

in three of these, this second murmur is probably hæmic in character for there is marked anæmia.

*Typhoid fever* may be taken as an example of a condition in which functional murmurs are extremely frequent, which contrasts strongly with anæmia. Here the more rapidly acting heart, the low tension pulse, the increased metabolism and evident intoxication of the system explain much more readily the strain on the cardiac system, of which the murmur gives evidence, than do the changes associated with a moderate anæmia. But, under such widely differing clinical circumstances, a common symptom makes one look for a common cause and the inference lies near, that in anæmia as in typhoid, a toxæmia rather than a hydræmia is at work, in the one case acting slowly and insidiously, in the other, suddenly, acutely, and poisoning rather than impoverishing the nerve centres. Other facts suggest this idea also. Everyone knows that one meets with systolic functional murmurs often in apparent health, and in 78 of these 466 cases, there is present neither anæmia nor fever, but often a condition which suggests some form of intoxication. Instances of such conditions included among these murmurs are: 43 diseases of the digestive system (including six cases of cirrhosis), gout, acute alcoholism, morphinism, etc.

Out of about 298 cases of typhoid examined, a pure systolic murmur was noted in 78, making something over 29 per cent.

In this disease as in all infectious fevers, an apical murmur always suggests the possibility of an acute endocarditis; this is however, rare; Osler states that he did not find it in any of his cases and that it was present in only 11 of the 2,000 Munich autopsies! Parenchymatous degeneration on the other hand is undoubtedly common, and yet though this is naturally often the main underlying cause for these murmurs, they often declare themselves functional in other ways, by disappearing during the active course of the disease.

Since the year 1896, minute daily records have been kept of the typhoid cases in the hospital. These "typhoid charts" reveal some interesting facts as regards the cardiac condition. When a murmur develops, although it frequently has a course parallel to the height of the fever, it often, too, appears and disappears quite irregularly without any apparent reference to this. In no condition of high continued fever are the variations in the cardiac condition more striking than in typhoid. The sounds vary in character and relative intensity; murmurs appear and disappear; signs of cardiac dilatation come and go, as the struggle between the reactive powers of the individual and the invading toxins of disease goes on in the organism.