

tremities, particularly of the gastrocnemius; only a few hours fencing will be productive of a similar effect upon the upper extremities, particularly of the biceps. The absolute increase of the muscular substance is the cause of the change, as the greater flow of blood continually supplies fresh matter and completely replaces those parts, which have been consumed and carried away by the veins. As everything has its conditions and bounds, so also must the muscular development be circumscribed. Physical endurance, which is more than the result of quiet strength, can only be attained by long continued exercise.

A great number of gymnastic exercises only consist of certain movements, which have for their object the increase and maintenance of flexibility, particularly of the joints of the hand, the shoulder, the spine, the hips, the knees, and the feet. On the flexibility of these joints *agility* depends. It exists naturally without exception in children and sickly persons. With the former consequently gymnastics does not require to produce, only to preserve. It is seldom found with such who have become strong by hard labour. This inflexibility of joints is caused by the ligaments and sinews, which through insufficient use have been suffered to lose their elasticity. Great flexibility often prevents serious results from falls or collision by the quick evasion of the danger. It is scarcely credible what agility can do to prevent the fracture of a limb. Experience teaches us daily that awkwardness is too often the cause of accidents. Muscular power and agility combined give the body firmness and decision in the use of the limbs, both producing a firm and noble bearing. It is a great error to develop one arm more than the other, which was censured as early as Plato. It is therefore one of the objects of gymnastics, that the left and right side shall receive equal power and skill. It will be seen from this that the end of gymnastics is not simply coarse strength.

Above all things the many arm movements as well as the slow and deep breathing produce a healthy expansion and development of the chest. This is of course followed by a freer and more perfect development and action of the organs therein contained, the heart and particularly the lungs. Every one who is acquainted with the process of respiration will easily see how important the latter is for the whole of the vital process. By the usual movements, walking, &c., we do not take a full breath; the chest consequently does not attain its full expansion and the air inhaled only partly fills the lungs. Those parts of the lungs not brought into action remain collapsed, lose their spongy elasticity, and in course of time their capability of being penetrated by the air. The blood, which flows copiously to the lungs, becomes more or less stagnant, the lungs are inflamed, and at length consumption is the necessary result of this partial inactivity.

All dissectors agree that perfect lungs are very rare.

Gymnastics is a preventative of *corpulence*, which is always a sign of weakness. We find such in females, after repeated bleeding, in wine and spirit drinkers, from weak digestion, diseases of the liver, from want of exercise, from too great proportion of nutritive food, old age, and in sanguine and phlegmatic temperaments. Corpulence is certainly a defect, something abnormal, unhealthy, and extremely burthensome. It is most unnatural in youth. With mathematical certainty powerful muscular exercises will prevent this evil. How different the body which has been practised in gymnastic exercises will prevent this evil. How different the body which has been practised in gymnastics from the one which has not. Certainly the body loses through gymnastics all female beauty and softness; but it gains a true manly beauty, on which every muscle in action is distinctly marked, as in the Laocoon and Apollo.

Further, Gymnastics has great influence on the skin. The contrast between a man who has grown up in active and laborious bodily exercise, and a youth or man educated in enervating habits shows this plainly enough. The former is adorned with a brownish firm skin, his marked features are signs of manhood and firmness; the skin of the latter is, on the contrary, white, transparent, the feminine forms of the face and body give everywhere the impression of weakness. Manly beauty makes not only a certain solidity of the skin desirable, it is also the surest means of preventing the external influences of heat, cold and rapid changes of the same. The skin perspires more freely by stronger motion, the danger of catching cold is therefore greater. The evil increases more and more the greater the careful protection from the air, and the unfortunate sufferer becomes at last so sensitive to all external influences, that he feels in a terrible manner every change of the atmosphere, like a living weather glass. Hufeland relates, that he has known learned men whose skin had become so painfully sensitive, that they could tell with great certainty in their study, when in clear weather a cloud passed their zenith. And the sensibility of the skin is only an evidence of the general morbid irritability of the nervous system.

History shows us on every page, that culture only makes people happy to a certain point, and that beyond this they sink faster or slower towards their destruction. "In the bloom of prosperity," says Von Koenen, "the seed of destruction is generated with the satisfaction of the desires, the refinement increases, the frivolity of wit and the epicurean taste for sensual pleasures destroys moral dignity, energy of mind, separates individuals from society, which finds its destruction in egotism, in bodily, and still more in mental weakness, and in intractable degeneracy. The more pressing is the necessity of restoring the only means which is able to reproduce the smouldering power of all civilised nations. And through filling up the gap in pedagogical science we would impart to the young a stability which would withstand many of the poisoned darts of luxury."

The only communicator between soul and body is the nervous system, the heart of which may be called the brain. The latter is consequently that part of the body which suffers more directly from the evil results of

excessive mental exertion. Every one has doubtless felt the truth, as he will have experienced after close and continued thinking a feeling of exhaustion and slight oppression in the head. Here the common law in all organic nature is applicable, that, where the irritation is greater, the circulation of the blood is stronger and the secretion more profuse. Heat in the head, tendency to inflammation, suppuration and obduration of the brain, hydrocephalus, epilepsy, catalepsy, somnolency, and sleeplessness are the sufferings which afflict the learned. If we consider the far greater sensibility of the child and youth, and the natural tendency of the fluids to the brain, it is easy to understand how premature development of the mind often destroys health and life. How often we hear parents say after the loss of a child, "it was an angel too good, too clever for this life," without thinking that they had allowed themselves from its natural quickness of comprehension to overtax its mental powers, and that they are the indirect cause of its death.

Excessive mental exertion, particularly in youth, often cripples mental power. Montaigne says "How many men have I seen become stupid through too great a thirst for knowledge. Not seldom are those cases where youths, who were the pride and the pleasure of their parents and tutors in their 10th or 15th year, in their 20th year are surpassed by others of their own age, and they often become quite unfit for thinking. We must not from the above draw the conclusion that the cultivation of the intellect is to be restrained as being detrimental to the health and vigour of a nation, and that it does not deserve the greatest care and attention. There is perhaps no greater or more inexcusable crime against the welfare and happiness of our fellow beings and those committed to our care, than with despotic power and inhuman barbarity to mark out the bounds, thus far and no farther. "It is true, that the poor systematically oppressed and kept in ignorance," says Wieland, "grow gradually to stupidity, and the sensual inclinations, which grow with their years, not having learned to obey any law, give rise to a number of prejudices and errors, which smother the power of discriminating between good and evil, that prerogative of human nature. They never will become matured to true beings."

We should exercise and educate the mind in every way and to the full extent of its power, but only at the right time, and in the right degree. In gymnastics we find the only regulator. It prevents, by strengthening the muscles, the irritability of the nerves, which is almost without exception combined with weakness of the muscles. Gymnastics searches out the ordinary external causes of the illness, as heat, cold, and the sudden changes of the same, rain, want of sleep and food, and teaches us to bear them with caution and safety. I have often noticed in my pedestrian tours, that even delicate boys, wet with rain to the skin, notwithstanding their wet clothes, have gone cheerfully on their way, have gone at night to their often simple couch, and risen early in the morning well and brisk.

Man acquires the highest degree of his physical perfection only when a higher degree of power and resistance is combined with the sensibility and mobility of the nervous system. Without having a great physiognomic knowledge, we perceive at the first glance such a constitution. "What a difference," says Niemeyer, "between children always tied to their mother's apron string, protected from every breath of air, warned against every bold exertion of their bodily strength as a great danger or even sin, and those who from their infancy developed their limbs by all kinds of exercise, and by that means defy every real danger or learn to make it harmless. The great danger to which the unpractised, awkward, anxiously guarded boy is exposed, and the privation of all the irreparable advantages, which produce strength and agility of the body, plainly show, how unpardonable it is so much to neglect this part of bodily education."

It is true, that the improvement of the health will produce a normal motion and mixture of the blood, but the more violent motions of the body have influenced on the rest of the body, and sedentary habits produce a disproportion between the venous and arterial blood. The veins, even of the external skin will rarely be found expanded, while blood is wanting in the arteries. If one considers, that the arterial blood only is of service for support, it is easy to understand, how too great a quantity of venous blood deranges the whole system. This disproportion is mostly the cause of the legion of diseases of the bowels, by which the nervous system is most developed. If we farther consider that the conversion of the venous blood into arterial, is caused through the process of respiration, and if we remember, that the most perceptible result of a continued and vigorous exertion of the body is the increased rapidity in the circulation of the blood and action of the lungs, it will be easily understood, that for them bodily exercise is the only comfort, and that through it in a few hours a refreshing and invigorating feeling of health is produced. Pressing is therefore the appeal to every one, to prevent this unhealthy state by regularly continued exercise of the body. We should certainly never find in one who had been trained from his youth in gymnastics, even frequent and difficult work of mind, producing hypochondria, hemorrhoids, liver-complaints, and the like, the true cross of our learned men. Addison says, "Gymnastics open the chest, exercises the limbs, and gives a man all the pleasure of boxing without the blows. I could wish, that several learned men would lay out that time which they employ in controversies and disputes about nothing in this method of fighting with their own shadows. It might conduce very much to evaporate the spleen which makes them uneasy to the public as well as to themselves."

Gymnastics is also of beneficial influence to the digestion, it keeps the balance between nourishment and consumption; thus the necessity of rest and recreation will be greater, the sleep sounder, more refreshing, and therefore shorter.

Our senses, from being the communications between the mind and the external world, form the basis of all mental development and improvement,