

to the extent of from twenty to fifty per cent. in the deposits and scale of marine boilers filled with fresh water, any loss being made up from the exhaust or from sea water has been fully set forth by Lewes,¹ who also gives the causes thereof and remedies therefor. He also alludes to the possibilities of this type of scale forming in stationary boilers.

The specimens presented serve to illustrate the importance of critically examining the nature of the "*organic matter*" of incrustations, the statement "loss of ignition" being far too general.

[CONTRIBUTED FROM THE LABORATORY OF THE LOUISIANA EXPERIMENT
STATION AND SUGAR SCHOOL.]

OCCURRENCE OF THE AMINES IN THE JUICE OF SUGAR CANE.

BY J. L. BEESON.

Received June 15, 1896.

THE presence of amines in the products of the sugar beet has long been known, but until this sugar season they have not been known to exist in the juices of sugar cane. Last December, while working with the precipitate formed by the addition of lime water to cane juice, it was noticed that the product dried at about 110° C. had a fishy odor. Upon heating some of this in a test tube over a burner, an alkaline vapor was given off which had a fishy ammoniacal odor. So about 300 grams of the dried substance was gradually heated in a hard glass retort upon a sand bath until an almost complete destructive distillation was effected. The products evolved were passed through a condenser and then through a series of U tubes, each of which was kept at a temperature a little below the boiling-points of each of the principal amines. A solid collected in the condenser tube, and an illuminating gas escaped from the last U tube, which was kept at -10° C. These products were not examined. There collected in the first receptacle about twenty cc. of an acid liquid. This was made alkaline with caustic soda and distilled. The products as before were passed through the series of tubes maintained at the different temperatures, when there

¹ *Chew. News*, 63, 181.

collected in the first, along with some water, about five cc. of clear liquid, which was strongly alkaline, had a pungent fishy odor, combined with hydrochloric acid, and otherwise manifested the general properties of the amines. An attempt was made to further purify it by freeing it from the water, but the amount was too small to bring to a definite boiling-point. The remaining liquid was neutralized with hydrochloric acid, and slowly evaporated down, whereupon a few crystals, slightly colored and deliquescent, were obtained. The quantity was too small to admit of an elementary analysis, so it was not possible to say whether the product was a single amine or a mixture of amines. The filter cake, the refuse from the clarification of cane juice, gave the same odor and alkaline vapor upon heating. It was my aim to subject several pounds of the filter cake to the same treatment in order to fully clear up the question, if possible, but the amount of other work required of me prevented. The clearing up of the matter is of the greatest scientific and practical interest to the sugar industry, as it will doubtless throw light upon the nature both of the amido and albuminous bodies of the cane juice. I write the account of the work with the hope that some chemist may be induced to continue the work, as the writer will discontinue sugar work.

[CONTRIBUTED FROM THE LABORATORY OF THE LOUISIANA EXPERIMENT
STATION AND SUGAR SCHOOL.]

A SIMPLE AND CONVENIENT EXTRACTION APPARATUS FOR FOOD-STUFF ANALYSIS.

BY J. L. BEESON.

Received June 15, 1896.

THE apparatus shown in the accompanying illustration I have adapted from the Johnston extractor, for the general use of the average student in the laboratory aiming at simplicity, greater compactness, convenience, rapidity of operation, and accuracy. The extraction tube *E*, which is rather short, is provided as usual with a perforated platinum disk fused into the bottom, and in addition with a specially devised funnel stopper of ground glass, by means of which the weighed sample can be rapidly