

skin is unbroken it can do no harm, but when an exploding fire-cracker, for example, forces it down into the flesh, it begins to increase and multiply, and in the course of time convulsions and spasmodic contractions of the muscles follow, and death is not far away. The antitoxin, if injected at the time of injury, i.e., before the lockjaw develops, battles with the poisons given off by the germs, and so saves the patient's life, for the poisons and not the germs themselves cause death.

Tetanus antitoxin is very expensive and its value is not generally appreciated, even among physicians. In consequence there are many cases in which it is employed too late or not at all, and so the death rate continues to rise a bit each year just after the Fourth of July. But where its uses are known, it has demonstrated its value most dramatically. In Baltimore, for example, every recurring Fourth of July was once followed by the appearance of many cases of tetanus in the death returns; but after that holiday in 1908 there was not a single case! This result, true enough, was partly due to a police war upon fireworks, but it was also partly due, and no doubt in greater part, to the general use of the antitoxin immediately the injury occurred. I have had twelve cases of rusty nail injuries, without a case of lockjaw, because of the free use of antitoxin.

The fact that every American city cannot show a similar clean sheet is a sad commentary upon public and professional ignorance and prejudice. An injection of antitoxin, within a few hours after injury, is a practically certain preventive of lockjaw, and even if it is not used until a day later it materially reduces the violence of the convulsions, and in consequence decreases the chances of death. But if it is not employed until the patient's jaws are actually "locked" it labors under crushing handicaps, and requires the highest degree of skill in the physician to prove its usefulness.

Promptness, in truth, is an essential in the use of all antitoxins. That for diphtheria, for instance, is just about ten times as valuable on the first day as it is on the sixth day. The Pennsylvania returns show that among children immunized within twenty-four hours after diagnosis but four and a half per cent. die. On the second day the death rate rises to nearly nine per cent., on the third day to nearly fourteen per cent., on the fourth day to nearly twenty-four per cent., and on the sixth day to nearly twenty-four per cent., and on the sixth day to forty per cent.

And even when, despite tardiness, the patient pulls through, the complications which follow in the train of most infectious diseases