

# AN INVESTIGATION INTO THE LOSS OF WEIGHT DURING THE MILLING OF CANE

## I. INTRODUCTION

Scientific control in a commercial sugar factory is becoming most important, as a high efficiency is required for economic gain.

In order to achieve the best results, the data obtained should be as accurate as possible; for instance, the information from milling figures, enables a factory engineer to get the best operation from his milling tandem.

In the "Boiling House" also, reliable data is required to give accurate figures for recoveries and losses. From the very beginning of chemical control the simple fundamental equation

$$\text{Cane} = \text{absolute juice} + \text{fibre}$$

was the basis for all control calculations. After it was found that by adding water to the bagasse blanket, further sucrose extraction resulted; then another factor was brought into the equation.

The basic equation has finally materialised into:

$$\text{Cane} + \text{Water} = \text{Mixed juice} + \text{Bagasse}$$

On the assumption that the above equation is a rational one, the technique employed is to weigh cane, water and mixed juice, obtaining the weight of bagasse by difference.

This procedure is carried out by those factories, which aim at accurate chemical control. There are many factories however, where this procedure does not hold true. In some cases control figures are calculated, where only the weights of cane and mixed juice are known, the use of the so-called "Imbibition Factor" being used. In other cases only the weight of mixed juice is known, and in extreme cases the weight of cane and mixed juice are not available.

However in factories where the 3 products are weighed and bagasse

obtained by difference, the highest degree of control is thought to be obtained. The weighing of bagasse was assumed to be unnecessary, as if the weights of cane, water and mixed juice were correct then the bagasse weight would be accurate, bagasse being at the same time a difficult product to weigh.

These assumptions were based on the fact, that, no serious loss in weight occurred during the milling process. The only obvious loss by evaporation was considered to be negligible.

In the Chemical Control at the College factory for the past few years, all four of the components in the basic equation have been weighed. From results obtained it was found that the actual "weighed bagasse" figure, never was the same as the bagasse figure obtained by difference, but was always much smaller. This led to a control experiment being carried out after all the scales had been checked and found correct.

In this experiment it was found that when each product was weighed the difference between Cane plus Imbibition Water, and mixed juice plus bagasse amounted to 4.2 %. This was 15.6 % on the calculated weight of bagasse. It was apparent that this loss was a serious one especially as cold imbibition had been applied.

With this point in view, it was thought necessary to carry out further investigations in the laboratory and factory, in order to find out whether this phenomenal difference was significant or not. If significant, then an attempt was to be made to discover the reason and nature of the loss.