to great advances in the history of science. And Coon never conceals situations where the evidence is contradictory or where there are serious gaps in our knowledge.

There was a long period when physical anthropology seemed to be intellectually stagnating. Its typological approach had reached the end of usefulness, and the numerous new approaches were still in the data-gathering stage. Coon's great new synthesis is one in a number of recent publications that signal the arrival of a new period. Regardless of how controversial it may be in parts, Coon's synthesis has an invigorating freshness that will reinforce the current revitalization of physical anthropology. The number of individual investigations that will have to be undertaken to test the correctness of Coon's inferences is legion. When a volume of such major scientific importance is at the same time highly readable, it is something for which to be truly thankful.

Economic Geography

A Geography of Manufacturing. E. Willard Miller, Ed. Prentice-Hall, Englewood Cliffs, N.J., 1962. xiv + 490 pp. Illus. $12.65.

The study of manufacturing is of growing importance and interest in the world today. There seems to be no doubt that manufacturing has been a major contributor to the economic growth of the economically advanced countries since the end of the 18th, or the early part of the 19th century. Manufacturing also seems to enshrine the hopes of rapid economic growth and of fast, substantial rises in per capita incomes and levels of consumption in the economically lesser developed parts of the contemporary world. There is so much we need to know about the pattern of world manufacturing—such things as its distribution and structure and the levels of activity within it, the bases of its existence, the processes and causes of changes in its location, nature, and size in various parts of the world. More precise and detailed information is required on the relationships and interdependence linkages that exist between manufacturing and other sectors of the economies of all regions, as well as on those that exist between manufacturing and other societal phenomena. One feels that greater knowledge and understanding of the nature of world manufacturing would provide the bases for much academic satisfaction and much necessary information for better economic and social planning, but to my knowledge, this is the first book to present a geographical survey of the world's manufacturing.

In a short but interesting introduction the editor discusses several definitions of the geography of manufacturing and his views on the nature and scope of various kinds of geographical studies of manufacturing. Factors that influence industrial localization and criteria and methods used in the measurement and mapping of manufacturing are also briefly reviewed.

Part 1, which accounts for about one-third of the text, deals with the world pattern of manufacturing. Chapter 1 is very short, and in it an attempt is made to describe the general location of world manufacturing. Chapters follow on the geographical pattern of manufacturing in each of the following areal units: Anglo-America; Europe; the Soviet Union; the Far East; and the southern continents. The chapter on Anglo-America (approximately one-fifth of the book) presents a detailed description and areal breakdown of manufacturing, especially of the United States.

Part 2 accounts for the remainder of the text, except for a few pages at the end entitled "Perspective," and contains nine chapters, of which one is devoted to each of the following industries: iron and steel, aluminium, machine tool, motor vehicle, merchant shipbuilding, agricultural machinery, petroleum refining, Portland cement, and cotton textiles.

Miller states that the primary purpose of his book "is to serve the needs of students of geography and economics by describing and analyzing the complex areal patterns associated with manufacturing in the world." In my opinion the book is not concerned with the "complex areal patterns associated with manufacturing" but rather with a description of the distribution of manufacturing in general, and of some industries in particular, in selected political units in the world. The emphasis is on distributional patterns of contemporary manufacturing, although brief historical statements are often provided. An attempt is made, at a general level, to indicate some of the main factors that have influenced the localization of manufacturing in the world today. The book is short on analysis and interpretation, probably necessarily so when a subject as vast and complex as world manufacturing is dealt with in a volume of this size. However, some of the brief general statements, given at the beginning of many chapters, on changes now under way are integrative, intriguing, and suggestive; these may very well inspire more detailed and deeper research.

This book, which is suitable for use as a textbook in a freshman or sophomore course on the world distribution of manufacturing as well as for use as a reference volume in various regional courses in geography, provides much information and many insights on manufacturing that I consider important and significant.

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Russian Text in Probability

The Theory of Probability. B. V. Gnedenko. Translated from the Russian *Kurs Theorii Veroyatnostei*, ed. 2, by B. D. Seckler. Chelsea, New York, 1962. 472 pp. Illus. $8.75.

This textbook in probability theory is suitable for first-year graduate students in mathematics (and mathematical statistics) and for superior mathematics students in the senior year. There is no assumption that the reader has a previous knowledge of probability theory; however, a certain amount of mathematical maturity is required. The book is extremely well written, and it is suitable for individual study, if the student is reasonably prepared. Although the book is designed for the mathematically oriented person, the author attempts to draw his readers close to problems in science and technology by supplying many examples of an applied nature.

Instead of covering the entire table of contents in a uniform manner, let me list just what to me are the highlights of this book. Chapter 3 contains an excellent introduction to Markov chains. In chapter 6 several weak and strong laws of large numbers are proved, including the celebrated theorems of Bernoulli, Khinchine, Borel, and Kolmogorov. The subject of characteristic functions is covered in a rigorous fashion in chapter 7. This chapter

contains elementary properties of characteristic functions, the inversion formula, the Helly theorems, the continuity theorem, and the Bochner-Khinchine theorem.

The most exciting chapter is chapter 9, on infinitely divisible distributions. Here the author limits himself to distributions with finite variance; he derives, in this case, the canonical representation of the characteristic function of such a distribution, and he proves limit theorems for sums of independent random variables. Chapter 10 is a masterful introduction to the theory of stochastic processes. Included in this chapter are the following topics: Poisson processes, Markov processes, processes with stationary independent increments, stationary processes and their spectral representation, and the Bochner-Khinchine ergodic theorem. Except for the last chapter (chapter 11, on the elements of statistics), all the chapters are good. What the author does well in the last chapter is his presentation of the Kolmogorov-Smirnov two-sample test. However, the rest of this chapter seems to be too hurried and inadequate. One such case is on pages 403 and 404, where a rather confused explanation is given of errors of type I and II in hypothesis testing.

The negative side of this book is small in comparison to its positive attributes. However, one negative aspect is that the mathematical prerequisites are not clearly stated. At first one gets the impression that the prerequisite is a rigorous course in advanced calculus. However, some measure-theoretic results of an advanced nature are assumed and used later, thus creating an uneven mathematical level for the book. Thus, if knowledge of a standard amount of measure theory had been assumed of the reader, not only could the mathematical level of the book have been kept even, but also certain basic topics that had to be omitted could have been included. For example, this book should contain a development of conditional expectation as a Radon-Nikodym derivative, the martingale convergence theorem, Kolmogorov's zero-one law, and the three-series theorem.

In general, Gnedenko's book is a milestone in writing on probability theory, and it will undoubtedly find its way to the bookshelves of mathematicians devoted to this field.

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A Challenging Puzzle

The Planet Saturn. A history of observation, theory, and discovery. A. F. O'D. Alexander. Macmillan, New York, 1962. 416 pp. Illus. Plates. $12.

To those people who have had an opportunity to see Saturn through a large telescope, it is perhaps the most esthetically pleasing object in the heavens. But to the cosmogonist, it is perhaps the burial crypt of many of the secrets of the origin of the solar system. Its oblate globe together with its rings strongly resembles the lenticular cloud of dust and gas from which it is believed the sun and planets were formed. Saturn was probably formed from a similar smaller cloud of the same nebula, and the rings may be a remnant of that cloud.

This book is but the third extensive treatise concerning Saturn to have been written. It follows the study of the planet in a historical and chronological fashion from 650 B.C. until A.D. 1960. The extensive visual phenomena as seen by many observers as well as the recent astrophysical studies are all included, often with quotations from and references to the original papers. But as a reference volume this book suffers from its chronological approach. For example, the rings are discussed on practically every page following the chapter which treats the introduction of the telescope. If one wants to find information about subdivisions in the rings, the index refers him to 41 pages scattered between pages 122 and 420.

A reader will probably find many parts fascinating, such as the one that treats the eventual realization by Huygens that the puzzling appearances and disappearances of "ears" on the globe were produced by rings encircling the planet. On the other hand the reader will possibly be bored by many of the plodding visual studies presented near the middle of the book. However, much of this material does not yet have an adequate physical explanation, and some of it seems contradictory.

I noted an important error. The author states that the presence of molecular hydrogen cannot be ascertained from a planet's spectrum. He was quoting H. N. Russell who was apparently thinking only of dipole absorption. G. Herzberg, in 1952, found lines due to induced-dipole absorption by hydrogen in spectra of Uranus and Neptune. C. C. Kiess published spectra of Jupiter in 1960 showing quadripole absorption by hydrogen. This year H. Spinrad found the quadripole lines in Saturn's spectrum.

On the whole this is a useful book to the researcher, for it brings to light much of the little-known and unexplained visual phenomena that occur on the ball and rings of the planet.

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Natural History

The Senses of Animals and Men. Lorus and Margery Milne. Atheneum, New York, 1962. x + 305 pp. Illus. $6.95.

Since remotest antiquity man has been fascinated by animal life and conduct. As if drawn by an irresistible allure, he wove fanciful tales about the animals he knew and romanticized freely about the ones he invented. The tall stories recounted by Pliny, frequently with due apology for their extravagance, and the utterly charming concoctions of the numerous medieval bestiaries bear full testimony to this inherent and characteristic curiosity of man in his fellow creatures.

The present volume may be said to cater to this same basic curiosity, but in a manner that reflects the new, sound, and no less intriguing horizons of modern science. The book is natural history at its very best, full of the fascinating aspects of animal behavior that are effected mostly by sensory intervention. It brings together, in readable prose and logical organization, virtually all that has recently been brought to light, through keen observation or ingenious experimentation, concerning the little-known world of animal conduct. From Steche's experiment with the electronically controlled dance of a mechanical bee sending forth a live swarm to a predesignated region, to the sea lamprey's electric arc, emerging from and reentering its body, with which it detects obstacles that affect it, to the remarkable adaptations of the wax-eating birds of the genus *Indicator* —incident piles upon incident, chapter follows chapter, unfolding adaptive behavior, mostly genetic in nature, whose functional expressions never lose their attraction and wonder. The mediation