century, neither the indigenous African systems nor the grafted-on European systems are suitable, or even adequate, to continue to provide food and other agricultural products for this continent with its increasing population.

Land-use systems and techniques appropriate to the diverse and largely tropical landscapes of Africa must be developed. This is one of Phillips' main arguments. Suitable techniques can be evolved only through intensive study of the relationships of the elements of climate, soils, and vegetation in the areas to be used. The extreme diversity of climate, soil, and vegetation associations must be recognized by persons concerned with agricultural development.

Among the problems posed by these factors in Africa, Phillips cites the high humidity of the rain forests and its role in furthering plant and animal disease. High evaporation in the semiarid lands and its limiting effect on plant growth is treated. This problem, so important over the vast savanna lands, should have been handled in more extended fashion, if it is to be understood by the government officials to whom the book is largely directed. Diagrams showing monthly precipitation, potential evapotranspiration, and water balance for several stations would have clarified the matter.

Among the vegetation problems treated is that of the annual grass burning of the savannah areas, its influence on soil fertility, and its relationship to thicket encroachment.

In all of these problems the stress is on study of the ecology of areas small enough to be relatively homogenous from the viewpoint of the agriculturalist. On the basis of association of climate and vegetation, Phillips tentatively categorizes Africa south of the Sahara into more than 40 type-regions. The regional divisions are shown on an adequate map. The climate, vegetation, and soils of each region are described in some detail, as are problems of tree crop, tillage agriculture, or livestock keeping when appropriate. Present land use is described, and a statement of Phillips' evaluation of possible future use is made for each region. This part is really a handbook, and it should be read selectively. Its readability is not enhanced by the continued use of symbols or abbreviations for elements of climate, severity of ecological factors, and variations in vegetation and so forth. In this section the author brings together much material previously available only in the reports published by the various agricultural research stations and colonial departments of agriculture, and in a number of journals. This is an important contribution. By bringing together this information Phillips forces himself and us to re-examine our earlier generalizations about African land use, which were based on less comprehensive data.

The latter third of the book deals with other factors influencing agricultural development, such as human health, livestock disease, and present agricultural productivity. There is a discussion of the large development schemes including the Gezira cotton scheme in the Sudan, the groundnut scheme in Tanganyika, and the proposed Volta River scheme in Ghana. Phillips argues that large schemes should be undertaken only after extensive examination of the ecological problems of the area to be developed.

This book could only have been written by an agricultural scientist with extensive field experience in Africa and a wide acquaintance with the literature from the numerous agricultural research centers in Africa. It should be of service to scholars of other disciplines and to the political leaders of the emerging African states.

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Wave Propagation in a Random Medium. Lev A. Chernov. Translated from the Russian by R. A. Silverman. McGraw-Hill, New York, 1960. viii + 168 pp. Illus. $7.50.

This is the first more or less complete account, in English, of the theory of wave propagation in random media. The results are necessarily specialized to perturbation solutions of one kind or another since closed-form solutions of the equations are unattainable.

The many detailed calculations include solutions based on the ray theory, valid when the scale of inhomogeneities is large compared with the wavelength; first-order perturbation solutions of the wave equation; and the effects of fluctuations of the medium on the focusing properties of optical systems. Of special interest is a section on the deviation of rays treated by means of the Fokker-Planck equation, a technique developed by the Russian school. Many detailed results on the correlation of fluctuations in the phase and amplitude of waves in inhomogenous media are derived by means of a straightforward application of first-order perturbation solutions of the wave equation.

One chapter is devoted to experimental data; this is surely too little for adequately describing the wide range of potential applicability of this theory. Chernov mentions American contributions to the subject which were made up to around 1954, but there has not been much of outstanding interest published since that time. This book is at present the only one available in English on the subject, and it is a valuable account of a theory which is not widely taught in America.

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The Search for New Antibiotics. G. F. Gause. Yale University Press, New Haven, Conn. 1960. 97 pp. Illus. $4.75.

This book is the record of the "Trends in Science" lectures given at Yale University, in December 1959, by Professor G. F. Gause (Institute of Antibiotics, Moscow). It consists of three lectures. The first, on the distribution of antibiotic-producing microorganisms, presents Soviet evidence that there are a greater number and a greater variety of kinds of microorganisms in the soils of the South than in those of the North, and discusses the idea that geographic factors are a controlling determinant of the distribution of antibiotic-producing organisms. The second lecture emphasizes the importance of the early classification of any unknown microorganisms producing antibiotics as an index of the type of antibiotic it is producing. The argument is less firmly grounded than that for distribution, and reflects a prevalent opinion in the Soviet Union on a somewhat controversial position.

The third lecture is on the use of microorganisms in cancer research. It is first concerned with the problem of whether "equivalents" to cancer exist in microorganisms. Such equivalents are thought to be found in certain (but not all) respiratory-deficient mutants of yeasts, molds, bacteria, and protozoa; methods are described for obtaining the proper types. While this approach is