why it works as well as it does. The research problems and opportun-
es are enormous. The book suggests some of these.

I he basic principles of maintaining soil productivity are the
same under shifting cultivation, of course, as under other systems.

But the methods are different, and they vary widely according to
the kind of soil and the associated climate and vegetation.

Roughly, the main features include: (1) Clearing of the soil
and burning or partial burning in place of the cut trees or other
plants; (2) cropping for two to several years (depending on the
soil and climate) commonly with mixed cultures, with regard for
soil protection and the rapid encroachment of the fallow plants
under the same conditions, and (3) a period of growth of the regenerat-
ing plants, which make the soil productive again. Considering the
many combinations of kinds of soil and cultural patterns a multi-
itude of systems are in use. Most of them grew up gradually,
guided only by experience and passed down as rigid traditions.

The authors have performed a great service in bringing together
a large part of the relevant data that are available and organizing
them into a logical and useful book, together with a helpful bibli-
ography. So far as this reviewer knows this is the first sound book
about soil management under shifting cultivation in the English
language. It is a good beginning. More kinds of soil and more
systems remain to be dealt with. The authors have depended
a great deal on their experiences in Ghana and Nigeria and on the
splendid work of the INEAC in the Congo. They have also drawn
widely on work that has been done in the few published studies
in Southeast Asia, Latin America, and elsewhere.

The book is especially useful in bringing together data on
the maintenance of plant nutrients under this system. As the authors
point out, fallow plants differ widely in their ability to capture
the several plant nutrients from the soil and air and to return them
to the soil. Even one small forest plot can support a wide variety
of trees with strongly contrasting effects on the soil. Then too,
the fate of these plant nutrients is related to cropping patterns and
the intensity of leaching.

Some improvements are possible. Among these are well-favored
areas for paddy rice; permanent mixed cultures of grasses with food-
bearing trees; compost; the use of ashes or wood from outside the
plot; and fertilizers.

The authors bring out clearly the contrasting physical conditions
of the soil and erosion hazards in fields following Savannah and
those after forest. On comparable soils, the forest is a better fallow
cover for several reasons.

They might have said more about the physical effects of growing-
trees and fallow trees on the soil. For example: In the tropics, young fallow trees grow to large ones. After cutting, the termite and other organisms rapidly destroy the crown and roots. Yet we don't find holes where they would be. The soil works its way into the place of the wood. Then when seeds sprout and grow into new trees, the soil is again pushed away to make
room for the crowns and roots. One might call this process a kind
of natural tillage under the forest fallow. But here again we have
few quantitative data.

More is also needed on soil management under permanent mixed
cultures of trees, vines, palms, and herbaceous plants for both food
and industrial crops.

This reviewer commends the authors for this little book and
strongly recommends it to soil scientists working in the tropics
and especially to those with curiosity about the soils and people
beyond their own localities.—CHARLES E. KELLOGG.

CROP HUSBANDRY. By R. D. Park. Oxford University Press,
477 Fifth Ave., New York 16, N. Y. 237 pp. $2.60.

The purpose of this well-written and well-organized book is
evidently to provide the student with a text that is easily
intended primarily for students in Farm Institutes or young peo-
ple attending part-time courses in Agriculture while working on
farms. The inclusion of a number of diverse skills required in farm-
ing is emphasized in the preface. The author, with the collabora-
tion of A. G. Harris and T. Jones, relates various fundamentals
of biology to farm practice in a most effective manner.

The book is divided into five main sections: (1) Soil and Water
science, covering many subjects such as climate, soil science,
and soil fertility. (2) The Carbon Cycle considers the role of carbon
in the soil system. (3) In the Nitrogen Cycle the author presents each of the many
transformations of nitrogen by microorganisms. (4) More Mineral
Transformations including phosphorus, sulfur, iron and others,
are considered in a similar way. (5) Ecological Interrelationships
between the various microorganisms in the soil, and between
microorganisms and higher plants, especially the roots, conclude
the book.

The explanations are generally clear, with tables and figures
almost sparsely used to illustrate the points considered. The
recognition of the interrelation and contributions of various dis-
ciplines to soil microbiology is helpful. Important concepts are
often stated in well-chosen phrases. To the microbiologist some
of the introduction to groups of microorganisms will seem ele-
mental, but many important properties and observations are con-
cisely stated. The detailed consideration of activities of specific
organisms or groups of organisms should be useful. The soil sci-
entist might wish for a more complete explanation of the role
of biological agents in some soil phenomena, but the broad outlines
of the subject of soil microbiology are sketched, leaving the
individual teacher or student opportunity to fill in specific informa-
tion relating to a certain region or topic.

Some almost unavoidable repetition occurs; e.g., in Chapter 4
the factors affecting activity of fungi are nearly the same as for
bacteria and actinomycetes, and many similarities exist in the
microbiology of the various carbohydrates. Usually, theory is dis-
tinctly separated from evidence, although the line is less distinct
in the chapters on organic metabolism. Most errors are minor, although
anaerobiosis is consistently spelled "anaerobicism."

This book should provide an adequate textbook for a beginning
course in soil microbiology. Many workers in soil science, crop
science, microbiology, and related fields will find topics of interest in this book.—LLOYD R. FREDERICK, Iowa State
University, Ames.