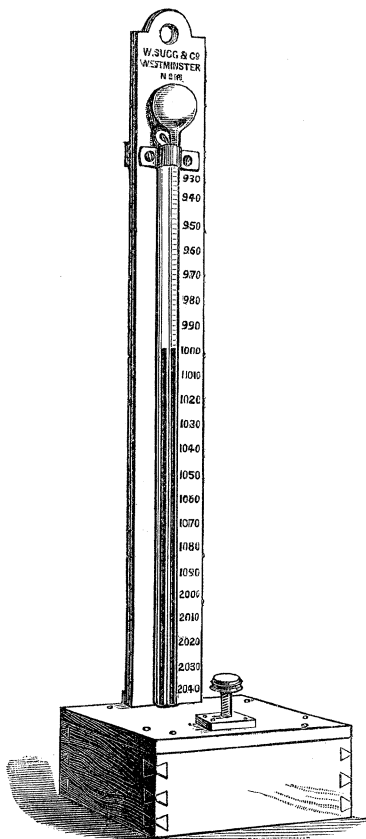


XVIII. "On an Instrument for Correcting Gaseous Volume."

By A. VERNON HARCOURT, M.A., F.R.S. Received June 13, 1882.

This instrument has been devised in order to facilitate the correction of the observed volume of a mass of gas, measured at any common temperature and pressure, to the volume the gas would occupy if measured under standard conditions. A reading of the instrument furnishes a number which serves for the making of this correction, and stands instead of readings of the barometer and of the thermometer, and a reference to a table of the tension of aqueous vapour at different temperatures.



The instrument consists of two small glass tubes standing side by side; the one is open above, having been drawn out and bent down-

wards to exclude dust; the other tube terminates in a bulb, whose capacity is about four and a half times that of the tube. The two tubes are connected below by means of caoutchouc tubing with a small cylinder containing mercury, closed above by a leather cap, which can be pressed down by a button attached to a screw moving in a fixed socket. When the screw and button are lowered the mercury rises in both tubes. The ends of the tubes and the reservoir of mercury are contained in a square box, upon the bottom of which they rest, and whose top carries the socket in which the screw turns. At the back of the box is a wooden upright which supports the tubes. The tube which terminates in a bulb is graduated and figured so as to mark the capacity of the bulb and tube, down to each line of graduation.

In technical measurements of coal gas it is still customary to take for the standard conditions an atmospheric pressure equal to 30 inches of mercury and a temperature of 60° F. The instrument here figured has been made for correcting to these conditions. The capacity of the bulb and stem down to the first line is 3.1 cub. centims., and that of the graduated portion of the stem is 0.7 cub. centim. The bulb and stem have been charged first with a minute drop of water and then with a quantity of air, occupying under standard conditions $3\frac{1}{2}$ cub. centims., the stem below this level being filled with mercury. This volume is marked on the instrument as 1000, the unit taken being $\frac{1}{300}$ cub. centim. The top line of the graduation marks a capacity of 3.1 cub. centims., and is figured 930, this being the smallest volume to which the inclosed air is likely to be reduced by low temperature and high atmospheric pressure. The maximum volume to which the inclosed air is likely to be expanded may be taken at 3.8 cub. centims., and accordingly the lowest line of graduation marked on the stem is 1140.

To use the instrument the pressure of the screw on the mercury is increased or relaxed until the level of the mercury is the same in both tubes. A reading is then made on the graduated stem, and represents the volume occupied at the actual atmospheric pressure and temperature by a mass of air in presence of water which, under standard conditions, occupies a volume 1000. Any volume of gas measured in a gasholder or registered by a meter, under the same conditions, may be corrected to its true volume, under standard conditions, by multiplying by 1000 and dividing by the number read upon the instrument.

When the standard conditions adopted are 0° C. and 760 millims. pressure the bulb is made somewhat larger, so that the 1000 graduation comes near the top of the stem, and the graduations are continued downwards to 1230.

The name proposed for this instrument which serves to correct the measure of a gas, is *aerorthometer*.

- XIX. "Sunspots and Terrestrial Phenomena. I. On the Variations of the Daily Range of Atmospheric Temperature, as recorded at the Colaba Observatory, Bombay. II. On the Variations of the Daily Range of the Magnetic Declination, as recorded at the Colaba Observatory, Bombay." By C. CHAMBERS, F.R.S., Superintendent of the Colaba Observatory. Received May 30, 1882.

[Publication deferred.]

- XX. "On a Method of Tracing Periodicities in a Series of Observations when the Periods are unknown." By VINAYEK NARAYEU NENE, First Assistant at the Colaba Observatory, Bombay. Communicated by C. CHAMBERS, F.R.S. Received May 30, 1882.

[Publication deferred.]

- XXI. "On the Causes of Glacier Motion." By W. R. BROWNE, M.A., late Fellow of Trinity College, Cambridge. Communicated by Professor STOKES, Sec. R.S. Received June 1, 1882.

[Publication deferred.]

- XXII. "The Life History of the Ringworm Fungus (*Tricophyton tonsurans*)." By M. MORRIS and Dr. G. C. HENDERSON. Communicated by Professor J. S. BURDON-SANDERSON, M.D., F.R.S. Received June 12, 1882.

[Publication deferred.]

- XXIII. "On the Nerves of the Epiglottis." By WILLIAM STIRLING, M.D., Sc.D., Regius Professor of the Institutes of Medicine (Physiology) in the University of Aberdeen, and G. DUFFUS. Communicated by Professor T. H. HUXLEY, F.R.S. Received June 14, 1882.

[Publication deferred.]

- XXIV. "On the Action of certain Reagents on Coloured Blood Corpuscles. Part I. Blood Corpuscles of the Frog and Newt." By WILLIAM STIRLING, M.D., Sc.D., Regius Professor of the Institutes of Medicine (Physiology) in the University of Aberdeen. Communicated by Professor T. H. HUXLEY, F.R.S. Received June 14, 1882.

[Publication deferred.]

The Society adjourned over the Long Vacation to Thursday, November 16th.

Presents, June 15, 1882.

Transactions.

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