

edly the disease is a zymotic, and probably due in most instances to microbes of a particular species. In regard to diphtheria, I believe, however, it to be, of all human diseases, the one to which a remark of Dr. Klein applies in a very special sense. He says: "Amongst the region of different species of micrococci and bacilli occurring in putrid substances, the great majority are quite harmless; when introduced into the body of an animal they are unable to grow and multiply, and therefore are unable to produce any disturbance. But some few species there are, which although ordinarily growing and thriving in putrid substances, possess the power, that when introduced into the body of an animal they set up a specified disease."

Regarding the culture and inoculation experiments which have been carried on up to date, with the bacteria found in diphtheritic membranes, Sternberg has summed them up by saying, after discussing the experiments of Oertel, Eberth, Waldeyer, Klebs, Formad, and Woods, and giving those of his own:—

"It is apparent from what has been said that the micrococci, bacilli (Ewart), and fungi (Leitzersch), which have been supposed to be the cause of diphtheria, present no morphological characters by which they can be distinguished from similar organisms which are found in the mouth and fauces of patients suffering from another disease in which the throat is involved, *e.g.*, scarlet fever, and of healthy individuals—at least so far as the micrococci are concerned."

He adds, "Morphological identity cannot, however, be taken as proof of physiological identity, and indeed we have ample evidence that certain organisms demonstrated to have pathogenic properties do not differ in form from others known to be harmless."

The experiments of Loeffler, carried out under the supervision and after the methods of Koch (1884), are the most recent of any I am aware of, and are definite in their statement of results. He discovered the presence of two distinct organisms, a micrococcus inoculation with which produced lesions like erysipelas, and a bacillus situated in the deeper tissues.

His conclusions are summed up as follows:—

1. The organisms were not discovered in every case; but this may be explained by supposing their

elimination during the course of the disease, as occurs in the case of other pathogenic bacteria.

2. The arrangement in the pseudo-membranes of rabbits and chickens (produced by inoculation) was not as typical as in cases of human diphtheria.

3. The application of the organism to the healthy mucous membrane gave no result; but it is not known whether a minute lesion is not necessary for the production of the disease in the human subject, and besides there is no tonsil with crypts and recesses favoring vegetation in these animals.

4. None of the surviving animals ever had post-diphtheritic paralysis.

5. The mucous membrane of twenty healthy children was examined with the result of finding bacteria once.

Thus from every source of information it would seem that we are daily obtaining evidence that the disease is an exhausting blood-disease in which the constituents of the blood and tissues are fed upon and altered, and the system poisoned by the products of sepsis.

From statistics and personal experience we know that the disease prevails more largely amongst young children, may remark *en passant*, that the dangers attendant upon a case of diphtheria vary much with the age of the patient. Ordinarily speaking, we expect diphtheria amongst children between the ages of 3 and 12 years.

Let us then take a typical case during this period of life. In most cases when called upon to visit professionally a child with diphtheria, we find our patient restless with hot skin, furred tongue, tonsils, uvula, and velum palati more or less swollen, hyperæmic, and in healthy children, usually of an arterial character. Should there be further an inflammatory exudation of a white, rather than creamy color, filmy and membranous, we are in a position to say with much certainty, especially when the disease in addition is endemic in the neighborhood, that it is a case of diphtheria we have to deal with. Especially is this true when the membrane is closely adherent and not removable without hæmorrhage.

We are made still more certain when there is a history of dullness, lassitude, and loss of appetite for two or three days previous.

In a special sense, therefore, we have to devote ourselves to the ends of preventing as far as possible the development of septic organisms in our