

**A LABORATORY
MANUAL OF SOIL
BACTERIOLOGY**

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A Laboratory Manual of Soil Bacteriology by Edwin B. Fred

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EDWIN B. FRED

**A LABORATORY
MANUAL OF SOIL
BACTERIOLOGY**

A LABORATORY MANUAL
OF
SOIL BACTERIOLOGY

BY
EDWIN B. FRED, Ph. D.

ASSOCIATE PROFESSOR OF AGRICULTURAL BACTERIOLOGY IN THE COLLEGE
OF AGRICULTURE, UNIVERSITY OF WISCONSIN

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PREFACE

THE exercises described in this laboratory manual are arranged primarily for students of soil bacteriology, soil chemistry and physics, and plant pathology. As far as possible the experiments are planned to give quantitative results. It is assumed that the student has had previous training in general bacteriology and chemistry.

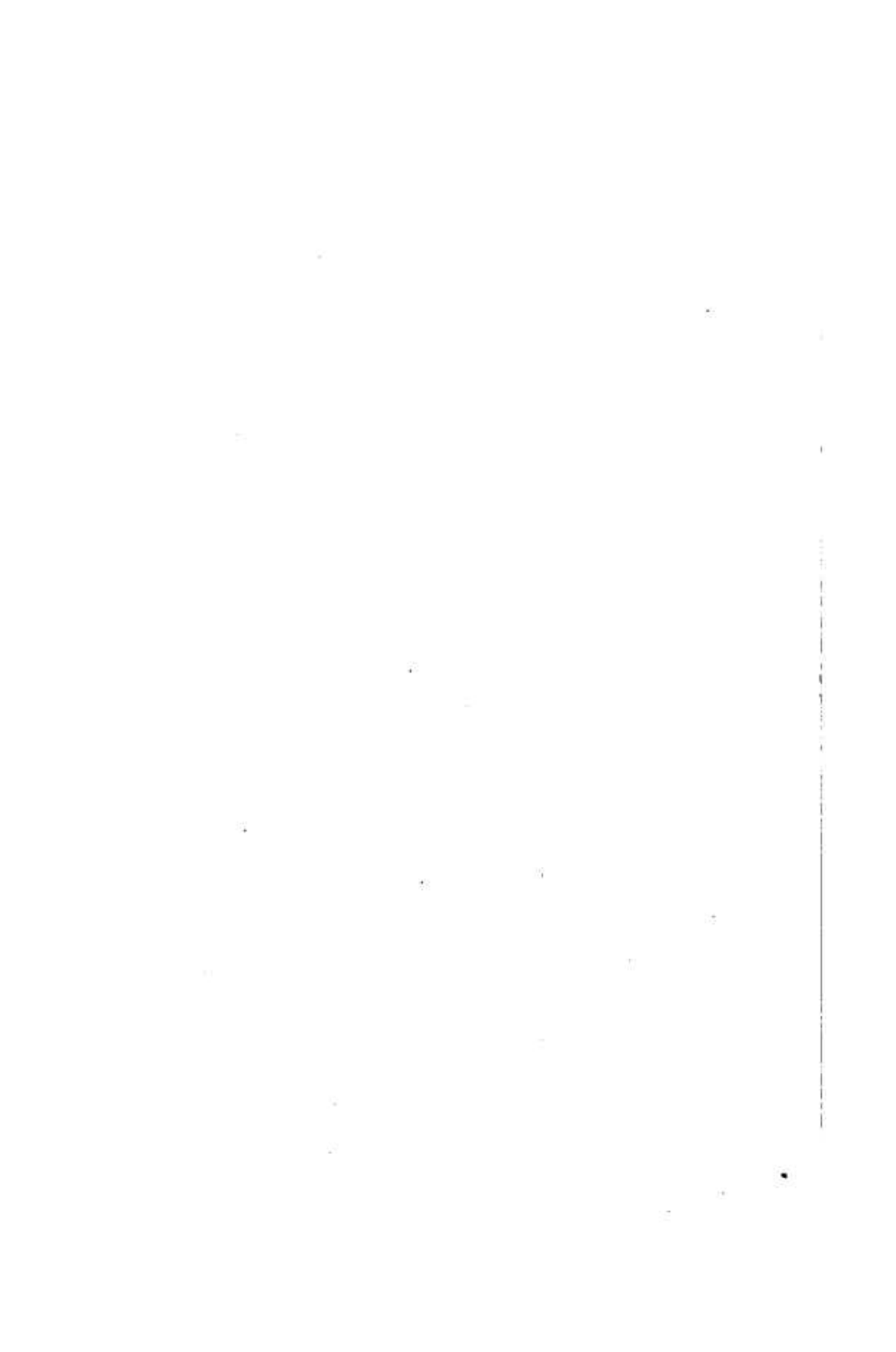
The section entitled "Formulae and Methods" is intended to present in a convenient form some of the more important media and methods used in a study of soil bacteria. The chemical methods employed are, with few exceptions, those given in standard text-books. Much of the material was collected and arranged by Mr. C. Hoffmann.

In addition to the references given in the text, frequent use has been made of the various manuals in bacteriology.

Any suggestions in regard to improvement of the manual will be welcomed.

E. B. FRED.

MADISON, WISCONSIN,
October, 1916.



CONTENTS

	PAGE
INTRODUCTION.....	11
Apparatus for One Student.....	11
Literature.....	12
Laboratory Rules.....	14
EXERCISES IN SOIL BACTERIOLOGY.....	16
Number of Microorganisms in Soil.....	16
Relation of Microorganisms to the Nitrogen Cycle.....	35
Relation of Microorganisms to the Carbon Cycle.....	75
Relation of Microorganisms to the Sulphur Cycle.....	81
Relation of Microorganisms to the Iron Cycle.....	84
Relation of Microorganisms to the Physical Properties of Soil....	87
FORMULAE AND METHODS.....	88
Cleaning Glassware.....	88
Preparation of Culture-media.....	89
Media for the Determination of the Number and for the	
Separation of Soil Bacteria.....	89
Counting Soil Protozoa.....	97
Ammonification.....	98
Nitrification.....	100
Denitrification.....	106
Nitrogen Assimilating Organisms.....	108
Cellulose Destroying Organisms.....	111
Sulphur Organisms.....	116
Iron Organisms.....	118
Yeasts.....	119
Fungi.....	120
Actinomycetes.....	122
Algae.....	123
Higher Plants.....	124
Preparation of Stains.....	127
Preparation of Reagents and Qualitative Methods of Analysis...	133
Quantitative Methods of Analysis.....	141
Special Methods.....	155
INDEX.....	165

SOIL BACTERIOLOGY

INTRODUCTION

APPARATUS FOR ONE STUDENT

THE following apparatus should be in each desk. Any omission must be reported to the instructor at once.

1 Bunsen burner and tubing.....	\$.40
2 Wire baskets.....	.50
1 Metal cup.....	.25
2 4-inch funnels.....	.24
1 Graduate cylinder (100 c.c.).....	.35
2 Erlenmeyer flasks (1000 c.c.).....	.80
4 Erlenmeyer flasks (500 c.c.).....	1.00
2 Erlenmeyer flasks (150 c.c.).....	.30
50 Test-tubes (small).....	.75
5 Test-tubes (large).....	.15
5 Petri dishes.....	1.00
20 Glass tumblers.....	1.00
10 Pipets (1 c.c.).....	.80
2 Pipets (10 c.c.).....	.30
1 Hanging-drop slide.....	.20
1 Thermometer.....	.75
1 Platinum needle.....	.35
50 Object slides (not returnable).....	.50
50 Cover glasses (not returnable).....	.25
1 Aluminium weighing dish.....	.20
6 Evaporating dishes.....	.60
1 Test plate.....	.20
1 Wash bottle.....	.10
Filter-paper (8-inch).....	.10
1 Forceps (steel).....	.25
1 Spatula.....	.25
1 Trowel.....	.10
1 Mixing cloth.....	.10
1 Slide box.....	.10
1 Test-tube brush.....	.05
1 Towel.....	.05
1 Box of matches.....	.01
1 Box of labels.....	

\$12.00