

cases of suppression of urine in diphtheria, leading to a fatal issue in 27 cases. The common characteristics of these cases were: Severe local disease; marked albuminuria; never hæmaturia or sediment in the urine; anuria more or less complete; frequent vomiting and cardiac failure. *Post-mortem* examination of the kidneys showed them to be usually normal to the naked eye in every respect. Ten cases were examined microscopically and only trivial changes found. Nothing can be more conclusive than that marked albuminuria and renal insufficiency may be due to causes outside of the kidneys themselves. F. Siegert reports a series of 100 tracheotomized diphtheria cases; 27 of these had albuminuria, but nephritis was found *post-mortem* only three times; 10 patients had from 0.5 to 6 per cent. of albumin in the urine *intra vitam*; careful *post-mortem* failed to reveal the presence of nephritis.

In estimating the effect of the antitoxine on the kidneys, therefore, much more must be taken into account than the existence or the degree of albuminuria. In fact, a new subject is opened for investigation, and the albuminuria of diphtheria has yet to be explained. One thing seems fairly certain, viz., that the antitoxine exerts no harmful influence on the kidneys.

It is probable that the experiments of Mya represent the truth of the matter, viz., that the antitoxine has no appreciable effect on heart, blood, or kidneys. This observer watched four children from eighteen months to six years of age. He kept them under very close observation for several days, noting pulse, diurnal temperature variation, blood, and urine. Then he injected 30 c. cm. of the antitoxine, and noted the changes during the succeeding hours and days. The first child, aged six years, convalescent from measles, presented the following conditions for several days before inoculation: The erythrocytes numbered 5,160,000; the leukocytes 6916. The average quantity of urine for twenty-four hours was 660 c. cm.; the specific gravity was 1014; the urea equalled 14.25 gm.; there was present neither glucose nor albumin, but a trace of indican. The rectal temperature varied from 37.5° C. to 37.8° C. The injection of the antitoxine was followed in a few hours by a reduction of the erythrocytes to 3,541,666; an increase of the leukocytes to 9381. No variation was noted in pulse or temperature. The urine increased to 1280 c. cm. on the second day; the secretion was free from albumin, glucose, and urobilin. All of these variations were transitory, and in a few days the normal was regained. The results in the other three children were the same. The changes due to the antitoxine may be summarized as: 1. Transitory diminution of the red blood-corpuscles. 2. Slight leukocytosis. 3. Polyuria. 4. Slight increase in the excretion of urea.

That the oligocythemia was not due to destruction of corpuscles is proved by the absolute absence of urobilin from the urine. It was probably due to dilution of the blood from the lymph-channels, as also evidenced by the leukocytosis and polyuria.

These observations of Mya are very important, as they were conducted with great care. Moreover, they agree with other clinical observations. Albuminuria is present in a majority of cases of diphtheria treated without the antitoxine, being variously estimated by Henoch, Baginsky, and Eberth, as occurring in from 50 to 60 per cent. of all cases. Schwalbe reports 470 cases of diphtheria in the Friedrichshain Hospital, before the antitoxine period; albuminuria was found in 227, though examinations were made but once in each case. Kolisko says that in 75 *post-mortems* of cases treated with the antitoxine, the kidneys presented no deviation from kidneys seen before the antitoxine period. Ganghofner, in a most guarded paper, reports albuminuria, lasting any considerable time, as occurring only in 20 of 110 injected cases. Of 33 cases injected on the first or second day, none had severe albuminuria. In Cincinnati albuminuria occurs in nearly every severe case of diphtheria. I had the opportunity in March of making a curious observation of five children in two families, two of whom were treated with and three without the antitoxine. The cases all ran a mild course, but all suffered from rather marked albuminuria. The cases lay side by side, in a hospital ward. The appetite was good in all, and there was no pain, no œdema, no morphotic elements in the urine; yet the albuminuria persisted in all, notwithstanding treatment for from two to three weeks. Authorities are almost unanimous in the belief that the antitoxine does not lead to increase in the proportion of albuminurics, some even noting a diminution.

Testimony on the subject of the heart is variable, the vast majority of writers noting no bad effects on the heart. Some few, among whom is Baginsky, believe that the heart is unfavorably effected. Mya observed absolutely no variation in the rate, rhythm or tension of the pulse, as shown by sphygmographic tracings. Observations of the blood have yet to be made. Certain it is that fear of bad effects need cause no one to abstain from the use of the antitoxine.

It is yet impossible to determine the effects of the antitoxine on the paralysis of diphtheria. Exact figures are not available. The occurrence of paralysis varies in different epidemics and in different regions. In Berlin it is very common (Henoch); in Munich it is not often met with (Seitz); in Halle it is uncommon (v. Mering). It seems incredible that the use of the antitoxine should increase the proportion of cases attended with paralysis; clinical reports, on the other hand,