

**THE CALIBRATION OF A SET OF
PLATINUM THERMOMETERS
FOR LOW TEMPERATURE
MEASUREMENTS**

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Thomas Lyman Bewick

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THOMAS LYMAN BEWICK

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THERMOMETERS FOR LOW TEMPERATURE MEASUREMENTS
BY
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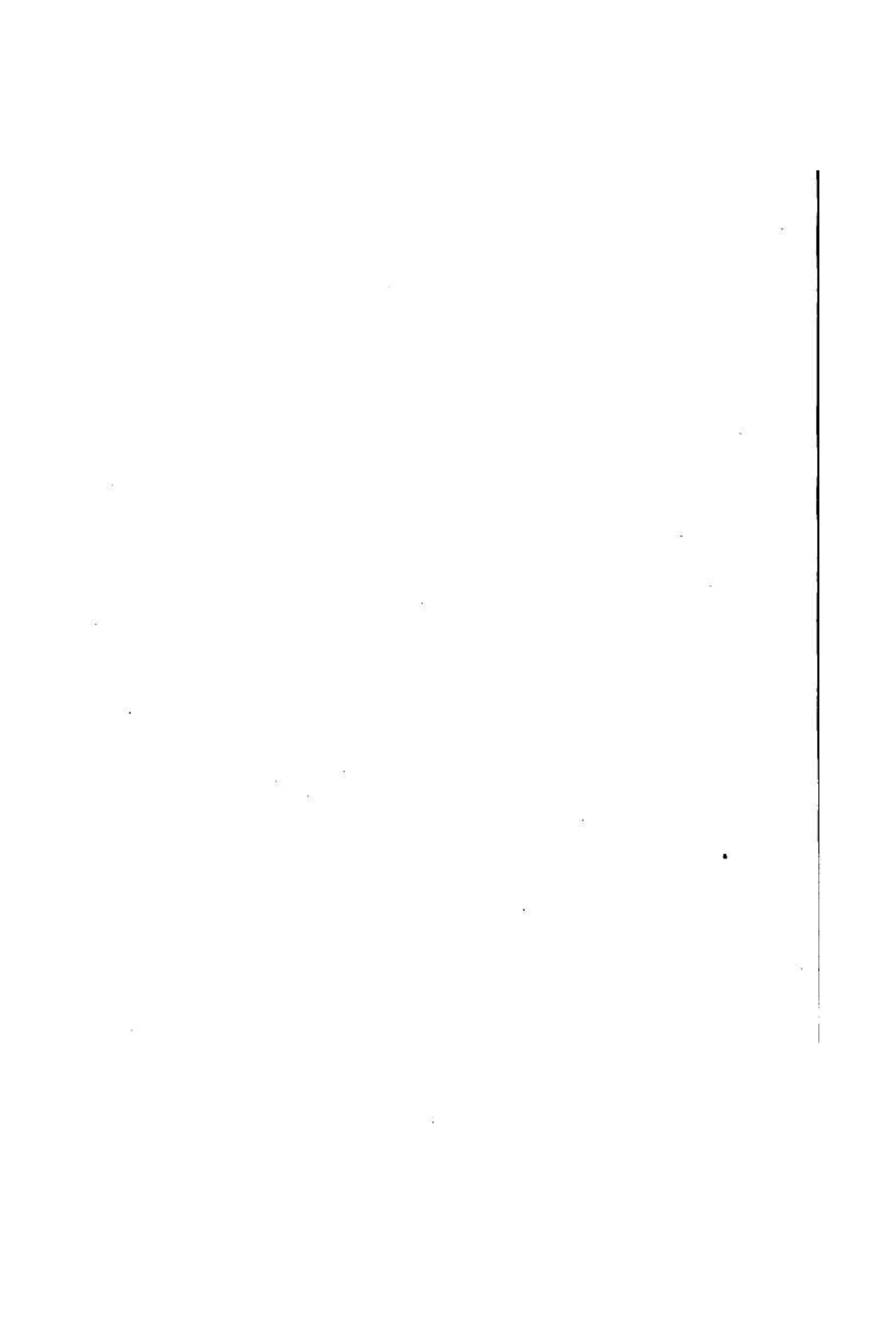
Outline.

I Historical Summary

Method and Theory of Platinum Thermometry

II. Experimental -

- (a) Description of Resistance Box.
- (b) Description of Thermometers.
- (c) Calibration of Apparatus.
- (d) Observations and Results.
- (e) Conclusion.



Historical.

Until the last decade platinum thermometry was a term almost without a meaning to the world at large. With the exception of a very few scientists whose attentions had been directed to this subject while in search of some more accurate and convenient method of measuring temperature, few knew anything of it.

The measurement of temperature by means of the variation of resistance of a wire was first seriously proposed by Siemens who submitted for trial and exposition, some platinum resistance pyrometers to a committee of the British Association for the Advancement of Science. These instruments however, were found unfavorable and faulty in many respects, some of which were then thought unsurmountable.

Prof. H. L. Callendar, an English scientist, was the next to take up this work and to him must be accredited the major part of the success and great perfection to which platinum thermometry has been brought. Prof. Callendar

* See British Assoc. Report 1874.



succeeded in showing the constancy of the electric properties of platinum, if pure and properly annealed, thus removing one of the greatest points of weakness in the work presented by Siemens. Since this introduction by Callendar much varied and extensive work has been done by Callendar and Griffiths, but other investigators as Heycock & Neville, Dewar & Fleming, Cailletet & Colardeau, and Waidner & Mallory have all brought additional testimony and made valuable accessions to the progress of pyrometry.

Resistance thermometry has not been dependent upon platinum alone but other substances have been used with some success, such as, - manganin, gold, silver, and alloys of platinum and silver or platinum and iridium. In fact most of the metals have been more or less experimented with. None however, have as yet supplanted platinum as the best under all conditions. Its choice as the standard metal is the outcome of a very wide and general agreement among all experimentors who have attacked the problem. Iridium though less fusible than platinum is too rare a substance and is hard to work. Similar objections apply to the other metals and alloys are rejected because of the small change of resistance with temperature and the inability to secure a uniform mixture.

In platinum resistance thermometry, a coil of wire is introduced into the space or substance whose temperature