inability to stain with indigo carmin. But such changes were temporary. If the artery was clamped for two hours, permanent injury occurred, evidenced by tubular necrosis with cast production, cellular infiltration, resulting in circumscribed scar formation with calcification.

Chirié and Mayer[8] after temporary clamping of both renal veins in dogs, noted, in four out of seven cases, death with convulsions. Carrel[9] was unable to confirm this observation.

Eisendrath and Strauss[10] have studied the pathological changes in the kidneys of rabbits after compressing the renal vessels for from fifteen to ninety minutes. According to their results, temporary compression — half an hour or less — caused slight damage. If longer, marked permanent lesions occurred in the parenchyma, as evidenced by interstitial cellular infiltration, coagulation necrosis of tubular epithelium, and later by the deposition of calcium in and about the destroyed epithelium.

Thus it has been shown that clamping of the renal vessels for periods up to an hour may produce temporary anuria, albuminuria and cylindruria. If interference with the renal circulation is maintained sufficiently long, permanent interstitial increase in tissue occurs in the kidney. Except for the amount of urine excreted and the presence in it of albumin or casts, no systematic study of renal function under such conditions has been made.

AUTHORS' EXPERIMENTS

In our experiments rabbits and dogs were etherized and the abdomen opened aseptically in the median line. The left kidney was exposed, and by careful blunt dissection the vessels were freed from the surrounding tissues. The artery and vein were raised on an artery forceps with as little stretching as possible and a small rubber protected bull-dog clamp placed around them. In each experiment it was noted that on the distal side of the forceps the artery did not pulsate, while the vein at once became distended; on the proximal side the vein was collapsed and the artery pulsated normally. No attempt was made to prevent the capsular circulation. After the left renal vessels were clamped, the right renal vessels were ligated. The right kidney was removed and weighed. In a few animals, for control, the right kidney was left untouched.

While the clamp was in place, the abdomen was closed and covered with a warm saline pad and towel. To try to obviate the factor of shock, the body heat was maintained. The animals were anesthetized as lightly as possible. After the desired interval of time had elapsed, the clamp was removed, the macroscopic appearance of the kidney noted, and

8. Chirié and Mayer: Compt. rend. Soc. de biol., 1907, i, 598.

9. Carrel: Compt. rend. d. Soc. de biol., 1909, i, 527.

10. Eisendrath and Strauss: Jour. Am. Med. Assn., 1910, lv, 2286; see also Guthrie: The Archives Int. Med., 1910, v, 232.