

fectious, although not to such a degree as scarlatina, measles, and small-pox. The other circumstances being favorable, a moist soil assists in spreading the disease, be the moisture a natural condition or brought about artificially, and particularly when the substratum is of an impermeable nature.\* A positive connection between diphtheria and filth cannot be verified, although the latter but adds to the evil influence of moisture. The contamination of spring water by human excrements, and of the atmosphere of the bed-chamber by the emanations from sewers, require further study. Several reports point to septic infection by drinking contaminated water, but a final opinion on that point would as yet be premature. Cold and dampness constitute an etiological factor in children, and in individuals with a predisposition toward the disease. Yet the statements concerning wind, temperature, and weather do not allow of any definite conclusions. Other circumstances being equal, natives of Massachusetts and strangers are affected alike.

Differences in the course and termination of the disease depend on the idiosyncrasy of the individual or family, and on age and on strength. Atmospheric conditions exert an influence which is not yet thoroughly comprehended. The period of incubation, where it was possible to determine it, was about a week. In adults the disease occurred less frequently, and in a milder form than in children. The disease was seen in babes of five, seven, and nine months. As during the prevalence of epidemics of typhoid and cholera, we encounter mild fevers and diarrhoeas, so during an epidemic of diphtheria there are always a large number of inflammatory affections of the throat.

The summary of the authors on this point is as follows:—Diphtheria is pre-eminently a disease of childhood. It is not frequent

\* J. G. Pinkham reports 614 cases of diphtheria in Lynn, 80 per cent. of which took place in valleys of brooks, in the vicinity of marshes, where the soil was damp and without artificial drainage. The immediate humidity of the atmosphere had no influence, however; nor was elevation of any account except in determining the condition of the soil. In all the endangered places the subsoil was an impervious clay.

among adults, very rare in old age. It is not frequent in the first year. Still there are, for physiological reasons, more cases before the third month than between the third and seventh or eighth. The sexes are liable to be taken in about equal proportion. Laryngeal diphtheria is more frequent in boys. Recoveries from it in girls. Diphtheria is apt to recur in those who once had it. Even membranous croup has been observed twice in the same patients. Some individuals, and even families, have a certain degree either of immunity or predisposition. Exposure and "colds" may act, but as proximate causes only. Most cases take place in the winter months in our climate, but there is no "invariable season law." "Filth" contributes to the generation of diphtheria, as it does to dysentery and typhoid fever. The question of a live origin of contagious disease in general was raised by Henle in 1840, also by Sir H. Holland and Eisenmann. Some pathologists find the morbid source of diphtheria in bacteria. "No bacteria, no diphtheria." This is not truer than that fermentation or putrefaction depend on bacteria only. The presence of bacteria in the diphtheritic blood has not been proven. There is no theoretical ground for assuming that preventing the bacteria of a diphtheritic patch from making their way through the underlying mucous membrane will, *per se*, prevent general diphtheritic infection of the system. On the contrary, the septic and putrid poison is claimed by A. Hiller as distinctly chemical. Of the same nature, viz., chemical, is very probably the poison of those of the infectious and contagious diseases in which the presence of a characteristic parasite is a recognized fact, as anthrax and relapsing fever.

#### MANNER OF INFECTION.

The entrance of the diphtheritic poison into the system is not the same in all cases. There are cases in which the origin of the disease is decidedly local. There are others in which the poisoning of the blood through inhalation is the first step in the development of the disease. In many cases both a sore integument and the lungs are the inlets of the poisons simultaneously. It is probable that the configuration of the vestibules of the respiratory apparatus, and the amount of active