

cane it becomes the last instead of the first of the chain. All the cells are successively treated in like manner. Thus as little water as possible is used to dissolve out the sugar—a very important factor, since all the water will have to be evaporated off. This so-called diffusion juice contains approximately two thirds the percentage of sugar found in the mill juice of the same cane; or in other words, two thirds of the “diffusion juice” may be considered as pure juice and the remaining third as water added to it.

The juice, no matter how obtained, contains in addition to water and sugar, a considerable portion of other compounds. Among these are albuminoids, amides, colouring matter, organic acids, gums and mucilages. All these have to be removed as much as possible before the evaporation of the water is begun. Frequently sulphur dioxide, produced by burning sulphur, is first used as a bleaching agent; but unless it is decided to produce the highest grades of sugar directly at the sugar house, the advisability of its use may be somewhat questionable, since it has a tendency to reduce the sugar yield. Lime is invariably used as a clarifying agent, either alone or directly after the use of sulphur dioxide. It is generally added, suspended in water, to the juice, in large iron tanks—generally enough to make the juice slightly alkaline. The mass is slightly boiled and the skum removed from the top several times, or rather just as the scum forms. The precipitate is allowed to settle and the clear liquid drawn off. A further clarification and the removal of any excess of lime by the use of phosphoric acid will probably be adopted in the near future. The skimmings and settlings are pressed through heavy canvas filters, and the liquid separated from them, which of course contains a considerable percentage of sugar, is added to the other portion of clarified juice, which is now ready to be boiled into sugar. The solid portion is thrown away or used as a fertilizer.

The evaporation of the juice is generally carried on in two stages. The first, to near the point of saturation; and the second to such a consistency that it will still run readily out of the vessel in which it has been boiled. Both these concentrations are almost invariably conducted in a partial vacuum. The vacuum is increased with the concentration of the juice. The initial evaporation is generally done in two or three separate vessels, the steam of the first being used to heat the