

fully into this part of physical education, and wish to mention that there is in the Kensington Museum a collection of means for scientific physical education, which I have exhibited in the International Exhibition of 1862. The task of hygiene is to give us the best raw material, otherwise we cannot manufacture a good article.

Dr. Roth explained a few diagrams of foot deformities, of bad positions; and a model of a hygienic chair and desk.

The second part required for the purpose of developing harmoniously the physical faculties consists in the practical use of a scientific system of exercises, based on anatomical and physiological principles, and adapted to the various ages.

*Greek Gymnastics.*—The science and art of bodily exercises was developed to its highest standard by the Greeks under the name of gymnastics. According to Lucian, Solon said to the Scythian, Anacharsis, "To us Greeks it is not enough to have a man as nature created him, but we train him by gymnastics that we may make that much better which nature has done well, and improve what is inferior."

Gymnastics was interwoven with Greek national life; it formed an essential and very important branch of the education of both sexes; health and beauty, which were considered essential accomplishments, were due to a great extent to scientific gymnastics. The highest developments of the beautiful human form, which served the Greek painters and sculptors as models for those wonderful pieces of art which still engross our admiration as well as the sense of the beautiful (the so-called æsthetic sense, which spread all over Greece), were owing to the same science. When agonistics (the art of wrestling, fighting, struggling, &c.), and, later, athletics (by which only brute force was developed) had a more prominent place in Greece, gymnastics went out of use and decayed.

*Unsuitable Gymnastics.*—That the Greeks spoke with much contempt of gymnastics when it began to degenerate, with regard to good manners, is shown by the following.—Kleisthenes, who lived about 500 B.C., may be looked upon as a type of the real Greek spirit prevailing at that time, which turned with antipathy from whatsoever was unæsthetic, gymnastics included, his daughter, Agarista, was courted by Hippocleides, a rich young Greek, who, by his engaging manners, had already obtained the father's good will, which he entirely lost by a single action. During courtship, and at other domestic festivals, it was the custom to amuse the visitors by gymnastic exercises. Hippocleides, well acquainted with all bodily exercise, performed miraculous feats, believing thereby to rise still more in the estimation of his future father-in-law, who with much difficulty restrained himself from expressing his disapprobation of the frivolous attitudes and exercises; but when the young man even stood on his head, and in this position commenced to gesticulate with his legs as if they were arms, Kleisthenes could no longer stand it, and called out with indignation, "O! son of Tisanodos, you have danced away your marriage," and the daughter was refused to her lover.

What a contrast between the indignation of Kleisthenes and the loud calls of applause which are bestowed on the same unæsthetic and similar feats performed in our theatres and so-called gymnasia! What would the well-educated old Greek say were he to see in our gymnastic institutions how the young men, hanging with their knees on a horizontal bar, swing round and round like a mill-wheel?

Since the fall of Greece no scientific system of gymnastics has been known till the eminent Swede Ling, who ranks amongst his compatriots as high as Linnaeus and Berzelius, invented in 1805 what is called rational gymnastics, a system based on anatomy and physiology. Ling, an eminent poet and patriot, wished to increase Sweden's power of resistance against further encroachments of Russia, which had already taken too many provinces from Sweden;

he believed the best to be done for this patriotic purpose would be the scientific physical development of every Swede.

Rational gymnastics is divided into four parts—the Educational or Pedagogical, the Military, the Æsthetic, and Medical.

*Æsthetic Gymnastics.*—Educational, rational gymnastics is the basis of this science, which teaches us to express by the body, through different positions and movements, a thought or a feeling. It is especially in this part of gymnastics that oneness of body and soul is aimed at. Each single movement following an idea conceived by the mind is a thought expressed by the body. When it is possible to express an idea by the body, the whole organism becomes an organ of the thought; consequently, this organ must in every part express this thought, otherwise the expression is not faithful or not clear. A person desirous of expressing tenderness while clenching his fist, expresses by his body something quite different from the idea intended. In æsthetic gymnastics it is the soul which acts on the body, while in educational gymnastics it is the body which acts on the soul. Thus, æsthetic gymnastics becomes a means of developing and perfecting sculpture, painting and the other fine arts. As in declamation and song, so in each gesture there is a definite rhythm; and the artist who wishes to represent a certain idea must choose a certain moment of action if he wishes to convey his idea through the creation of his art.

All our passions are divided into two classes, those of sympathy and antipathy, or affection and aversion. The first are expressed by oval, the second by angular lines; even the various degrees of intensity of the same idea are expressed by various positions and movements.

*Military Gymnastics* is also based on the educational branch, and is the science which teaches how to subdue, by the assistance of external means (as weapons), or by our own bodily force, another will external to our own. Fencing, sword and lance exercises, bayonet fencing and wrestling are, besides the educational branch, the principal exercises of military gymnastics.

*Medical Gymnastics* is the science which teaches "to allay or cure pains and disorders by certain positions and movements, done either by ourselves alone, or with the assistance of others, acting upon us, whereby the harmony in the different parts of the body, which has previously been deranged, is restored." A number of patients who suffered from chronic complaints and deformities, owe to the genius of Ling relief and cure. Although medical gymnastics has always been used by the Chinese, and later by the ancients, the special movements and manifold manipulations invented by Ling were not known before. I believe it more suitable to say a few words on the various branches of Ling's rational gymnastics, before I enter more fully on the aims and final result of pedagogic gymnastics.

*The aim and final results of pedagogic gymnastics* is to develop man to such a degree of perfection as is shown by very good health, complete energy and harmony in all his powers and faculties, the ease of movement of the limbs, and by the symmetry of his bodily form. Having obtained such a development, the organism is ready and capable of obeying the commands of the will, and of serving the soul as an useful and enduring instrument. For the purpose of obtaining this result, it is not enough to find out by numerous combinations and variations of certain sets of exercises all that is possible to be done, but we must study and inquire into the laws according to which the exercises answer the object and the results we are aiming at. These laws are based on the exact knowledge of the nature of the human body; therefore the knowledge of the bones and muscles forms an indispensable basis. As the muscles are influenced by the nerves, and as the various organs of the living body act and react on each other, physiology is necessarily an additional science required for the practice of rational gymnastics.