

which do not explode previously), of nearly a thousand precipitates which are used or have been proposed to be used for inorganic gravimetric analysis. Most of these curves have previously been published; but it is convenient for all to be collected together.

A thermobalance is particularly adapted for obtaining a complete pyrolysis curve, but it can also be used with a furnace maintained at a constant temperature. A precipitate which is known from a previously determined curve to attain constant weight at that temperature can be placed on the arm of the balance in the furnace and its weight noted as soon as the recorder shows that no change is occurring. No time need be lost in cooling to room temperature before weighing. A further application is to the gravimetric analysis of certain mixtures. For example, a mixture of calcium and magnesium oxalates (such as might be obtained by precipitating calcium from a solution containing much magnesium) can be weighed after heating at 500° C. ($\text{CaCO}_3 + \text{MgO}$) and again at 900° C. ($\text{CaO} + \text{MgO}$). The amount of each metal in the precipitate can then be calculated.

It is not every laboratory that could use economically a thermobalance; but some might find the time saved well worth the expense. All could benefit by applying the information given by pyrolysis curves obtained with this relatively new technique to the ordinary operations of gravimetric analysis.

J. R. NICHOLLS

THE FACE OF THE EARTH

The Skin of the Earth

By Prof. Austin Miller. Pp. ix+198. (London: Methuen and Co., Ltd., 1953.) 21s. net.

SEVERAL books on the geographical employment and interpretation of the map have recently appeared. To the geographer the map is not merely an instrument for finding one's way from place to place, but is much more a record of the face of the earth the character of which can be discerned by those who have the skill to read and understand. This skill has two fundamental ingredients. The first is familiarity with the map itself and with the ground the features of which it records. A geographer must be intimate with both the actual landscape and the map, which is a drawing of that landscape as shapely to the geographer as plan and elevation to the architect and as portrait to the painter. The second ingredient is experimental technique in extracting from the map all that it can tell us, and to this end the geographer practises laboratory methods of isolating each element in turn for examination.

Prof. Austin Miller has written "The Skin of the Earth" in order to develop precisely these skills. His object is not simply map literacy but map understanding. It is based on the experience of twenty-five years of experiment and of teaching. Many of the techniques employed are either his own invention or have been sharpened by his hands. Some have appeared previously in research papers, but they are here arranged in sequence to form a coherent exposition of methods of analysis. It is not only the techniques themselves which attract the reader, but also the way in which they are presented to expound Prof. Miller's conception of the subject. The introductory chapter is a finely written essay in this field. The argument is that map analysis consists, first, of

the dissection of the anatomy of the landscape, limb by limb and nerve by nerve, and, second, of the elucidation of the physiology of the skin of the earth, "its temperature, its moisture, and the circulation of air and water in it and upon it". But time and time again Prof. Miller insists that dissection of each element considered singly is not enough and that the objective of the geographer is the recognition of the full orchestral symphony of the landscape. With the humanized landscape, however, he does not attempt to deal. "Human geography begins where this book ends."

In the reviewer's opinion the section entitled "Topographical Anatomy" is the more immediately successful. The treatment of the "Circulatory Systems" is at once more difficult, for it involves rapidly moving elements which cannot be measured so readily as the geomorphologist's physical landscape, and less documented, for the evidence arises out of instrumental observations which present but a coarse network. Nevertheless, in this second part of the book as in the first there is a whole armoury of tools. The great merit of the book is that it challenges the reader to experiment for himself, to devise more and more refined methods of map dissection and of cartographical experimentation, so that the whole structure and function of the skin of the earth shall be laid bare.

WILFRED SMITH

VISTAS OF ORGANIC CHEMISTRY

Progress in Organic Chemistry

Vol. 2. Edited by Prof. J. W. Cook. (Progress Series.) Pp. viii+212. (London: Butterworths Scientific Publications, 1953.) 42s. net.

VOL. 2 of the series "Progress in Organic Chemistry" is, like its predecessor (reviewed in *Nature*, 170, 993; 1952), a very mixed assortment of articles, some being gallant but wholly inadequate attempts to survey topics of wide scope, and others concise but satisfying accounts of subjects of much more limited range. Since no topic has even a remote connexion with those of Vol. 1, it is evident that the editor has decided to show how diverse can be the interests of the present generation of organic chemists; in future volumes he will, we hope, lead us to still fresh fields and pastures new.

Faced with such an assortment of topics, most readers will come to the individual chapters for general information, welcoming a lucid exposition above all else. Judged in this light, the first chapter, by M. J. S. Dewar, on recent developments in theoretical organic chemistry, is the least satisfactory. Symbolism is unavoidable in dealing with wave-mechanics, but it is surely unnecessary to pack the text with jargon such as "the NBMO of an AH". Since it seems that organic chemists now must be presented with mathematical equations prefaced by "it can be shown that", they do, at the end, wish to discover the extent to which there can now be traced a quantitative correlation between computations and experimental measurements. Unfortunately, one finds as the conclusion: "The experimental data do not yet enable one to judge the quantitative value of such calculations in most cases; but the results seem promising". Are they?

Following this, M. Stacey's chapter on organic fluorine compounds surveys far too much in far too few words, but is simple and most informative to