

suspended on limbs of trees. The cells were a little smaller than our drone cells; the drones were built in the same cells as workers, but the appearance of drones was different to worker bees. He found them not to be bad tempered, and their sting was not as painful as ordinary bees, and were awkward in stinging.

Prof. Riley, United States Entomologist, Washington, D.C., said the question which had just been taken up was problematical; yet he doubted that *Apis dorsata* would ever cross with our own bees. He had little hope in that direction, but he thought for other reasons it would be worth while to experiment.

Mr. Crane followed, dwelling upon the importance and necessity of improving our own races of bees.

Doctor Willetts, assistant Secretary of Agriculture, Washington, D.C., said the Department was taking much interest in the beekeeping industry; and the Secretary of that Department desired him to say that they were going to assist beekeepers in the advancement of the beekeeping industry. The Department would be pleased to hear suggestions. The experimental stations would do most of the work; the Department might assist in defraying expenses.

#### AFTERNOON.

A paper by Prof. Cook was read, "Detecting the Adulteration of Honey." Prof. Cook stated we could now detect the adulteration of honey, and therefore we could convict. From work done by Dr. H. W. Wiley, Dr. Kedzie, and Prof. Scovell, honey, if only one quarter adulterated with glucose, can be detected.

Dr. Wiley then followed. He stated that an analysis of honey had been made, and doubts expressed as to the ability of the chemist to detect sugar. Fifty-eight samples were sent, and in every case adulteration had been pronounced. Some, gathered rapidly, had been pronounced doubtful. He thought he could detect sugar fed to the bees, stored, capped and examined from honey gathered from flowers. It was difficult to detect the difference, yet there was a difference. He

did not agree with Prof. Cook in this. Dr. Wiley mentioned a brand of honey found in almost every store, "McMechen's old Virginia" always adulterated. Of samples secured, forty-five per cent were undoubtedly adulterated. Pure honey does not show right handed polarization, and such samples show a high percentage of ash; from the latter alone glucose can be detected. Honey gathered from the exudation of aphides showed a slight right handed polarization. He thought a pure floral honey will have eighty-six to ninety-six per cent reducing sugar.

He tested a pure exudation from the aphides on pine trees, and found it much the same as after the bee had gathered it and stowed it in the comb. Now, if all the adulterated material could be excluded from the market (it was fifty per cent), what a relief it would be to the beekeeper. Honey should have the protection of legislation; it was strange that butter should have been singled out for protection and not other articles, such as honey. The skill of the chemist will keep pace with the beekeeper. Another adulteration had cropped up, that with invert sugar. This was more difficult, and was secured by feeding cane sugar to the bees which inverted it. Prof. Cook thought that nectar was cane sugar and was inverted by the bees. He did not think that Prof. Cook was right about nectar. He explained that at a certain temperature he could detect the difference between honey from flowers and sugar syrup fed to bees and then extracted; if honey and syrup were mixed he could not.

Dr. Wiley then explained the method of analysis. The pollen in the honey assisted in discovering the source of the honey. They had never discovered an adulterated comb honey.

Prof. Riley stated he could not see that it was possible to state that any sample was the product of honey dew. He thought the natural product would vary very much, and this fact would make analysis difficult. He referred specially to honey dew.

Prof. Wiley's definition of honey was that it was a saccharine substance gathered from flowers.