

whole trouble has arisen over the translation, and the fact that Mr Young did not know the force of the word "ring" as we here understand it, and that he meant no disrespect to those interested. In our reply to Mr Young we recall to his memory promises made us while here, that he would have a friend in New York do the translating for us, and failing in that he would himself translate his articles for us, on our promising to correct any little inaccuracies of speech to suit the idiom of our own country, also that we wrote him after his return, pressing the request for these translations, but failed until now to receive any reply. This we write in answer to his remark that we had his journal always sent us, and that we might have examined it for ourselves.

From the Bee-Keepers' Guide.

#### Changes Effected in Syrup and Nectar by the Secretions of the Bee.

**T**HE changes effected in syrup and nectar by the bee are matters which are beyond the range of observation of the ordinary bee-keeper. To be able to say of one's own knowledge whether nectar undergoes a chemical change or not, when mixed with the ferments in the secretions of the bee, one would need first to examine the nectar as it is found in the different flowers, and afterwards, as it is stored in the hive. To do this properly, skill in the use of the polariscope, and of chemical tests is required, such as most of us do not possess.

We are therefore obliged to depend upon the results obtained by those whose life business it is to make such researches. The investigations made, go to show that the amount of cane sugar, or sucrose as the chemists call it, and glucose, found in the nectar of different blooms, varies very much. In a foot note, page 582, Bees and Bee-Keeping, Mr. Cheshire tells us that the nectar in the flower of the garden pea is almost wholly glucose, that of the claytonia is two-thirds cane sugar, and that of the fuchsia is five-sixths cane sugar, I have read elsewhere that nectar has been known to crystallize in the flowers of the fuchsia. Mr. Cheshire says further, "the blossom whence the bees gather nectar, yield mostly cane sugar, but this undergoes inversion [changing to glucose] through the action of the salivary secretions of the bee." The physiologists tell us that honey, and sucrose changed to glucose, are in the condition which requires no preliminary process of digestion, to fit them for

absorption into the current of fluid contained in the blood vessels. In view of this fact Prof. Cook is justified in calling honey, "digested nectar," because the change it has undergone meets the requirements of the definition for digestion, viz.:—A process which has for its object to fit substances for absorption into the system.

But what I particularly wish to discuss is the crystallization of sugar syrup in the combs, when fed for winter stores. Vinegar and other acids have been used to change the sucrose to glucose, but, as in the case of the nectar, it is impossible to know by mere inspection, whether or no the change has been effected, and often the first thing we do know about it is that the bees are starved between combs filled with candied sugar which they could not use, mixing honey with syrup to prevent crystallization is recommended by some, but it has not been a success with me, and, from the reports in the bee papers, the experience of some others has been no better than my own. Speaking of cane sugar when it is changed to sucrose, Prof. Wiley says "it does not crystallize." Evidently this is just the change we bee-keepers must learn how to effect, if we are to save our bees, when feeding sugar. Mr. Cheshire tells us that bees cannot take thick syrup without thinning it with their saliva, and that in the process of thinning the ferment in the saliva changes the sugar to glucose. He says further "when crystallized sugar is rapidly stored, the inversion [change to glucose] is very imperfectly performed, and considerable crystallization in the cells is the result." Ten years ago we fed in small feeders, which allowed the syrup to cool and become thick, and we rarely had a case of crystallization in the combs. Now we feed a gallon of hot, and therefore thin syrup, in a night, and it candies in the combs before spring. Recently Mr. Heddon wrote as follows: "For some reason unknown to me, sugars of late years are bound to crystallize in the comb, notwithstanding the more than usual amount of tartaric acid added." Instead of attributing the change to a difference in the sugar, I think it would be well to see if the supposed increase in its tendency to crystallize is not contemporaneous with the invention of a certain large feeder, which has "of late years" come into general use.

Rapid feeding has so many advantages that it is worth while to learn how to change the sucrose to glucose, before it is put into the feeders. I know of a gentleman, a graduate of English and German universities, who has made chemistry his special study. He has been for some years, and is now I believe, employed as chemist in a large sugar refinery in an American city. If I were the owner of a bee paper having 10,000