

of the body, and the performance of the processes of oxidation required by all the tissues.

* * * "It is evidently impossible to exercise all our faculties at once in such a way as to bring each to a state of the utmost development. It is the business of an educator to see, first, that the faculties essential to well-being are developed; the muscles of respiration, through singing, dancing, running, and childish athletic sports; the muscles of the will, by similar methods, and perhaps gymnastics; the intelligence, by school instruction of various sorts; but while doing this, he should bear in mind those traits of childhood which are most irrepressible, and should guide them and be guided by them. Muscularity—or, more rightly expressed, a liberal indulgence in muscular sports—is the craving of healthy boyhood; if denied, no amount of mental occupation will take its place; on the contrary, mental stimuli are most dangerous to a boy who is physically idle, and only tend to hasten those sexual crises (so fatally ignored by many educators) which are sure to come, and to place a certain proportion in peril both of health and morals. I am speaking of a great evil, and one little understood: for which the remedies are to be found in a liberal stimulation of all the nobler parts of a boy's nature at once—his will, his courage, his fortitude, his honour, his sense of duty to God and man, his interest in some mental pursuit.

"As respects girls, there is no doubt that they are capable of taking as keen enjoyment as boys in muscular exercise, though of a somewhat different nature.

"That it would be for their good to strengthen their wills and their courage by such methods, no physician can doubt. But the obstacles to such development are very great, especially in cities, and in all places where fashion imposes a limit to the expansion of the lungs, and cuts off the indulgence in the pleasure of breathing. * * *

"There are three special faults in sanitary conditions which do harm to the nervous system of those in school-rooms. These are, the means employed in lighting evening schools, the undue heat of school-rooms, and the excessive dryness of their atmosphere, with other impurities.

"Our nation is fond of burning a good deal of gas and mineral oil, and as a result, our rooms are apt to get overheated. One gas burner consumes as much oxygen in an hour as several persons, thus contaminating the air very rapidly and heating the upper strata very much. In burning, gas gives out impurities, very perceptible to the smell, chiefly composed of sulphurous acid gas. Besides which, the power of direct radiation of heat possessed by a cluster of burners is very great; so that the heads of persons in the room, enveloped in a cloud of hot deoxidized sulphurated vapour, are subject to the effects of radiant heat, which are of an irritating nature, quite different from those of fixed heat. Of course headaches and utter exhaustion are the result. * * *

"Neither heat, carbonic acid and oxide, sulphurous vapour, nor excessive dryness of the atmosphere are felt as evils by the majority of our people. But all of them are dangerous in a special sense to the nervous system. Recent experiments made by Dr. Falk in Berlin, show that air deprived of moisture makes the breathing more rapid and less deep; it quickens the pulse, and slightly lowers the temperature of the body; and in a few instances it appears that a current of absolutely dry air, continued for several hours, produced epileptic attacks in guinea pigs exposed to it. Dryness of atmosphere certainly tends to make the human subject irritable and excitable.

"A few people are the victims of untold misery when exposed to carbonic oxide fumes. I do not know what can be done absolutely to prevent the evil—unless we give up furnaces altogether.

"I will now close this portion of my remarks with a brief summary of the most conspicuous results of the investigation.

"First. School work, if performed in an unsuitable atmosphere, is peculiarly productive of nervous fatigue, irritability and exhaustion.

"Second. By 'unsuitable' is chiefly meant 'close' air; or air that is hot enough to flush the face, or cold enough to chill the feet; or that is 'burnt,' or infected with noxious fumes of sulphur or carbonic oxide.

"Third. Very few schools are quite free from these faults.

"Fourth. Anxiety and stress of mind, dependent mostly upon needless formalities in discipline, or unwise appeals to ambition, are capable of doing vast harm. It is hard to say how much is actually done; but a strong sentiment against such injudicious methods is observed to be springing up in the minds of teachers.

"Fifth. The amount of study required has not often been found so great as would harm scholars whose health is otherwise well cared for.

"Sixth. Teachers who neglect exercise and the rules of health, seem to be almost certain to become sickly or to 'break down.'

"Seventh. Gymnastics are peculiarly needed by girls in large cities, but with the present fashion of dress, gymnastics are impracticable for larger girls.

"Eighth. The health of girls at the period of the development of the menstrual function ought to be watched over with unusual care by persons possessed of tact, good judgment, and a personal knowledge of their characters.

"Ninth. One of the greatest sources of harm is found in circumstances lying outside of school life. The social habits of many older children are equally inconsistent with good health and a good education."

GYMNASTICS FOR SCHOOLS, BY DR. S. S. PUTNAM.

* * * Gymnastic training could not fail to be of use in regard to training children who were not naturally strong, and therefore not inclined to take part in outdoor sports, which are, of course, beneficial to the healthy and vigorous among our children. The benefits resulting from systematic gymnastic training are, too, decidedly different from those accruing from ordinary outdoor sports. The former scientifically trains special groups of muscles and confers special benefits upon the bodily system. Skilled instructors are, of course, required, and Dr. Putnam maintained that the result of such training was to promote general health, and to bestow special accomplishments.

It is not necessary that very great muscular power should be developed, as that is not necessarily conducive to good health, nor does it always accompany it. One way in which school children may be greatly benefited is by helping them to perfect the process of respiration. This was demonstrated by the work done by Prof. Monroe with the children of the Boston schools. Good breathing is by no means common, and the singing teacher has always much to accomplish in this respect. Instruction in this regard may not only give vastly increased power to healthy persons, but it may save many who are affected by lung disorders from early deaths. Dr. Putnam thought Prof. Monroe's little book the best treatise upon this subject, while most German and French works on gymnastics, are very deficient in this respect. For the exercise recommended by Prof. Monroe no apparatus is required, or special costume, and for walking and running a large empty room is all that is needed.

Proper physical instruction in our schools would also relate to the sitting of the scholars, to proper methods of study or of mental application, to proper means of ventilation, etc. It is a notorious fact that many cases of injury to the spinal column arise from improper postures while sitting. Among 731 pupils at Neufchatel, sixty-two cases of this sort were observed among 350 boys, and 156 cases among 381 girls. The curvature of the spine occasioned was mostly to the right, caused, no doubt, largely by writing at unsuitable desks. The excess among girls is due, no doubt, very much to the fact they take less active exercise and are much less robust, as a rule. Herr Raag, of Berlin, says that he has found gymnastics very useful in preventing these spinal curvatures. With practical benefits resulting from these exercises, the lectures of hygiene, etc., will have much greater force than otherwise.

For proper school gymnastics it is only requisite that there should be space enough about the desks to enable the pupil to advance one step and to swing the arms freely. A large hall with a few desirable pieces of apparatus, is all that is needed for further gymnastic exercise which is to give to the scholars special accomplishments in this matter. In Europe halls are now considered absolutely necessary for the uses of scholars in the public schools.

EFFECTS OF SCHOOL LIFE UPON THE EYES OF SCHOOL CHILDREN.

By Dr. C. R. AGNEW.

This paper was read by Dr. Webster, a co-worker of Dr. Agnew, and illustrated by diagrams.

Dr. Agnew states, that Herman Cohn, of Breslau, published, in 1867, the results of observations made upon the eyes of 10,060 school children. He established the fact that school life in his country was damaging the eyes of scholars to a most alarming degree. He was followed by Erismann, of St. Petersburg, and others who showed that elsewhere the same results were being produced. The broad fact was evidently demonstrated, that wherever children were brought under observation, and the effects of the use of their eyes upon minute objects carefully noted, nearsightedness, a grave malady, was found to exist. That this malady was found less fre-