

be observed in prescribing exalgine are:—1. To commence with doses not exceeding from two to five grains. 2. Not to give more than from ten to twelve grains in twenty-four hours. 3. To consider the febrile condition as a formal contra indication. With these precautions, exalgine may be ordered with confidence and without hesitation.—*A. S. Gubb, in Medical Press and Circular, Feb. 26, 1890.*

EXPERIMENTAL RESEARCHES UPON THE DIPHtheria BACILLUS.—Klebs in 1883 published experiments, in which he found two different micro-organisms in diphtheritic products. Loeffler found Klebs' bacillus in the deeper layers of the false membrane, and obtained pure cultures of it, demonstrating experimentally its eminently pathogenic properties. The bacillus lived and died *in situ*, being never found in the blood, or viscera, but acted upon the constitution by producing a poison. The streptococci, which have been found in false membranes, predominate, especially in post-scarlatinal diphtheria, and to them is due the necrobiosis of the tonsil occurring in this form of diphtheria. Contrary to the diphtheria bacillus, they are found in internal organs (heart, liver, spleen, and kidneys). Their pure cultures never produced false membranes in animals, and they are therefore not pathogenic of diphtheria. The inoculation of Loeffler's bacillus upon scarified surfaces always produced false membrane identical with human diphtheria, their inoculation in cellular tissue produced vascular lesions, œdemas, hæmorrhages, etc. Loeffler, however, remarked that the bacillus had not been isolated in some typical cases of diphtheria, it had further been found in the saliva of a healthy child, and animals which survived the inoculations did not present paralytic phenomena. Later on, Loeffler demonstrated a pseudo-diphtheritic bacillus which had no pathogenic action upon animals.

In 1888, Roux and Yersin verified Loeffler's researches, with the important addition that they were able to produce experimentally in pigeons and rabbits late paralyses, which resembled post-diphtheritic paralysis in the human subject, and they obtained solutions from their cultures which acted as chemical poisons retaining pathogenic action. In 1889, con-

tinuing their researches at the Pasteur Institute, they succeeded in producing the same paralyses in a dog, and also toxic albuminuria. In 1889, d'Espine made experiments to show the action of various antiseptics upon Loeffler's bacillus, which he demonstrated to be the specific bacillus of diphtheria. Kolisko and Paltauf also found the bacillus in fifty cases of diphtheria, and never in the pseudo membranous sore throat of scarlatina and measles. Ortmann also isolated the bacillus in fifteen out of sixteen cases from diphtheritic false membranes, and Spronck, of Utrecht, repeated the experiments of Roux and Yersin, producing late paralyses and albuminuria from the injection of filtered cultures in the rabbit and pigeon. He also, with Wintgens and Doets, isolated the bacillus from the false membranes, in seven cases of diphtheria. Zarinko, from twenty cases of epidemic diphtheria, isolated and cultivated Loeffler's bacillus in eighteen, which in eleven cases of catarrhal origin (common catarrh, scarlatina, measles) the bacillus never occurred. In eighteen cases where examination of the apparently normal pharynx was performed, the bacteriological results were negative.

D'Espine and de Marignac isolated Loeffler's bacillus in eleven cases of diphtheria. These results were negative in four cases, of which only two exhibited the clinical aspects of diphtheria; in one of the others, of scarlatinal origin, the streptococcus was found also in the last case of "diphtheria" of the wound after resection of a knee.

The normal diphtheria bacillus resembles the tubercle bacillus in length, and its form varies much with the age of the cultures, the medium of cultivation, and method of coloration. The authors give the following method for detection of the bacillus in false membranes: A small thin piece is stretched over a cover glass, dried over a flame, and rapidly coloured with gentian blue. The bacilli appear under the form of slightly curved sausage-shaped organisms, strongly coloured, and having nearly always the same length. They are most numerous in recent membranes. Gramm's method of coloration is serviceable to detect saprophytic bacilli from diphtheritic in false membranes, the former being entirely decolorised, the latter not.

The authors discuss the action of light and