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SUGAR ANALYSIS*

This is an admirable manual of sugar analysis, and will prove a great boon to everyone engaged in sugar work. The *resumé* of the chemistry of the sugars with which the book opens is of especial value to the student who wishes to get a clear idea of this complicated subject. Perhaps it had been desirable to have had the book delayed a little longer in order to have incorporated the results of the last year's study in sugar analysis, but this objection would obtain equally against any book published at any time. Another valuable feature of the book is its collection of tables referring to all conditions of sugar analysis, viz. specific gravities, solubilities, etc. The author is careful to cite authorities for his statements, and thus anyone wishing to pursue any given topic further can readily do so without being at the trouble of hunting up each theme for himself.

There is, however, a vast mass of French and German literature on certain sugar compounds which might be very appropriately drawn upon in an exhaustive study of the chemistry of sugar, and which is of no use whatever to the analyst. There is much of this in the book before us, and while it detracts nothing from its merit as a help to the analyst, it certainly adds nothing to it.

That portion of the work which is devoted to the description of the optical examination of sugars is to be highly recommended. We have, however, used for three years a Schmidt & Hänsch polariscope, and were therefore a little startled to read "ordinary lamp light, and not the monochromatic flame, is required."

We doubt very much whether, in testing the accuracy of the scale of a polariscope, quartz plates of various thicknesses are better than solutions of pure sugar. First of all, the plates themselves would have to be tested, and this would require as much work and trouble as testing the scale directly with sugar solutions. If quartz plates could be secured which were absolutely accurate, of course this objection would not occur.

Among the sources of monochromatic light the author omitted to mention the new double burner of Laurent, which leaves nothing to be desired in the steadiness and intensity of the sodium flame.

There is one statement which the author makes in a note (p. 137) on Clerget's method of analysis that seems calculated to mislead. It is: "it must be remembered that the process is entirely inapplicable when any optically active body is present besides cane or invert sugar, and also if the invert sugar itself exists in an inactive condition as regards polarized light." In point of fact, any optically active body may be present without rendering the process inapplicable, provided it is not affected by the process of inversion. Thus, by Clerget's method we can accurately determine cane sugar in the presence of dextrose, maltose and glucose. In polarizing an inverted cane sugar, too, metal tubes should be used, since the temperature is more accurately obtained from an external thermometer than in a glass tube.

The author's directions for estimation of raw sugar and syrups are those which are generally recommended and employed. The description of these methods is full and admirably arranged. In fact, this praise can be bestowed on every part of the work. The only trouble about the methods is that if applied to the ordinary syrups of commerce they will give the most alarming errors.

The great fault of the work, in fact, is found in its failure to give reliable methods for the examination of the mixed sugars and syrups which are on the market to-day.

Perhaps, however, we should not say this is a fault of the book, it is rather a fault of science. To determine cane sugar, invert cane sugar, dextrose, dextrine, and maltose *exactly*, is a great problem which the author leaves untouched and which demands the careful attention of sugar chemists.

In papers read before the A. A. A. S., at the Boston and Cincinnati meetings, and published in the proceedings for the Boston meeting and in this JOURNAL, Nos. 65 and 66, Prof. Wiley has shown the relation between rotating and reducing power in commercial starch sugars and also a series of determinations of cane sugar in mixed sugars.

Since the polariscope has grown to be the chief instrument in sugar analysis and starch sugars and syrups a common article of commerce and consumption the omission of any reference to those papers is a matter to be regretted.

* Manual of Sugar Analysis, by J. H. Tucker, Ph. D., Van Nostrand, New York, 1881.