KLOTZ: CLOSURE OF THE DUCTUS ARTERIOSUS

attached to the base of the vessels. This pericardial sac, he points out, is adherent to the diaphragm, and through the anterior mediastinum to the sternum. Schanz finds that after respirations have commenced, the relative positions of the vessels to the intrathoracic organs is considerably altered. Particularly does he find that the direction of the ductus arteriosus, in its relation to the pulmonary orifice of the heart, is changed, and this, he holds, is the result of the firm attachment of the heart through the pericardium to the diaphragm and sternum. With the expansion of the lungs the diaphragm is drawn downward and the sternum rises and increases its distance forward from the vertebral column. In these new positions the heart is pulled upon so as to become more vertical, altering its relation to the ductus arteriosus. Not alone is the relative position of the ductus arteriosus disturbed, but this vessel also experiences an active stretching during expansion of the chest.

In considering the above opinions, one is struck with the many sides there are to the question of the closure of the ductus arteriosus, and to seriously weigh the theories expounded by Thoma, the bearing upon what we may term the mechanics of arteriosclerosis makes a study of the mechanics, and the histological structure of this part of the circulation essential.

Briefly, the fetal circulation differs from that of adult life in having the blood entering the right auricle divided into two streams. The greater part of the aërated blood coming from the placenta passes from the inferior vena cava directly through the foramen ovale to the left heart, and is supplied to the head and upper extremities. The venous blood returning from these parts enters the right auricle by the superior vena cava, and with an admixture of inferior caval blood, which is aërated, passes to the right ventricle, from which a meagre supply goes through the pulmonary system, while the greater part passes by way of the ductus arteriosus to the aorta and supplies the abdomen, the lower extremities and the placenta. During this stage, the right heart, the trunk of the pulmonary artery and the ductus arteriosus form the most conspicuous part of the circulation in the thorax. The ductus arteriosus is in a direct line with the pulmonary trunk, is the direct continuation of the same, and is of

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