

Mental Growth
Through
Physical Education.



By
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The following pages contain the notes taken for a popular lecture delivered by the writer at the Hall of Philosophy at Chautauqua, N. Y., July 24th, 1893.

There appears in them nothing which is new to the physical director, and probably very little which is unknown to the general educator; but it is hoped that they may be of some little assistance to a few of the numerous young men and women who leave the normal schools of physical education each year, full of aspiration and hope to do something for the elevation of their profession, in calling their attention to a field as yet nearly uncultivated, and where great progress may be expected within the next few years.

J. B.

Mental Growth Through Physical Education.

The aim and purpose of all education is to make better men. From time immemorial Nature has striven to make better men, has carried on an educational process. Evolution of man from lower organisms, the rising of the savage to barbarism, and of the barbarian to civilization, are Nature's results in her endeavors to make better and more perfect men, to adapt them to surrounding conditions, to educate them. And the means she has used have been physical ones acting upon physical organisms, it has been a physical education. Mental evolution has been possible only through physical adaptation, physical education. The senses were evolved through physical means, the will, the intellect, and the emotions, in the same way. And they are so evolved to-day.

Put an object—let us say an orange—before the new-born babe. Not having inherited the ability to discern any optical phenomena, except great differences in light, the babe has no sensation of its color—can perhaps not even detect it at all; the pleasant fragrance makes no impression upon the babe, as its sense of smell is very imperfect; the babe cannot enjoy its juice like a grown person, because its sense of taste is as yet undeveloped; the babe cannot feel whether the orange is smooth or rough, because the delicate sense of touch required for this process comes but later; and thus, of course, the child's perception of orange, if there be any at all, is very much more vague and indistinct than ours. But at the same moment the rays of light reflected from the orange strike the eye, education commences. These rays of light, themselves molecular movements, induce molecular movements in the

nerves and brain cells connected with the eye. The molecules of these nerves and brain cells have inherited from their predecessors a tendency to move in a certain manner when stimulated by just that kind of external excitant; but not yet being organized for business, so to speak, the movements induced in them are too weak or too indefinite to call forth a sensation. Still, the work has begun. Rays upon rays stream forth incessantly, endeavoring to set up the same kind of movement among the molecules of the nervous system. Finally, these molecules, from moving hither and thither, as recruits when first drilled, become habituated to that definite movement when that same kind of excitant stimulates them, and when they have thus become veterans, are able to execute the new formation without error, a sensation is called forth. This is surely a physical education—a training of the physical organism by physical means. So with the other senses: only through the exercise of their functions are they evolved. But mental processes are possible only through sensations received and stored up in memory to be again brought forth at will and compared with others.

Thus all education rests upon a physical basis, is, or at least presupposes, a physical education, a training of the abilities dormant in the physical organism, a fact which is supposed to be acknowledged by everybody, but to which is not given as much thought as it deserves.

However, if we desire to give this broad meaning to the term *physical education*, then there is so much to be said on the topic before us, that it would involve the whole science of education, and it would be in vain to endeavor to draw the outlines of a sketch within the short time at our disposal. The intention is, however, to assert that what is commonly understood under the name of physical education, the systematic muscular work in the gymnasium, on the base-ball field, at the lawn tennis court, in the rowboat, etc., has the power indirectly and directly to influence the growth of the mental powers and to explain in a few words how it can do so.

In order to do this, it will be well for us to remember, what has already been stated, that sensations are the basis for all mental work. Without seeing, hearing, smelling, tasting or feeling, we could have no perceptions. From this immediately follows that the organs of sense, with their communications through nerve fibres with their respective brain cells, must be, not only existing, but well

trained and drilled. But training and drilling are impossible, at least in the best manner which we can think of, if these organs are not in a healthy state. Everything which tends to keep the receiving organs, the organs of sense, the communicating organs, the nerve fibres, and the registering apparatus, the brain cells, in more perfect health, must, therefore, have a decided tendency to facilitate their training and consequently increase the mental powers. Now, we claim for gymnastics and games, for systematic muscular work, a high rank among the agents which may keep these organs in good trim, and also among the curative agents, which may ameliorate their condition when deteriorated. The muscular work does not concern the muscles alone, but has a powerful influence upon every other tissue, every other organ as well. We can never remember too well that the body is not a conglomerate of parts independent of each other, but a piece of machinery so delicately adjusted that what affects one part, stretches its influence to every other part.

To understand this influence of one group of organs upon others, it is necessary to consider in brief what happens, when an organ is at work. It makes no great difference what organ we choose, or what its special function is. In each and every case, we are justified in saying, that the organs, when active, use up, transform certain nutritive materials brought to them for that purpose. So when the muscles work, there goes on within them a constant chemical change—a breaking up of materials, and a newformation of other materials; so also when our organs of sense work, so when our nerves are active, so when that molecular movement in the brain cells is induced, which we have spoken of. We cannot clasp the hand of a friend, cannot see his face, nor hear his voice, cannot think of him, can have no thoughts at all without such breaking of tissue. Whether we swing a pickaxe or solve a mathematical problem, we are tearing down and at the same time building up the system. The tearing down is the cause without which no effect appears; the building up is the increase of functional ability—the educational process. Without the former, the latter would be impossible. The opinions we hold, are the tangible results of chemical work, as well as the blow we strike. The religious feelings within us are marked by similar changes. In short, without this metabolism, as the chemical process in the living tissue is called, no physical work is possible, but neither is psychical

work. Without the metabolism within us, the world without us could not exist for us, because we would have no means by which to perceive it; self-consciousness would be abolished without it, work, science, art, morals, religion, life itself, would be abolished, at the same time as metabolism were stopped. Everything would be a vast endless void, a total blank, nothingness everywhere. And on the other hand, in the same ratio that metabolism is lively (other conditions being equal), in the same ratio life is more complete in all its aspects. But the muscular work is necessary to keep the metabolism of the body at a high level, because it is the agent most commonly employed by the system, and the most efficient one, too, to stimulate the respiration, which shall bring us that most important of all nutritive materials, oxygen, and the circulation through which the different elements which are necessary for new-formation shall be brought to the tissues where they are needed. Thus we see that a certain amount of muscular work—or physical exercise, if you prefer that term,—is indispensable, if life shall be of the highest intensity in its mental aspect, as well as in the purely physical one.

But the muscles, when active, do not only afford an opportunity for the other tissues to appropriate an increased amount of nutrition, compared with that which they would acquire if the muscles were kept at rest, but they fulfill another office, just as important.

When a chemical transformation is carried on, as we now understand is the case in all mental work, the result is not only such matters which are of use to the body or, which is for our purpose identical, to the part where they are manufactured, but this transformation leaves also a residue, a collection of effete matters, of cinders and ashes from the animal machine, as it has been called. The presence of this residue in great quantities is injurious to the system; these matters act as poisons and decrease the abilities of the organism, and must therefore be eliminated. Again do the muscles step in superintending and regulating, primarily through circulation, ultimately through respiration, perspiration and urination, this sanitation of the body.

Thus, when you are sitting at your desks for any appreciable length of time, sunk in profound thoughts, these thoughts, however pure and lofty, are actually slowly poisoning your brain, decreasing its aptitude to the work at hand, and you will find, as time passes,

that you are not able to keep your attention fixed, your will power has lost its grip, your memory is deteriorated, you cannot grasp an idea as readily as before, and there creeps over you a certain feeling of lassitude and dullness. Your temples throb, your face is flushed, there is a sensation of fullness, your head aches. And all this because your thoughts—your mental work—have pumped up into your head a quantity of blood giving the necessary fuel for these thoughts, but there has been no agent at work strong enough to remove the ashes and refuse. But rise from your table, take a few deep inhalations, move your arms in rhythm with the respiration, walk for a quarter of an hour, and you will probably find the unpleasant symptoms gone, and yourself ready to begin anew. Your attention, which was wandering, has become fixed, your will power is stronger, your memory its own self, your ideas from vague have become clear, and your conclusions more logical.

And the temporary beneficial effects of occasional muscular work are easily made permanent by applying the remedy steadily and systematically. It will take a muscularly well educated—I do not say muscularly well developed, because these terms are not synonyms—a muscularly well educated man (other conditions being equal) a longer time to become mentally fatigued than one not so educated.

We must not make ourselves guilty of that dualism which separates widely the mental and the physical man, believing that both cannot exist side by side in their fullest development without encroaching upon each other. Mental work, if properly carried on, not only not antagonizes man's physical well-being but is a necessary assistance to it, and, in the same way, physical work is not in opposition to but closely allied to mental activity. They cannot be separated. And still, I believe, that even among those who warmly advocate physical education in our schools, this dualism is very strong. The old saying of a healthy mind in a healthy body seems to convey to them the idea of a healthy body as a ground-structure, upon which they will erect an *independent* superstructure of a healthy mind.

They seem to keep mind and body apart, which are absolutely and inseparably united. For many of them, physical education is only a hygienic measure to keep the pupils in bodily health, while they acquire the necessary amount of knowledge or, at the best, the necessary ability to observe phenomena and draw correct conclu-

sions from them, to think. If this is the right view, then physical education is no more a branch of education proper than, for instance, school ventilation. If it is to be more, it must be studied in its relation to psychology; its direct effect upon the mind must be ascertained, not only the indirect results from its ability to give a healthier general bodily condition. We have had an altogether too long period during which the teacher of gymnastics or of other branches of physical education has been debarred from proper relations to the educators of the world, and has done his work according to his own ideas of what was conducive to the best results, or, at the best, relied upon the dictates of physiologists. Strength was for a long time the aim, then health. This last was a great step forward, and was to great extent the result of the active work of the medical profession and of a few laymen. But these knew hardly more of psychology than the teacher of gymnastics in general, and it is only within comparatively few years that psychology has been brought into the question. Those physical educators who claim the proud title of *educators*, are no longer satisfied with being relegated to handle their pupils for the sake of conferring upon them the negative educational benefit generally conceded to be a result of their labor, absence from disease, however important that may be. In their efforts they have a higher aim. They do not look upon their pupils as so much muscle, nerve and so on, but consider it a duty, and claim as a right, to go behind these organs and study how they may affect those processes in the body which are, if not of another kind, of a higher grade than the mere vegetative physiological actions—the mental processes. *Pedagogic* or *educational* gymnastics and physical education are misnomers, as long as their effects are studied only with regard to the hygienic benefits derived from them, while their purely educational aspect, their effect upon the mind and its processes, are set aside or overlooked.

Are there, then, any mental qualities which can be awakened or enhanced by systematic bodily exercise? If this question be answered in the affirmative, we must claim for it a place among purely educational means.

In the very beginning of this lecture we agreed that without the senses, no mental work could be possible. Then we conclude, that in the same ratio the senses multiply in number and strength,

other conditions being equal, the perceptions will be more in accord with the realities. The five special senses—sight, hearing, taste, smell and touch,—all evolve through that general physical education which we spoke of as going on incessantly, even without our direction, as a result of the reaction of external nature upon us. We have further stated that their strength is increased by muscular work, as in the more special physical education which we are considering. And now we finally assert that by this special physical education—systematized muscular exercise—we increase their number.

Physiologists accept, besides the five senses just mentioned, a sixth, the muscular sense. We mean with this sense the “peculiar sensibility” of a muscle “to its own states and conditions when in action, so that the mind is able to determine with accuracy the amount of effort that is necessary to be put forth on any given occasion.” “By means of this sense we discriminate (1) between different degrees of exertion put forth, or called out; (2) the duration of different muscular sensations, giving an idea of time, as also of space in movement through space; and (3) between the speed or velocity of different movements. We thus by it determine the resistance of bodies, their force, weight, and other mechanical properties; measure distances and velocities; and ascertain the form, size, position, and so forth, of external objects.”* We thus acquire by this sense a vast store of sensations which either cannot be gained through other channels, or which if reached by several ways, is at least more secure and less liable to bring us wrong conclusions. It has often struck me, when approaching the elevated road in New York City from a side street, how confused one must be, if deprived of a single sense. My sense of hearing, assisted by calculations with regard to the reverberating sounds among the tall buildings has plainly told me the direction from which a train was coming, only to be shown at the next moment by my eyes that my judgment was wrong. The one sense must correct the other. The sensations received through only one channel are not always to be relied on. You have often seen a baby grasp for things far out of its reach. The sense of sight alone cannot give it a correct idea of distance without the help of the muscular sense

* Kay: Memory.

telling it how far to reach in order to grasp it, telling in what conditions its muscles must be placed in order to cover the distance.

And it is only through muscular exercise that this sense can reach its development.

Those of you who have visited a gymnasium have probably observed how the teacher endeavors to get the movements executed to a certain extent, tries to get the pupils to move their feet, for instance, just so far, no farther. You have seen in marching, the steps at a certain command suddenly shortened or lengthened. You have perhaps observed the demand made, that the pupils shall put their feet at a certain spot—so many footlengths straight forward—so far in a degree of 45 degrees to the median plane and so on. If you have given it only a superficial thought, you may have supposed this to be done for the sake of uniformity and for learning something which looks pretty. That which is pretty is always of value because of its prettiness, but I doubt very much if we would spend all the time necessary to get the correct footplacings, if uniformity and prettiness would be our primary or most important object in view. Some teachers do. But then, you know, some teachers teach poetry recitations because of the impression the pupils may make upon outsiders as being clever. Our main object with these and similar exercises is to educate the muscular sense, so that we by it may recognize distances and angles, thus creating another path for the knowledge of proportions. The carpenter or joiner learns to correctly judge of lengths and angles by his eyes and hands and tools; the same is taught the pupil in the manual training class; we add, by gymnastics, the knowledge through the whole muscular system, thus incorporating a still wider basis for the mind to work on.

You may perhaps also have noticed that the movements are executed in a certain definite rhythm, all pupils performing a certain movement at the same time and at a certain speed. This is not done in order to "show off." By it we endeavor to teach our pupils to have, by means of their muscular sense, a due appreciation of time, of the proper order of things, and also to do things exactly at its proper time, to let things follow each other in a previously arranged order, to complete one thing before they undertake a new enterprise; we teach them also by the same means not to feel as if each were a completeness by himself, but try to let them

acquire the habit of considering themselves as units of a greater whole, which suffers if not each unit works with the aim in view of gaining the greatest perfection for the whole. In the gymnasium, each one must subordinate himself to the welfare of his class; in the base-ball field, that sensation of identification with the team is created; in the rowboat, each works in harmony with everybody else; and thus, through evolving this feeling of belonging together, we hope to react favorably upon the doings of these same individuals as units of a greater whole, the community, the nation, humanity, so as to direct their mental as well as physical capacities toward the common welfare, toward the progress of the race, to make not a better man, but better men.

But we must remember that no mental landwinning is made without attention. If the perceptions shall not make a rough-and-tumble fight with each other, no one predominating sufficiently to make a choice possible, attention must be fixed. In this connection it is perhaps best to emphasize that every act of ours if done for a purpose must at first be conscious, and only through frequent repetition can any action so far become a habit as to exclude consciousness. It is, therefore, our duty to fix the attention upon the exercises, until the time comes when the organs concerned are so well under control, have such a memory of previous actions, so as to be able to execute them without consciousness. This is the only natural way to make a movement properly unconscious. And if we succeed from the beginning to fix the attention closely, this result is reached within a comparatively short time; but if we on the other hand, against the laws of nature, introduce an irrelevant agent, such as music, we draw part of the attention to it, make the movements dependent on it, prolong the time which should be necessary to acquire the power to control the movements by the only natural agency, the volition. To combine educational gymnastics with music is an act of the same nature as that which we meet in certain systems of mnemonics, in which facts are recollected by associating them with totally incongruous ideas which occupy the mind to the detriment of memory as a whole or of the higher kinds of memory. It is supposed that the music in gymnastics is for recreative purposes. Very well, let it then be used as recreation. Music is one of the best recreative agencies, but why insist upon it in educational gymnastics? Gymnastics, properly speaking, in our schools have

two main objects—the one hygienic, the other educational. Both suffer by the introduction of music. Gymnastics should not be used principally for recreative purposes—we have games, sports, etc., for that purpose, agencies which are fully as important, perhaps even more so than gymnastics. Gymnastics are not movements simply, but movements regulated by laws, physical and psychical, and are not play but work, work of the highest intensity, work just as much as Latin or mathematics, and must be treated as such. Gymnastics must have a definite place on the hour plan of every school, high or low, but their place is among the studies, they must not encroach upon the already short time for rest and recreation. Thus, by fixing the attention in a proper way, we increase the power of attention.

In all kinds of work we meet difficulties, obstacles which can be conquered only by diligent work, by applying the volition to it; and, therefore, we have a right to say, that physical education, if properly carried out under the direction of the will, must, as well as other education, assist in training the will.

Besides, the pupil gains the knowledge of his own physical powers, at the same time he is creating them; he learns to rely upon them and compare them with others; he learns to have a regard for others; if he is a milk-sop, he soon finds out that there is no reason to be one, and if he is a bully, he will meet his superior and will benefit by it. In either case there arises within him a mental quality, which our present system of bringing up children is too apt to stifle—courage. Not the coarser form of courage, but that more delicate and subtle kind, which sees and acknowledges the shortcomings of self as easily as the abilities, and recognizes, therefore, the duties to self and others, as well and as readily as the rights.

I have here spoken mainly of gymnastics, because I know them best, but in the same way we must look upon all kinds of physical education, catering to that which will improve mankind and rigorously excluding everything else. Never is a movement in the gymnasium executed for its own sake, it is always considered as a means tending to an end, the improvement of the individual in all his aspects, and through him the improvement of humanity, to make better men,

We have in the foregoing tried to show from a purely theoretical standpoint that, by physical education, the senses, the attention, and the will may be improved. There are, so far as I know, no theoretical difficulties in the way, no reasons why we should not be able by this branch of education to provide our pupils with stronger minds as well as with stronger bodies. And if we succeed in adding a little to the mental strength of our children, they will, according to the laws of inheritance, give rise to an offspring in which the tendency to great mental powers is stronger than it was in themselves. The healthy boy and girl of our day will bring into the world healthy boys and girls of the next generation, and every spark of increased intellect created in future fathers and mothers will beget in future sons and daughters a stronger inclination towards the goal—the betterment of the race. Perhaps it is well to say in this connection that such a tendency may be expected as a result from physical education even if the individual directly worked upon would receive no mental benefit from it. It has been said, and I do not see any reason to doubt the assertion, that the brains of our children are already before birth stunted in their development by the injurious pressure of a too small pelvis in their mothers or, at least, that the severe births which are the rule nowadays leave the brain of the child in a less healthy state than it ought to be. Increase the pelvis, and we can do that by judicious training of the body, and the result will be better developed brains in those who come after us. Is there a woman in the world willing to cramp the development of her child, to stunt the free growth of the brain of her unborn babe; is there any one willing to cause, by erroneous living, children to be born, doomed already before birth to possess less mental ability than they could have? There is hardly a woman who would dare to give a "Yes, I am one," as an answer to these questions, even to herself; and still, nearly every one lives in such a way as to bring about such sad result.

But is not this only theories after all, hypotheses without foundation in fact, brought forth by rampant cranks on the subject? Are there any facts to be brought forward to substantiate the claims? I must say the facts are not so many, nor so convincing as might be desired; but then we must remember that psychology is a new science hardly thirty years old, and that psychological laboratories date only from 1870, and facts are now collected, verified and classified which

belong to the whole field of psychology, so there cannot be very much of great importance for us to rely upon. Still we may be able to bring forward something to support the theory. First we have the statements of prominent men in all professions, lawyers, physicians, artists, men of letters, clergymen, and others who testify to their personal experience of the beneficial influence of physical work upon their mental powers. Secondly, there are the reports of teachers and educators who gladly bear witness that since physical education has been incorporated in the curricula of their schools, instead of taking away some valuable time from other important branches of study, it has actually heightened the result gained in them by conferring upon the pupils a greater ability to keep the attention fixed upon the work before them and by giving their thoughts greater clearness, thus intensifying the work.

And we have finally the results of actual experiments. So, for instance, by physical training the late Dr. Seguin made some of the idiots under his charge from living corpses without movement and without expression of any kind into fair specimens of humanity. He had, for instance, among his patients, a child who could not speak; who had apparently no emotions, no desires; who could not use his muscles, could not grasp an object placed in his hand, but let it fall. This child was treated to a great extent with physical exercises. In the beginning, an assistant held the child in front of him, with the child's hands stretched out and palms up, so the doctor could let a little staff fall into the hands of the child, which were then closed upon it by the assistant, whereupon the patient's arms were given a jerk which sent the staff back to the doctor's hands. By keeping up this work for a long time, slowly increasing the distance the wand was let fall, the doctor succeeded in creating a certain amount of attention in the little fellow and in directing it to a particular part of his body, the hands, and when finally the slight pain which resulted from the treatment was caught by this embryonic attention, the child got angry and actually endeavored to throw off the pain-causing object: emotion was aroused and will called forth which induced a muscular power slumbering to that time. And so the training went on. Later on this same child learned to hang by its hands from the rounds of a ladder—the emotion of fear of falling induced will of grasping, stimulating the muscles to grasp in obedience to the dictates of the will. Step by step forward in the same

direction, till this living corpse, a mere bunch of flesh without apparent life, differed only in small degree from any other dull child.*

We can also put forth as proof of the correctness of our views the now well known but always equally interesting and touching story of Sylvanus, related by James B. Richards at the twelfth annual conference of charities at Washington, D. C., 1885, which I quote from "The Pedagogic Phase of Physical Training," a paper read at the physical training conference in Boston, Mass., 1889, by Dr. H. D. Wey.

"Sylvanus was eight and a half years old. He had never known his mother, and a smile had never been seen upon his face. His father had tried to send a light from some shining object into his eyes, but he never blinked but once. He had not the power of locomotion; his lower limbs were paralyzed. Not even the sense of pain or the sense of touch did he have. This boy I found dressed in a red flannel gown, lying on the floor. He could not even roll over; he could do nothing.

"I took the boy with me with the greatest care to the institution, and dealt with him as with a babe. He was held in arms, fed, rubbed, manipulated, worked upon, to see if we could not arouse the energy of his body. He was properly bathed and exercised, and everything was done to develop him. * * * *

You must take hold of the slightest things in your favor. Day after day, for an hour at the time, for three months, I took a book and read aloud to that boy, intelligently, as if he understood every word I said, adapting the intonations as if I were reading to an intelligent person. * * * He finally heard this voice that was ringing around him in a musical tone month after month; and one day, when I came and simply sat in a chair and read to myself, I looked on one side to see if he missed me, and the child actually appeared uneasy. Imagining that he missed me, I lay down on the floor beside him as usual, saying: 'Oh, you want me, Sylvanus? Well, I am here.' He breathed a soft, 'Ah!' I had planted the first want. He wanted me, and he wanted me there. He had felt my influence there; I was too far off in the chair. So I read to him two or three months more. Then, instead of reading aloud, I read

* This and a number of other histories of treatment are to be found in Dr. Seguin's admirable book on Idiocy.

to myself one day. After a long time, I saw he was trying to do something. I watched him. Gradually, he lifted his finger and laid it on my lips. 'Oh, you want me to read to you, do you?' and so I read. Another want had been implanted. I read to him every day, letting him always have the privilege of opening my lips. At last he smiled—the first smile of recognition that ever came to the child's features. It was enough to pay me ten thousand times over for all I had done. * * *

This boy, step by step, went on. Finally, I could take him up and have him where I pleased. He was near me; we were one. He felt it and knew it. He was glad to be taken up. This training went on till one day I found he could move his limbs. I put him on his hands and knees, to teach him to creep. This was nearly a year and a half after he came to the institution. As I placed him there, I said, 'I wonder if I can help him to talk.' He had not talked any. I said to him, 'Now move this hand; that is right. Now the other; that is a good boy,' guiding them as I spoke. I did this every day for months, till finally I found he was trying to do it himself between the drills. A while afterward I thought I saw his lips moving as he did it. Putting down my ear very close, I found he was talking. He was whispering to himself, 'Move this hand; that is right. Now the other; that is a good boy.' He had heard me talk in such a way that it had aroused him to talk.

"And so pupil and teacher went on. Object lessons were taken up and followed out until a connection was established in the expanding mind of the former. The teacher's reward was when the mother came to see her son. Entering the room, she looked about and said, 'Where is Sylvanus?' When he heard his name, he answered: 'Here I am; is that my mother? Oh, mother, I am so glad to see you.'" * * *

Now, this is an exceptional case—exceptional equally in the success gained as in the good judgment and great patience displayed by the teacher. We do not get such cases to handle every day, and even if we did, most of us would probably be unable to do them justice. But it affords an illustration of what can be gained in less obdurate cases, if we follow the same plan, if we intelligently cater to the physical needs of the pupils.

This has been tried upon a larger scale by two American physicians. One of them, Dr. Walter Channing of Brookline,

Mass., writes me: "After six years steady experience, the last two of these years having employed a resident instructress trained in your own system (i. e. the Swedish), I can say the results are excellent in a large percentage of cases. If you ask me how these results show themselves, I should say, in improved physical condition, and a greater degree of self-control. These two conditions make the patient more plastic and accessible to new impressions. He responds more quickly to other influences which are brought to bear on him. He is held and steadied and taught self-dependence by a shorter and more direct method.

"Physical training is capable of being made one of the most important means of benefiting cases of nervous and mental diseases in an institution especially adapted to them. In fact the whole place should be permeated with its influence if it is to do a maximum amount of good. * * *"

"* * * I can say truly that my enthusiasm increases instead of diminishing."

The other is Dr. Hamilton D. Wey of the New York State Reformatory at Elmira. In this institution, which is not a prison in the usual meaning of the word, though young criminals from 16 to 30 years of age are imprisoned there by order of the courts, but a school where the minds of these young men are awakened, an educational institution where are offered the opportunities for mind-development which have been lacking, a hospital where the diseased minds are treated according to the comparatively new theory that it is bodily and educational defects which, combined, make a man to a criminal, this theory which states that, if hampered by certain bodily defects, inherited or acquired, we all under certain influences would have become victims of the criminal disease, fit to be imprisoned in a dungeon.

As an experiment to see what effects physical training might have upon the mental development of criminal dullards, a first class was formed at the reformatory on June 5, 1886. "This first class consisted of ten whites and two colored of an average of 22.9 years, 19 and 29 years representing the extremes. For a period ranging from one to two years the men had made no appreciable progress in school work, and the performance of their daily tasks had been equally unsatisfactory. In physiognomy they presented the features indicative of criminal tendencies. Not one had learned a trade,

but all had had a precarious living as common laborers, tramps, hostlers, and street loafers. * * * * The physical part of the program to be embraced in baths at frequent intervals and with regularity in conjunction with passive exercise, as kneading the muscles, working the joints, and friction applied to the entire body. * * * * and, later in the day a manual drill and calisthenics. * * * * All were well nourished, with the exception of one, who was convalescing from an acute disease. There were no indications of disease of the nervous, respiratory, vascular or digestive systems, and the bodily functions, save that of the skin, were all well performed. * * * * When the men began their manual exercises they were an awkward squad, and it was a matter of patience and perseverance to teach them to execute the figures simultaneously and with precision. They were slow to comprehend an order and deliberate in its execution. * * * * November 6 the class was discontinued, and the following day a physical examination of the men made," * * * * which showed, as could be expected, improvement in the physical condition. "With physical culture and improvement there came a mental awakening, a cerebral awakening never before manifested in their prison life. The purely animal man with his oxlike characteristics seemed to recede before the intellectual. Their progress in school work was not steadily onward, but intermittently progressive. For a time they would learn with comparative ease and appear to assimilate their mental food, when, suddenly, and without apparent cause, their minds would cease to work, and they would lapse into their former state of mental inertia.

"This might continue for several days, when the mental cloud would slowly lift, and they again give evidence of mental quickening. It was as hard to develop their mental receptivity as their power of retention. During the five months they were under observation their average marking in school was 74.16 per cent. as against 45.25 per cent. for the five months immediately preceding their course of special training. * * * * During the following six months they were watched with interest, to observe whether they would maintain themselves in their elevation, or fall back into their former state of sloth and mental lethargy." The statistics with regard to their percentage markings in the school show a slight declination, the average being 71 per cent. "A study of these

statistics will show a simultaneous and rapid improvement (from the beginning of the treatment) along the three-fold line of moral, physical and intellectual capacity, more pronounced in certain individuals than others, but most encouraging, considering the general average before the class was formed, as compared with that after disbandment. The advance made in moral and intellectual development * * * * is most striking, and occurs in no isolated case, but is common to all." Though there was a slight declination, as said above, after the physical treatment was discontinued, the physician is able to say after a year's observation, that the general improvement still continued, and where the marks were comparatively low—in three cases—these have "proved recreant in moral rather than in intellectual lines. * * * * The stimulation of the physical powers a year ago, in the case of three, impressed their mental organization to a degree that enabled them to earn their release on parole, whereas, if left to themselves their minds would never have quickened, as a reflex of an improved physical state." *

Similar classes have since been formed with like results.

Such data as these now begin to collect from several sources, and seem to give the impression that there is truth in our theories, that by physical education the mental development will be greatly assisted; that the former not only gives us healthy, but mentally strong, intelligent men and women with a will of their own, and power to carry out their will. And if this is so, we must certainly not be satisfied with the knowledge of it, but we must act upon it. We must well remember that all these results are gained, not by well studied efforts, but by groping experiments in the dark, using means which we have not been able to follow all through their chains of cause and effects. If we desire to gain the best results we must not continue in the same hesitating way as hitherto, we must, all of us, who are engaged in the physical training, observe and study its psychological aspect. The duty to our children, to humanity, demands that we give each one of them the best education we know of. Every one of us has been more or less hampered by deficiencies in our educational system, even when it has been at its

* "Physical and Industrial Training of Criminals," by Hamilton D. Wey, New York, Industrial Education Association, 1888.

best, and we should therefore see to it that those who come after us may be less hampered. We have, during this hour, seen that physical education may be made a great pedagogical boon, as it has been definitely settled long ago that it is such a boon hygienically. And I therefore wish to enlist not only your sympathies for the work which we carry on, and which we try to raise to the highest scientific level, but your active support for all such measures which tend to bring this matter of physical education to the attention of legislators or other persons with influence and power. I wish to stir up the feeling in you, if possible, that each must give his or her mite to the common work of introducing physical education, systematic gymnastics, rational, scientific gymnastics into all our educational institutions, low and high, from the kindergarten to the university, and not only this but into our homes, our families. First by so doing and by inculcating into the popular conscience, that gymnastic movements carefully selected according to their known effects on body and mind are equally indispensable to the welfare of every individual as food and sleep and proper clothing, we can hope to fully realize the true meaning and the true importance of physical education.

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