PROCEEDINGS OF THE AMERICAN CHEMICAL SOCIETY.

Regular Meeting May 4, 1883.

At Mr. Stebbins' request Prof. Leeds occupied the chair.

The minutes of the February meeting were read and approved.

The minutes of the meetings of the Board of Directors, held January 16, 1883, and March 20, 1883, were also read.

The following papers were read :

1. On apparatus for producing high vacuum with low pressure, by C. J. Lawler.

2. Platinic Iodide as a test reagent for deleterious organic substances in potable waters, by Dr. A. R. Leeds.

3. A note by Dr. Breneman, on a "Eudiometer for Rapid Gas Analysis."

4. A note by Prof. A. R. Leeds, on "The Conversion of Carbon Monoxide to Dioxide by Active (*i. e.* Nascent) Oxygen."

The papers were followed by discussion participated in by Messrs. Stebbins, Casamajor, Alsberg and Leeds, after which the Society adjourned.

THOMAS S. GLADDING,
Recording Secretary.

NEW ASPIRATOR, CAPABLE OF GIVING A HIGH VACUUM WITH A LOW WATER PRESSURE.

BY C. J. LAWLER.

In the London *Engineer* for 1876, Mr. Bronson has described an aspirator, giving results which are about the same as those obtained with the apparatus which I propose to describe. The only merit claimed for the new aspirator is its greater simplicity.

With the new apparatus a vacuum equal to the barometer vacuum may be obtained, minus the tension of the water vapor corresponding to the temperature of the water used to work the apparatus.

This result can be reached with a water pressure not exceeding 5½ pounds.

The good results obtained with such very low water pressure, by means of an apparatus of very simple construction, have been

received with great favor by several friends, who have urged that the publication of the results obtained would be useful and interesting to other chemists.

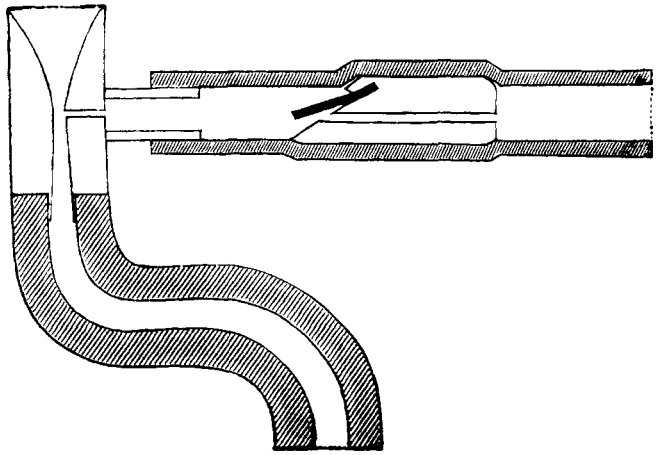
Experience has shown that a high vacuum is not necessary for filtration, but for other purposes, such as fractional distillation, a high vacuum is a great help.

High water pressure cannot be obtained in many laboratories, especially those situated in the lower part of New York city, and chemists constantly complain that they are unable to secure a vacuum with their filter pumps.

In order to get an aspirator which gives the best results with lowest water pressure, it is simply necessary to adapt a few well-known principles in Hydrodynamics to the end in view.

A volume of water thirty-four feet high will support a column of mercury thirty inches in height. In order to do the same amount of work with a less "head" of water, a greater volume of the liquid must be employed. As a mass falling from a given height exerts a definite amount of energy in its fall, to secure the same amount of energy from a body falling from a lesser height, the mass must be increased, *i. e.*, the mass must be inversely proportionate to the height.

We must also consider that the form of tube or nozzle which has the greatest co-efficient of discharge must give the best results.



This shape, as shown by Venturi, is a tube whose interior presents the appearance of the frustrum of a cone, the sides of which diverge at an an angle of five and sixteen one hundredths degrees,

and whose length is nine times that of its lesser base. The discharge in this case is 2.5 times greater than through a thin plate, 1.9 times greater than through a short cylindrical tube, and 1.46 times greater than the theoretic discharge (Haswell).

The water enters the aspirator through a short funnel, whose sides converge towards the narrow part of the cone. The aspirating hole is at the junction of the cone and funnel, and should not be more than one-third the diameter of the throat of the apparatus.

Conical diverging arteries give their best results when submerged, but, as this is not convenient in the case of aspirators, the same end may be attained by attaching to the extremity of the pump a short piece of lead-tubing of slightly larger calibre than the discharge, bent at least twice at right angles.

The efficiency of this pump is shown by the following comparison with that of Prof. Richards (Chem. News, 1876, pp. 141.) The barometer standing at 29.8 inches, temperature of water in hydrant 47° Fah.

Water pressure.	New pump.	Richards' pump.
1 pound	4.8 inches Mercury	1.0 inches Mercury
2 "	10.7 " "	1.6 " "
3 "	17.8 " "	2.3 " "
4 "	24.7 " "	2.8 " "
5 "	29.2 " "	3.4 " "
5½ "	29.4	3.8 " "
25 "		29.2 " "

No disparagement is intended in this comparison to Prof. Richards' aspirator, which was designed for high pressures, and which works admirably with a pressure of twenty-five pounds.

While it was an easy matter to get the necessary data for the construction of the aspirator, it was a matter of no little difficulty to get a workman that would rigidly adhere to these data. Fortunately I found in Mr. Ketchum, 171 Gates Avenue, Brooklyn, a person qualified for the work. To this gentleman I am also indebted for designing an ingenious and efficient check valve, which is a necessary adjunct to all aspirators which work with water-pressure. His method of setting the valve is also very ingenious. A piece of brass rod, one-quarter inch in diameter, and one-quarter inch long, is bored, turned and filed to the shape shown in cut. A small piece of thin sheet rubber, one-sixteenth inch smaller than the face of the valve, is permanently fixed to its seat by a lug cut in the upper

part of the face, this is placed in the end of the piece of rubber tubing which is attached to the aspirating tube, by first introducing a thin metal tube, whose internal diameter is slightly larger than the diameter of the valve. The latter is then dropped into the tube, and by means of a small rod, pushed into place just beyond the metal tube which is then withdrawn. The rubber tube embraces the valve so securely that it is impossible to displace or disarrange it. This method is superior to the older one of cementing the valve in the aspirating tube.

A pump actuated by water-pressure has some advantages over the Bunsen Pump which are worthy of attention. It is less expensive, less difficult to place in position, the degree of vacuum is easily regulated by turning on just sufficient water to secure the desired result, avoiding pinch-cocks which injure the rubber tubing, it is not liable to freeze, because there is no great length of pipe to be exposed, an attachment for producing a blast can be added with less trouble and expense.

PLATINIC IODIDE AS A TEST-REAGENT FOR DELETERIOUS ORGANIC SUBSTANCES IN POTABLE WATERS.

By Albert R. Leeds.

In the Chemical News 43, p. 180, M. Field has proposed to employ the reaction of certain organic substances upon a very dilute solution of platinum iodide in solution of iodide of potassium, and by their effect in the removal of the rose-color of this solution, to determine the fact of their presence in greater or less amount. Although the author proposes to employ the test only, or chiefly to establish the fact of the freedom of the water under examination from sewage contamination and from albuminous matters, yet the establishment of this fact alone is of the highest importance. The introduction of specific tests for the various kinds of organic matter, fresh or partly decomposed, which might possibly be present in potable water, would mark an advance in the practice of water analysis, and any proposition looking in this direction merits careful study.

After verifying Field's statements as to the decolorising effect of