rapidly dividing tumour cells have an abnormally high glycolytic coefficient suggests a theory of growth (Chapter iv); but this discussion loses much of its interest in view of recent work by Boyland and Boyland (*Biochem. J.*, 33, 618; 1939), who found little correlation between growth-rate and glycolysis in different strains of grafted tumours. Study of cellular forms and movements suggests that non-spherical cells should round up after death, and experimental evidence on this point and on the effect of various drugs on cell shape would be of great interest.

The remaining chapters summarize the author's abstract mathematical theory of the functions of the central nervous system, and discuss excitation and inhibition, reaction times, discrimination of intensities and perception of visual patterns. This work is still highly conjectural, but the conclusions reached connect up to some extent with experimental evidence.

Dr. Rashevsky's method of analysing mathematically the behaviour of abstract systems from which all irrelevant complexities have been eliminated has been so successful in physics that it holds out promise in biology; but the problems are here more difficult and we are still very far from the systematic mathematical biology which the author envisages. E. C. R. REEVE.

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# GEOMORPHOLOGY

## Geomorphology

An Introduction to the Study of Landscapes. By Prof. A. K. Lobeck. Pp. xii + 731. (New York and London: McGraw-Hill Book Co., Inc., 1939.) 25*s*.

## A Textbook of Geomorphology

By Prof. Philip G. Worcester. Pp. viii + 565. (London: Chapman and Hall, Ltd., 1939.) 22*s*. 6*d*. net.

THE increasing use of the word 'geomorphology' may be regarded as symptomatic of the emancipation of the science from parental control; for as a hybrid science, the offspring of geology and geography, its early footsteps have hitherto been guided in the direction dictated by one or other of its parents, so that it was either 'physical geography' or 'physical geology'. Now the science has its own journal, less than two years old, and a rapidly growing literature which is steadily developing its own technique, and a personality quite distinct from its parents.

In the two books under review the subject-matter is much the same but the treatment differs vastly; it may be said that while Prof. Lobeck is a geomorphologist, Prof. Worcester still follows the tradition of physical geology. While both explain the operation of weathering and erosion in shaping the features of the earth's crust, the latter is concerned mostly with the 'process' and the former with the 'product' at each stage in an evolutionary process, tracing, with delightful clarity, the development of land-forms from youth, through maturity to old age in each structural type and under each denudational process.

In both books is recognized the importance of illustration as an aid to description, for words alone can never adequately portray the subtle but significant variations of form in landscape. Prof. Worcester relies mainly on the photograph, supplemented by line drawings, but Prof. Lobeck brings to bear his great skill as a draughtsman and uses the block-diagram to isolate and demonstrate the physiographic essentials of a landscape. These are not simply illustrations, but are, as it were, an essential part of the text, built into it and amplifying it.

Though unnumbered, there are about five hundred of these, varying in size from 4 sq. in. to full-page drawings, and, in addition, each chapter is introduced by about a dozen beautiful photographs, illustrating the land-forms to be described in that chapter. In this way the unnatural simplification of the idealized block-diagram is corrected by the view of the actual scene, but the diagram, in its turn, analyses and explains the landscape. Treated in this way the block-diagram becomes a most effective instrument for teaching, and it is in this function that Prof. Lobeck excels. There is an early chapter, too, on scientific method and presentation which is very helpful and suggestive to teachers and learners alike. The striving after clarity, simplicity and mental tidiness sometimes leads the author into the error of excessive orderliness in what is, after all, not an exact science; as an example we may quote his recognition of 'mature stages' in each evolutionary series of land-forms; these are always carefully defined, but the definition is often highly arbitrary and not always generally accepted.

Prof. Worcester's book is much more conventional and follows the high traditions of such standard works as Salisbury's "Physiography".

A. A. MILLER.