

**LABORATORY NOTES IN  
HOUSEHOLD CHEMISTRY,  
FOR THE USE OF STUDENTS  
IN DOMESTIC SCIENCE**

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Laboratory notes in household chemistry, for the use of students in domestic science by  
Hermann T. Vulté

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**HERMANN T. VULTÉ**

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FOR THE USE OF  
STUDENTS IN DOMESTIC SCIENCE

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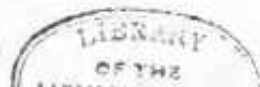
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SECOND EDITION

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## Preface to the Second Edition

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The favorable reception of the first edition has encouraged the authors to prepare and submit the second revised and enlarged edition; with the hope that it will fully meet all requirements and expectations.

It has seemed best to include in the present edition a large amount of descriptive matter, which was not made a feature of the former edition, as well as specific instructions in the preparation of reagents and a list of the necessary apparatus.

For the guidance of teachers the following list of reference books is suggested:

Elementary Chemistry.....Alexander Smith  
Organic Chemistry.....Perkin & Kipping  
Industrial Chemistry.....Thorpe

In conclusion, the authors will be glad to receive suggestions for future editions, from any instructors who may use the book.

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## Introduction

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### CONSTRUCTION OF THE BUNSEN BURNER

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Unscrew the tube, examine and light the inner jet. Examine the outer tube and collar that controls the air-ports. Turn off the gas and replace the tube. Now turn on the gas again, strike a match and approach it to the top of the tube. Always observe this latter precaution when lighting the Bunsen burner. Observe the character and color of the flame, move the collar on the tube and note the effect. Hold a piece of glass tubing near the top of the flame, remove from the flame and bend. Hold it in the same position in the yellow flame, and after removal observe the condition of the tube and try to bend it. Is there any apparent difference in the intensity of the heat developed? Lower a piece of fine iron wire gauze half way in the flame, why does the flame fail to penetrate the gauze? Apply a light above the gauze, explain the phenomenon. Place a piece of paper on the gauze, lower it half way in the flame, notice the charred ring. Hold a splinter at the same point in the flame, note where it is charred and explain. Introduce the large end of a dropping tube

into the flame near the tube, and approach a light near the exit. From the results of the last three experiments what is your idea of the combustion zone?

Carefully turn the gas down at the key, watch the effect, why does the flame disappear? Now immediately turn the gas on full force and note the result. Approach a light to the upper end of the tube, observe the character of the flame, compare with the original flame as to color and heating effect. Strike the rubber tube a quick blow with the closed hand and explain the resulting phenomenon.

Make a simple drawing illustrating the structure of the Bunsen burner, with the gas and air supply and the zones of combustion of the flame.

#### **INSTRUCTIONS FOR MANIPULATING GLASS TUBING AND CONSTRUCTING SIMPLE APPARATUS**

Two kinds of glass, "hard" and "soft," are used in making apparatus for the laboratory. Hard glass is very brittle and quite infusible in the ordinary Bunsen flame. It is used in heavy apparatus where a high temperature is required for heating dry, but never liquid substances, as the latter would cause it to break. It can usually be recognized by the striations on its surface and by its greenish-yellow color, best seen at the end of a broken tube.

Soft glass is less brittle than hard. It is easily fusible