stances which a healthy kidney would not permit to remain in the blood.[1]

It may be that further studies will show that the essential pathological element in the forms of uræmia already considered is the presence of the proteid serum poison to which reference has been made; although in the form of uræmia characterized by gastro-enteric derangements, the accumulation of urea, salts, etc., appears to be a regular and probably a determining factor.

An element quite different from simple renal insufficiency enters into many cases of uræmia, namely that of infection.

There is a small but suggestive group of patients who, after exposure to cold or wet, develop high fever, partial suppression of urine, albuminuria and perhaps hæmaturia, with headache, delirium and coma. The peculiarity of these cases is that the kidneys have previously been normal so far as can be determined by clinical methods. There seems little doubt that the cerebral symptoms in such cases of acute degeneration of the kidney or acute exudative nephritis are due wholly to the action of toxines and not to the retention of substances in the blood which are normally eliminated by the kidney.

These unusual but instructive cases appear to me to represent the type of uræmia most widely removed from human obstructive uræmia in its pathological basis. As might be expected, these cases retain their purely infective type only a short time, for the damage to the kidney soon leads to pronounced insufficiency and to the accumulation of urea, extractives, etc., in the blood in marked excess. A condition analogous to that just described can be produced in monkeys by the subcutaneous injection of pathogenic bacterial filtrates.

In a considerable number of cases of chronic nephritis which have run an afebrile course there is a sudden development of fever, partial suppression with increase in the albumen of the urine and cerebral symptoms such as delirium, coma or convulsions. At autopsy the kidney may show the lesions of an acute nephritis grafted upon those of a chronic nephritis. Post-mortem cultures made from the blood and various organs frequently show the presence of pyogenic or other pathogenic bacteria. In short we have in these cases both clinical and pathological evidence of the occurrence of an acute infection. It seems reasonable to suppose that many of the symptoms which we call uræmic in these terminal cases are due to the combination of this infection with a pre-existing toxæmia due to chronic renal insuffi-

[1] The increase in the fibrin content of the blood which I have found in some cases of this sort is of interest in this connection, though its significance is still uncertain.