

the legend says represents a zone of reflecting planes, whereas in fact it represents two halves of two distinct zones; Fig. A.1 shows points W and X within the primitive circle whereas they must be outside because the tangent plane cannot cut the equator inside the primitive circle; Fig. A.6 shows the point Q on the near side of the projection sphere but the gnomonic point corresponds to it, being on the far side.

W. A. WOOSTER

Practical Chromatography

Preparative Gas Chromatography. Edited by Albert Zlatkovic and Victor Pretorius. Pp. viii+402. (Wiley: New York and London, 1971.) £8.50.

WHEREAS analytical gas chromatography has been one of the most successful techniques of the last two decades, preparative gas chromatography has never lived up to its initial expectations. There remains, however, a steady small application for preparative gas chromatography for small quantities (usually 100 mg-100 g) of pure materials not easily purifiable in other ways and this is ably described in this collection of essays. Being on a severely practical topic, the book will appeal to severely practical readers, that is, those who have a specific problem which might be solved by the technique, or those who have a commercial apparatus which they wish to use to best advantage, or those who plan to make their own apparatus. The book caters for all these three categories of reader.

There are three essays on specific applications; to general organic chemistry (Verzele), to flavour research (Merritt), and to biomedical applications (VandenHeuvel and Kuron). The latter two essays are well documented and one has little doubt that they summarize all the significant applications in their fields up to 1968 or 1969.

The book caters particularly well for the apparatus builders. Inlet systems and collection systems, and all the problems associated with such things as introducing samples to columns in compact zones, and preventing fog formation while condensing products from the gas stream, are dealt with very fully by Hupe. Other chapters on the design technology are by Busch on programming repetitive runs, and by Kaiser on temperature and flow programming. The technique of making preparative columns, a topic which will be required by most users, is well covered in a chapter by Pecsar where, though the style is often reminiscent of a manufacturer's glossy, the context is as informative as the state of the art

allows. It must be admitted that a novice at the art might find himself confused at the multiplicity of imperfect techniques described.

The theory of preparative gas chromatography is covered by Pretorius and de Clerk, who try hard to make the best of a bad job. In preparative gas chromatography the aim is to produce as much product as possible, as pure as possible, as quickly as possible, and the theory is studied in the hope that it will help one predict the parameters required for this aim. The trouble is that there are so many parameters that optimization procedures are rarely unambiguous. There is a final chapter (Barker) on the appealing but technically difficult device whereby the column is made circular, and by rotating the column with respect to the inlet and outlet ports one can conduct continuous chromatography.

The book is well edited with little overlap between chapters. The balance of the book in general is as good as could be produced on a not altogether satisfactory topic.

A. B. LITTLEWOOD

The Caledonides

Geology of the East Greenland Caledonides. By John Haller. Pp. xxiii+413. (Wiley: London and New York, December 1971.) £20.

THE appearance of this magnificent volume in the series on the regional geology of the world, edited by Professor de Sitter, marks an important stage in the understanding of the East Greenland Caledonides and in the achievements of Professor John Haller alike.

The brief, and therefore partial, view of Greenland exploration in the preface is of special interest; the contribution of Laue Koch is clarified and the achievements of his remarkable series of expeditions between 1916 and 1958 are given justifiable emphasis in the context of this book and their great intrinsic value to the geological reconnaissance of Greenland.

After a brief chapter on physiography a comprehensive but succinct history of the geological exploration of East Greenland is presented, although the coverage of the research of the last decade on the northernmost parts of the island is relatively slim.

The analytical critique of the style of tectonism of the Caledonian fold belt and discussion of basic problems and controversies are particularly valuable and should serve as a framework for the further research which must be needed, particularly in the light of current plate tectonics theory and the question of the sundering of the

Caledonides of East Greenland, Spitsbergen, Scandinavia and the British Isles and a Lower Palaeozoic "Proto-Atlantic". In this chapter remarks on the author's techniques of interpretation of aerial photographs coupled with his personal observations from the air indicate significant factors in his methods; these were found to be more precise than "normal field work" on the excellently exposed mountain landscapes. Landings were made at key localities in the East Greenland fold belt (75°-82° N) but it is clear that more ground control was used in the southern part (70°-75° N), which was studied in more detail in earlier years. In the far north-east (79°-82° N) it seems fair to say that Haller has relied to a great extent on the other workers for his ground control and has personally made only few landings at key localities; lack of finance can be blamed and the unexpected termination of the series of Koch's Danish expeditions in 1958. More published details of Haller's field-work would provide a clearer basis for evaluation of the need for future research.

The "Pre-Caledonian Succession" (chapter 3) includes a section on Precambrian evolution with valuable summaries on the basement complexes of north, west and east Greenland. The section on the Thule Group and Koch's "Thule Formation" is a useful summary of early work but is regrettably incomplete: no discussion is presented of recent papers, from 1966 onwards, by Kerr, Christie and others in arctic Canada; by Jepsen, Dawes and Soper in northern Greenland or of recent discussions by Dawes and Cowie. Haller's main topic is the East Greenland Caledonides and this is not greatly affected by controversies regarding the value of his stratigraphical framework in north and north-east Greenland (Hagen Fjord Group, Thule Group and their ages) and the Carolinian Fold Belt.

The section on the Lower Palaeozoic strata is well presented for both northern and eastern Greenland with clearly designed and draughted maps, sections and tables coupled with excellent photographs.

The heart of the book is undoubtedly chapter 4 on the Caledonian Orogeny, which is consummately done. A slight criticism is that in some maps the topographic outlines are a little fine (for example Fig. 58 on page 152) but the draughting and printing are sharp and clean and all the details can be made out with careful examination.

Concluding chapters on Post-Caledonian and Cainozoic events are followed by a valuable selected bibliography which is comprehensive but has few entries in the late 1960s (for various reasons); a new generation of