

influence of both heat and chemicals much more readily than their spores. Dr. Kooh, now so famous in connection with the cure of consumption, says that the spores of anthrax, or splenic fever are only killed in a five per cent solution of phenol, when exposed to it for twenty four hours, but that the bacilli themselves are destroyed by a solution of one per cent. A solution of one fifth of one per cent. is the strongest that can be fed to bees. Most of the drugs recommended as remedies for foul brood will kill the mature bacteria with which they come in contact, and will prevent their multiplication, but they will not destroy the spores, when used in the greatest proportion possible among live bees and brood. When a cure is affected with drugs the different *hatches* of bacilli, so to speak, are killed by repeated applications, until there are no more spores to germinate.

A solution of corrosive sublimate, about one in one thousand, is sure death to all bacteria and spores. It is a very powerful poison, and cannot be fed to bees or used with effect as a spray, without killing the patients as well as the disease germs. One eighth of an ounce in a gallon of water may be used as a wash for the hands, smoker, and other implements. Half a molasses barrel-ful of the solution will cost less than a dollar and a half. In this solution hives may be dipped and disinfected at a trifling cost, but they must be thoroughly rinsed to remove the poison. It has been recommended that one ounce of potassium permanganate be added to every four gallons of the solution, coloring it, to prevent possible accidents, arising from mistaking the solution for water, whilst it is also a useful disinfectant.

Sulphurous acid, produced by the burning of brimstone will kill exposed bacteria, but will not kill their spores.

The method of cure, by changing the bees to a clean empty hive in the honey season, has been more generally successful than any other. It was practiced by Seydell in 1767, by Voight in 1775, by Bonner in 1789, by Della Rocca in 1790, and was given in Quinby's "Mysteries of Beekeeping" in 1865. It is contended by some that, inasmuch as the disease lurks in the honey, the bees should first be placed in a state of quietude and starved till the last particle of honey in their honey sacks is consumed. Even if it were possible to know when the last particle of honey in every bee was consumed without making a post mortem examination of each one, placing the bees in a state of quietude in which their functional activity is reduced to a minimum, is about the poorest possible way of causing a speedy consump-tion of the honey

carried with them from the diseased hive. Besides this there is abundant evidence to show that the vitality of bees thus treated is so reduced by want of food that the stock is found to be seriously injured for work for a considerable time. The alternative method of feeding the bees liberally during their confinement, causing them to secrete wax and build comb, is found to be more effectual in changing the contents of their honey sacs, while at the same time the bees are kept in a state of vigorous health.

The theory that the disease is most commonly communicated from hive to hive, and from one apiary to another, in honey rests on circumstantial evidence which is not conclusive to every one. Diseased hives have been robbed without the disease being carried by the robbing bees. Prof. McLain, gives apparently strong reasons for believing that the disease germs most commonly lurk in the pollen. Cheshire says "such minute bodies as bacilli, produced in inconceivable numbers in the hive, must occur in honey as an occasional contamination, but the idea that they grow in the honey is quite contrary to all evidence. They cannot grow in any fluid having an acid reaction". All experimenters find it necessary to make their cultures slightly alkaline, or else the bacteria will not grow and multiply. To settle these questions we require experiments to determine whether a large number of cultures can be freely inoculated with bacillus alvei, by the addition of honey, and of pollen, taken from diseased hives. As the settlement of these questions has an important bearing on one of the agricultural industries of the country, our Association might fairly ask the Director of the Dominion Experimental Farms, and the President of the Ontario Agricultural College, to have the investigations made in their laboratories. Ordinary beekeepers lack the time, the appliances, and above all the skill, to make such experiments for themselves. Speaking of such investigations, Tyndal says "here, as elsewhere, in these difficult enquiries the sagacity which comes in a great part from nature, the skill which comes from training, and the care which ought to root itself in the moral constitution, are all necessary to save the experimenter from error, and to lead him to truth."

S. CORNEIL.

Lindsay, January 6th, 1891.

] Meyers.—Wish to know if queens really did carry the disease.

S. Corneil.—Queens discharge fæces. The spores are in the honey, and they pass through and are discharged in the fæces. Even though all bees which