

REVIEWS

N. Kirkham 1968. Derbyshire lead mining through the centuries. Truro: D. Bradford Barton. 132 pp., 12 pls. 30s.

Miss Nellie Kirkham (Mrs. J.H.D. Myatt) is, beyond all question, the greatest authority on the lead mines of the Peak District. Her personal knowledge of the mines is immense; she has visited and studied most mines that have been accessible within the last thirty years and has examined a great deal of the available documentation - mine plans and records, manuscripts in public and private collections, and published histories. Her many friendships among Derbyshire mineral miners and speleologists have been a further fruitful source of data. The product of her researches has been an impressive sequence of papers describing the mines, soughs, and mining history of the Peak: she has also written two books, one of which, "Unrest of their time" (London: Cresset Press, 1938), is a fascinating and unusual novel of Derbyshire lead mining life, now regrettably difficult to obtain. (Her second, "The Pilgrim's Way", is an account of travels in south east England). For many years, Miss Kirkham carried a lone torch in her researches; it is only within the last decade that industrial archaeology has become a fashionable study. Beyond question, her work has saved for posterity much information that would otherwise have been lost; her endeavours merit the highest praise.

The publication of her book on Derbyshire lead mining has long been eagerly awaited; and it has been well worth waiting for. This is a sound, balanced and extremely readable general treatment, which can be enjoyed equally by the newcomer to the field and by the specialist. It is divided into eight sections ("The lead miner"; "Laws and customs"; "Minerals"; "The mines"; "Ore dressing"; "Drainage"; "History"; "Finance, production and closure"), prefaced by an introduction which includes a fine verbal evocation of the Derbyshire landscape. There is a fascinating section on terminology and a useful, if perhaps over-brief, bibliography. The illustrations are well chosen and excellently reproduced. (The dust-jacket picture of the magnificent Water Grove Mine Chimney caused the reviewer certain pangs of regret, for he was one of those who fought a losing battle, some years ago, to save it from being destroyed).

Some points merit criticism. On page 22, the terms "tut" and "tutwork" are discussed: their Cornish definition is given, but the Derbyshire meaning is not made clear. On page 120, "£9.11" should presumably read "£9-11-0". At several points, the text is rather unspecific and it would have been more interesting if a mine name or locality had been quoted. For example, the last paragraph of p.91 quotes atmospheric engines as being "erected in the Winster district"; at which mines? - there are many in this area. Two underground installations are mentioned: the mine names are again not quoted. Similarly (p.87): "It has been stated in print more than once that soughs were useless . . ."; the quotation of a specific instance would have been helpful. A brief list of Derbyshire lead mines and soughs is given as an appendix; this is useful, but a more comprehensive list would have been even more so, and one giving the grid references of the mines would have been of immense value. The text contains a general map of the lead-mining area and detailed maps of the Eyam mines and Watergrove Sough; but the reader unfamiliar with Derbyshire has no means of locating most of the mines mentioned, for very few are named even on Ordnance Survey maps.

In general, though, this is a first-class account and one that is unique in its subject-matter: the only other work currently available dealing, in part, with the Derbyshire mines, Raistrick and Jennings' "History of lead mining in the Pennines" (1965. London: Longmans, 347 pp.) is almost exclusively historical and is oriented more towards the Yorkshire lead mines. Perhaps we may hope eventually for a much larger and more detailed work on this area from Miss Kirkham; but, as a general account of the Derbyshire mines, the work here reviewed is unlikely to be surpassed.

William A.S. Sarjeant

P.C. Sylvester-Bradley & T.D. Ford (editors) 1968. The geology of the East Midlands. Leicester: Leicester University Press. 400 pp., 7 pls., 57 text-figs., 19 tabs. 84s.

Although geological accounts of parts of the East Midlands area had appeared much earlier (for example, Henry Porter's "Geology of Peterborough and its vicinity", 1861, and J.W. Carr's "Contribution to the geology and natural history of Nottinghamshire", 1893), the first attempt at a general geological account of the whole of this region was made in 1948, when a "Guide to the geology of the East Midlands" was published by Nottingham University, under the Editorship of Professor C.E. Marshall. This comprises a series of papers, each treating a particular part of the geological column, variously written by J. Shirley, W.W. Black, W. Edwards, H.H. Swinnerton, K.C. Edwards, P.E. Kent, F.A. Henson and the editor: the papers are contained within a total compass of 111 pages, so that they are of necessity both brief and generalised: there was not room for detail and the value of the book to the geologist in the field is inevitably reduced, as a consequence.

Perceiving that there was room for more comprehensive and up-to-date work, Professor P.C. Sylvester-Bradley began the preparation of the present volume around 1961, when contributions were solicited, and received, from a number of authors. At the time of formation of the East Midlands Geological Society in 1964, the book had not appeared; and during the following year, Dr. F.M. Taylor and the reviewer paid a visit to Professor Sylvester-Bradley, to enquire regarding its progress, specifically as to whether there was any prospect of its appearing in time for the Nottingham meeting of the British Association in 1966. Possibly under the stimulus of this visit, active work on the production of this volume recommenced, under the joint editorship of Dr. T.D. Ford; but, as a result of unforeseen delays, the book did not finally appear until September 1968.

Once again, this work consists of a collaboration by a number of different contributors, each dealing with a particular area and/or a particular district. In the 1948 volume, the area considered to comprise the East Midlands was centred on Nottinghamshire and included parts of Derbyshire, Staffordshire, Warwickshire, Leicestershire, Northamptonshire, Lincolnshire and Yorkshire, with the River Humber taken as northern boundary; the exact limits were thus somewhat nebulous. The limits imposed by Professor Sylvester-Bradley are much more clearly defined: they are illustrated in Text-fig.1 of the volume and are based on National Grid lines (though the sketch map leaves one wondering whether the area hidden by the key is included!) One feels, however, that the limits chosen are both arbitrary and surprising, for whereas the northern parts of Derbyshire, Nottinghamshire, Staffordshire and Lincolnshire and southern Yorkshire are excluded and the area nowhere intersects the North Sea coast, it does include points as far south as Banbury and even Luton.

The account provided of the geology of the East Midlands, as thus delimited, is well-planned and comprehensive. The style of presentation is sufficiently closely controlled to produce the necessary degree of standardisation between sections, but there is necessarily some variation in quality between chapters, according to their authorship. The format is sufficiently luxurious to justify the high price; the text, plates and figures are clear and attractive (though Fig.57 was inserted upside-down in the reviewer's copy!)

Of the nineteen contributors, six are members of this Society - Dr. T.D. Ford, Dr. M.J. LeBas and Dr. R.J. Rice (Leicester); Mr. K. Spink and Dr. F.M. Taylor (Nottingham); and Dr. P.E. Kent (British Petroleum.) Dr. Ford deals with the Precambrian of Charnwood Forest, the Carboniferous Limestone and the Millstone Grit; he is co-author, with Mr. Spink, of the Section on the Coal Measures and, with Mr. R.J. King, of the chapter on "Outliers of possible Tertiary age" and he contributes to Mr. King's chapter on "Mineralisation" and Dr. Rice's treatment of the Quaternary. Dr. LeBas deals with Caledonian igneous rocks: Dr. Taylor with the Permian and Triassic forma-

tions: and Dr. Kent is responsible for the chapters dealing with the Rhaetic beds and with the buried floor of eastern England.

An adequate review of a volume of so wide a scope is impossible in the space available - and would, in any case, require the services of a team of reviewers! In brief, Professor Sylvester-Bradley, Dr. Ford and their team of contributors are to be congratulated on having produced a work of profound importance, which merits a place on the shelf of every geologist interested in the East Midlands.

William A.S. Sarjeant.

R.G. West 1968. Pleistocene geology and biology, with especial reference to the British Isles. London: Longmans. 377 pp., 16 pls., many text-figs. 63s.

The Quaternary is the period of the Earth's history whose events have most immediately determined our present landscape; its deposits, albeit often thin, are more widespread than those of any earlier period, even if one excepts soils from inclusion in this category. Yet somehow it occupies a surprisingly small part of the attention of most British geologists, whether professional or amateur; and it is accorded scant treatment in the stratigraphy courses of many Universities and colleges. The reasons for this are twofold. First of all, it lacks the glamour of ancientry and its faunas and floras, with only a few exceptions, are available for study in the living version: their fossil remains are thus of reduced interest. Secondly, and most importantly, its study involves quite different techniques from those applied to the earlier geological systems. Quaternary sediments are thus dismissed as "drift" - a tiresome blanket hiding the real geology. . . . and so their study has progressively come to be taken over, in Britain (though this is not the case elsewhere in Europe and in America), by the botanist and the geographer.

Since the nineteenth century, there has been a great gulf in Quaternary literature between the two extremes of scientific papers, only accessible to and digestible by specialists, and solid reference works on the scale of Charlesworth's expensive, two-volume "The Quaternary Era". The relatively few works on an intermediate scale have either been specialist in scope or else American in origin and orientation: these latter have, in many instances, been scarcely less restricted in coverage and none has provided anything approaching a satisfactory introduction to all aspects of post-Tertiary geology and biology. The work here reviewed (written, be it noted, by a botanist!) is the first to attempt the formidable task of being comprehensive in coverage: it thus fills a real gap in scientific literature.

The plan of the book is admirable. The term "Pleistocene", in West's usage, includes the Holocene and thus covers the period right up to the present day; it is equivalent in scope to "Quaternary". This is essentially a glacial episode in the earth's history and, as West emphasises, we are probably now living in an interglacial: we cannot assume the episode is over.

Appropriately, therefore, the character of glaciations occupies prime attention, after which the nature of landscape-forming processes in glaciated and non-glaciated regions are successively considered. Excellent sections on the techniques of stratigraphical and biological investigation follow: then the questions of land/sea level changes, the problems of chronology and dating, and the topic of climatic change successively receive attention. A general discussion of the Pleistocene and its subdivisions prefaces the final section, in which the Pleistocene of the British Isles, its flora and its fauna, are given special attention. Two appendices (on techniques) and an index complete the text, which is illustrated by a group of plates and an excellent series of text figures.

The wide scope of this work, combined with its compression into the comparatively brief span of 377 pages, necessitates a high density of facts per paragraph. This is very definitely a textbook: information is packed too closely for it to be easy reading. A detailed and adequate index to the very many technical terms used is thus an essential; and, unfortunately, the index

falls far short of being satisfactory. Many terms are not indexed at all : for example, "limnic", "telmatic", "autochthonous", "allochthonous", "sags", "calcareousness", "turfa", "talik", "crysturbation" "cryohydric", "cryoxerotic", "hydrosere". Other terms are mentioned on more pages than the index indicates : for example, "ruderals" appears on p.132, as well as on p.323; "Deckenschotter" on p.218, as well as p.163; "cryostatic effects" on p.70, as well as p.78; and the discussion of "humification" is not confined to p.54, but extends onto p.55.

The author is careful to define most terms quite clearly, but a handful entirely escape definition (e.g. "swalls", "ruderals", "Deckenschotter") and several are used, either in text-figures or in the text itself, ahead of their definition. Examples : "till" used p.10, defined pp.20-25; "urstromtaler" used p.67, defined p.88; "positive economy" used p.11, defined p.13. The text-figures in general are clear and helpful, but there are a few points of difficulty here also; for example Text-fig. 5.9 is most difficult to understand and the shading in Text-fig.7.10 is not adequately explained.

Errors in punctuation occur : and a few sentences fail to convey their meaning or make incomplete sense, e.g. p.10 "Ablation results in melting . . ." : p.9 "Two characters in banding appear less important. . . ." (it is not clear to what their importance is relative). Such slight errors would be less serious in a work with a lower concentration of data per paragraph : but, as it is, they can produce serious confusion.

The author has also not been particularly well served by his publishers. The dust jacket picture of Britain under ice is excellent and evocative but, whilst a contraction of the title on the spine was inevitable, surely the full title, with its exact indication of the scope of this work, should have appeared on the front cover of both book and dust-jacket. (The contracted title, "Pleistocene geology and biology", is misleading in that it suggests a world coverage.) The plates are well chosen and informative; but they are poorly reproduced. Their concentration into one section must have reduced production costs and is forgivable; still, their placement, where relevant, in the text would have been helpful.

The good things in this book, however, far outweigh the faults. The excellent exposition on techniques is invaluable : the section on geomorphology is refreshingly comprehensive and up-to-date; and the clarity of conception and execution evinced by the text-figures merits especial praise (the key to sediment symbols, Text-fig. 4.2; the series of figures illustrating structures in the sediments of the periglacial zone; and the series of pollen diagrams are noteworthy). The excellent summary of current information on British Pleistocene palaeogeography is particularly useful. All in all, the author is to be congratuated on having tackled a formidable task with outstanding success.

William A.S. Sarjeant.

"Studies in Speleology" Vol.1, No.4, December 1966. London : Association of the Pengelly Cave Research Centre. 25s. (free to members of the Association).

The scope of this journal is adequately indicated by its title : geology is one of several concerns and the journal is of more direct interest to speleologists than to geologists. Of nine papers in the issue in question, only one (A. Droppa : The correlation of some horizontal caves with river terraces) is of direct geological relevance : another (T. Harrisson: William Pengelly, 1864 and the Niah Caves, 1965) is an interesting sidelight on the work on an early geologist. One paper on archaeology, two on speleological techniques, and four on biological topics complete the issue; their scope is world-wide. The format is attractive, the illustration (text-figures and well-produced plates) excellent.

William A.S. Sarjeant.

R. Neves and C. Downie 1967 : Geological excursions in the Sheffield Region. Sheffield: University of Sheffield. xlv + 163 pp., 48 figs., 5 pl. 16/-. Available from Messrs. Hartley Seed Ltd., University Booksellers, Glossop Road, Sheffield 1.

This book was published in time for the 6th International Congress of Carboniferous Stratigraphy and Geology, which was held in Sheffield in September 1967. Many of the itineraries listed were used for the congress excursions. However, it was thought by the publishers that the book would have a wide appeal for students of geology and the general public in Sheffield, Yorkshire, Nottinghamshire and Derbyshire and elsewhere, who wished to visit the area. Thus the book covers a wider spectrum of the geological column than that of the conference, extending upwards and including the Cretaceous System.

The publication of the book was made possible by financial assistance from the Peak Park Planning Board, the University of Sheffield, the Department of Geology at Sheffield University and the International Congress of Carboniferous Stratigraphy and Geology.

In all, there are some 24 separate excursions listed, extending from the Wye Valley and Earl Sterndale, Derbyshire, in the west to Nettleton, Lincolnshire, in the east. The southernmost localities include Crich, Ambergate and Wirksworth.

A map (Fig.1) illustrates the geology of the area but embraces a region somewhat in excess of that covered by the excursions.

The book commences with an introduction summarising the geology of the area, with up-to-date tables on the Carboniferous Stratigraphy.

Each excursion has an introduction giving details of the sequence present in the area, often illustrated by a text-figure. The itinerary given (complete with National Grid references) allows the excursionist to follow a route without difficulty but not necessarily in the numerical order shown on the maps, which would sometimes cause unnecessary detours.

On the Ashover excursion, for example (Fig.61 p. 38), visits to localities three and four would entail a diversion of several miles, if visited after locality two and before locality five. It would perhaps be better to start at locality four and omit locality three altogether or call there on the return journey.

Such difficulties are fortunately few and this book will be a welcome guide for the many teachers, students and schoolchildren, who are now beginning to realise that there are things to be seen in the Peak District National Park and the Sheffield region of considerable geological interest. With the book 'Geology of the East Midlands' (edited by P.C.S. Bradley and T.D. Ford, 1967 and here reviewed) a very large area of Eastern England is now served with modern geological excursion itineraries and literature.

Frank M. Taylor.

D. Rayner 1967. The Stratigraphy of the British Isles. Cambridge: University Press. 453 pp., 80 text-figs., 8 pls., index. 70s.

For many years students of British stratigraphy have been asking for a course book on the subject that is detailed and up-to-date enough to make it largely unnecessary to delve into scattered literature, unless a research topic is contemplated. Dr. Rayner's book admirably fills this need, which had existed for far too long.

Dr. Rayner is a Senior Lecturer at the University of Leeds and has specialised in stratigraphy and palaeontology. She is thus well qualified to write a book of this type; and no doubt its content has been tried out on a number of generations of undergraduates! Dr. Rayner is especially to be congratulated on producing a book of such scope written entirely by herself, ensuring continuity of style and presentation.

The book commences with an introduction which is concerned with the general principles of stratigraphy, including the time factor, and the use of sedimentary structures and fossils in correlation. Reference is also made to the general tectonic setting of the British Isles. Some readers may prefer to continue reading these general topics by moving from this point to the end of the book, where a chapter includes such topics as palaeogeography, the effect of continental drift and the origin and development of British seas.

The detailed stratigraphy is described, using the major divisions of the geological column for chapter headings. The way in which this is done must always be a personal choice and no doubt the need to conserve space may also have an influence on the actual division decided upon: the result, however, provides some anomalies which everybody will not be willing to accept. Thus the Pre-Cambrian rocks are condensed into a single chapter, only 23 pages in length; this has been achieved by including the Dalradian Series at the end of the Cambrian chapter, which is 24 pages long. The Carboniferous System, on the other hand, is divided into two chapters, 34 and 36 pages in length respectively. This difference in length and detail no doubt reflects the interest of the author; but students of Pre-Cambrian geology will find their chapter too brief, whilst the two chapters on the Carboniferous will be too detailed for them.

The description of Ordovician rocks is one of the best accounts so far available of a very difficult succession of sediments and volcanic rocks. Not everyone will like the inclusion of Silurian rocks in the same chapter, if they are interested only in the Ordovician.

In dealing with the time between the end of the Carboniferous Period and that of the Jurassic. Dr. Rayner is faced with the difficulty of describing one System, the New Red Sandstone, or two, the Permian and Triassic Systems. In the main Sherlock (1911) is followed for the East Midlands by the use of the term Permo-Triassic System and Wills (1948) for the West Midlands. The main difficulty apparently occurs in the East Midlands; Dr. Rayner, following Sherlock, believes that the Bunter Sandstones of that area are equivalent to the Magnesian Limestone (p.238, p.249) and overlain by the Keuper Group (Upper Triassic). The Institute of Geological Sciences, in recently published maps and the Ollerton Memoir (1961), clearly include the Bunter Sandstone facies in the Lower Trias. Thus the Lower Trias is either present in the East Midlands, or not, depending upon the authority consulted. At the present time this problem has still to be clarified, but this is not the impression given by Dr. Rayner. If one accepts either one view or the other, then reasons should be given in support of one and rejection of the other. No new evidence is available in Dr. Rayner's book to support a Zechstein age for the Bunter Sandstone. Where can one see the lateral passage of Bunter Sandstone into Upper Magnesian Limestone? Sherlock's work applied particularly to Southern Nottinghamshire, where a sandy facies similar to the lowest Bunter Sandstone (Lower Mottled Sandstone) was seen adjacent to parts of the Middle Permian Marl; but Lower

Mottled Sandstone and higher Pebble Beds also overly the Upper Permian deposits in south Notts. The same situation applies in Yorkshire; and the Beds are thinning in Durham. Are there no Triassic beds above the Middlesbrough beds in Co. Durham?

The author's somewhat dogmatic approach to the subject no doubt results from the need for brevity arising from shortage of space. The lack of explanation is encountered in other places too. In the chapter devoted to the Jurassic, the word Kimmeridge(ian) is spelt with a single 'm' throughout, except for the heading to p.303 (which is presumably an error.) However the British Mesozoic Committee have recommended that D'Orbigny's original spelling (Kimmeridgian) be adopted, even though this was probably an error: and this recommendation was accepted by both the International Colloquia on the Jurassic (1962, 1967).

The factual evidence given is generally of a high standard, but there appears to be at least one important slip; surely ammonites have been collected from the German Muschelkalk (p.237) ?

The book is printed in very clear type and the many original illustrations are valuable additions to the work. Some of the figures (e.g. Fig.63, p.318) look a bit crowded, however, with sections and diagrams filling all the available space. The reviewer's copy (purchased) was badly trimmed, with corners of pages folded in and other pages not cut.

The reviewer has enjoyed, and been stimulated by, reading this book and found it an excellent summary for his students.

Frank M. Taylor.

W. Youngquist 1966. Over the hill and down the creek. Caldwell, Idaho: Caxton Printers. 322 pp., 15 text-figs. \$5. (Available directly from The Caxton Printers, Ltd., CALDWELL, Idaho, U.S.A; currency transfer can be arranged on basis of invoice).

In the late nineteenth century, the death of a scientist of any eminence was inevitably followed by the production of a biography (or sometimes of several), usually in two or more volumes and containing transcripts of all his letters that could be found and which were considered worthy, or fit, for publication. (One suspects that the letters of such turbulent and warm-hearted figures as Hugh Miller were drastically censored!) The reading of these tomes is often a long process, but it is a fascinating and rewarding one; and they are in valuable source - works in the history of science.

Regrettably, the changing winds of the twentieth century have blighted this particular branch of literature. Even the adventurous life of such an eminent figure as J.W. Gregory has gone unchronicled; and it is regrettable that Sir Edward Bailey was too occupied, in the latter part of his life, in writing the biographies of others to set forth his own.

It is thus good to find at least one truly contemporary geological biography, written, not in the sternly respectable vein appropriate to our Victorian and Edwardian forebears, but in a much more lighthearted vein appropriate to our present age. It is studded with the sorts of anecdotes which geologists delightedly treasure - anecdotes which, nonetheless, give a perfectly accurate impression of the bizarre range of chance happenings to which the geologist's activities inevitably subject him.

Dr. Youngquist is primarily a palaeontologist, though his commercial work involved a wider concern. He worked first of all at the University of Idaho; then in South America with Standard Oil (New Jersey); and finally he returned to work successively at the Universities of Kansas and Oregon. His biography frequently disappears from sight among the anecdotes and there is little said about the two latter stages of his career: but the concerns he expresses and the problems he encountered are quite typical ones and the whole gives a very true-to-life impression of the activities of a geologist of today. As well as being entertaining reading, this is an excellent historical document!

One small correction; the geologist rebuffed by the postmaster (p.56) was surely Patrick, not Robert, Sutherland?

William A.S. Sarjeant.