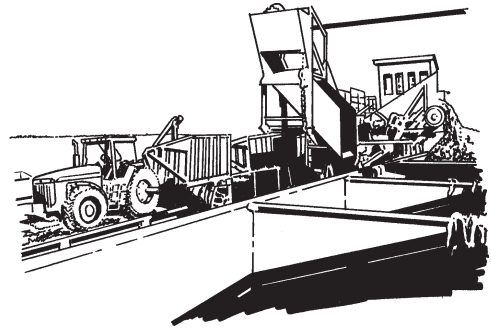




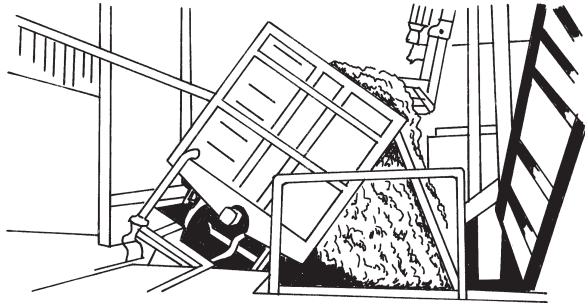
## 1 Sugar Cane Growing and Harvesting

Sugar cane, a giant grass, has a 12-to-15 month growing season and yields 3 to 4 successive crops before it has to be replanted. It is harvested by mechanical harvesters that cut the stalks into foot long lengths.



## 2 Rail Transfer Station

At railroad transfer stations in the fields, the cane is transferred to nearby rail cars which transport the cane to the mills.



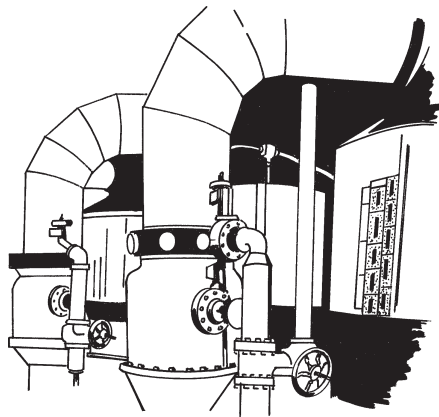
## 3 Cane Receiving

Each rail car full of sugar cane weighs approximately 40 tons. The cars are hydraulically tilted and opened on one side, dumping the cane onto the conveying system. About 1,100 cars are unloaded every 24 hours at the two mills.



## 4 Milling Tandem

The cane is sent to a series of mills, *the tandem*, where it is crushed and the juice extracted. The residual fiber known as *bagasse*, is used as a fuel to generate steam and electricity needed to operate the factory.



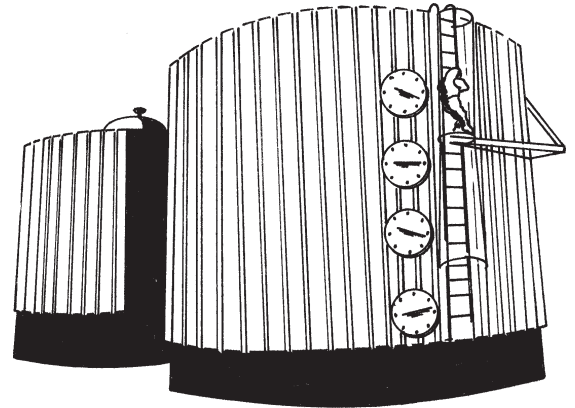
## 5 Vacuum Pans

The crystallization of sucrose (sugar) out of syrup or molasses is carried out in large vessels operated under a vacuum called vacuum pans. The first step in sugar boiling is *seeding*. The mixture of sugar crystals and syrup or molasses is called *massecuite*. Sugar boiling is a complex art that requires an individual with unique skills and experience.



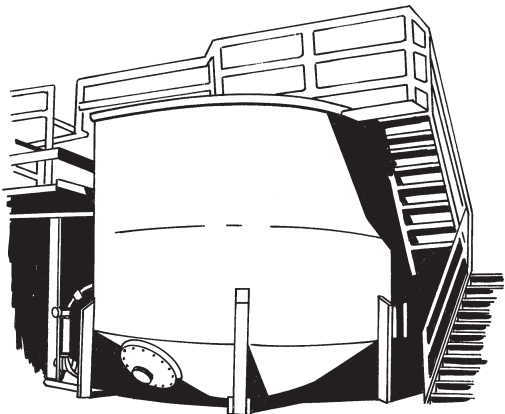
## 6 Evaporation

The clarified juice contains about 85% water. Most of this water is removed in steam-heated multiple effect evaporators operating under a vacuum. The product from the evaporation station is a high density fluid called syrup.



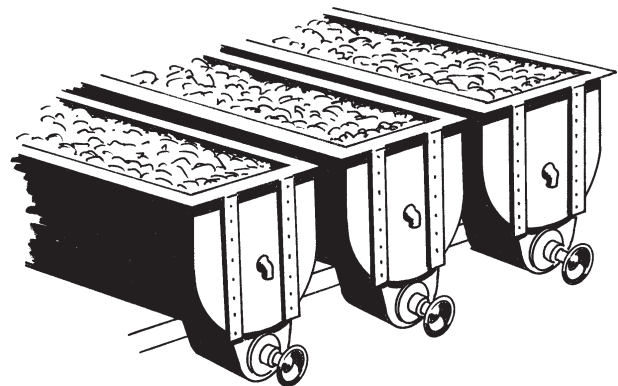
## 7 Clarification

The combined effect of heat and lime is the formation of a heavy precipitate of complex composition. The separation of this precipitate from the clear juice is accomplished by continuous decantation in large tanks called *clarifiers*.



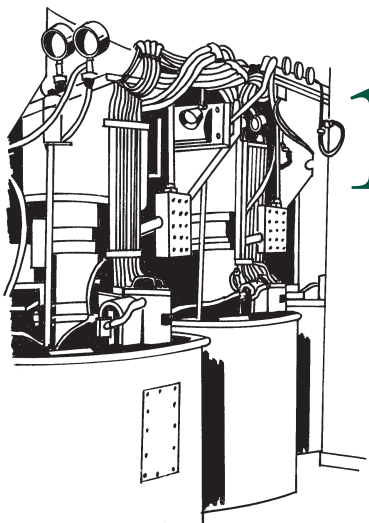
## 8 Liming and Juice Heating

The sugar cane juice, which has a pH of approximately 5.5, is treated with lime and heated to the boiling point. The main purpose of liming is to neutralize the acidity and to prevent inversion of sucrose.



## 9 Crystallizers

The crystallization process is continued in the crystallizers where the massecuite is *cured* by slow cooling and stirring for a period of 36 hours. This process increases the recovery of sucrose from the molasses.



## 10 Centrifugals

The next step in sugar manufacturing is initial separation of sugar crystals from molasses. This is accomplished by centrifugal force in batch or continuous machines called centrifugals. Basically, a centrifugal consists of a drum covered with a fine screen rotating at high speed (1,200 rpms) on its vertical axis. The molasses is forced through the screen producing a pre-refined sugar stock.