

dictum. In pernicious anæmia, representing the most extreme degree, we know that there do exist often extensive degenerative changes in the myocardium leading to weakening of the heart and the papillary muscles and to consequent dilatation. Here then are the conditions for a relative insufficiency, and here every murmur is apical. Of the 16 cases, 10 occurred alone at the apex and pulmonary cartilage, and the only one heard best at the pulmonary is transmitted into the axilla, indicating that it too is an apical murmur. In chlorosis, on the other hand, where there is a lesser degree of blood alteration, there are only seven cases at the apex against 15 at the pulmonary area, and 19 heard with equal force both at the pulmonary cartilage and apex. Of the seven cases with a murmur at the apex, five showed only slight chlorosis, scarcely sufficient one would think to produce a relative insufficiency; the thought is suggested that although mitral valvular murmurs are heard best at the apex, all apical murmurs are not necessarily valvular.

The apical murmurs of pernicious anæmia, however, do not always present the other cardiac conditions that we would expect to find in a relative mitral incompetency of some duration. The murmur is generally transmitted, but in only ten cases is there cardiac enlargement or pulmonary accentuation; but the absence of these signs is explained by the physical facts. We cannot expect much increase in area where the heart though frequently dilated, is atrophied rather than hypertrophied, and the right ventricle must often be too weak to give rise to pulmonary accentuation. In pernicious anæmia where pulmonary accentuation does occur (as in most advanced cases) it is probably dependent on the dyspnoea, due to the imperfect aëration of the tissues by the diminished number and power of the oxygen-carrying elements of the blood.

The cases of *exophthalmic goitre* illustrate the same point as do the anæmias. It is known that in this disease in cases where there is much vasomotor disturbance, there is apt to be dilatation of the overworked heart resulting in a relative mitral insufficiency. In the ten cases before me there is only one that does not show marked implication of the vasomotor system; in this one there is but a slight anæmia (erythrocytes 4,000,000, hæmoglobin (Fleischl) 70 per cent.) and the murmur is hæmic in its character being heard only at the pulmonary cartilage without pulmonary accentuation or cardiac enlargement.

In all the other nine cases there is vasomotor disturbance and the murmur is at the apex, generally well transmitted into the axilla. In five of the cases another murmur is also described at the pulmonary,