

however, to be followed by a systolic rise. The increasing strain thus thrown on the heart is met by an hypertrophy. So long as this compensatory growth of muscle can compete with the rising pressures, which it may do for some years, no cardiac symptoms arise, but a time inevitably comes when the myocardium, after a game fight, is no longer able to meet the demands of the increasing peripheral resistance and cardiac failure supervenes. To try to effect improvement in this stage by giving cardiac stimulants, is similar to flogging a weary horse who has been making a noble effort to pull a cart up-hill with the brakes on, the therapeutic inference is clearly to try and take the brakes off, but frequently this is overlooked. When, however, we are in the presence of heart failure, the patient has reached a late stage of the disease, the curtain is being rung down on the fourth act, and only palliative measures are now possible. At an early stage in the disease changes occur in the coats of the arteries, probably due largely to the unusual mechanical strains caused by the high pressure.

The physical signs will, of course, depend on the stage at which the disease has arrived; it may, however, be convenient to consider some of the more important signs separately:—

(1) *The blood pressure.*—The systolic pressure will be found to lie between 180 and 280 mm., and maintained at this level, with a corresponding rise in the diastolic pressure.

(2) *Arteriosclerosis.*—Progressive changes take place in the arterial walls. It must not be forgotten, however, that the distribution of arteriosclerosis may be, and indeed usually is, localised and patchy, especially in the early stages. For example, the cardiac and cerebral vessels may have undergone extensive degeneration, before palpable changes in the peripheral vessels can be detected; or the dorsalis pedis may be markedly affected and the radials apparently normal. Not rarely the retinal vessels give the first indications of the degenerative process. It is probable that arteries containing powerful muscular coats can to some extent protect them from the injury resulting from mechanical pressure strains, by contraction.

(3) *Cardiac signs.*—Hypertrophy, especially of the left ventricle, is sooner or later inevitable. Care must be taken, however, not to overlook those cases in which the hypertrophy is present without any increase in the area of absolute dulness. The first sound at the apex often has a changed tone and an apparent lengthening. When once appreciated this change in quality of sound is an undoubted aid in diagnosis. The aortic sound is usually accentuated, and has a ringing or hollow tone.