

considerable difficulty in obtaining a sufficient supply of the serum. In France its preparation on a large scale has been undertaken by the Pasteur Institute, and it is hoped that in a couple of months' time the supply will be sufficient for the needs of France. The British Institute of Preventive Medicine expects shortly to be in a position to supply a considerable quantity. The treatment, however, is rapidly passing out of the experimental stage, and in the case of a disease so murderous as diphtheria, which produces annually so fearful a mortality, especially among children, the public may well look to the State to take steps to insure a constant and adequate supply of the remedy at a reasonable cost. Professor Behring, in an address before the German Naturalists' Society of Vienna, stated that in Germany and Austria alone the mortality from diphtheria might be estimated to be about 2,000,000 in every ten years. The serum treatment would reduce this high mortality, amounting to over 50 per cent. of the persons attacked, to 10 per cent., and, if employed in the early stage, to 5 per cent. "In other words," he added, "about 1,500,000 lives may be saved every ten years, but of course the serum must be obtainable in large quantities. This is not now the case, and will not be the case until the State takes the matter in hand and prepares it at the public cost." The mode in which the serum is obtained at the Pasteur Institute is as follows: The animals which are to furnish the antitoxic serum are rendered immune by the injection, under certain precautions, of the toxin of diphtheria. This toxin is formed when the virulent bacillus is grown in broth, and in practice the rate at which it is produced is increased by drawing a current of air through the culture liquid. After three or four weeks the culture is sufficiently rich in toxin to be used. The animals employed are horses in good health, and previously tested by the injection of mallein to prove that they are free from glanders. The culture, filtered through a porcelain filter, yields a clear liquid, with which the horse is inoculated by injection under the skin. Gradually, by repeated injections over a period of two or three months, the horse is brought into a condition in which its serum possesses very high antitoxic properties. The animal does not suffer in health at all, or only to a very slight degree. The efficacy of its serum having been ascertained by a test experiment on a guinea-pig, the animal is bled. It suffers little from this operation, and it is possible, if necessary, to bleed it again in two or three weeks, but it is advisable in the interval to strengthen its immunity by some further injections of the toxin. The animals used are cab-horses, sound in constitution, but broken down in limb, who after inoculation live a life

of ease and luxury, varied by a periodical phlebotomy, such as our grandfathers submitted to voluntarily two or three times a year.—*British Medical Journal*, Oct. 6, 1894.

*Behring's Antitoxin*.—Dr. H. U. Walker, in reporting a successful case, states, with regard to Behring's solution, that it has been proven that if a mixture of 0.001 cubic centimetre (1-64th grain), with the same amount of poison, is subcutaneously administered to guinea-pigs, not only are no symptoms of disease caused, but also no local symptoms are observable, especially no infiltration at the place of injection. The antitoxin solution contains 2 to 2.5 per cent. egg-albumen and a further admixture of 0.4 per cent. trikresol for preservation purposes. For the immunization of adults and elder children 1 cubic centimetre (15½ minims) of the solution is injected subcutaneously by means of a Pravaz syringe, which has been previously sterilized by alcohol and 3-per-cent. carbolic-acid or 1-per-cent. trikresol solution. For young children up to 2 years the dose should be 0.55 cubic centimetre (8 minims). The above quantity of antitoxin thus administered to persons threatened by diphtheria is at least ten times as much as is required to render them immune. The immunity from diphtheria is therefore much more lasting.—*Lancet*, October 6, 1894.

*Manner of Using Antitoxin*.—In order to arrive at any satisfactory conclusions, it is all important that in every instance where antitoxin is used there should be a bacteriological examination of the throat. It is also important that the urine of the patient should be examined for albumen before and after the injection. The dose for procuring immunity, according to some observers, is 1 cubic centimetre (15½ minims) for any age over 3 years, and half that for younger children. For a cure of the disease during the first 2 or three days, under 2 years of age, 2 to 3 cubic centimetres (31 to 46 minims); from 2 to 10 years, 5 cubic centimetres (1¼ fluidrachms); over 10 years of age, 10 cubic centimetres (2½ fluidrachms). After the third day, in a severe case, twice as much may be used with positive advantage. If the disease does not seem to be ameliorated by the first dose, a second should be given in twelve hours. The question of dosage is one that can only be decided by a more extended use of this agent. In the account of the cases treated there is no evidence of any distressing or annoying symptoms caused by the injection. One advantage of this treatment is that, after the injection, into the back or abdomen, there is no interference with the patient; no swabbing of the throat; no tearing of the mucous membrane. It is stated that even in the worst cases that proceed to a fatal end there