

*I. The Nutritive System of Organs.* These organs are divided into three classes, the Digestive, the Circulatory and the Respiratory. It will be sufficient for our present purpose to state that the food which is consumed by man undergoes the processes of chymification and chyfication. All the elements originally existing in the food fitted for nutrition are now concentrated in a fluid called *chyle*. This fluid is then discharged into the *vena clara*, at which point digestion ceases and circulation begins. The chyle having entered the *vena clara* mingles with the blood and is conveyed along with it to the heart, thence to the lungs, (where it undergoes a certain change which we will speak of presently,) thence back to the heart, whence it is diffused to all parts of the body through canals called arteries. After performing its duties in the various parts of the body it is taken up by the veins and conveyed back to the heart, when it again commences this circulatory process, which is constantly going on. Such are the leading features of circulation. We have mentioned that the blood undergoes a certain change in the lungs. This leads us to consider respiration, which more particularly concerns the educationist. The blood, which is taken up by the veins, is of a dark colour, and has not only given out all its nutritive elements, but has also collected substances which are injurious to the system, the most important of which is carbon. In its passage it receives the chyle which is not yet in a condition to become part and parcel of the body. It proceeds to the lungs, where it comes in contact with the inhaled atmospheric air, with the oxygen of which its carbon unites and is expired in the form of carbonic acid gas. The blood now becomes of a bright scarlet colour, and is assimilated or is fitted to supply the waste which is constantly going on in the body. The degree of perfection with which the assimilative process is carried on in the lungs depends greatly upon the elements contained in the inhaled atmospheric air. In a pure state atmospheric air consists of seventy-nine parts of nitrogen to twenty-one of oxygen. But, if the oxygen exists in a greater proportion than this, the effect is an increased circulation and an unnatural activity in the whole system. If nitrogen preponderates, a lethargy or sluggishness is produced. Similar effects result from the presence of carbonic acid gas. Now in the assimilative process a great portion of the oxygen unites with the carbon of the venous blood and forms carbonic acid gas, which is poisonous. If this gas is not allowed to escape and fresh supplies of oxygen admitted the most disastrous effects follow.—The death of the victims in the Black Hole in Calcutta is an instance of this. It is absolutely necessary then, both for the health of the body and the activity of the intellect, that every school room be properly ventilated. In securing this object we must attend to the size of the room and the proper mode of ventilation. Each individual requires one hundred and fifty-two cubic feet of atmospheric air for healthy respiration for three hours, so that a room intended to accommodate fifty-six scholars should be thirty-eight feet by twenty-five. In admitting supplies of fresh air, draughts upon the body should be particularly guarded against. This can be done by having the ventilators in the upper part of the wall. The vitiated air is best carried off by openings in the ceiling overhead, as being heated it is lighter and consequently ascends.

*II. The Supporting System of Organs, the Bones.* The bones are composed of earthy and animal substances. In young persons the animal matter preponderates, and accordingly the bones are much more flexible, and, of course, more liable to be deformed or put out of shape than in those more advanced in

life. The great object is to keep all the bones straight, and accordingly the seats and desks should be proportioned to the size of the scholars, so that every one may sit at ease with his feet resting upon the floor. A support should also be provided for the back. Every scholar should likewise be made to sit with the trunk of his body erect, and to stand in an erect position, that the spine may retain its natural shape.

*III. The Cutaneous System of Organs, or the Skin.* The principal function performed by these organs is that of exhalation, which is of two kinds, known by the names of sensible and insensible perspiration. These processes are performed by innumerable pores in the skin. It has been proved that of eight pounds of food received into the system five are thrown off by means of these pores. The substances thus exhaled are highly injurious to the system. The action of these pores is deranged by the presence of any foreign matter, and the secretions being thus confined within the body produce serious results, such as severe colds, &c. It is of great importance, then, that the cutaneous system of organs, by means of ablutions, friction, &c., be kept in a healthful and vigorous condition.

*IV. The Muscular System.* The great law of the muscles is that of contraction and relaxation. When one set of muscles is in a state of contraction the corresponding set of muscles is in a state of relaxation. Nature requires that no class of these organs should be kept in either of those states for any considerable time. In preserving this part of our system in a proper tone the means to be employed by the teacher are physical exercises, which are of two kinds, those performed in the school room and those beyond its walls. The latter are to be attended to during recesses, and the teacher himself should take the lead in them. They should be of such a nature as to impart freedom and grace of motion, strength to the various sets of muscles, expansion of the chest, &c. Those within the school room should be, as far as possible, mingled with the mental exercises. They may be of various kinds, as singing, marching, certain motions of the bodily parts, &c. The latter consist of motions which exercise all the muscles, such as throwing the shoulders back, extending the arms forward, raising them above the head, bringing them down with force by the side, standing on tiptoe, &c. The following rules should be observed in these exercises:—

1. They must be stimulated by nervous and mental excitement.
2. They should be varied as much as possible. Unless this be attended to they become monotonous and fail to secure the attention, and, of course, the desideratum of the first rule cannot be obtained.
3. They should be proportioned to the age, size and strength of the pupils.
4. They should be performed in the most favourable hours of the day.

*V. The Nervous System of Organs.* The brain, with its branches of nerves extending to all parts of the body, is the agent by which every mental function is performed. If this system of organs be not kept in good working order the action of the mind is proportionally affected. Thus one-tenth part of the arterialised blood goes to the brain. If this blood has less than its due share of oxygen, lethargy is the consequence, if more than the necessary portion of this element undue excitement is produced and disease speedily follows. One great law of our constitution, which must be particularly attended to in connection with this subject, is that no two sets of organs can perform their functions vigorously at the same time. Thus, if