

and which consequently are constantly under the strain of the aortic pressure are very liable to degenerative changes, but the terminal portions of the arteries which are imbedded in muscle are not as a rule much affected. So when a coronary is blocked the heart may be supplied with blood from the venous side. In cases of stenosis of the tricuspid orifice the coronary veins are often much dilated, and form regular sinuses in the cardiac muscles.

#### THE PULMONARY CIRCULATION.

The pressure in the pulmonary artery is not more than one-third and the velocity of the blood about three-fourths of those respective conditions in the aorta; but, unlike the vena cava, the pressure in the pulmonic veins is always positive, so that the blood always enters the left side of the heart under pressure, while it is usually sucked into the right side. There is a gradual fall of the pressure-gradient from the right ventricle to the left auricle, and there does not seem to be much resistance to the circulation either in the arterioles or capillaries.

Bradford and Dean, and Francois Franck have shown by a series of very elaborate experiments that the pulmonic vessels are innervated; but while such innervation may be sufficient to maintain slight tone in the vessels, the experiments with adrenalin, to which I have before referred, would show that it cannot constrict the vessels so as to effectively increase the resistance.

The experiments of Lichtheim showed that the greater number of the branches of the pulmonary artery could be ligatured without lessening the input into the left heart or lowering the aortic pressure. But Cohnheim showed that this end was attained by increased work on the part of the right ventricle as demonstrated by the increased intraventricular pressure, and once this ventricle began to fail there was a sudden fall in the input to the left heart, and in the aortic pressure. Any diminution in the pulmonary vessels, such as occurs in pneumonia and in emphysema, increases the work of the right ventricle, but so long as it is able to meet the demand, the circulation is maintained. It is the failure of the right ventricle which is the principal cause of death in pneumonia. The pulmonic arteries are fairly well endowed with muscular fibre, and even after death have a considerable power of contraction so to drive the blood right on through the capillaries into the pulmonic veins.

If formaldehyde, which firmly clots the blood, be injected down the trachea after death, there will often be found firm thrombi in all the pulmonary veins, but not in the pulmonic arteries. It is therefore highly probable that any nerves which the pulmonic vessels may possess merely maintain the tone of the vessels or have a trophic effect. In cases of mitral stenosis the intrapul-