

second and that of the second to heat the third. The final concentration is accomplished in a large iron vessel containing seldom less than five to six tons of sugar, or rather of a mixture of molasses and sugar, when the boiling is completed.

The molasses is separated by centrifugal force from the crystals of sugar suspended in it. In making the finer grades of sugar, the molasses still clinging to the sugar crystals is washed off either with steam or by the use of water. If a weak solution of stannous chloride is used in place of the water a sugar having a rich amber colour (Demarara sugar) is obtained. By great care in the manufacture and a liberal use of water in the centrifugal it is possible to make a sugar directly from the juice.

This sugar would be difficult, if not impossible, to distinguish from a product refined with animal charcoal. To get rid of the water still clinging to the crystals, the sugar is dried in a slightly inclined, horizontal, heated, rotating cylinder called a granulator. The sugar is called granulated and contains over 99 $\frac{1}{2}$ of sucrose. However, comparatively little sugar is made of this grade in the sugar houses, there being considerable loss by washing in the centrifugal. The greater portion is sold to the refiners. Here it is redissolved, filtered through animal charcoal and again boiled into sugar.

To produce a good quality of sugar, it is necessary to have the crystals of uniform size and as large as they can conveniently be made. Small crystals are liable to choke the sieve of the centrifugal, and prevent the easy and perfect separation of the molasses from the sugar, and this of course reduces the quality. The preliminary evaporation to near the point of saturation, gives the sugar maker a more perfect control of the crystallization. The process is briefly as follows: The pan in which the boiling is done is partially filled with the already concentrated juice, called syrup. This is boiled down till the crystallization has just begun. A small quantity of additional syrup is then drawn in. Thus by very slightly diluting the boiling mass the tendency to prevent any further crystals from forming is brought about. The amount of syrup added from time to time must be enough to do this but not so much as to redissolve the crystals already formed. The evaporation going on all the time, and no new crystals being allowed to form, those already there must increase in size, and that uniformly. The smaller the number of crystals relative to the size of the pan, the larger they can be made to grow.