conditions being normal, cause any vascular or cardiac murmur. Foxwell in the Bradshaw lecture for 1899 (Lancet Nov., 4th, 1899), gave most convincing experimental proof that alterations in the character of the blood passing through a normally shaped heart would in no case cause a murmur, and as already stated and illustrated we have all seen cases of profound anaemia without murmurs and, on the other hand, cases of well marked functional murmurs without anaemia. Skoda wrote in 1839 that "It is not true that a watery state of the blood is a cause of murmurs because in many cases one does not find it." In order to understand the pulmonary murmur it is necessary to look for a moment at some of the physical conditions which govern the production of murmurs anywhere, and here I must acknowledge my indebtedness to Professor J. C. McLennan of the Physical Department of Toronto University for kindly help given.

1. Fluid of any kind flowing at any speed through a cylindrical tube will not cause a murmur, even if the tube be curved, so long as it retain its cylindrical form.

2. Fluid flowing from a cavity into a cylinder will similarly produce no sound. This explains why no murmurs normally exist at the pulmonary and aortic orifices. Here the blood flows from a cavity into a cylinder, there being no constriction normally at the arterial orifices.

3. Fluid flowing from a cylinder into a cavity may produce a sound, but it is not likely to do so unless the flow be very rapid. Probably the murmur heard frequently over an aneurysm is explained on the physical grounds of fluid flowing from a cylinder into a cavity.

4. The figure par excellence which will most easily give rise to a murmur is one in which the fluid must flow through a constriction. This constriction sets up eddies and fluid veins in the blood which cause sound vibrations.

It is easy to understand now how a true stenosis of an orifice gives rise to a murmur, for here we have a cavity (the ventricle) a constriction (the stenosed orifice) and a cavity again (the normal artery beyond). But can we apply the same explanation to the inorganic murmur in the pulmonary region? I think we can. All that is necessary in order to produce the hour-glass figure that we require is that the pulmonary artery be dilated while its orifice remain of normal size, but to this point we will return. Curiously enough Fagge in discussing the functional murmurs which occur at the base of the heart in anaemia, says, "The trunks of the two main arteries are supposed to be unable to retract in correspondence with the diminished volume of the blood to the same extent as the orifice through which the blood enters them." It is hard to understand how a fibrous ring like that at the orifice could retract and furthermore