

of the hive as possible. The evaporation is rapid and with very strong odour. Hence, if too much used, the brood will be deserted by the workers and death of the bees may take place. As soon as the dose has evaporated it is renewed.

As a preventive, naphthaline has been very favourably reported upon by a number of writers; and Cowan (73) states that he inspected very thoroughly a live belonging to Merney which had been cured by this substance.

Experiments. In our laboratory, crystals of naphthaline about the size of a large pea were put into test tubes containing sloped agar, inoculated with one loopful of spores, capped with tin foil paper and kept at 22° and 37° C.

Results. After 48 hours—good growth in all tubes. Inoculated agar plates containing a crystal of naphthaline likewise gave good growth in 24 hours at 37° C, as did also the control tubes and plates. Hence, we conclude that naphthaline has no antiseptic power; and we are forced to look upon its use rather doubtfully. It may, perhaps, act as a stimulant.

(11) *Formic acid.* This substance was first suggested by Dønnler in 1885 (74), but he did not ascertain the strength in which it could be used. Sproule (75) states, that since the year 1882 he had successfully treated foul brood with formic acid. He was the first apiculturist to use the remedy and give the treatment. The solution used is pure acid, 10 parts; water, 90 parts; and the treatment is as follows:—

A part of the comb is taken from the hive and as many bees as possible are shaken from the diseased comb; and then two or three empty combs are used, into one of the sides of which 100 grams of the solution are poured, while it is held inclined so as to allow the liquid to run into the cells and stay there. These combs are placed on each side of the brood, the side containing the solution next the brood. Eight or ten days after, an inspection is made; and if there is no cure, the dose is renewed and continued every week until the cure is complete, which is often after the first treatment. In fact the disease rarely resists the second or third application. To hasten the cure, this remedy can be given in the food of the bees—a teaspoonful to a litre of syrup.

Experiments. Formic acid probably has an important rôle to play in the keeping properties of honey. As long ago as 1878, formic acid was found in honey; and Muhlenhoff (76) observed that when honey is not intended for immediate use, the bee deposits in each cell a drop of formic acid, secreted by the venom glands, and then seals the cell. Erlenmeyer (77) says that formic acid of the strength of 1.205 gr. to a thousand parts of water was antiseptic. Planta (78) refutes Muhlenhoff's idea that 100 grams of sealed honey contains .0186 grams of 22% formic acid. "100 grams is the capacity of 165 worker cells, but the smallest droplet of venom contains at least .0254 grams of formic acid, which would make for 165 cells, 4.1910 grams; that is to say, 200 times more than there is in reality." This opinion is, however, contrary to one expressed before by the same writer, in the year 1884 (79).

Formic acid seems to help bees to ward off the disease, especially when we supply it to them ready made; and that found in certain kinds of honey has probably an antiseptic effect. Two samples of clover honey and two samples of buckwheat honey were analyzed in our chemical laboratory with the following results:—

1	Buckwheat honey	0.15	grains of formic acid in 100 grains of honey.				
2.	"	0.17	"	"	"	"	"
1	Clover honey	0.0579	"	"	"	"	"
2	"	0.057	"	"	"	"	"