

or 15.6 per cent., developed rashes of a general type, while of all primary injections, those of July 10th being excluded, there only developed rashes in 6.5 per cent. I might remark that the serum first used was Mulford's preparation, and that during the remainder of the year we used that of Parke, Davis & Co.

#### GENERAL REACTIVE DISTURBANCES, AS EVIDENCED BY RASH

As before stated, 23 per cent. of all injections developed a single urticarial elevation at the point of insertion; but, excluding these, there was found to be a general reactive disturbance, as evidenced by rash, in 3.88 per cent. of all injections, or 10.6 per cent. of all patients developed a rash at one time or other—excluding the injection of July 10th, 6.5 per cent.

These figures need some explanation. It may be seen that of the three hundred and eighty-four patients some would receive it as often as seventeen times, others again but once or twice, the number of rashes for all injections being much lower than the percentage of rashes for all patients. The only explanation of this is that immunity to antitoxin must play some part. Of all cases 68 per cent. developed a rash after the initial dose, leaving 32 per cent. to develop rashes after succeeding injections. In this 32 per cent. are included some petechial rashes which have really no relation to antitoxin, and also some of doubtful origin. Then, again, when it is considered that over thirty cases received antitoxin more than ten times, making 300 odd injections out of a total of 1,056, that some immunity to antitoxin has been effected and also brings out the fact that the antitoxin used must have been uniform. This will be considered again under General Constitutional Disturbance.

There requires to be described four distinct types of erythema:

1. The urticarial.
2. An erythema with minute papular elevations.
3. A general roseolar erythema.
4. The purpuric.

Of these the urticarial was by far the most common, occurring in all but eleven cases, which were distributed as follows: two were of the second variety, the circumscribed erythema with minute papular elevation, four of the general roseolar type, and five purpuras, of which two alone should be described, the other three being petechial in character and due to other causes.

The lesion in the urticarial type is the same as that described occurring locally at seat of injury, and is of a migratory character, presenting itself in from twelve hours, or even less time, to three or four days. Its onset is from two to thirteen days after the injection has been made; but curiously enough, in a