November, 1912

would feed the larvae, not so well as the younger bees, but they could adapt themselves to the work of the younger bees if it was absolutely necessary. On the other hand if we had a colony composed largely or exclusively of young bees we would find they would go to the field sooner than would be the case under normal circumstances. But in the normal colony we have a marked division of the labor of the colony according to the age of the bees. It has been stated in a number of bee books and in other places that there is a division of the castes inside of the hive, some of which secrete the wax, others which guard the colony, others which clean out the colony and still others that feed the brood and so on, but that is not correct. For instance, if a colony of bees is carefully watched during wax secretion it will be seen that some of the bees hanging in the curtain will separate themselves from the curtain and go over and feed a few of the larvae or clean out some place that needs cleaning out, and after a while come back and deposit on the comb, which is being built, the wax that, in the meantime, is being secreted in the wax pockets, and they shift around. Those feeding broods will go over and hang in the curtain while others secrete wax, so there is no demarcation in castes inside of the hive, which has often been reported. But perhaps the most interesting part of the division of labor is that which occurs outside the hive. Supposing an apiary were located in the region where white clover is abundant, and in the apiary itself and on the grounds there were 100 heads of white clover secreting nectar. Did it ever occur to you that the bees are no more prevalent on the clover within 100 feet of the hive than at some distance. Why is it if these 100 heads of clover contain nectar as they do, that every bee that comes out of the 100 colonies does not rush for these single heads of clover scattered through the apiary? There must be some system to this, because if a

340

bee's one ambition were to find a clover head naturally they would all go for it. But you don't find bees any more prevalent right in the apiary than you do a quarter or half a mile or mile or more. We have no very good explanation of this fact which all of us know to be true. but there was some good work done by a Frenchman named Bonnier a few years ago which is most interesting in this connection. I will give you an illustration of one of the experiments which he performed out of a great many to show what he thought to exist in the community of bees. First of all he cut ten twigs off a honey plant,-I have forgotten what he used,-and put them into bottles of water to keep these twigs fresh so that the blossoms which were on them would keep on secreting nectar, and he put them out one afternoon away from all other honey plants in an open field where he noticed the bees at work. They were working in other fields and around on the edge of fields where other plants were in bloom, but right out in the middle he placed these ten twigs. He put them out and sat down beside them and waited and no bees came. These were exactly the same kinds of plants as those on which they were working elsewhere. All afternoon no bees came, and his first conclusion was that the abnormal conditions under which he had placed these twigs had stopped secretion. However when he took a similar twig and put it right where the honey plants were the bees worked on it normally, and he was forced to the conclusion that they were still secreting nectar, but out to this open field no bees came. But next morning at daylight he was out with these plants again. In a little while a single bee came and flew over this group of plants which he had in the bottles. It alighted on one of the flowers for a very brief space. It did not suck any nectar, did not gather any pollen, simply alighted on one flower long enough for him to touch it with a brush which he had ready to

November,

leave a spot could idenif it. The bee time this be turned and a bee came "B, another came ing each one thorax with d could be ide seven bees at 1 he had cut and back to this sa the flowers wh Out of the sev pollen all day and those that touched the pol the same flowers pollen never su bees came but n these flowers Th was out again a came back and these same flowe. perfectly fresh co ing nectar. Whe retained the same the place where h and cut what he : valent amount of in ten bottles which side the others. back to their work supposed was doul they flew away fro soon he found that he also numbered w group of twigs. Ty pollen and four gati concluded his judg particularly good in ly the right amount; to be the same amou evidently in some wa was not quite as muc as in the first. But to work all day, four nothing but pollen a gathering nothing but