

from 5 to 10 per cent. of a substance which undergoes conversion to glucose only by prolonged treatment with acid. (Maltose, gallasin?) Soubeiran and Dubrunfaut also state that honey contains certain undefined sugars, and the same conclusion is deducible from the analytical results of other observers.

Besides the true sugars, honey contains a sensible quantity of the "saccharoid mannite." It is not a pure sugar; it is not chemically a sugar, it is allied to the sugars but it is not chemically speaking a sugar. "Which may be isolated by fermenting a solution of the honey with excess of yeast, filtering, evaporating the filtrate to a low bulk, adding excess of boiling alcohol, evaporating the filtered liquid to dryness, extracting the residue with boiling alcohol, concentrating the resultant solution, and precipitating the mannite therefrom by the adding of ether."

"The other constituents of honey are water, small quantities of wax, pollen, mineral matter, traces of flavoring and bitter substances, organic acid, &c. Formic acid appears usually to be present in honey." The foregoing is an epitome of the results of these chemists. Then he goes on to give the results, on the average, as obtained by various chemists in England and upon the continent. I am just going to read you a few of those results. One authority, J. C. Brown, gives dextrose as 31.77 to 42.02 per cent; and levulose 33.56 to 40.43 per cent. Another authority gives dextrose 22.23 to 44.71; levulose 32.15 to 46.89; water 16.28 to 24.95, and so on. On looking over those results carefully the one thing that will strike you is this, that there appears to be great variability in the analysis in the composition of various honey. I say "appears to be" because I can scarcely believe that there is such a

great variation but nevertheless the results as they appear on record would give that indication, viz., that there is great variability. After adding up all the materials that have been determined and subtracting from 100 we have undetermined matter; one authority states it may be from 4.95 to 11.00 per cent; another from 1.29 to 8.82 per cent; another 8.48 to 19.17 per cent; another 8.67 to 10.79 per cent; and still another authority says the undetermined matter may amount to as much as 13.63 to 19.56 per cent.

Now all these analyses have been made by men of reputation, men endowed with skill and with honesty, but the difficulty has been in connection with the material itself and the process of analyses employed. And now I think I can tell you the reason for this apparent discrepancy. We understand that the two principal sugars of honey are dextrose and levulose. Let us consider their properties. Dextrose crystalizes; this is the material which you see in candied honey. Levulose, on the other hand, does not crystalize; it does not become solid; it assumes the form of a thick syrup; it is the sweetest constituent of honey; it is much sweeter than dextrose; further we find by experiment and analysis that in the artificial drying of honey it is extremely subject to decomposition consequently during the ordinary and usual methods of analyses employed as I hope to show you, decomposition of levulose takes place and its disappearance has been recorded by the analyst as water. Now, in order to allow you to intelligently follow me let me give you a brief idea of how the water in honey has been usually estimated. You see this little glass tube I have in my hand, it contains asbestos, known commonly as mineral wool and used for packing the tube;

Mineral wool after a fluid is thoroughly boiled is an excellent quantity to be thor-

al wool, how what the weight of honey. V honey is i when repla ed for a hat take e tube :