

**FIELD AND
LABORATORY
STUDIES OF SOILS**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649430529

Field and Laboratory Studies of Soils by A. G. McCall

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A. G. MCCALL

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Under the Soil in any Field is Solid Rock.

Frontispiece.

(Adapted from Hall.)

FIELD AND LABORATORY
STUDIES OF SOILS

*AN ELEMENTARY MANUAL
FOR STUDENTS OF AGRICULTURE*

BY

A. G. McCALL

Professor of Agronomy, Ohio State University

FIRST EDITION

FIRST THOUSAND



NEW YORK

JOHN WILEY & SONS, INC.

LONDON: CHAPMAN & HALL, LIMITED

1915

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MBS

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THE SCIENTIFIC PRESS
ROBERT DRUMMOND AND COMPANY
BROOKLYN, N. Y.

SUGGESTIONS TO TEACHERS

THIS little book of soil experiments has been prepared in response to the demand for a brief laboratory and field course in elementary soils, which may be given without the purchase of expensive equipment. With a few tools and the aid of the pupils, the teacher should be able to construct all of the apparatus necessary for many of the exercises. Such cooperation on the part of the students will stimulate a keener interest in the work than can be secured by the exclusive use of purchased materials. However, as funds become available, it is advised that special equipment be purchased and substituted for the less satisfactory, home-made apparatus.

In many schools apparatus from the chemical and botanical laboratories will be available for the soil work. For example, a good balance may be purchased for the joint use of the chemical and soils laboratories, and the compound microscope may serve for both botany and soils. The first purchase of equipment should include the following:

1. Gasoline or kerosene stove with oven.
2. Balance similar to the one shown in Exercise A-7.
3. Soil auger and spade.
4. Small equipment, such as sample cans, glass tumblers, tin cans, wrapping paper, cheese cloth and twine.

A supply of clean sand, and also some loam, clay and muck soil should be secured in the fall. This material should be dried, pulverized, and passed through a sieve with one-eighth-inch mesh, to remove stones and sticks.

The exercises are intended to furnish sufficient material for one period per week throughout the year or two periods per week for a half year. Although they are arranged in logical order, it is not necessary that the exercises should be taken up in the exact sequence in which they occur in the text. Indeed, it will be necessary for the teacher to vary the arrangement in order to adapt the study to the season and to the facilities of the school.

A small working library should form a part of the equipment. For a study of soils this library should include several elementary books on soils, a collection of Farmers' Bulletins from the United States Department of Agriculture and the publications of the State Experiment Station.

While much of the material in the text is original, the writer has drawn freely from all sources for suggestions and illustrative material. Some of the illustrations have been adapted from the text-books and much material has been taken from the publications of the Agricultural Extension Department. The author wishes to make especial acknowledgment of the helpful suggestions of former Superintendent A. B. Graham and Mr. Clark S. Wheeler of the Agricultural Extension Department of the Ohio State University.

A. G. McCALL.

DEPARTMENT OF AGRONOMY,
OHIO STATE UNIVERSITY,
June, 1915.