

## REVIEWS

EHLERS, J. (Editor). *Glacial deposits in North-West Europe*. 1983. Balkema, Rotterdam. 482 pp., index. £29, hardback.

Jürgen Ehlers of the Hamburg Geological Survey has compiled this volume by persuading 45 other European scientists to contribute papers (all of which are in English) and as most editors will appreciate this is a remarkable achievement in itself! What is perhaps even more remarkable is the coherent nature of the resulting publication, so that despite the widely varying lengths of the 53 chapters, a uniformly high standard of presentation and consistent style is present throughout. The text is profusely illustrated by 409 figures and 300 photographs, of which 95 are in colour. A bibliography at the end of the book combines over 700 references, whilst the index is unusually comprehensive.

The aim of the book is to review recent developments in the study of glacial sediments, particularly their lithological characteristics and their association with depositional landforms, in North-West Europe; which is defined in this context as Norway, Sweden, Denmark, northern West Germany and the Netherlands. This rather restricted definition is in many ways regrettable since glaciers and their deposits tend to pay little heed to political boundaries, however one can sympathise with the editorial problems involved in trying to produce a more comprehensive synthesis. Whilst the geographical scope of the book may be restricted, its scientific content is most certainly not and various chapters consider glacial stratigraphy, glacio-tectonics, till deposition, associated marine, lacustrine, fluvial and aeolian sediments together with applied aspects such as mineral prospecting in glaciated regions and the engineering properties of glacial deposits. The book is subdivided into five sections, one for each country, and after an introductory chapter on the glacial history of each area, a number of selected topics are discussed in the succeeding contributions. Clearly the subject matter of these latter chapters varies depending upon which area is being considered, e.g. the Norwegian section is concerned largely with the effects of the last glaciation (since this is best represented in the Norwegian Quaternary record) whilst more extensive consideration is given to glaciofluvial and glaciolacustrine sediments of several glacial periods in the section dealing with the Netherlands. Some of the papers are extremely short (in one case consisting of only a one page summary) whilst others, e.g. those considering the stratigraphic use of palaeosols and the stratigraphy of Schleswig-Holstein, represent comprehensive reviews of their subject areas.

The declared intention of the book is "to show the glacial deposits of Northern Europe to all those who have neither the time nor the possibilities to see them all by themselves", particularly those "interested in Quaternary or Sedimentology Research, amateurs as well as students or professionals". Most of us, amateurs or professionals are unlikely to ever get the opportunity to visit all the localities illustrated in this book, or (even if we did get there) we would be fortunate to see the sequences as well exposed as they were when photographed for this volume since many of the exposures occur in working quarries or other temporary excavations (the illustrations of ice contact deltaic sequences are more striking than any which I have ever seen over several summers of working in Norway, whilst the illustrations of glacio-tectonic structures are only equalled in the United Kingdom by those exposed in the cliffs near Cromer). The book therefore provides an invaluable opportunity for anyone with an interest in this subject to broaden their horizons, by simply examining the excellent illustrations of these diverse deposits and on this basis the book is strongly recommended to amateurs and professionals alike. Additionally, for anyone studying glacial deposits in Europe the up-to-date bibliography will be a valuable source of information. At a time when standard paperback textbooks often cost over £15 this book will be reasonably priced solely on the basis of the quantity of material it contains, however the informative colour photographs and extensive bibliography ensure that the book is a bargain which many glacial geologists will wish to purchase for themselves.

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COLLINSON, Margaret E. (1983) *Fossil Plants of the London Clay*. Palaeontological Association Field Guide to Fossils No. 1. London: The Palaeontological Association. 121 pp., 242 text figs. £7.95.

The fossil flora of the London Clay is one of the most varied fruit and seed floras known, and the only rich flora of lower Eocene age in Europe. Remains of some 500 types of plant are known from the London Clay, including about 350 named species. Seeds, fruits and other macrofossils can readily be collected from coastal exposures and more temporary sections inland, but their identification poses considerable problems. These difficulties of identification are due partly to the variable condition of preservation of the fossils and partly to the available monographs (principally those of E.M. Reid & M.E.J. Chandler 1933; M.E.J. Chandler 1961, 1964, 1978) being devoted to comprehensive taxonomic descriptions rather than to hints for identification of the commoner fossils.

The present book provides the first convenient guide to identification of the plant macrofossils of the London Clay. Over 250 of the commoner fossils (mainly fruits and seeds) are included, with clear photographic illustrations of 238 taxa. The keys and the illustrations cover the identification not only of whole and well-preserved material but also of internal casts of seeds and other common fossils, including a number whose botanical identity is uncertain.

Although the greater part of the book is devoted to keys, brief descriptions and illustrations, it is a compact handbook rather than merely an identification guide. Introductory sections deal with the geological setting, depositional environments, an annotated list of fossiliferous localities, hints on collection, conservation of fossils, systematic studies and their evolutionary implications, states of preservation and palaeo-environmental and palaeo-climatic implications. In addition there are lists and a table summarising the stratigraphical ranges of all genera recorded from the London Clay.

Only about one-third of the London Clay plant macrofossils are placed in living genera (e.g. *Magnolia*, *Vitis*, *Rubus*, *Sabal*), and all of these are considered to be represented by extinct species. Others can be assigned to living families although not genera, and still others cannot be placed in living families. Amongst the plant fossils that can be identified are palms, mangroves, and others that imply a palaeo-climate much warmer than the modern climate of southern England. Trees, shrubs and vines are considerably more strongly represented than herbs, implying that it was predominantly forest vegetation. The remains of this vegetation were deposited in the inshore marine environment in which the London Clay accumulated.

Although this richly varied flora has received a great deal of detailed study it is evident that much remains to be discovered. Many of the plant taxa are still known from only a few remains, so that their ranges of variability are poorly understood and hence their taxonomic delimitation is unsettled.

Short-lived exposures of the London Clay occur commonly in both the London and Hampshire Basins, and these offer frequent opportunities for collection of seeds from new sites. The few professional palaeobotanists cannot study more than a fraction of these ephemeral sites so that much of the material that is potentially available remains uninvestigated.

This well produced little book offers a great deal of assistance to those wishing to join in the study of a difficult but fascinating group of fossils. It is also a convenient source of reference to the Eocene flora. The author and publishers alike are to be congratulated on an attractive and useful addition to the literature.

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(Copies of this book are obtainable from Dr R.J. Aldridge, Department of Geology, University Park, Nottingham, NG7 2RD at £7.95 inclusive of postage and packing).

GALLOWAY, W.E. and HOBDDAY, D.K. *Terrigenous clastic depositional systems. Applications to Petroleum, Coal and Uranium Exploration*. 1983. Springer—Verlag, New York. 423 pp., index. £29, hardback.

This book has been produced with the expressed aim of integrating modern developments in sedimentology with the more traditional economic geology of mineral fuel deposits. Following a very brief discussion of the fuel mineral resource base the authors outline their approach to 'genetic stratigraphic analyses', i.e. the use of sub-surface exploration techniques, particularly downhole wire-line log data, to determine the way in which sediments, deposited in a variety of environments, are combined by tectonic processes to form parts of the earth's crust. The major part of the book (chapters 3 to 10) is devoted to reviewing sedimentary environments in terms of the processes which act within them and the sedimentary successions which result. This section of the book is comparable to '*Sedimentary Environments and Facies*' (edited by H.G. Reading) and the more recently published A.A.P.G. Memoir '*Sandstone Depositional Environments*' (edited by P.A. Scholle). Galloway and Hobdday's discussion of environments and facies is more concise than that contained in equivalent chapters of the volume edited by Reading and as such will no doubt appeal to many economic geologists. The brevity of this treatment has inevitably led to somewhat uneven emphasis on the various facies models, e.g. in discussion of deep sea turbidite fan models, only the model proposed by Walker being presented in any detail. However, a strong point of the book is the integration of examples of economic deposits into each chapter: an approach which I found much more satisfactory than the way in which examples of economically important sediments are rather awkwardly appended to each chapter in the A.A.P.G. Memoir.

In chapter 12 the authors consider basin hydrogeology, emphasising the important interaction between depositional and groundwater flow systems in determining the location of potentially economic fuel reserves; whilst the remaining three chapters consider economic reserves of coal, sedimentary uranium and hydrocarbons in the context of the preceding chapters.

The book is well illustrated with 237 figures, most of which are line drawings. Most figures are reproduced from other publications and in some instances insufficient attention has been paid to redrafting them, e.g. Figure 10-1 contains an arrow mystically labelled 'Z->X': the caption of the figure fails however to tell us is that this represents the prevailing wind direction! Such errors are infrequent and the drawings are for the most part clear and concise. A feature which will particularly appeal to industrial geologists is the inclusion of schematic wire-line log motifs alongside many of the more conventional diagrams depicting facies sequences. Detailed illustrations of the various structures and textures described in the text are clearly beyond the scope of the book and emphasis is placed on the larger scale features recognisable from geophysical data or at a basin-wide scale and as such the book is unlikely to replace Reineck and Singh's '*Deposition Sedimentary Environments*' as a student text. The book ends with a comprehensive bibliography although somewhat frustratingly several of the key citations refer to unpublished North American theses which are not easily accessible to readers based on this side of the Atlantic.

In summary, this is a book written for the practising exploration or production geologist and as such deserves to find a place on the bookshelves of almost every company involved in mineral fuel exploration. Whilst the text assumes too much knowledge to be easily understood by a newcomer with no background in sedimentology, it does provide an excellent introduction to the application of sedimentology to the search for the fuel resources of the future.

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*London illustrated geological walks*. Book One, 1984. Robinson, E. Scottish Academic Press Ltd., for the Geologists' Association, i-iv + 98 pp including 95 photos, 1 line drawing, 11 street maps, references and 2 pp glossary, plus 10 blank pp for readers notes. £4.95p.

This excellent guide to London's East End was published to celebrate the 125th anniversary of the Geologists' Association: it is the first of a series of illustrated London walks. If subsequent publications are as good as this they will give much pleasure and profit to many geologically inclined London residents and visitors.

The writer has personally walked three of the five itineraries and can consequently testify from first hand experience that this guide is very easy to follow, maps and photographs appearing in the text just when required to reassure the reader he is really looking at what is described in the text. Users should, however, be warned to check the captions of photos against the maps. The writer has found only one ambiguity but since this concerns the first building mentioned after leaving St. Paul's in the first walk described it creates an altogether false

impression of otherwise almost faultless editing. This photograph on page 7 labelled “Juxon House from the West Front” (of St. Paul’s) is in fact a picture of Bancroft House and the building bordering the east side of Paternoster Square with a small part of Juxon House appearing in the left hand foreground. The careless reader, with whom the present reviewer must be numbered, can all too easily examine the building stones in Bancroft House, which are similar to Juxon House, and become increasingly disturbed by the mis-match between the text and his observation until he turns over the page and finds a map which tells him that he has been looking at the wrong building.

Other problems may arise through no fault of the author due to the rapidity with which London property is bought and sold and perhaps refaced or even demolished. For instance, the Burnley Building Society premises on Ludgate Hill were sold shortly after this guide was published and it seems unlikely that the new owners will retain the name even if they keep the granite cladding. Fortunately the author gives the address (30-32 Ludgate Hill) so this particular site should be easily identifiable.

At first sight the care, attention to detail and sheer hard work which has gone into producing this slim volume is not obvious. Only when one actually follows the itinerary is it realised that these have been selected to demonstrate a very wide range of building stones with as little duplication as possible. To do this so successfully many more buildings other than those mentioned in the guide must have been examined. Moreover the identification of the source of unusual building stones is no easy task for adequate records are rarely kept by architects or clients. The author gives due credit to Eva Wilson’s fascinating detective work in tracking down the probable source of the black marble formerly used in the steps of St. Paul’s, but he modestly does not discuss his own painstaking efforts.

As a user of the booklet I found 115 mm × 225 mm a convenient size for slipping into a pocket and the cover and pages stood up to 6 hours wear and tear exceedingly well. A London map showing the general location of these walks would have been welcome. More mention of building materials other than stone would have added to my enjoyment, particularly since the area abounds in brick, terracotta and brushed aggregate concretes from a great variety of geological sources. Also I felt that since the first walk started from the steps of St. Paul’s it was a pity not to look at decorative materials used in the interior fabric and monuments in the cathedral. This diversion merely confirmed my lack of knowledge and a companion guide to the ornamental stones of St. Paul’s itself would admirably complement the present volume. Doubtless readers new to geology will derive as much benefit from Dr. Robinson’s explanations of the genesis of building stones as I did from his comments on architecture, conservation areas and environmental politics. His affirmation that a Shap Granite bollard in front of St. Paul’s provides “the best example you could find anywhere for the molten origin of granites” caused me wry amusement since in my student days such feldspathised xenoliths were cited by many geologists as strong evidence of granitization without recourse to a magmatic stage—a salutary reminder of how drastically geological interpretation can change.

Such minor criticisms must not be allowed to detract from a booklet with its lucid text, excellent maps and first class photographs (by Mike Gray and Colin Stuart) which has given me much pleasure and information and moreover has provided an excuse to visit parts of London which I would not normally frequent.

I strongly recommend this guide and can assure would-be users that visitors and residents take scant notice of an idiosyncratic geologist examining the stone facings of buildings with a hand lens. I was accosted only once and that by an over zealous security guard who, on reading Eric Robinson’s words of wit and wisdom, was almost persuaded to buy a copy and certainly now knows more about the building he was guarding than he did before.

I look forward to more illustrated London walks describing other parts of the metropolis which I am sure, if produced by the same team, will be at least as good as Book One.

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