

**INVESTIGATION OF THE GLOBE
PHOTOMETER: A THESIS, SUBMITTED
FOR THE DEGREE OF BACHELOR OF
SCIENCE, ELECTRICAL ENGINEERING
COURSE**

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Investigation of the globe photometer: a thesis, submitted for the degree of Bachelor of science, electrical engineering course by Roy Lyon Dodd & Jesse Eugene Miller

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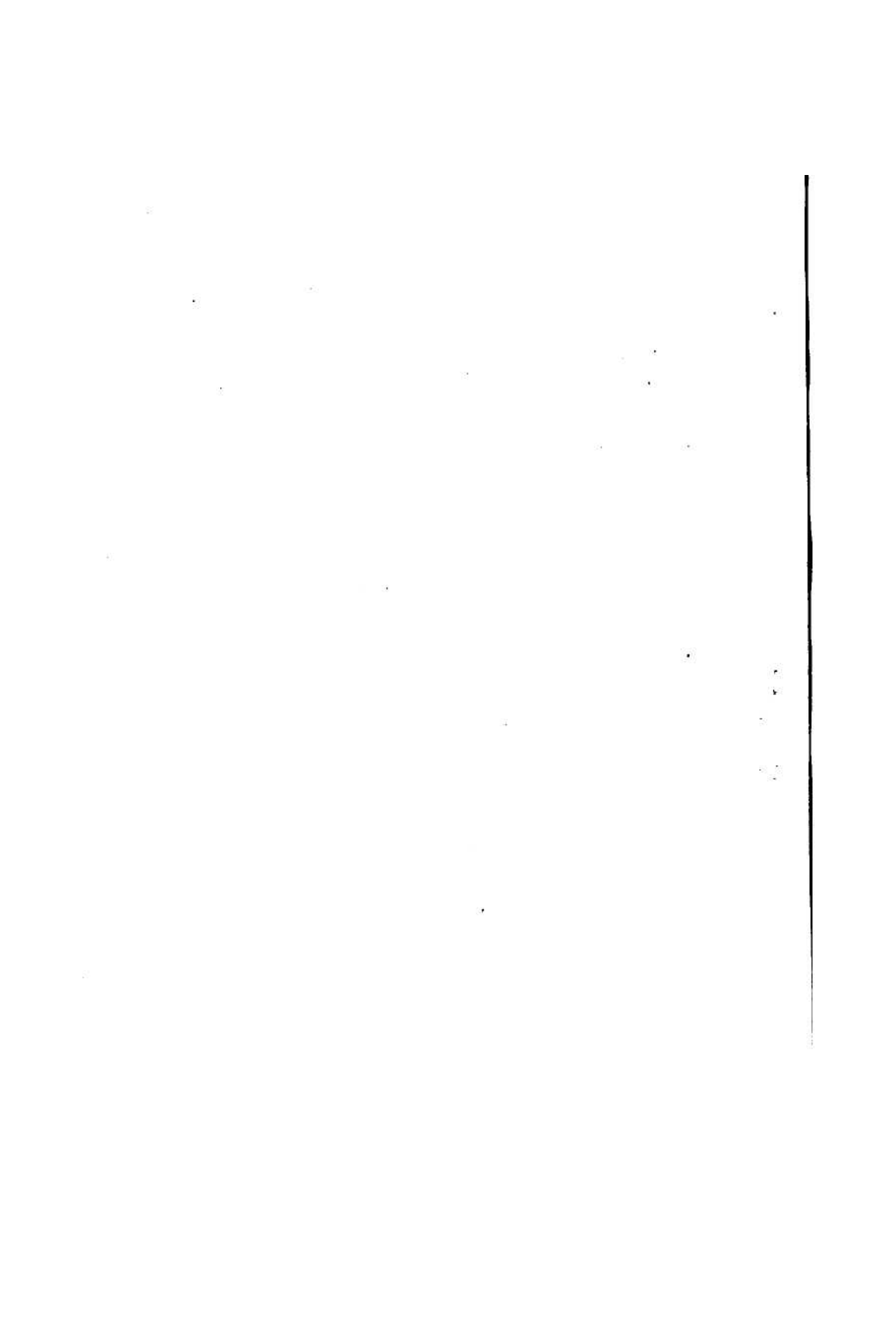
INVESTIGATION OF
THE GLOBE PHOTOMETER

BY
ROY LYON DODD
AND
JESSE EUGENE MILLER

A THESIS SUBMITTED FOR THE
DEGREE OF BACHELOR OF SCIENCE
ELECTRICAL ENGINEERING COURSE

University of Wisconsin

1913



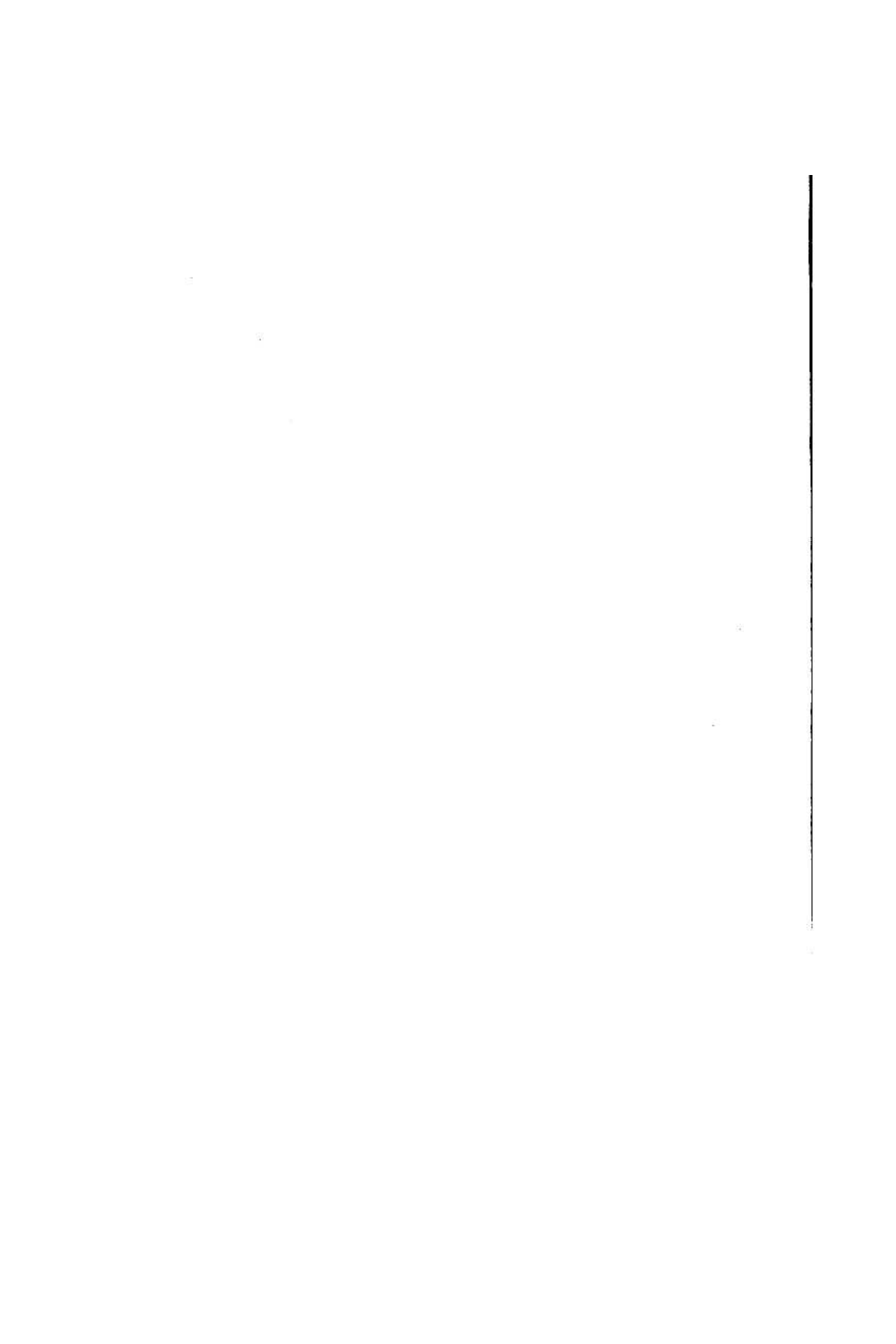
CONTENTS

	Page
Foreword	1
Description of the University of Wisconsin Globe	3
Introduction	4
Purpose and general nature of the work	
Need for this investigation	
General outline of the Investigation	6
Detailed description of experimentation with discussion of data and results	9
Screens and readings	9
Effect of joint opening	9
Effect of position of light source	12
Effect of size and position of screen	17
Effect of distribution curves	20
Effect of dust in the globe	21
Reflecting qualities of the lining	22
Determination of globe constant	24
Sharp- Miller photometer	24
Open photometer bar	26
Enclosed photometer bar	28



CONTENTS (cont.)

	Page
Detailed description of experimentation with discussion of data and results	
Arc lamp photometry	29
Conclusions	32
Specifications for the use of the globe photometer	33
Bibliography	35
Approval	36



FOREWORD.

The globe photometer, or more properly, the Ulbricht integrating sphere is not in itself a photometer. It consists of a hollow globe or sphere, usually of from 18 to 80 inches in diameter, lined with a white material having as nearly as possible a perfectly diffusing surface. Ulbricht demonstrated in 1900 that if a light source be placed in such a globe, the illumination of a small translucent window flush with the globe lining would be proportional to the total light flux emitted by the light source within the globe, provided however that the window were screened from the direct rays by a small opaque screen, and the only rays incident upon the window be those reflected from the entire globe lining. This fact immediately brot this novel integrating device to the attention of photometric engineers, for it is necessary to take but one reading to get the total light flux of the source to be measured, where it is necessary with other devices to take a large number of readings or to rotate the light source. This is not expedient nor accurate for arc lamp photometry on account of the natural variability of arcs. The globe can be used in connection with an ordinary photometer bar or some special photometer. It can be demonstrated^{*} mathematically that the illumination received by the window is a constant, times the total light flux emitted by the light source within the globe. This constant

* Barrows, Light, Photometry and Illumination, page 166.