

**A RESPIRATION CALORIMETER
WITH
APPLIANCES FOR THE DIRECT
DETERMINATION OF OXYGEN**

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A respiration calorimeter with appliances for the direct determination of oxygen by W. O. Atwater & F. G. Benedict

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W. O. ATWATER & F. G. BENEDICT

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FOR THE

DIRECT DETERMINATION OF OXYGEN

BY

W. O. ATWATER and F. G. BENEDICT
OF WESLEYAN UNIVERSITY



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PREFACE.

The apparatus to be described in this report has been in process of development for twelve years. During this time the resources of Wesleyan University have been supplemented by appropriations from the United States Department of Agriculture and the Connecticut (Storrs) Agricultural Experiment Station, and by contributions from private individuals. In aid of a series of experiments with the apparatus in its earlier stages, grants from the Elizabeth Thompson Science Fund and the Bache Fund were obtained. The addition of the apparatus for the determination of oxygen was made possible by liberal grants from the Carnegie Institution of Washington.

In the development of apparatus necessarily so elaborate as this the active coöperation of a skillful instrument builder is absolutely essential. It has been our good fortune to have the service of Mr. S. C. Dinsmore, whose mechanical skill has insured the successful operation of many parts of the apparatus. Dr. Paul Murrill, formerly associated with this research, rendered invaluable assistance in devising the methods of computation. Mr. R. D. Milner and Mr. H. L. Knight have assisted materially in the preparation of this report.

Dr. E. B. Rosa, physicist of the National Bureau of Standards, but previously professor of physics at Wesleyan University, was actively engaged in this investigation in its earlier stages and has subsequently from time to time given advice which has assisted greatly in the furtherance of the work.

The first grant of the Carnegie Institution for the development of the apparatus for the direct determination of oxygen was made to my colleague, Prof. W. O. Atwater. It was then expected that the report containing the description of the apparatus would be issued under the joint authorship of Professor Atwater and the writer. It has been deemed fitting, therefore, to retain his name on the title page of this report. A serious illness has compelled his untimely retirement from the work, and the writer, who has had the personal supervision of the development of the apparatus since 1895, has continued the research.

Inasmuch as this report has been written, some of the apparatus herein described has been developed, and the experiment with man has been carried out subsequent to Professor Atwater's retirement, the writer assumes full responsibility for this report as it stands, and against him alone should adverse criticism be directed.

FRANCIS GANO BENEDICT.

August, 1905.



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