

digestive action. You know that as food passes through the mouth it is mixed with the saliva, and there is in the saliva a chemical substance, ferment or diastase known as ptyalin which acts upon the starch of the bread or the starch of the potato we may be eating and converts it into sugar, and that sugar then is assimilable and passes into the blood. If it were not for that saliva and the principle it contains that starch would be indigestible and therefore unassimilable. Just in a similar way the saliva of the bees acts upon the nectar they collect and converts the sugar of the nectar into two very closely allied sugars.

Now, I must introduce just a little bit of chemistry, but it shall not be any more technical than I can possibly help. I want to tell you in the first place that there are in chemistry many kinds of alcohol closely related, first cousins and second cousins and so on, similarly there are many kinds of sugar; there are some of them half brothers, and some first cousins and second cousins, so that when we speak of sugars chemically, we may include a great family of closely related substances, but not absolutely identical in character. This fact you must bear in mind when thinking of the composition of honey. Let us consider first ordinary sugar that we see upon the table; that is known chemically as sucrose; that is cane sugar; it is the same material whether we obtain it from the cane or from the sugar beet. If we take starch, which is a sort of second cousin to sugar, and treat it with acid we convert it into a kind of sugar, but it is not cane sugar; it is nevertheless a sugar—and is known as glucose. Now we suppose that sugar in the nectar in the form of cane sugar and the saliva of the bees converts it into a sort of glucose, which on further ex-

amination proves to consist of two closely allied sugars, dextrose and levulose. It is very doubtful to me if there is really any cane sugar in honey at all. There might be under certain circumstances a small proportion, but sugar in honey is not in the form of cane sugar, but rather allied to the sugar of the starch.

Now, I must go one step further, if you will bear with me. How do we distinguish chemically between these sugars? We have various methods, one of which is the action of the sugar upon a certain kind of light which we call polarized light. With a certain kind of sugar placed in the instrument designed and constructed for that purpose, the ray of polarized light is turned to the right, and with another kind of sugar which chemically is closely allied to the first, the ray of polarized light is turned to the left. In honey we find a mixture of both those kinds of sugar. Now, it will help you to remember if you think of dextrose as right handed sugar, and of levulose as left handed; in honey we have dextrose, or right handed sugar, and levulose, or left handed sugar, and it has been found that these exist in about equal proportion.

Now let me read you a brief extract of the composition of honey, having said so much, from an English authority of high reputation. He says: "Chemically, honey is essentially a concentrated aqueous solution of certain sugars, dextrose and levulose being the most important constituents. Occasionally, a small percentage of sucrose appears to be normally present, especially in the new honey from bees fed on cane sugar, but after a time this constituent undergoes inversion." "According to James Bell, (who was the chief analyst of the Inland Revenue Department of the English Government) honey contains