Evaporation and Droplet Growth in Gaseous Media

By N. A. Fuchs. Translated from the Russian by J. M. Pratt. Edited by Dr. R. S. Bradley. Pp. vii+72. (London and New York: Pergamon Press, 1959.) 30*s*.; 5.50 dollars.

DROPLET evaporation in gaseous media is important in a wide range of problems such as the formation of cloud droplets, the evaporation of fuel in the internal combustion engines and in particular in fogs and atmospheric pollution. This book is a translation from a Russian paper by N. A. Fuchs, who himself has made most important contributions towards this subject. The treatment is largely mathematical, but a particularly valuable aspect of the work is the critical review of the whole of the experimental work in this field.

Fuchs considers evaporation and droplet growth in three chapters, of which the first is concerned with drops which are motionless with respect to the gaseous medium and thus no hydrodynamic factor is present. Chapter 2 deals with drops moving in relation to the gaseous medium—described as quasi-stationary evaporation—while the final chapter deals with non-stationary evaporation of drops in which the droplet is moving about in the gaseous medium.

In the first chapter, the basis of the theory is that put forward by Maxwell in an article on diffusion written in 1877 for the "Encyclopædia Britannica", and from this a rate of evaporation equation is developed. The influence of the Stefan flow on the rate of evaporation of drops is discussed, and also the influence of concentration change at the surface on the rate of evaporation. The fall in temperature is next considered both for freely evaporating drops and for supported evaporating drops with a very complete review of the experimental work.

As regards evaporation and the growth of drops moving relatively to the medium, Fuchs used the relationship which has been developed between the Sherwood and the Reynolds and Schmidt groups and discusses the effects of the diffusion and the rate-boundary layers.

F. H. GARNER

Boundary Problems in Differential Equations

Proceedings of a Symposium conducted by the Mathematics Research Center at the University of Wisconsin, Madison, April 20–22, 1959. Edited by Rudolph E. Langer. Pp. x+324. (Madison, Wisc.: University of Wisconsin Press, 1960.) 4 dollars.

THE Mathematics Research Center of the United States Army, founded in 1957, is directed by Prof. R. E. Langer of the University of Wisconsin; it has its permanent home in a new building in the center of the campus of that University. The scientific staff of the Center, numbering about thirty, consists in the main of mathematicians (not all American citizens) on leave from other institutions, who are free to work in any fields they please, though they may be called on by the U.S. Army for professional advice.

The principal interests of the Center are in numerical analysis, statistics and probability, analysis and classical applied mathematics, operations analysis. To increase interest in these fields, the Center held a three-day symposium in 1958 on numerical approximation, another in 1959 on boundary problems in differential equations, and proposes to hold more on similar subjects. The papers read at the 1959 symposium are now available in book form. Because of the shortage of time, the field of discussion was restricted to boundary problems for ordinary and partial differential equations. Even though initial value problems were excluded, the field is very wide. The nineteen papers, six of which were given by visitors from Europe, differ greatly in outlook. Some deal with numerical methods, others are in the strict tradition of classical analysis; a few made use of the more modern approach using fixed-point theorems for operators on a topological space. While some of the work has been published in more detail elsewhere, the book is, nevertheless, a useful addition to the literature of differential equations.

E. T. COPSON

Topographical Anatomy of the Dog

By Dr. O. Charnock Bradley. Sixth edition, revised by Prof. Tom Grahame. Pp. xiv+332+21 plates. (Edinburgh and London: Oliver and Boyd, Ltd., 1959.) 36*s*. net.

THIS well-known book, now in its sixth edition, has retained its essential character as a systematic guide to the dissection of the dog. The general plan consists of a description of the various anatomical regions, including short, easily followed, dissection instructions. Thereafter the spinal cord, brain and lymphatic system are described, and finally useful tables of arteries and cranial nerves are added. The nervous system has been elaborated in the present edition, and there is an excellent brief account of the autonomic system. The text is concise and easily followed, and there are numerous illustrations, many of which are in colour. There is also a considerable number of radiographic plates of high quality, including several excellent injected specimens.

Prof. Grahame has to be congratulated for successfully revising this work to meet the requirements of modern veterinary practice, and there is no doubt that it will retain its established position as an essential text-book and guide to dissection. The book is very well produced, and the publishers are also to be congratulated for the high quality of their work.

T. NICOL

Ecological Processes

By Dr. Alan Mozley. Pp. xi+68. (London: H. K. Lewis and Co., Ltd., 1959.) 9*s*. net.

THE title of this book somewhat belies its contents. Far from being a generalized account, it is concerned with a few specific ecological problems considered mainly in the light of their influence on molluscs. These problems include certain aspects of ecological succession, population ecology and animal movement. The length of the book (68 pages) gives a fair indication of the depth of treatment: the text is almost entirely descriptive. Various references to other works are included, but these are few in number and scarcely make up for the general superficiality of the writing. It is somewhat surprising to find that the splendid work of Goodhart, Cain and Sheppard on populations of *Cepaea* is not even mentioned.

All things considered, it is a little difficult to see what prompted the writing of this book. Nor does the author's final "conclusion" help to throw much light on the matter—"study the ecological organization of the community, then alter it. In other words, study the ecological processes, plot their course, and modify them as necessary".

W. H. DOWDESWELL