

amount and the quantity of lead acetate started with gave amount precipitated by the hydrogen sulphide from which the sulphur existing as sulphide was calculated.

Grams calcium carbide taken.	Per cent. sulphur found.
2.4492	3.37
3.1234	3.57

No attempt was made to check the application of the method. It is obvious that the impure calcium carbide may have evolved other products capable of removing lead from the solution. It is the writer's intention to investigate this and other points connected with this method.

NOTE ON THE PRESENCE OF OIL IN BOILER SCALE.¹

BY CHARLES A. DOREMUS.

Received June 9, 1896.

IT is difficult to remove cylinder oils, whether pure mineral or mixtures of mineral and animal from condensed exhaust steam. The practice of recovering steam either for the preparation of distilled water or for boiler feed water is now so general that opportunities for observing the troubles attending the procedure are not wanting.

This sample of water was obtained by melting the "core" of cakes of artificial ice. The sediment is fine, flocculent and of red color. When removed from the water and dried it is pulverulent. There is very slight evidence of oil in the dry mass, the moist sediment does not appear oily. The large proportion of oil extracted by ether shows how inefficient the filters were in purifying the condensed steam. Yet very great pains were taken at the ice plant to secure pure distilled water, and there was no visible oiliness in the water as it flowed to the freezing cans. Here however the corrosive action of the distilled water on the galvanized iron produced a mass of iron and zinc hydrates which in being pushed to the centre by the gradual formation of ice gathered the oil and carried it to the core.

Another specimen is one obtained from a steamboat trafficking on the Hudson river and using salt or brackish water in the surface condensers. The boilers were said to be foul with masses

¹ Read before the New York Section. June 5th, 1886.

of oil coating the sides and tubes. Having determined the presence of the salts of sea water in the boiler, due to leaky condensers, a treatment was suggested which caused a fine precipitate. This precipitate gathered the oil in masses easily brushed from the crown sheets. When this mass is treated with ether a dry powder remains and oil dissolves.

A third specimen sent for examination from a large plant in Chicago, evaporating 2500 gallons of filtered river water and 25,000 condenser water every twenty-four hours. Lubricating oil, mineral with ten per cent. animal, is freely used, and the fine clay in the water has together with some incrusting ingredients, caused the oil to form into balls.

The next two specimens are in striking contrast to the foregoing. This is light colored, one-quarter inch thick, has a layer of dense nature near what must have been the heated surface on which the scale formed while the bulk of the incrustation is fibrous. The incrustation consists of calcium carbonate and sulphate, with which is intermingled clay and organic matter, the latter partly oil.

The general appearance of the next sample is quite different. The incrustation is in thin sheets about three-sixteenths inch thick, of light slate color, and made up of alternating layers of deposit of varying hardness. The ingredients are again calcium carbonate and sulphate and clay, while there is much organic matter. This can be separated from the mineral in great part by a little acid. The presence of oil is then noticeable. The boiler of this plant is fed with Lake Michigan water and condenser water. The latter goes directly to the hot well of twenty barrels capacity. While there are no oil filters the boiler is provided with a skimmer, which draws off floating materials from just below the water line. The lubricating oil used is mineral with fifty per cent. animal.

Notwithstanding the skimmer, the scale has formed and baked into a hard mass. It is highly non-conducting. It can be held by the fingers quite near to where a portion is heated in a Bunsen flame, the heat of which distils out and ignites the oil. A few pieces of this scale heated in an improvised retort made from a test tube yield quite a gas flame. The presence of oil

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
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OCCURRENCE OF THE AMINES IN THE JUICE OF SUGAR CANE.

BY J. L. BEESON.

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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.