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ON

PHYSICAL EDUCATION.

A LECTURE

DELIVERED BEFORE THE

AMERICAN INSTITUTE OF INSTRUCTION,

ANNUAL SESSION, HOLDEN IN SPRINGFIELD,

AUGUST, 1839.

By ABEL L. PEIRSON, M. D.

OF SALEM.

BOSTON:

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1840.

264846
Washington, D.C.

The following performance was written several years since, for an association of teachers, and its publication declined by me on account of its imperfections. I have followed the poet's advice and kept it seven years, and it has grown no better ! But in the mean time, the lapse of years has diminished my sensitiveness to criticism, and as some experience has shown me that medical opinions on subjects connected with Physical Education, have an official weight independent of the personal importance of their promulgator, I have yielded the manuscript to a renewed application to publish it. Some of the remarks are those which occurred to me in the course of miscellaneous reading, and I would honestly affix a mark to the property of others to distinguish it from my own, if my memory retained any clue to guide me in doing it. Nevertheless, I hold this to be not of the slightest importance, for I am of opinion that it is just as honest to steal the language, as the ideas of others, as the canny broom-maker preferred purloining the brooms ready made, to plundering the stock of which to make them. A. L. P.

PHYSICAL EDUCATION.

SOLOMON, who is high authority among schoolmasters, but whose memory is not over fondly cherished by transgressing school-boys, has directed us to bring up a child in the way he should go, and this maxim has met with universal assent. The meaning however, of this plain direction, has received a variety of constructions. The mathematician believes it means the way in which a child should *cipher*, and the classical scholar the way in which he should *translate*, while the professor of calisthenics interprets it to mean the way in which he should dance, and make his bow, and turn out his toes. But the man of wisdom had no such narrow views, and by "the way in which he should go," he doubtless meant that his education should include all those particulars which are calculated to train all his faculties, both of mind and body, to their most effectual exercise during his *transition* through his present state of existence, to the high destiny to which his Maker has invited him. The greatest earthly mystery, is the union of an intellectual spirit with a corporeal body, and in complying, my friends, with your request to provide a lecture on, "the connection of the Physical and intellectual well being of Pupils in Schools," I shall offer you but a humble and imperfect contribution towards promoting the objects of your very praiseworthy institution. You must be aware that if I were to attempt to satisfy your minds upon such a theme as the one you have proposed for my discussion, I must expend much time and labor in preparation, and go back to those fountains of learning from which the active business of life causes us widely to stray, and for the want of whose refreshing influences our minds for the most part, become arid and

barren of all literary product. In fact, I hope I shall not *appear* to be as much out of place as I *feel*, since it would much better comport with the literary deficiencies of men who lead a life of active labor and exertion to take the lowest form in such an audience as this, rather than the teacher's desk. Thus much allow me to have said in no affected modesty, and as anticipating the incompleteness of the discussion into which I shall lead you. My object will be rather to excite your inquiry than to gratify it; and my end will be obtained if my remarks induce you to read and to think.

It is well for us to consider what manner of beings we are, and in this the very threshold of our subject, we are prone to overlook one of the soundest and most valuable of physiological truths. Man sways the sceptre of the animal kingdom, and he is accustomed to consider himself as entitled to this distinction by reason of his superior animal organization. Whereas he is in reality the weakest, the most defenceless, and at his birth he is, so to speak, the most imperfect of all the inhabitants, with which creative wisdom has covered this globe. And paradoxical as it may seem, it is owing to this imperfection, this weakness, this want of defence, that he owes his superiority and his elevated rank, the blessings of the social state, and the almost indefinite enlargement and improvement of his intellectual faculties; to this cause he is indebted for that ray of heavenly illumination, in virtue of which he takes a rank but little lower than divine.

How many of the animal kingdom surpass him in the acuteness of the senses! He cannot, like many birds and quadrupeds see in the dark. And in the brightest noon-day, his glance cannot, like the piercing gaze of the eagle, penetrate an immense region of atmosphere. The hare, the mole, the bat, have more sensitive organs of hearing, and singing birds have more facility in distinguishing intonations of sound. In the perception of odours, man's inferiority is most manifest. The greyhound conducts him to his game, by his unerring scent—the despised swine distinguishes the odour of his truffle and pignuts through a foot of solid earth, and the voracious vulture scents the tainted gale from Egypt to Pharsalia. In his sense of touch how does he fall below the zoophytes and mollusca, even the very earth-worm that feels the slightest concussion of our step in season to avoid our destructive approach. The antennæ of many insects, nay, the whiskers of our domestic cat, put to shame man's nicest sense of touch. There is then no sense left

to him in which to excel, but the taste, and it might be thought that the refined palate of our grand gourmands, men who can perceive the peculiar nature of the soils from the flavor of the wine, or of the fish who inhabit the water which they drink, nay, who can perceive not only that the butt of wine has an iron taste from the key which had been lost therein, but that it smacks of leather from the thong to which the key was fastened,—that such palates as these might bear comparison with that of the winged robbers of our cherry and plum orchards, who attack only the sunny side of the fruit, or of that troublesome insect whose taste in cheeses is so exquisite. But what animal besides man swallows liquid fire, and who but he envelopes the organs of taste with the filthy smoke of tobacco, or steeps them in the still more filthy infusion? There is no brute that breathes whose palate would not reject them with loathing and abhorrence. And then in brutes these senses so acute, are guided by an unnerving instinct which distances immeasurably all the boasted refinement of man's reason.

It is not then the superior physical organization of man that elevates him lord of creation. It is his weakness which constitutes his perfection. Look at the young human animal on its entrance into the world, naked, helpless, unfit to be left for a few moments, and inevitably destroyed if the fostering care of others be withdrawn but for a few days. Unable even like the young ape, its hideous representative among brutes, to cling to its parents for protection. The very weight of that brain which by its operations is to elevate its possessor to its destined rank in the scale of being, is too heavy for its strength, and requires the most careful horizontal support. Months must elapse before even the creeping posture can be maintained, and at last after many perils the tottering limbs are able to support the weight of the whole body in that erect posture which is man's noble and peculiar prerogative. Then follow years of helpless infancy, and still more years of immature adolescence, and thus slowly and amid a multitude of necessities and dependence on others, are we brought to the full development of our organs, and are fit to be entrusted with the care of our own support. But it is to this weakness, to these necessities, to this want of preparation for our own support, to this dependence on the fostering care of others during a tardy development, that we are indebted for that which makes us strong and swift,—gives us air and water for our residence, above ground and below ground for our habitation. The flight of eagles is beneath us in the air,

the inhabitants of the mighty deep are distanced in speed by engines fabricated by our skill.

Suppose man's unreasonable complaints to have been heard and his requests granted, and man to have been born as are most animals, strong and robust from his birth, clothed with hair, armed with talons and with teeth, prepared to obtain his food by force, and instructed by instinct. He must forever have remained a brute. It would be manifestly impracticable to subject him to the discipline, the study, the instruction of childhood. Such a being could never be docile, never be restrained within those paths which alone lead to knowledge. The arts of life would not be cultivated. Clothing and shelter which now call forth the utmost ingenuity of man, and which in architecture and machinery have developed the loftiest geniuses, and in painting and design have given birth to the finest products of taste and imagination, would then cease to be objects of interest or forethought.

The beautiful and complex organ, the hand, which while man retains he *must* be master of the world, (would that he had never employed its terrible force but to obtain a legitimate and peaceful empire over brute force, and the powers of nature,) the hand must be sacrificed for the purpose of substituting prehensile organs of more force and stronger armed, whereby to secure his subsistence.

Give man the swiftness of the courser, the lightness and the mobility of the feathered race, and you strike at the root of social order and domestic attachment. He is none too stable in his present estate, but *then* what bonds would restrain him? The petty vexations of life, a paroxysm of anger, a fit of disgust or despondency, and he changes his place to avoid his pain.

"He would roam through the world like a child at a feast,
Who but sips of a sweet, and then flies to the rest,
And when pleasure began to grow dull in the east,
He would order his wings and be off to the west."

There is a principle the neglect of which, lies at the bottom of much of what is erroneous in the systems of modern education. It is that the intelligent principle of our nature is held in connection with physical organs, and that the development of the whole must be equally promoted. Man though an intelligent being, is an *animal*, and like other animals, may be trained by physical culture, from a state of imperfect development, to a high degree of physical energy and perfection.

The subject of physical education is one which has received far less attention from all classes, than the importance and practical nature of the subject demands. It is within the observation of all that our modes of life and external circumstances, modify our health, and that upon our health depends much of our attainment in knowledge. It is thus that the blessings of Providence are equalized. This is a beautiful sentiment which is contained in the answer which the poor aged domestic made to the rich Barmecide, who asked why princes and people of wealth were short lived, while such as he mostly attained old age? "It is," said the old sweep, "because God gives his bounty to them at *once*, but to us by slow *degrees*." The world is filled with instances in which individuals and nations have lost their intellectual superiority and their political freedom, by the degeneracy of their bodily powers. The succession of nature is, that wealth and luxury engender idleness; this produces disease, and disease creates imbecilities both of body and mind, and imbecility is thrust aside by vigor and activity; on the other hand, necessity leads to frugality and temperance, these homely virtues are the parents of health, from health flows the vigorous exercise of the mind and body, and these bear triumphant sway in the moral and physical creation.

These are every day truths, mere common facts, so common I fear, we are prone to overlook them, and although we all desire to remain on the top of this revolving wheel, we are not sufficiently mindful of the means to keep us there. Does the common notion of education in this country, take in a reference to the growth and condition of the body? The influence of external circumstances upon every thing else seems to be better understood than upon children.

Let us draw an analogy from the vegetable kingdom. And here let me ask you to forgive me the humble sources from which I may draw my illustrations; but nature is so true to herself, that our comparisons drawn from the vegetable world, and the brute creation, are consistent with the most enlightened views of the human economy. When trees and shrubs grow languidly—when their stature is small—their bark rough and covered with parasitic plants and animals—their flowers thinly scattered, imperfect and of small size, and their fruit never reaching to maturity, what does the skillful gardener set himself about? He proceeds to modify and improve the physical circumstances in which the vegetable is placed. He clears out the roots, loosens and enriches the soil, clears the epidermis

from dead scales and from animal and vegetable parasites, and probably is at last rewarded by a vigorous and healthy growth. Now let us give our attention to a few facts drawn from stable discipline. Examine an ill conditioned horse—see his hard and unsightly skin closely binding his flesh—his cracked heels—his emaciated, bony appearance—his feebleness—his supplicating, subdued countenance—his awkward and inelegant deportment. Look at the same animal after the well applied labor of the groom, joined to nutritious feeding, have brought him into condition. See how the skin becomes smooth, and sleek, and soft, and pliant—how plump and elastic become the muscles—how the animal acquires flesh, and strength, and spirit, and energy, greater far than he ever attains in his natural condition of existence; how all appearances of disease and debility vanish; and how he becomes master of those wonderful powers which astonish us in the hunter or the race-horse.

From this comparison we may advert to what is witnessed in those men who are trained as prize-fighters, or to perform extraordinary feats of strength or activity. By diet, and exercise, and medicine, and sweating, and friction, and feeding, all regulated by the nice tact and judgment of experience, the body is brought into a state capable of enduring the most extraordinary exertions. We ought not to despise such facts,* homely though they be, we should avail ourselves of them, and be assured that if judicious culture will do so much to elevate and improve the *inferior* beings in creation, the same sagacity will afford the means of advancing the power and energy of him who stands at their head.

The intelligent principle of our natures being held in partnership with physical organs, the development of which controls and modifies this principle, in order for the intellectual part to perform its operation, the physical part must furnish the materials.

And now let me ask the experienced instructors by whom I am surrounded, if this very obvious and simple idea is not too frequently overlooked in our American notions of education? Are we not wont to think that the minds of children may be urged to any extent, without thinking of their bodies, and that it would be deemed almost preposterous to institute tasks for their bodily organs, as we do for those of the mind?

Shall I be permitted to tell you what I think is meant by

* Baron on Tuberculous Disease, page 152—4.

education among us? It means, for the male sex, the acquirement of certain branches of general knowledge, and the principles of those sciences, whatever they may be, which are necessary to the practice of a particular profession; and for the female, an acquaintance with the elements of common everyday learning, and the addition of as much of what is called accomplishment, as the very humble means we have among us will allow, and the sooner and earlier this is done the better.

I do not mean to be severe, nor to accuse either parents or teachers of intentional neglect. There is ambition enough to excel among all parties. But the fault of this education is, it is too partial, it does not develop the faculties in anything like an equal proportion; it is, if you please, too *intellectual*. It produces too rapid a development of the intellectual faculties without waiting for a corresponding growth and corroboration of those organs with which the intellectual faculties are essentially connected; and hence the unnatural excitement of the one exhausts the energy of the other. Sound philosophical education should be *gradual*. One organ should not be tasked at the expense of another, but there should be a reasonable waiting and delay for each to come forward and expand itself. In short, education should be *natural*. Once more let us consult nature in her humbler performances. Does the rose blossom most perfectly when trusted to time under the genial influences of light, and heat, and moisture? or when the impatient florist has rudely torn open the petals of the tender bud? And is it any less ridiculous and absurd to stimulate the minds of the young to a precocious forwardness at the expense of their bodily health and customary hilarity? But nothing demonstrates the imperfection of some parts of our system of education more, than the subjects of it themselves, after they have attained all that was contemplated. In very many instances, there is not health enough left to practise those very accomplishments which it had been the object of their instructors to confer upon them. Look at the pale countenance and slender figure, which too often is seen occupying the sacred desk, and at the debilitated frames of the multitude of aspirants for intellectual renown, whose studies have ruined their health, and the development of whose mental faculties have exhausted their bodily energies, and will open for them an early grave, or worse, condemn them to a premature decrepitude. Of what use in such a feeble casket, are the treasures of knowledge, and how little do the embellishments of mind serve to effect any purpose, but to ren-

der the possessor a more amiable victim to the king of terrors, to weave

"One poor garland
To hang upon his hearse, to droop and wither there."
SCOTT.

But this is fault-finding in general, let me endeavor to be a little more particular.

What a beautiful instrument is the hand, and how readily may it be educated to manipulations which delight and astonish us, while they promote the happiness of the whole human family! And yet how many men of influence and standing are there, who have so neglected the education of this important instrument, that they hardly know what it is made for, except to make a pen, or cut up their food, and who would be just as capable of making a chronometer, as of constructing a box which would hold a hen and let out her chickens. And the eye is, if possible, a still more ingenious apparatus, susceptible of being trained to a delicacy of vision, which will detect the minutest shades of color, and discern distances and proportions of parts, with the accuracy of a mathematical instrument. And yet half the men in the world so neglect the culture of this organ, that they would never discern of themselves that a straight line is the shortest distance between two points, and whose conjectures concerning the height of a mountain, or the width of a river, would be laughably at variance with the truth. And how many men dwell amidst the loveliest scenery in nature, and never discover that the road to market or to 'Change, lies over regions whose lovely or magnificent scenery is calculated to give pleasure to the senses and elevation to the thoughts. And then the voice! How do our hearts yield willing homage to him or her who possesses the soft, persuasive, irresistible, musical tones of a sweet voice!

The skill of the musician can give to the voice all the modulation of a wind instrument with stops, and can even bring a harsh and unmusical one to softness and harmony; and yet, in our day, who dreams of educating the voice for the common purposes of life, of softening its harsh tones, and giving it compass, and energy, and sweetness?

Is it common for any of us to give ourselves much solicitude, when a child is learning to speak, as to his mode of speaking, and when the alphabet is learned, is it common to pay much regard to distinct articulation? We, New-Englanders, are accustomed to pride ourselves upon our correct speaking of Eng-

lish. But surely our national vanity misleads us. There is not a well-educated Englishman who comes among us, who is not at once struck with our indistinct and mumbling articulation, and our want of elegance in pronunciation.

But let us once more revert to principles. It may be stated as a law of the animal economy, that the exercise of an organ is necessary not only to its development and perfection, but even to its preservation. This is often exemplified by the state of parts which are not kept in due activity, for if they are not exercised they degenerate, while by exercise their size and vigor may often be carried beyond the natural degree of perfection. Compare the legs of a foot-soldier, increased beyond their natural size, by his perpetual marchings and counter-marchings, with those of the dragoon, which have become almost useless, and are dwindled to an insignificant appearance, by the want of exercise, and the pressure of the boot and saddle. So the bandaging a limb and laying it at rest, will cause it to diminish, a practice well understood by deceiving mendicants. The fact, then, is sufficiently obvious, that the nutrition and growth of the *muscles*, are promoted by their motion and use. But although not so obvious, this is equally true of the *bones*. The fundamental law is, that inaction creates loss of power and atrophy, or wasting; that every part degenerates unless it continues to perform to a certain degree its peculiar functions. The changes in the muscular system are visible or cognizable to the senses, but those in the bones, are, from their position, necessarily concealed. There are not wanting, however, opportunities of ascertaining these changes, which are familiar to most medical men. As soon as a bone becomes permanently dislocated, the vacated and useless socket becomes filled up, and smoothed to a level with the surrounding bone. If a soldier, in active service, receive a wound for which *immediate* amputation is necessary, or if the same operation be performed on a strong laborer, while he is in full health and exercise, the bone is found nearly as hard and dense as ivory. But let the patient be confined in a hospital, without any motion in the limb, for a number of weeks, and the bone becomes soft and spongy. Medical museums contain many specimens of this change of structure. Perhaps the most remarkable, is the one mentioned by Cheselden, the most eminent surgeon and anatomist of his day. This is the thigh bone of a soldier, who was shot in the right groin at the siege of Gibraltar. He was brought home the next winter and died of a dropsy. After

his death, the thigh bones were sawed lengthwise, with a fine saw, to exhibit the wasted appearance of the internal structure of the injured one; and on weighing them both, the right weighed less than half the weight of the other.

Analogous facts may be observed in animals. It is well known, for example, that the bones of the leg of the race-horse, when he is in full vigor, are as hard as ivory;* and the inferior bone of the foreleg of the lion is so hard and heavy, that with a well-applied blow, he is able to crush the skull or break the back of an animal much larger than himself.

I will now offer you another striking illustration of the principle, that the exercise of organs is necessary to their development, perfection, and preservation.

And I trust I shall not tire you by insisting on this topic, as I desire to fix the principle so incontestibly, that you will permit me therefrom to derive some very important practical inferences.

It sometimes happens, that a bone-setting quack performs a cure upon an injured limb, which has baffled the skill of the scientific surgeon. When this is the case, it is, invariably, by dint of rubbings and manipulations which restore action to parts which have lost the power of action by disease. Although, probably, unacquainted with the principle upon which they are acting, by the labor of rubbing and kneading they bring into operation those laws of the animal economy, and dormant natural powers, upon the performance of which the cure often depends. It is not to be wondered at, if under such circumstances, the patient should praise the *quack* at the expense of the *surgeon*. The operations of the quack are carried on with the parade of ointments and washes, and with the intent to deceive, pretending, by certain manipulations, to put little bones that are out, into their proper places again. But "*fas est ab hoste doceri*," and a valuable lesson upon exercise may be learned from the good effects produced upon contracted ligaments, and emaciated muscles, by the diligent and faithful rubbing of the charlatan.†

Keeping in view the principle which these facts establish, let us advert for a moment to the structure and organization of bone. For it is evident, as the bones form the frame-work of the body, much of the vigor of the constitution will depend upon this frame-work being properly constituted. Bones are

* Shaw on Distortions, page 1—14.

† Shaw on Distortions, page 23, &c.

the levers upon which the muscles act. They are the *organs* of locomotion, as the red flesh, or the muscles, are the *agents* of this motion. You well know that bones contain lime, since the burning or calcining of bones, to make lime, is a manufacture extensively carried on, by which process the animal part of the bone is consumed, and the earthy, incombustible part, remains. Bones are at first formed of a soft, transparent jelly, which is rendered hard by the gradual deposition of lime, in the form of phosphate of lime, a process which is not completed until after the first twenty years of life. In fact, the relative proportion of lime in the bones is never the same, for in advanced age, the increase of it renders the bones brittle, as in infancy, the want of it renders them flexible. So that the application of the same force, which in advanced life would *break* a bone, in the early stage of existence, would only *bend* it.

And the difference between the broken bone of young and old subjects is frequently this, that in the latter case, the fracture is complete, as in glass or pipe-stem, while in the former, it is like the fracture of corn-stalk, or of tenacious wood. Now I have called your attention to these facts, in order to show you how readily, the bones of young and growing subjects, may be moulded by pressure and distorted by the irregular action of muscles, and even deformed by the want of power in those muscles, to preserve them in their proper shape. And in the course of the investigation, we shall see how much the vital organs, the heart and lungs, are made to suffer from the same causes.

The law of the animal economy which we have been considering, and which, we have stated, operates in regard to the bones, as well as the muscles, may be expected to operate very distinctly upon that column of bones, called the spine or backbone. This column is supported, in its erect posture, by various strong muscles, attached to its sides, somewhat as the shrouds of a ship sustain its masts, or as the cords of a tent-pole support it in its upright position. These muscles may be so weakened, by want of exercise, as to become incapable of giving that support which is necessary. When this takes place, the bones of the spine, and the ligaments which bind them together, yield to the superincumbent weight, and this the more readily, from the imperfection in the structure of the bone, to which we have already alluded.

But we will anatomize this subject a little farther. The spine consists of twenty-four blocks, or pieces, decreasing in

size from the base, at the lower part of the back, to the smallest one, which is next the head. These blocks, or pieces, are called *vertebræ*, from the Latin *verto*, to turn, in order to allow of a turning motion, and, at the same time, not to weaken their connexion, they are not placed in contact with each other, but have inserted between each of their opposing surfaces, a very strong and very elastic substance, which enables the whole column of the spine to receive very severe shocks, and extinguishes the force of these shocks before they reach the brain, which is thereby enabled to ride more securely upon the top of the column, than a coach upon pliant springs. Dr. Maclaurin, an old anatomist, was accustomed to illustrate the use of this elastic substance, by comparing it to a bladder partly filled with water, and placed between two trenchers; in which case, the water would readily diminish in bulk, as the circumference of the trenchers became approximated on one side, and would occupy the increasing space on the other. It is a very curious fact, by the way, that since the time of Dr. Maclaurin's conjectural exemplification, an animal has been discovered, the basking shark, in which this structure actually exists. This immense fish has between its *vertebræ*, a bag of water, and so great is the elasticity of the substance by which it is surrounded, that when the bag was cut into, the expansion of this elastic matter projected the fluid to the height of four feet, in a large perpendicular stream, compressing the bag into a small compass, and forcing its sides into numerous wrinkles.* This description readily explains the flexibility of the spine, and the necessity of health and vigor in the muscles, which are destined to preserve it straight and erect. The *vertebræ* are all perforated with a round hole, in order to contain and transmit that portion of the brain, called the spinal cord, or spinal marrow. The uses of this part are very essential, and the disorders which result from its compression, or disease, are very painful and distressing. I think I may now venture to claim your assent to a proposition which I consider of the very first importance in Physical Education. It is this; that the proper growth and perfect development of the trunk of the body, or in common language, a fine shape, is almost uniformly connected with bodily vigor. Those practices, therefore, which injure the shape, should be avoided as much as possible, and those exercises promoted which are calculated to improve it. And here we open at once upon a wide and fruitful field of

* Abernethy's Lectures.

practical ideas, in which we labor long and gather abundance of improvement. Certain positions of the body, when long continued, have a direct tendency to produce distortion of the spinal column. We shall understand better by examining the mode in which the body is supported in standing. This process is effected by *muscular action*. But muscular action, you will say, implies motion. There are two kinds then of muscular action. A bow which is bent and ready for use, is constantly exerting that same kind of spring, or elasticity, which propels the arrow, and yet by the counteracting influence of the two sides of the bow, connected by the string, no motion is produced. So in the human body, when a strong man hurls a stone, some of his muscles are put into violent and rapid contraction. If the same man stand like a soldier at drill, his muscles are likewise contracted to a certain extent, but in a very different manner. The Crotonian Athlete, Milo, is said to have been able to stand on a polished metal shield plentifully covered with grease, so firmly, that no one could push or pull him from his station. I am inclined to think this story the product of Grecian mendacity, but it shows that the Greeks, who understood well every thing which related to exercise, were acquainted with the second kind of muscular action to which I have alluded, and which has been called muscular tone, or tension. The following examples will show what is meant by regulated muscular tension. When a man is going to run a race, he stands prepared at the starting post, and looking earnestly for the signal, which being given, he darts off instantly and loses no time till he arrives at the goal. He has placed himself in a proper position; his muscles were braced up to that degree of tension which practice has taught him to be the one in which they can be instantly used to the best advantage. Two wrestlers or pugilists engage in a contest. They stand up to each other with every muscle, even to those of the eyes put upon the stretch, and ready to use a violent exertion to prostrate each other, and each preserving such an attitude as is best preferred to give or avoid a blow. But, at length, one of them, by the power of the will, calls into action the proper muscles and puts in his blow.

This is positive muscular action, the rest was muscular tension, or preparation to act. The chisel of the sculptor, among the Greeks, was often employed to represent this braced condition of the muscular system, and some of the finest specimens of sculpture extant, are those of gladiators and throwers of the

discus, in a state of preparation for their performances. But while the soldier on the parade is holding himself in his erect and martial attitude, let his commanding officer give the command, "stand at ease," and observe what a change immediately occurs in his attitude. His musket slides to the ground and rests upon his relaxed arm. His body is thrown sideways and rests over one hip. If his back were now examined, it would be found that his spine has a serpentine curve, and that one hip and one shoulder is more prominent than its fellow. Now the former condition is one in which the muscles are to a certain degree exercised, and, of course, is followed by a corresponding degree of fatigue, while, in the latter, the necessary degree of tension is produced by a mechanical arrangement, in which there is little or no volition, and, of course, little or no fatigue. This position, then, by which a temporary distortion of the spine is produced, is the one which those persons assume in standing, whose general or local muscular debility renders exercise or muscular action peculiarly fatiguing. The arch of the foot becomes a fixed point on which the bones of the leg rest, as a firm pillar upon its base. The body being bent sideways at the hip joint, the muscles which go from the hip to the knee are put upon the stretch, so that the thigh becomes fixed upon the leg, and the double curve in the back-bone stretches the dorsal or back muscles of both sides, and the head being a little inclined sideways, is balanced directly over the centre of gravity. Borelli, long ago, explained this in demonstrating the manner in which a bird sits upon a branch when asleep. The weight of the creature and the consequent flexion of the limbs drawing the tendons of the talons so as to make them grasp the branch without muscular effort. Now if you will examine a row of children standing up in a school to repeat their tasks, you will find them nearly all balancing their bodies upon their foot, after the manner I have mentioned. As a natural consequence of this position, there is a slight curve in the whole spine, and although the muscles of the more robust soon learn to balance each other again, in the debilitated and feeble, this position long continued may lead to more permanent deformity. It is easy to understand why girls are more subject to this deformity than boys, since they have much fewer opportunities of counteracting these causes of deformity by the active exercises in which boys indulge. How very remarkable is this fact and how much valuable instruction does it convey, that lateral curvature of the spine is a disease of the very rarest occurrence among

boys, and is distressingly frequent with girls. If a weakly girl of ten years old be obliged to sit for hours on a narrow bench, without any support to her back, she will inevitably suffer her body to sink down upon one side into the attitude of ease we have been describing. If, besides that, she is placed in a situation in sewing, writing or drawing, to favor the same curvature, and if in addition she be prevented from taking such exercises as tend to give tone and strength to the muscles of the spine, it would be wonderful indeed if she escape being crooked. But the *spine* cannot change its shape, especially the superior part of it, without a corresponding change in the form of the ribs and breast bone, and a consequent interference with the functions of the heart and lungs. One part of the circumference of an elastic hoop cannot be bent without a corresponding alteration of shape in its opposite arc. Each pair of ribs with its attached portion of spine and breast-bone constitute an oval, subject to the same laws as the elastic hoop. Thus, if the right shoulder become *prominent* from curvature of the spine, the left ribs are flattened in front. Where this deformity of the chest has taken place to a degree sufficient to diminish materially the room required for the movements of the heart and lungs, very serious injury of the health is produced. I remember to have found in the case of one person who had passed a miserable existence from this cause, that the heart had received a deep furrow or indentation from the constant pressure of the sixth rib. The usual position of the body in writing or drawing, has a direct tendency to aid this deformity. And in very weakly subjects the position of the body while asleep may also conduce to it. There are some of the sports of children likewise, in which one hand and arm only are exercised, which have a tendency to pull the spinal column to that side. Immediate attention therefore, should be paid to the commencement of this difficulty in young and slender persons. It is no part of my plan to talk about the medical treatment of cases of distorted spine. Let it suffice to state generally, that since the deformity is produced by muscular weakness and irregular action, the muscular system should be brought, as speedily as may be, to a sound and healthy state of action. And this is to be done by those exercises which call into play the various muscles of the body.

I shall trespass on your patience with a few remarks on particular exercises. The refinement of the manners of society, has not always produced a favorable effect upon these exercises. The predominant wish of all classes is to live without labor.

The female sex especially, suffer from the influence of those customs which seclude them from exercise in the open air, and condemn them to the sedentary occupations of the needle and the lace frame. I am almost disposed to acquiesce in the petulant injunction of a fault-finding commentator upon present fashions, that we cannot make too much of our old women, for we never shall have any more of them.

Labor-saving machinery which now does so much to impart to our convenience, has extinguished some of those active employments which conduced to the health of females. The spinning wheel, a knowledge of the use of which used to be considered indispensable to every thrifty housewife, is now very generally laid aside. This implement was an admirable fortifier of the muscles. It gave simultaneous employment to both arms, to the lower extremities, and to the muscles of the chest. Cobbett, in his *Cottage Economy*, goes into raptures in the description of a tidy house-maid, baking bread. Had he lived in New England in the days of the spinning-wheel, I think he would gladly have exchanged the picture, for that of a smart farmer's daughter, spinning her winter stock of knitting yarn. In those days, it was no uncommon thing to see a young woman, with a spine as straight as Diana's, even though her parents were rich enough to afford that she should be as crooked as the last letter of the alphabet. It is easier to prevent deformity than to cure it. The plan of exercise therefore, should be adopted in very early infancy. In general, the vivacity and hilarity of very young children, is sufficient to keep them constantly in motion, and changing their position. This is sufficient, and all attempts to restrain them and reduce them to quietude, for our convenience, should be avoided. But their misfortunes are too apt to commence from the moment they begin to go to school, and this is often at a very tender age. It is certainly no uncommon thing to see twenty children, under six years of age, shut up in a room less than fifteen feet square, well warmed with a stove, and furnished with narrow benches without the least support for the back. Here, when the natural mobility of their system prompts them to vary their position every minute, they are chid for not sitting still, and those who from languor or debility, are enabled to conform to orders, are commended for their obedience. Every school-room for young children, should be large and airy, and furnished with such conveniences for sitting and reclining, as may prevent their falling into constrained and fatiguing postures. Their position also should be varied by some employment, at

least as often as every five minutes. With children of all ages, the practice of balancing the body always upon one limb during recitations, should be watched over, and they should be made to change their posture by word of command.

The infant school system, is certainly founded on a correct view of the animal economy.

This system is so emphatically that of common sense, that I cannot doubt but that in a few years the best parts of it will be introduced into all the schools for little children. Let the small, heated, ill-ventilated rooms, the uncomfortable seats, and the constrained positions in these schools, be relinquished in favor of activity and motion, and free circulation of air, and the natural dread which children have of imprisonment in going to school, will yield to joyful anticipations of pleasure. Two things seem to me to be essential to the health of small children in the arrangement of their schools. A pleasant play-ground in the open air, and a well protected building for exercise in the winter and in rainy weather.

As children advance in age, their exercises must have more plan and arrangement, and their sports become systematic games. Cricket is an unrivalled game among boys for the exercise of the limbs and body. Swimming deservedly ranks high as an exercise. Besides the invigorating effects of the cold bath ; in swimming, every muscle of the body is called into action. It was possibly owing to his fondness for this exercise, that Lord Byron was to combat successfully, for so long a time, with the destructive effects of his gin-and-water mode of life. A swimming school, where it could be obtained, would deserve the patronage of every parent and instructor of boys. Skating likewise, is a fine exercise of the limbs, and in some countries helps to brace the muscles and freshen the complexion of girls as well as boys. But in this country, as fashion, who is supreme arbitress in such matters, has decreed that skating is not a proper amusement for girls, they must rest content with sliding.

Battledoor, and the variations of this game which modern ingenuity has contrived, is a pleasant and useful exercise for ladies, but it is hardly exercise enough for those who are in health ; and when the game is followed, by using only one hand and arm, I am inclined to think its tendency is bad for a spine inclined to curvature. There is no amusement which could be contrived, better suited to improve the shape of delicate females, by calling into action all the muscles of the back, than the game of billiards. But this game has unfortunately come into bad repute, from being

the game resorted to by profligate men of pleasure, to destroy each other's health, and pick each other's pockets. Fencing as an exercise for young men, has fallen into very undeserved neglect, and might be usefully revived amongst us, as an antidote to the dispeptic misfortunes of modern dandies.

It will doubtless be expected that I should have an opinion upon the subject of Gymnastics, which have lately become fashionable amongst us. But it would require much more time than now remains to me, to recount all that may be said, for or against these exercises. They certainly are not, what their name professes to be, a revival of the practice of the ancient Greeks. Some of the French writers, have adopted the name of Somasceutics, from the Greek word *σωμασκειω* to exercise; this is a much more appropriate title, and at least, does not mislead us. It is an error to suppose that great flexibility of the limbs, such as may be acquired by stretching the ligaments in unnatural postures, is a desirable acquisition, and it seems to me this error has been embraced by some teachers of gymnastics.

The truth is, that the exercises by which ropedancers, posture-masters, and tumblers acquire their astonishing powers, do not conduce to permanent muscular strength. Such people, if their history is followed to their old age, will be found to be feeble and prematurely decrepid. A tumbling boy has been known who could stand erect, and then gradually bend his head backward, till it passed between his legs, and looked the spectators full in the face, while he was in that situation; he would then gradually return himself to his erect position.

To enable a boy to perform such feats, he must for a long time have been exercised in such a way as to stretch and lengthen the ligaments of the spinal column, and the injury thus produced, would more than counterbalance any good derived from increased strength, in the muscles. A late writer has traced the history of several of the buffo or pantomime performers of the London stage, to their decline of life. Delphini was a native of Venice, a gondolier. These people during the carnival and on other occasions, employ themselves in practising feats of activity and strength, to amuse themselves and their countrymen. Delphini became so eminent in these pursuits that he relinquished his gondola, and betook himself to the stage in London, and became the most eminent performer of his day. At the age of forty he is described as having become so debilitated he could scarcely place one foot before the other; and although he lived to his ninety-ninth year, a proof of the natural strength of his

constitution, he had, for half a century, the appearance of being in the last stage of existence. Grimaldi was another of these actors, celebrated at Drury Lane and other theatres. He had a frame that was like the body of Hercules, and strength that was equal to it, besides more activity than any other performer of the same description that existed in his time. A few years ago he quitted the stage, in consequence of being rendered incapable of following his occupation. The Times newspaper gives his farewell address, in which he states that eight and forty years had not then passed over his head, and yet that sickness and infirmity had come upon him, and that he found himself sinking into a premature decline, and was then not able to stand so well on his legs as he formerly had been upon his head. He supposed that he was paying the penalty of the course he had pursued all his life; that his desire and anxiety to excel in his calling, had excited him to more exertion than his constitution would bear, and like vaulting ambition he had overleaped himself.* "The premature termination of the professional career of two men, who were eminent in their department, may be taken as an exemplification of some of the injuries which result from overstrained and unnatural exertions made by young subjects, with a view to acquire extraordinary flexibility of limbs. And wherever gymnastic exercises are founded upon such practices, they are unhesitatingly to be condemned. No such injurious exercises were practised in the gymnasia of the Greeks. Their object was to train men for war; and the custom was to make every male native of all the nations of Greece, acquainted with the use of arms, and every exercise that was connected with military pursuits." "In order to do this, at the gymnasia established in every city, all the exercises that could be useful were taught, and the study was followed with so much earnestness, that children were led to them as soon as they could walk; they were then taught such gentle exercises as were adapted to their tender years; as they advanced in life, their exercises were increased in power, and as they approached to manhood, raised to the full height to which the active powers of man could be carried; till they entered into active life fully qualified to perform whatever task was assigned to them. Prizes for competition were also established, and hence the Olympic and other games, in which children of eight or ten years of age contended. The festivals at which these games

* See M. Sheldrake's remarks on gymnastics, in the *Lancet*, vol. 1. 1828-9. page 333-4. et seq.

were practised, were so frequent, that the expertness of the gymnasts was never lost, and the Greeks became an active and warlike people. But it cannot be conjectured they would ever have obtained this character, by practising the monkey-tricks which, with some persons, pass for healthful exercises. The Greeks were religious, as well as warlike, and the dancers of their solemn festivals were as much the delight and ambition of the females, as contending for prizes at the Olympic games was of the males. In the opinion of the best writers on health, dancing is an exercise well calculated to give elasticity, strength, and firmness to the female form, and it was no doubt owing to this cause, in a great measure, that there were so many faultless models of female form, to be found among the Grecian females. These dances were a part of their religion which consisted in festivals of honor to their different divinities, in sacrifices, and in processions to the temple where these sacrifices were performed. In these processions all well-born Grecian females bore a distinguished part, and the honor of bearing a leading part was competed for with the greatest energy. To acquire excellence in this art the young females attended the gymnasia, where they were taught with as much anxiety, and as much constancy, as the males who attended, to acquire a knowledge of their military exercises; and the consequence was, that each sex attained perfection in its own peculiar exercises. The females practised their dances with great diligence, because the frequent recurrence of the festivals occasioned a frequent selection of the most beautiful and accomplished to bear a part in the processions, and thus a stimulus of the strongest kind, was constantly applied to their minds. And as all this was connected with their religion, with that feeling of love and adoration, which has its favored residence in the female breast, the effect in producing attention to these exercises, and the acquirement of skill in them, was far beyond any thing which at this time we can conceive of. Besides the great festivals of the Olympic, the Nemean, the Istrian, and the Pythian games, a desire to attend which was common to all the inhabitants of Greece, each city had lesser festivals of its own in which the same practices were followed, with a degree of the same zeal and energy." "There was a gymnasium in each city, in which the same exercises were taught with care and constancy."

"Attention to these exercises, was an important portion of the business of every person's life; first as a pupil to learn; next as an adept to practice; and in the end, as a spectator, interested in the success of the rising generation, and enjoying in *their* suc-

cess the memory of former exploits. And with all this, their religion, such as it was, was connected." Thus was an universal passion for gymnastics excited, and such an effect produced, as renders the application of the term to our supposed imitation of them, almost ludicrous.

In commending dancing as an exercise for females, I shall not be understood to mean dissipation. Dancing has no necessary connexion with late hours, dangerous change of dress, or improper food. And when pursued as a recreation for the young, it should be most studiously separated from all these excesses. The French, as is well known, are passionately fond of dancing, and they commence their preparatory exercises almost as early, and with some of the same zeal, as did the ancient Greeks. And as the practice is universal, from the duchess, and the leader of ton, to the chambermaid, and the peasant girl, the result is, that the French women excel those of the other European nations, in the lightness and symmetry of their forms, and especially in preserving their vivacity and agility to an extreme old age. Dancing is likewise so common an amusement among the French, that it more rarely leads to excess and dissipation, than among the northern nations.

With the French, dancing is not confined exclusively to the ball-room, and heated apartments. It is apropos to every thing, both in the parlor, and in the hall, in the public gardens and promenades, and by the road-side, wherever a fiddle can be heard. The argument to be drawn from the termination of the professional career of the French professional dancers, is entirely the opposite of that to which we just now alluded, in the examination of the exercises of tumblers and rope-dancers. Some of these performers have lived to very advanced age in possession of great health and activity. The wife of the celebrated Garrick was a stage dancer, educated in the French school, of high reputation. She enjoyed perfect health to the last day of her life, and died suddenly in her ninety-ninth year. The dancing of the Italian opera, of which some disgusting specimens have been exhibited in this country, is only a modification of tumbling and posture-making, and has been found to exert the same debilitating effect upon the joints and frame. It is said by those who are good judges of the matter, that the old fashioned, stately, French minuet, is, of all dances, the best calculated to give grace and elegance to the female form.

There is one other pursuit congenial to the health, and improving to the form of females, which is far too much neglected

by them. I mean the cultivation of the garden. I know of nothing better calculated to give strength and pliability to the form, than the common business of horticulture. I cannot help suspecting, from the description of the heroine of Scott's most beautiful, or at least most popular poem, that she was addicted to gardening, or at least to botanizing.

"What though the sun with ardent frown,
Had slightly ting'd her cheek with brown,
A form more light, a step more true
Ne'er from the heath flower dash'd the dew."

In our zeal to train the physical and mental faculties, we must not lose sight of another principle, the connexion of which with moral and physical health is intimate and extensive. It is that the unnatural excitement of organs is invariably followed by corresponding depression and debility. Education is too apt to be hurried. In our impatience to arrive at results, we are prone to stimulate the young to undue exertions. It is not the *amount of knowledge* which is obtained at school, which constitutes *education*, but the mental and bodily discipline, the habits of attention and study, the *ability* to acquire knowledge.

The great doctrines of temperance all hinge upon the principle we have just stated, and children should be thoroughly instructed, that a reckoning will surely come, by which an ample forfeit will be paid for every excessive indulgence. In educating our children with reference to this principle, we are doing much to enable them to escape from the dominion of appetite, and what a feeling of independence does this security bring with it! The attention of some philosophical minds has lately been directed to the subject of diet, and some experiments upon a large scale, have proved that a diet of the simplest and least expensive materials may be adopted by young men who are pursuing their studies, and with the best effect upon health. Much of the disability which young men of slender pecuniary means labor under in the acquisition of knowledge, arises from the supposed necessity of paying three or four dollars a week for board. How much independence is acquired by a young man's ascertaining practically, that he can live in perfect health upon simple water and the plainest vegetable food. And what cannot a man accomplish who has youth, and health, and independence?

To make the exercise of the bodily organs conducive to health, this exercise must be habitual. It is difficult to make those who are suffering from a languid circulating, and a debilitated muscu-

lar system, realize this simple truth. In taking up a prejudice against exercise from the ill effect of single, ill-judged efforts, causing fatigue and exhaustion, they reason like the honest Hibernian, who, having heard of a feather-bed, thought he would first try a feather betwixt him and the floor, and exclaimed, as he stretched his aching limbs, "if a single feather is so hard, what must a whole bag full be?"

Habitual labor, not temporary exertion, invigorates the system, and renders the laboring man unsusceptible to the impression of ordinary hurtful circumstances. I cannot think, therefore, that we are to gain much by the use of gymnastic exercises, in the way they are commonly managed.

In conclusion, let me recapitulate some of those principles which I deem important to be kept before the minds of teachers and parents in training the young to their allotted stations in life.

1. That man being at his birth the most imperfect of all creatures, is the most susceptible of being modified by education, and most dependent upon it.

2. That he is to be educated with reference to physical development, in connexion with the expansion of his intellectual faculties and moral sentiments. That this development, both of mind and body is naturally slow, and is to be waited for; and education must, therefore, be a slow and gradual process in order to be a faithful one.

3. That the inaction or disease of bodily organs results in their loss of power and capacity to perform effectually their functions.

4. That the unnatural excitement of the powers of organs is followed by a corresponding depression and exhaustion of these powers.

5. That the exercise of these powers, to be useful in inducing health and vigor, must be habitual and continued.

In the very slight sketch I have now offered, it will be seen how numerous are the topics to which the discussion of our subject will lead us, and however trivial some of them may appear, they are all of them important in their effect upon the health and welfare of the community. A sound mind in a sound body is the perfection of human existence, and the business of instruction can never be properly carried on, without keeping constantly in view, that these two different portions of our fabric must be educated together. We certainly live in a community where juster notions are beginning to prevail. The profession of teaching has be-

come an honorable, and, I hope, a profitable employment. The responsibilities of teachers are more and more realized. They do not, to be sure, make or administer the laws of the State, they do not watch over the pecuniary interests of society, but to them is committed a far more weighty and precious charge. In their hands is placed the destiny and the happiness of future generations; the prosperity and welfare of *the State*.



