

seem to show that the proportion is not reduced. Heubner reported paralysis in 7.4 per cent. of 207 cases treated with the antitoxine; C. Seitz injected 74 cases on the first or second day of the disease, and encountered some very severe cases of paralysis. Hager had 3 cases of paralysis among 20 under observation; Washburn 6 among 48 survivors; Fischer 21 in 190 cases; Mya 5 in 50 cases; Soltmann only 4 among 76 recoveries; Germong only 8 in 290 survivors; Siegert 33 in 100 tracheotomized cases; and so on through a long list. It is advisable to look over old records of the pre-antitoxine period and strike a general average for each locality, and then to follow up all new cases with watchfulness. This will require years of attention, and this is destined to be one of the last problems connected with the subject to be solved.

When we come to the final question as to how far the antitoxine has reduced the mortality of diphtheria, we enter upon a most perplexing field of enquiry. When all is said and done, the statistical method is the court of ultimate appeal; and yet just this method exposes us to a thousand errors. Here, too, it will be found profitable to seek the sources of error and eliminate them as far as possible from future research and summaries. Up to the end of January over 3000 reported cases had been collected, with a mortality of 20 per cent. (Heubner), and reports since that time have given us about the same results. On its face-value this seems to give us a marked reduction in mortality as compared with former times, and yet a critical estimate bids us withhold our judgment.

I should like to emphasize the following propositions:

1. Hospital statistics considered by themselves are likely to be misleading.
2. Diphtheria treated under favorable conditions is not so fatal a disease (even in Europe) as is commonly supposed.
3. The bacterial criterion of diagnosis has a wide influence on the results achieved.

*Regarding Hospital statistics.* Common observation teaches us that agitation of new remedies among the populace leads to a rapid influx of patients suffering from that disease to the centres of treatment. In 1890 the tuberculous world flocked to Berlin and to the hospitals for tuberculosis. During the past year hospitals have dealt with vastly more cases of diphtheria than heretofore. We are indebted to Gottstein, of Berlin, for some brilliant observations on this score. He compares the admissions and deaths in the Berlin hospitals with the municipal cases and deaths during the past five years. From September 30th to November 24th there died of diphtheria in the Berlin hospitals in 1890, 131 cases; in 1891, 124 cases; in 1892, 178 cases; in 1893, 197 cases; and in 1894 (antitoxine period), 131 cases; the admis-

sions, however, during this period increase from 318 in 1890 to 712 in 1894. The mortality in Berlin from diphtheria is less than half the mortality in the Berlin hospitals; i.e., the severest cases are sent to the hospitals. Now if all of the cases in Berlin were sent to the hospitals the mortality would, without any change of treatment, fall, *eo ipso*, 50 per cent.

This is just what happened in the autumn of 1894. The number of admissions more than doubled and the mortality sank 50 per cent. The total mortality, however, was not thereby reduced, and as many cases died in 1894 as in 1890, only the place of their dying was changed. In 1890 there were 1592 deaths from diphtheria in Berlin, of which 682 (or 43 per cent.) occurred in the hospitals; in 1894, from January 1st to November 24th, there were 1281 deaths in Berlin, of which 737 (or 57.5 per cent.) occurred in the hospitals. Gottstein concludes with complete justification as follows: 1. The death-rate in hospitals was reduced 50 per cent., because twice as many cases were admitted. 2. The total mortality in hospitals in 1894 (to November 24th) was already larger than for 1890 or 1861. 3. The total mortality in the hospitals and the city was not at all reduced.

This able analysis explains the apparent benefit of the antitoxine in many other hospitals, and we may justly doubt the value of the statistics of any hospital that has suddenly experienced a large increment of patients.

With very few exceptions it is true that the mortality from diphtheria in cities at large is very much less than in the diphtheria hospitals, and hence any influx from the city to the hospital would of itself lower the mortality percentage of the latter. This is exemplified in the reports from Trieste. In 1893, 110 cases were treated in the hospital and 52.7 per cent. died; in the first eight months of 1894, 159 cases were treated and 46 per cent. died. Now came the antitoxine period; in the next five months 362 cases (!) were admitted and the mortality was naturally reduced to 20 per cent. Hahn reports from the Friedrichshain Hospital that though the number of cases in 1894 was very much increased, the total mortality in the hospital was not reduced, but only the percentage. Thus we see that hospital statistics *per se* are unreliable, and we should know in every case the number of cases treated as compared with the total number in the respective city.

*Diphtheria treated under favorable conditions is not so fatal a disease as is commonly supposed.* At the Congress of Internal Medicine, recently held in Munich, Baginsky said that his contemplation of diphtheria in former years was among the most gloomy of all his experiences: "In the diphtheric pavilion I gained the impression that we were absolutely helpless in dealing with diphtheria, and that nursing did more than medicines." All this