

Theory of Lie Groups, I

By Claude Chevalley. (Princeton Mathematical Series.) Pp. xii + 217. (Princeton, N.J.: Princeton University Press; London: Oxford University Press, 1946.) 20s. net.

IN recent years great advances have been made in our knowledge of the fundamental structures of analysis, particularly of algebra and topology, and an exposition of Lie groups from the modern point of view is timely. This is given admirably in the book under review, which could well have been called "Lie Groups in the Large". To make such a treatment intelligible it is necessary to re-examine from the new point of view such subjects as the classical linear groups, topological groups and their underlying topological spaces, and analytic manifolds. Excellent accounts of these, with the study of integral manifolds and their constructions in the large, are given in the earlier chapters. In Chapter 4 we come to the definition of an analytic group and its underlying manifold, and to the introduction of the important concept of a Lie algebra associated with an analytic group. A Lie group is then defined as a locally connected topological group related in a certain way to some analytic group; from this it follows that the concept of Lie algebra can be used freely when dealing with Lie groups. Chapter 5 contains an account of Cartan's calculus of exterior differential forms and its application to the theory of Lie groups. The final chapter is concerned with compact Lie groups, and after a brief consideration of the general theory of representations it is proved, among other things, that every representation of a compact Lie group is semi-simple.

The style of writing, though very condensed, is clear, and the printing is excellent. The notation is that of the modern school, with 'union' (\cup) and 'intersection' (\cap) in place of the older 'sum' and 'product' of sets. (A misprint has unfortunately interchanged the symbols \cup and \cap in their definition on p. xii.) The author promises a second volume, to be mainly concerned with semi-simple Lie groups.

A. G. WALKER

Animal Nutrition

By Prof. Leonard A. Maynard. (McGraw-Hill Publications in the Agricultural Sciences.) Second edition. Pp. xviii + 494. (New York and London: McGraw-Hill Book Co., Inc., 1947.) 25s.

THIS is one of the very few books which deal adequately with the fundamentals of the biochemistry and physiology of nutrition and with the applications of this knowledge to the feeding of farm animals. Since the first edition was published some nine years ago, much of the newer knowledge of nutrition has emerged, and this has meant extensive alterations in the sections on amino-acid, vitamin and mineral nutrition. In his preface, the author points out that owing to the limited opportunity which was enforced by war and its aftermath, it has been impossible to take account of the results of recent research in foreign countries, because the data have either remained unpublished or the journals containing them have not reached his desk. The student is warned by the author that he should not thereby gain a distorted picture of the progress of our knowledge of this very important field of physiology and chemistry. The present volume takes us up to the end of March 1946.

It is difficult to single out any particular parts for special comment, but the chapter on mineral

deficiency is especially well treated, and the chapters on feeding experiments contain one of the best reasoned discussions on the pros and cons of the paired-feeding technique. In the author's view this method would appear to find its largest usefulness in comparisons in which food consumption is not markedly restricted by the conditions imposed, and in which the measure is in terms of the specific effect of the nutrient under study, instead of the more general measure of increase in weight. It is considered that there are many problems concerning which the use of separate experiments of both *ad libitum* and controlled feeding will give much more information than either procedure alone.

The chapters on growth, reproduction, lactation and work production are likewise excellent. In its clarity and brevity this work has few equals.

D. P. CUTHBERTSON

Photoelectric Cells

By Dr. A. Sommer. (Methuen's Monographs on Physical Subjects.) Pp. viii + 104. (London: Methuen and Co., Ltd., 1946.) 5s. net.

DR. SOMMER is well known for his work on photo-electric cells, and in this monograph he collects the basic work done by himself and others between 1931 and 1945. While there have been excellent texts on the industrial applications of photo-electric devices, there appears to be no review of the theoretical and research work since about 1934, so we are grateful to Dr. Sommer for his work and his bibliography. He is here concerned solely with photo-emissive cells. Commencing with Hertz, Planck and Einstein, he outlines the theory of emission, and shows how the number of materials useful as photo-emitters is strictly limited by ionization energy and work function, as well as physical properties. He then deals with the relationship of the wave-length of the incident light, the resulting emission, and the effect of gas in the enclosure. The manufacture of photo-cathodes is then outlined, and also the way in which they can be used for practical applications. Of great value is his critical table outlining the suitable types of cells for established technology, such as photometry, sound-film reproduction, picture-telegraphy, and television.

L. E. C. HUGHES

City Region and Regionalism

A Geographical Contribution to Human Ecology. By Robert E. Dickinson. (International Library of Sociology and Social Reconstruction.) Pp. xv + 327. (London: Kegan Paul and Co., Ltd., 1947.) 21s. net.

WHILE this book is not directly about planning, it deals with matters and conceptions that are essential to any far-sighted planning schemes. Human ecology, as the relation of society to the area in which it lives, is a difficult but most important study and one that is too often overlooked in schemes of administration. The spatial relations of human society is a study that has received too little attention in Great Britain. The city is a regional centre of a larger or smaller area, and its function as such is an important condition in delimiting regions within any country. Some cities weld together larger areas than others and size is not a necessary criterion of this function. Mr. Dickinson deals mainly with the town or city as a regional capital, but has also a good deal to say on the possible delimitation of regions in the United States, France and England and Wales. The book merits close attention.