Introduction.

During the past number of years, The Sugar Technology Department attached to The Imperial College of Tropical Agriculture has been conducting clarification trials on raw cane juices, with special reference to those of the refractory class, or poor clarifying varieties.

With the rapid introduction of new varieties throughout the cane growing world; possessing a very much higher sucrose content; giving better yields in the field; and at the same time being able to stand up to more adverse weather conditions, the difficulty experienced during clarification has necessitated a great deal of experimentation and discussion.

Of the new varieties, P.O.J.2878 has given a considerable amount of trouble in most countries where it has been introduced, insomuch that in some places its future propogation has had to be discontinued owing to defecation difficulties. In Java and British Guiana however; the former where this variety was bred, and the latter where it now occupies about fifty percent of the total acreage; no trouble has been experienced during clarification.

In the clarification of raw cane juices using a suspension of $Ca(OH)_2$, the calcium phosphate precipitate on settling, entrains and mechanically drags down all suspended matter, thereby giving rise to a sparkling clarified juice.

It has been shown that the phosphate present in the juice of the refractory class, is in most cases very much higher than those of the non-refractory class, but all of this phosphate is not available during clarification, and that a fairly large percentage is still present in the final clarified juice.

Duncan and Yearwood[1] showed by analysis that the colloidal content of P.O.J. juice was in no way higher than those of a non-refractory class, namely,B.H.10(12), and that if any decision was to be arrived at due to the colloidal matter present, it must be

in the chemical composition rather than in the total amount present. They provised a method of dealing with this class of juice,known as The Fractional Liming and Double Heating Process, where as the name implies, the juice is subjected to a double heating and liming. The method has proved to have been very successful wherever installed.

The authors attribute the success of the process to the fact that the colloidal matter in P.O.J.2878 is more highly hydrated, and requires a double dehydration in order to get rapid settling.

Davies[2] paper, "A Contribution to Raw Sugar Clarification" read at The 6th Congress in Lousiana, suggested that the difference in clarability between the refractory and the non-refractory classes, was mainly due to organic silica present. He stated that the P_2O_5 content is very much higher in P.O.J. than B.H.10(12), but that only a part is in a form suitable for taking part in the reaction, which takes place during clarification. This led to the suggestion that organic phosphate compounds are present in the juice, and to explain why P.O.J. does not behave as would be expected from its comparatively high phosphate content. He also stated that the phosphoric acid which is added is available for clarification reactions, but that the whole of the natural content is not, however careful the process is operated.

Duncan and Yearwood[1] state, however, that the addition of phosphoric acid to difficult clarifying P.O.J. juices had little or no effect on the settling rate or subsequent clarity of the juice.

Muller[3] who carried out a series of analyses on P.O.J. juice, states that the silica present in the juice, is partly in the form of an organic colloidal complex, and that organic silica forms a greater part of the total silica present.

Gomez[4] found that during the clarification of P.O.J. juices, organic silica underwent a change forming inorganic silica. The amount converted no doubt seemed to give some indication as to its subsequent clarability.