

**A LABORATORY  
GUIDE FOR  
GENERAL BOTANY**

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A laboratory guide for general botany by C. Stuart Gager

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GAGER

A LABORATORY GUIDE  
FOR  
GENERAL BOTANY

BY  
C. STUART GAGER  
DIRECTOR OF THE BROOKLYN BOTANIC GARDEN

SECOND EDITION

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## PREFACE TO SECOND EDITION

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At the suggestion of teachers who have been using the first edition, laboratory directions are added for the study of three additional forms, viz.: *Exoascus deformans*, *Microsphaera Alni*, and *Ustilago Zeæ*. The author is indebted to Dr. E. W. Olive for the preparation of these directions, and for a careful re-reading of the entire text, resulting in the correction of various typographical errors and other inaccuracies.

The directions under the caption, VII, The Path of Water in the Plant (B-F, pp. 35-41), have been considerably extended at the suggestion of Prof. Ernest Shaw Reynolds, who generously consented to prepare the manuscript for the study of stem structure. Grateful acknowledgment is also made to Prof. James S. Compton for suggesting and preparing the manuscript for the study of bacteria (pp. 145-148).

The author will welcome constructive criticisms from those who are using the book.

C. STUART GAGER.

BROOKLYN BOTANIC GARDEN,



## PREFACE TO FIRST EDITION

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THIS LABORATORY GUIDE is intended for the use of students in their first course in universities and colleges, or other institutions doing work of similar grade. It is not a teacher's manual, and therefore does not include information as to laboratory equipment, the purchase and care of apparatus and materials, nor references to the literature. The author believes that botanical instruction in America has now reached a stage where such directions to university instructors are no longer necessary nor appropriate.

As to the most desirable kind of laboratory directions there is a wide diversity of opinion among teachers of experience. This GUIDE has been prepared in harmony with the theory that the beginning student needs to learn, in his first laboratory course, not merely botanical facts, but how to observe and how to record his observations. It is believed that rather full directions, such as are given in the following pages, will accomplish this result. In advanced courses the student should, of course, be expected to work with increasing independence, both in his thinking and his handling of apparatus and material. The GUIDE, substantially as here offered, has been used with a number of large beginning classes.

The order of topics follows that in the author's *Fundamentals of Botany*, but with only minor changes the GUIDE may be adapted for use with any text.

The author is indebted to Dr. E. W. Olive for his careful reading of portions of the page proof.

C. STUART GAGER,

BROOKLYN BOTANIC GARDEN,

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