

demand for larval food, and essential in maintaining the health and vigor of the bees while the digestive and secretory organs are being taxed to the limit of their capacity. This failure of natural resources results in low vitality, susceptibility and predisposition to disease, and inability to successfully perform the function of hibernation. With some exceptions, due to local advantages, throughout the States stricken by the drouth of the past summer, the bees have entered upon the period of hibernation under conditions more or less unfavorable in proportion as they have suffered in greater or less degree from the effects of the all-consuming drouth and heat.

The symptoms of starved brood are distinctively characteristic. Upon opening the hive a slightly offensive odor may be noticed if the colony has been suffering for some time. If the comb frame be lifted from the hive, and the bees shaken off, few if any eggs can be found. Of such brood as is sealed, the cappings to be thin and flat, and slightly sunken, and commonly of darker color than is usual in prosperous colonies. Upon opening the cells they are found to contain dead pupæ in various stages of development, always inferior in size, and the food supply exhausted.

In the midst of sealed brood patches of uncapped larvæ appear, and sometimes a patch of 5 or 6 inches square, and sometimes there seems to have been no effort made towards sealing half the grown larvæ in the hive, although the time for such sealing may be far overdue. The membranes of such larvæ do not present the plump, pearly-white appearance common to well fed larvæ. On the contrary, the membranes are more or less shrunken and wrinkled, and not unfrequently, when the larvæ have reached the advanced pupa stage, the compound eyes begin to color, and the cells are partially capped and then abandoned, and the appearance is that commonly designated by the term, "bald-headed bees." Sometimes a few of these bees, dwarfed in size, emerge from the cells and engage in the hive with what vigor and for such term as their limited development will permit.

In a number of tests made during the past season, the progeny of the same queen, reared under directly opposite conditions of larval growth, so varied in size as not to be recognizable as offspring of the same progenitors. The reason for this variation was not far to seek. The changed conditions of the colony during the time when the different generations were being reared, determined the modification in development. The remedy I used and prescribed for others was a preventive rather than a curative.

Starved brood means starved bees. If the cause be removed, the effect speedily disappears. All that needs to be done is to supply them with a substitute for these resources essential to their own health and vigor, and indispensable in brood-rearing, in search of which they are rapidly and vainly wearing out their vitality.

The recipe for preparing the remedy is as follows:

To 10 pounds of sugar add half a pint of dairy salt, 2 table-spoonfuls of soda, 2 table-spoonfuls rye flour, 2 table-spoonfuls of very finely powdered bone ash, and 1 table-spoonful of cream-of tartar. Mix thoroughly, then add 2 quarts of hot water, and stir until thoroughly dissolved, then boil for two or three minutes only. To one-half a pint of fresh milk add three fresh eggs thoroughly beaten, and when the syrup is cool enough to feed add the eggs and milk, and when thoroughly stirred, feed warm. Feed in the hive as one would feed honey or syrup.

I used this same food for preventing spring dwindling, and for building up colonies to full strength and efficiency, so that all colonies may be ready for work at the very beginning of the season, when surplus honey may naturally be expected. This food fed in the hive keeps all the bees at home to aid in performing the functions of brood-rearing, and in keeping up the temperature of the hive instead of spending their little remaining strength in battling against the cold, damp winds while searching for the food elements needed to repair the waste and drain upon their vitality while hibernating, and indispensable in brood-rearing. This food is not intended for use until after the bees have had a good flight in the spring, and almost any grade of honey or sugar may be used. This special food is a potent stimulant and tonic to the adult bees, giving tone and vigor to the organism, and furnishes the elements essential in brood-rearing in the place and in the manner suited to the convenience and tastes of the bees. No greater quantity should be fed than is required for the current needs of the colony.

THE CONTROL OF REPRODUCTION.

In ordea that the laws of heredity and the active principles of selection may be practically and persistently applied in the breeding of bees, I have in obedience to your instructions continued my experiments, striving to discover a simple and practical method for securing control of the natural process of reproduction.

I devised and constructed a fixture, which I call a fertilizing cage, 22 feet square and 26 feet high. Selecting a level plot of ground I set 4 rows of posts, 4 posts in each row, forming a