

heart, while a similar relationship also exists between the heart and the circulation in the arteries. To a great extent this relationship centres around the question of blood pressure within the arteries. It is realized, too, that this blood pressure is normally altered with great ease and that the alteration is observed by a greater or less response in all of these organs. From the recognition of the physiological interdependence of the activities of this group, have proceeded the theories that many of the pathological processes arising in any one, have their explanation in changes occurring in one or both of the other organs.

The lesions which we recognize in heart, kidney, and arterial disease, are of the character of sclerosis in each. The heart is hypertrophied, mainly in its left ventricle, and shows areas of sclerosis throughout its musculature. The arteries are thickened with more or less distortion of their lumina, although the altered calibre may not be referable to intimal sclerosis. The kidneys are small and fibrosed, showing characters that we readily classify as chronic interstitial nephritis. In the fully developed cases of heart, kidney, and arterial disease, the fibroses of these organs are marked, though the relative extent of the cirrhotic change differs in each case, sometimes being most marked in the heart, at other times showing an unusual arterial sclerosis or, again, having marked chronic interstitial reactions in the kidneys. Because of the variation in the quantitative deposition of fibrous tissue there has been much speculation in suggesting the disease or the organ which was primarily at fault.

Bright and subsequent pathologists recognized the association of the contracted kidney with morbid changes in other parts of the body, particularly in the presence of hypertrophy of the heart. It was generally believed that the kidney was the organ primarily affected and that other bodily conditions were secondary.

The hypertrophy of the heart has been explained on a purely mechanical basis as due to the difficulty of the circulation in the cirrhotic kidneys. Ewald and, later, Loeb have suggested that the heart lesions were the result of increased work brought about by the greater viscosity of the blood. Others (Hasenfeld and Hirsch) have found that the cardiac hypertrophy was associated particularly with a sclerosis of the splanchnic vessels while sclerosis in the remaining portion of the peripheral tree, they believed, had less effect.

In the belief that the kidney was primarily involved in disease and was followed by the retention of a variety of products of meta-