

AN INVESTIGATION OF THE OPTIMUM CONDITIONS FOR THE PREPARATION
OF FOOTINGS FOR LOW GRADE MASSECUITES.

I. INTRODUCTION.

The attention of the Sugar Industry was drawn by Webre (1), to the possibility of producing low grade massecuites in the raw sugar house, by "seeding" A-molasses with icing sugar, in conjunction with a two-boiling system.

The main feature of this process, is that the use of high purity footings for C-strikes is avoided, the footing being formed directly from the material to be boiled. Molasses exhaustion therefore proceeds throughout the entire history of the strike. This produces a large increase in effective pan loft capacity, and steam economy, while the sugar made is said to be of superior quality and more easily cured.

The method is however not possible without rigid supersaturation and vacuum control, and the necessity of expensive mechanical circulators in the pan, has precluded its use in most West Indian Factories.

The work of Ryle-Davies (2) has confirmed the importance of mechanical circulation, but Gomez (3), in British Guiana has avoided this by graining A-molasses instead of seeding it, and claims to have retained most of the advantages of the original system.

The widespread interest which the sugar industry has shown in these processes, has prompted the Sugar Technology Department to investigate the basic principles underlying the system, and the possibility of developing a new modification, in which the manifest advantage of mechanical circulation would be exploited, without the installation of expensive equipment.

At the beginning of a Webre strike, the surface area of the crystals is extremely small, and continued

evaporation would increase the supersaturation faster than the sucrose could be absorbed. Boiling is therefore interrupted on the addition of the seed, and circulation is continued until the crystals have developed sufficiently in size to "take" the molasses directly. Boiling is then re-started.

This is impossible in the pan without mechanical circulation, but the same effect could be produced far more cheaply, by stirring the concentrated and seeded molasses external to the pan in equipment similar to a seed mixer.

Here under the ideal conditions of vigorous circulation and constant water content the crystals would be allowed to grow to some pre-determined size. Successive portions of this massecuite would then be taken back into the pan as footings for C-strikes.

The object of this work was to standardise the optimum conditions for the preparation of these footings outside the pan. The effects of seed rate, size of seed, supersaturation, and rates of stirring were examined, while the relative merits of seeding, graining and shocking were compared.

The work was divided into two phases. In the first, factory conditions were simulated as closely as possible in the laboratory and the optimum conditions standardised. These were then followed as far as possible in the College Experimental Factory where the final comparisons were made.