confusion incident to the surprise. Now, exercise acts upon the lungs as moral training does upon the character,—gradually accustoming them to prepare for and meet the emergencies of sudden exertion with calmness; so that they really learn to breathe more deeply and more evenly under this efficient teacher, and to make less ado about it at the same time. The ascent of two stairs at once, to one accustomed to mount only one at a time will at first make a girl “out of breath;” but constant repetition of the exercise will make it as easy to ascend two as one, while breathing with ease and comfort. So will a run down a gymnasium hall or swinging of Indian clubs, mean breathlessness to one who tries it for the first time; but the ease with which one in training can perform these trifling exercises, and many more considerable, shows how the lungs are trained by exercise to adjust themselves to work, so that they take in more breath and take it in more easily than before. The experience of mountain climbers corroborates this; and that is the secret of “training” in running, or other rapid exercises.

The joints are immensely improved by exercise; and this is a direction that needs cultivation and repays the training.

It is really upon the ease with which we move our joints that most of our grace and skill in movements depends. And perhaps some of the most noticeable regions of improvement through exercise are the joints. By movements they rapidly become more limber, more supple and easy in their movements. Piano-practice is a proof of the influence of constant exercise upon the joints in the hands and wrists, as well as an excellent one of what training will do to strengthen and educate muscles. The acrobat, too, and the contortionist show the result of constantly exercising the joints of the body, while ordinary gymnasium practice soon shows its results in the increased pliability of the shoulder and arm joints. The fluid that lubricates these regions is probably increased in quantity by exercise, so increasing the smoothness of their action; and we know, too, that constant exercise tends to delay the changes in the joints that come with old age, when concretions form, and the fluid is apparently less in quantity, with the result that the joints become stiff, and are moved even with pain.

It is not a gracious thing to refer to the age of ladies, but it is well known that the most famous and charming women actors are no longer in their girlhood; yet who would fancy from the grace of motion and the supple attitudes, and the succession of rapid changes in position, involving sometimes the larger proportion of the important muscles and joints of the body, that these women were beyond their earliest youth. In fact these queens of the stage put to shame, in their physical accomplishments, the average girl of sixteen or twenty, and this by no means because they were born graceful and supple; on the contrary most of them have attained this

skill through persistent exercise, carried on systematically for many years. In the sense of the bodily changes that mean old age, such people will remain young long beyond the natural period, and are generally physically fresh to the end.

The effects demonstrated by exercise upon the digestive canal, composed, as that is, so largely of muscular fibre, are very evident. Anything that develops the natural powers of organs improves their structure. Since digestion depends partly upon the movements of food all about the stomach, which are effected by its muscular coats, and intestinal digestion also partly upon the vigor of the muscular coats of that canal, we can readily believe that a better digestion and more regularity of the intestinal functions, and consequently better health and vigor will follow strengthening of this muscular structure. Practically we find this true, dyspepsia and constipation being often relieved by the prescription of muscular exertion when medicine has failed.

Exercise will also undoubtedly reduce fat in the body. While a certain amount of this tissue is indispensable, and many girls need more instead of less, many individuals suffer from an excess, which is really undesirable for various reasons. Such excess is a dead weight upon the body. Now, it appears to be so partly from its actual mechanical weight, and partly because it absorbs a large quantity of oxygen which would otherwise go to support more useful parts of the body, so that very stout persons easily become breathless because the supply of oxygen which should belong to the body in general is largely appropriated for the benefit of adipose tissue alone. Exercise reduces fat evidently by increasing perspiration, which subtracts water from the fatty tissue, and also by increasing the combustion and destruction of its constituents.

So through all the different machinery of the body we can trace the benefits of regular exercise in invigorating and developing organs and making their working power greater and easier; and we can see how we have by exercise really improved upon ourselves as we came from nature (not as we were intended to come, however), and have, seeing the changes that we can effect at will in this way, demonstrated to ourselves once more that heredity, powerful as it is, is by no means all powerful and conclusive.

Suppose we look for a moment at the record of "gains" that can be shown in a girl's gymnasium. It is not a small thing that a young woman should have all of her body machinery so improved and stimulated to growth by twelve months' practice in a gymnasium that she should add two inches to her narrow chest, the same to her stature, and increase her lung capacity by thirty per cent. It is not unimportant, when we remember the small strength of her arms when she entered, and how tired her back that she should find many of her strength tests doubled in actual figures, and that she can look with a pardonable pride upon the erect spine and the vigorous arm that she has gained herself in these few months, while the consciousness of controlling her body instead of having it control her, the knowledge that skill and agility and courage and a dozen other longed-for qualities have come to her through these few months of systematic but pleasurable practice, make the benefits of exercise seem very

real to her, and to many others such as she. For this is not a fancy sketch, but has been repeated once and once again within the writer's knowledge, and I doubt not is being happily repeated in every well-organized gymnasium in the land, where the city girl is having an opportunity to recover her birthright.

Figures have been printed in every recent book that has been written upon any one's experience in the direction of physical training, to prove what wonderful gains can be made in a few weeks or months of systematic exercise. It is nothing unusual to find much more startling records than the simple case that has just been quoted. Every one of experience knows that a chest can be developed, and arms can be increased in size, and backs can be strengthened and straightened, and muscular strength even trebled. But once more, desirable as these things are, it must be remembered that they are only the external signs and tokens of the many complex changes for good that have been simultaneously going on within the body, by which the whole economy has been stimulated to better growth, quicker life, and higher activity, improving its chances for life and doubling its capacity for enjoyment.

These results of exercise prove its importance for the adult and the mature as well as for the child and the young girl who has yet to perfect her physical powers; they help to persuade us that even after physical training has helped to develop us in youth there is still a large sphere for it in maintaining the good work it has begun, so that exercise is part of the privilege of the mature young woman as well as of the undeveloped girl.

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