the vertebral column, and enclosing the heart (*h*) between them, (Fig. 90, *l l.*) The lungs communicate with the atmosphere by means of a tube composed of cartilaginous rings which arises from the back part of the mouth, and divides below, first into a branch for each organ, and then into innumerable branches penetrating their whole mass, and finally terminating in minute sacs. This tube is the *trachea* or *windpipe*, (*w*,) and its branches are the *bronchi*. In the higher air-breathing animals the lungs and heart occupy an apartment by themselves, the *chest*, which is separated from the other contents of the lower arch of the vertebral column, (161,) by a fleshy partition, called the *diaphragm*, passing across the cavity of the body, and arching up into the chest. The only access to this apartment from without is by the glottis, (Fig. 22, *o*,) through the trachea.

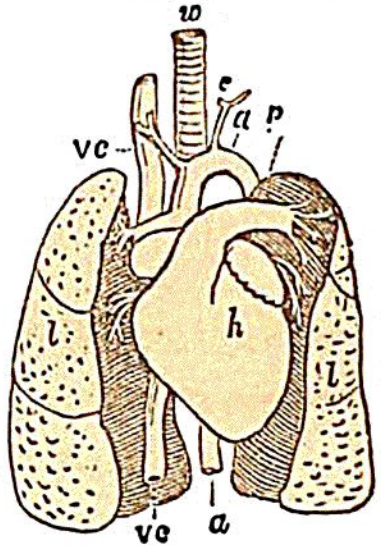

Fig. 90.

248. The mechanism of respiration by lungs may be compared to the action of a bellows. The cavity of the chest is enlarged by raising the ribs, the arches of which naturally slope somewhat downward, but more especially by the contraction of the diaphragm, whereby its intrusion into the chest is diminished. This enlargment causes the air to rush in through the trachea, distending the lung so as to fill the additional space. When the diaphragm is again relaxed, and the ribs are allowed to subside, the cavity is again diminished, and the air expelled. These movements are termed *inspiration* or *inhalation*, and *expiration*. The spongy pulmonary substance being thus distended by air, the blood sen. from the heart is brought into such contact with it as to allow the requisite interchange to take place, (235.)

249. The respiration of animals breathing in water is ac-