

covers, especially red clover, where bumble-bees were enclosed in the sacks, the fruitage was equal to that of the uncovered plants

These experiments seemed to show conclusively that cross-pollination was necessary, and that bees and other sweet-loving insects were a most important factor in securing a full crop of fruit.

It has been objected to the above experiments, that the very fact of the covers vitiated the results; that very likely the covers themselves would partially or wholly prevent the development of fruit. I would reply that in hand pollination such is not found to be the case, and that in some of the above cases the flowers were covered, and bees caught and put inside the covering sacks, and a good yield of fruit secured.

EXPERIMENTS AT POMONA COLLEGE.

Upon coming to this State and county, early this year, it occurred to me that it was very desirable that similar experiments should be conducted at this place. That a thing is true in Michigan is no certain proof that it is so under the very different conditions of California. If cross-pollination is essential here, where fruit culture and bee-keeping alike are important industries, it is very important that it should be generally known, that the fullest benefits of such knowledge may be secured. I therefore commenced some investigations, which though less extensive and complete than I should like, and less so than the importance of the subject demands, are as much so as the time at my command would permit. Some of the experiments, indeed we may say all of them, are yet in progress.

Among deciduous fruits I have experimented on plums, cherries, apricots and pears. I am also investigating the pollination of the orange and lemon among citrus fruits. As yet I can only report

on the deciduous fruits, and of these the report will be but partial.

The experiments were conducted in much the same manner as in Michigan, only in every case I put bees in one of the sacks surrounding the blossoms, and in one experiment with the plums I removed one sack when the bees were working in force on the tree, and marked the blossoms on which I saw the bees alight; covering all up again as soon as I ceased watching them. I caught some of the bees and examined them with a lens, and found their heads, legs and bodies well dusted with the pollen. A similar examination of the flowers showed that they had received pollen from the visiting bees. The number of blossoms in each experiment varied from 32 to over 100.

As soon as the blossoms withered I removed the covers, and a week later found what seemed healthy developing fruit in abundance on all the twigs. Thus we see that any lack as the result of cross pollination does not show at once. Last Friday I examined all the twigs. The plums—two different trees in different orchards—the cherry and the pears (two trees) show not a single fruit on the twigs from which all bees were excluded, while those covered with sacks in which bees were put, given on plum in one case three, in the other five; the cherry five and the pear six and eight, respectively. The limbs uncovered from the same number of blossoms give eight and five on plums; the cherry seven; and the pear eight and eleven.

It will be observed that only from one-fourth to one twentieth of the blossoms under observation have developed fruit. You all know that this is always so. The blossoms are in clusters of five, more or less; while the fruit, if we except crab-apples, is usually single. In case of oranges, how very few of the blossoms come to fruit.

(TO BE CONTINUED.)