

ARCHETYPES AND ANCESTORS. PALAEOLOGY IN VICTORIAN LONDON, 1850-1875, 1982, Adrian Desmond, Blond and Briggs, 287 pp., £15.95.

This is a fine example of the newer style of work in the history of the earth - or indeed any - sciences. It is also clearly written, often witty, and enjoyable to read. The scope of the book accurately defined in the subtitle, might seem narrow and of limited interest. But the science lay at the crucial intersection of the earth and life sciences; the city contained arguably the greatest concentration of scientists in the world, and certainly the largest total population; and the quarter-century was the one that saw the general adoption of an evolutionary perspective and the emergence of fully "professional" careers in the earth sciences.

The sharp focus is better justified, however, in terms of the kind of history Desmond has set out to write. At least in intention, and to a creditable extent in achievement too, this is *histoire totale* applied to a part of science at a specific time and place. Desmond understands his fossil vertebrates thoroughly from the perspective of a modern practitioner, but also from the perspectives that were available to his historical actors. Here is no cheap celebration of those who got it right from a modern point of view, or vilification of those who did not; but nor is there any cutting of corners about the detailed substance of scientific argument. Furthermore, these arguments are firmly grounded not only in the wider conceptual foundations of contemporary biological theorising, but also in the social and economic realities of the scientists' lives. Money had somehow to be earned from science; reputations had to be made and careers constructed; the territories of colleagues had to be respected or else besieged. In such ways, the lives and work of the scientists must be displayed as the totalities that those historical actors experienced. In short, the book illustrates how good history of science now ignores the futile distinction between "internalist" and "externalist" approaches, not just programmatically but as a matter of course.

The end product, however, is not, and cannot be, innocently factual. Like any honest historian, Desmond has an overt interpretative thesis. His main figures are Richard Owen and T. H. Huxley, with their supporters and disciples ranged behind them. His main topics are their interpretation of dinosaurs, the relations between the vertebrate classes, and so on. But he goes behind the myth-making propaganda of the winning side in these great debates. Owen is rescued from obloquy as a stubborn obscurantist; Huxley's shining armour as a crusader for Truth is left at least a little tarnished. But this is not done in order to award them a more equitable distribution of retrospective credit points, though Desmond does point out that both sides were in some respects "right" by modern standards. It is primarily to illustrate how scientific materials - whether they are abstract concepts like phylogeny and archetypes, or actual fossil specimens and concrete reconstructions - are

used in science as adaptable resources, to be moulded to fit conflicting scientific interpretations and even conflicting social ideals and interests.

It is only at that final level that some readers may feel that Desmond has asserted more than he demonstrates. He makes a good case for understanding alternative reconstructions of dinosaurs, and alternative treatments of mammal-like reptiles, in terms of their use in the service of wider interpretative goals. He is less persuasive when he imposes a broader kind of sociology of knowledge, and suggests that the conflict between Owen's party and Huxley's reflects the tension between traditional and aristocratic ideals and social interests on the one hand, and those of a "professionalising" mercantile bourgeoisie on the other. Nonetheless, despite that questionable generalisation, this is a book that deserves to be read widely, and to be used as a model by those writing the history of other branches of the earth sciences in other periods and places.

Martin Rudwick

WORLD PALAEOLOGICAL COLLECTIONS, 1983, R. J. Cleevely, British Museum (Natural History) and Mansell Publishing Ltd., 365 pp. £50.00.

The significance of geological material in museums and other institutions in Britain and overseas, in terms of its scientific and historical importance, hardly needs to be stressed. Yet palaeontologists, and others with related fields of interest, frequently experience difficulty in documenting the dispersal of private and institutional collections, and establishing their present whereabouts. Those who are involved with such pursuits will welcome R. J. Cleevely's book as a valuable source of information on palaeontological collections and collectors.

The author's original intention was to produce a revision of C. D. Sherborn's (1940) classic work *Where is the - collection?*, a proposal that, because of the potential scope of the project, was modified to concentrate on palaeontological material. Some of the original element was, however, retained; the author has fully appreciated that "many of the earlier collectors did not confine themselves to one branch and that information relating to their activities in one field might be applicable to another" and has attempted to include some information on related interests and collections. He has omitted references to fossil hominids - an area comprehensively covered by Oakley, Campbell and Molleson's *Catalogue of fossil hominids* (British Museum (Natural History), 1971, 1975, 1977) - and, in general, to "rock" collections. Information on minerals has, however, been included.

In addition to the limitations on subject matter which are imposed by the author, there are other constraints which operate on him, not the least of which is the amount of time which can be devoted to the task of collecting

and collating information. Like Sherborn's pioneering publication, this work has been restricted to those collections "which have come under the notice of the compiler." It is perhaps understandable that an early questionnaire survey elicited a poor response, considering the detailed information required. As a consequence, published material has been a major source of information. From the outset the author has stressed that it has been his intention "to provide a broad framework upon which others can build ...".

The geographical scope of the project is claimed to be world-wide, but it is noted that there "is little real knowledge, particularly in the western world, of fossil faunas of the USSR, most of Asia, and large areas of South America; this is equally true of the palaeontological collections in their institutions." It is conceded that some areas - USSR, China, Japan, and South America - are under-represented in the "Index of Collectors."

Special reference is made to "the difficulties of confirming the survival of material following the Second World War, or its whereabouts in the re-organization of institutions in Eastern Europe." Anyone who doubts the difficulties involved in locating material under these circumstances should read *Paperchase* by Nigel Lewis (Hamish Hamilton, 1981) or Peter Whitehead's much shorter account "The Treasures at Grüssau" in *New Scientist*, 94: 226-231 (22 April 1982).

The contents of the volume fall conveniently into two sections. In the first of these is to be found a brief "Introduction" to the Index ... (pp. 7-8), in which the scope of the work is defined, and a series of chapters which survey related areas: "History of Earlier Guides to Geological Collections" (pp. 9-12), "The History of Fossil Collecting" (p. 13), "Reasons for Compiling this Index" (pp. 14-15), "Acknowledgements" (p. 16), and a three-part "Bibliography" (pp. 17-23) (covering "The History of Palaeontology and Fossil Collecting," "Collections and Collecting" and "Biographical and Other Reference Sources").

Although the treatment of some of the material covered in these chapters is uneven, they do contain much valuable information. The bibliographies are likely to be particularly useful, but I question the wisdom of providing three such lists when the decision to include a reference in one or another is made on such a subjective basis. Indeed some references have been included here which might have been better placed in a fourth list, the "Bibliography of Published Catalogues of type, figured and cited material," which follows on pages 26-37. I feel that the provision of multiple bibliographies simply serves to make the information that they contain more difficult to abstract and easier to overlook than need have been the case.

The second section contains the extensive index to collectors and their collections. It begins with a brief section "How to Use the Index" (pp. 23-25) and a "Bibliography of Published Catalogues of type, figured and cited material" (pp. 26-37). The "Index of

Collectors," arranged alphabetically by collector, with occasional institutional entries, occupies pages 38 to 323. The "Index of Institutions and Collection Holdings" is on pages 324-365.

The "Bibliography of Published Catalogues of type, figured and cited material" is based on earlier compilations, together with some additional references. Not all the entries to be found in the source-compilations have been included, but those that have been omitted are usually to be found in the "Index of Collectors."

The "Index of Collectors" occupies pages 38-323, this last page being additions since going to press. As one might expect in a compilation of this size and scope, there are a number of editorial and typographical errors and inconsistencies ranging from the significant to the trivial or mildly irritating. I find, for example, the mixture of short-form and Harvard style references a particular irritation, the more so because of the necessity to search four bibliographies (sometimes without success) to find the full citation. A random check of the content of some of the entries for collectors in whom I have a particular interest, or of whose collections I have some knowledge, brought to light some more significant errors.

None of these criticisms should, however, detract from the value and importance of this work. The only major reservation I have concerns its high price.

M. D. Crane

"FORMED STONES," FOLKLORE AND FOSSILS, 1982, Michael G. Bassett, National Museum of Wales, Geological Series No. 1, Cardiff, pp. 32, illus. £0.95 (£1.20 by post in U.K.).

This booklet is a revised and expanded version of an article first published under the same title in *Amgueddfa, Bulletin of the National Museum of Wales* in 1971, in which the author describes familiar groups of fossils associated with folklore in Britain, and other parts of the world.

The value of this very modestly priced publication is considerable, not only in being informative and well illustrated, but also because it is one of the only publications readily available on the subject. The most comprehensive pieces of work previously written on this subject are F. D. Adams' "Birth and Development of the Geological Sciences" (reprinted by Dover, 1954) and K. P. Oakley's "Folklore of Fossils" (*Antiquity*, vol. 39, 1965), in which Adams concentrated on folklore recorded in the early literature, and Oakley studied fossils recovered in archaeological contexts. Michael Bassett presents the subject mainly under headings of British colloquial fossil names (e.g., Star-stones), and under these headings describes the type of fossils referred to, and the geographical and literary sources of their names. Following the earlier version of this booklet of 1971, nearly all the British colloquial names are derived from

Robert Plot's "Natural History of Oxfordshire" (1677) and his "Natural History of Staffordshire" (1686), but in this new version the author has expanded the text to include the folklore of fossils from other regions of the world, demonstrating similar interpretations of certain fossil groups in distant regions. Also included in this new version is a most interesting section on "Ammonites and Architecture," discussing the inclusion of ammonite designs in Sussex architecture, plus a selected bibliography and a geological time scale.

The whole of the subject is well illustrated with many good black and white photographs (the cover bears a splendid snakestone in colour), and the additions to this revised issue include a fine photograph of a Pahvant Indian necklace from Utah adorned with trilobites. This and the "snakestones" are, however, the only two types of fossil illustrated of actual "folklore artefacts," and it is perhaps a pity that one or two medieval or earlier archaeological items (e.g., a toadstone ring, or fossil beads) could not have been illustrated at the expense of the generous space given to some rather repetitive coats of arms, and a whole page of "Delabole butterflies."

The only other criticism is that in revising for this new version, some additional British colloquial fossil names might have usefully been added from the early literature. One finds for instance the terms "Brain stones" and "Mushroom stones" for certain fossil corals widely used (e.g., see Woodward's "Natural History of the Fossils of England," 1729), and authors such as David Ure (History of Rutherglen and East-Kilbride, Glasgow, 1793) give a valuable insight into Scottish names (e.g., "Witchbeads" for crinoid items, "coal stalk" for *Stigmaria*). John Walcott in his "Descriptions and Figures of Petrifications" (1779) quotes the marvellous story of Edward Lhwyd's observations in Scotland, where Lhwyd tells us about "Cock-knee" stone amulets:

The Cock-knee stone is an Echinites pileatus, minor of flint; which they firmly believe to be sometimes found in the knees of old cocks; and a fellow in Mul protested to me, (though I was never the nearer believing him), that he had with his own hands taken one of them out of a cock's knee

Walcott also tells us of the expressive term "Leeches" which quarrymen near Bath then applied to the palatal teeth of fossil fishes.

Fossil vertebrates and plants, despite being recognized as the remains of animals or plants, have a greater folklore history than perhaps the author gives them credit for. Bone remains for many hundreds of years were variously tied up with myths of giant races of men, and later with elephants dating to the Roman occupation of Britain, while many fossil plant remains were attached to stories of Noah's flood. Many fossils (especially sponges) and naturally shaped pebbles received the common names of fruit and nuts (e.g., "Pear stones"), and fossil and sub-fossil trees were attached

to all sorts of stories of the flood (in the East, fossil wood on hilltops produced many candidates for the remains of Noah's Ark itself.)

The colloquial names given to rocks and stones is of course beyond the scope of this work, but it is interesting to note that the name of "cat skulls" applied to stromatoporoids from Gotland would appear to have a British parallel in the name "cat's heads" applied to ironstone nodules (Woodward, 1729).

It is of course too easy to suggest the expansion of a subject which has been fairly economically placed within just 32 pages, and to be fair, Michael Bassett has produced an informative and entertaining piece of reading, which at the price, should be on the shelf of every person with an interest in the history of geology.

M. J. Bishop

THE RISE OF THE EVOLUTION FRAUD, 1982, Malcolm Bowden, Bromley, Kent, Sovereign Publications, San Diego, Creation-Life Publications, pp. xii + 227, £3.90.

Here is a book that is selling well and can be found in your local (evangelical) book shop. It is the history of evolution as seen through Creationist eyes. At first glance it appears that Bowden gives a comprehensive survey, but in fact he sees the rise of evolution as a conspiracy engineered by Lyell with Darwin as a willing pawn. In this Lyell is claimed so cunning that no one has realised his real motive for destroying belief in the Biblical Flood (p. 94), and thus of Christianity. In fact Bowden has simply not understood the Uniformitarian-Catastrophy (sic) controversy (p. 30) or Lyell's very real problems over Evolution. Bowden also tries to show that Lyell had revolutionary leanings (p. 103), and his treatment of Darwin is no better. To Bowden the great naturalist was an amateur and no real scientist (p. 55), who returned to a faith shortly before he died, (p. 188ff).

Many Christians who read this will not be aware of its historical inadequacies, so before any fingers are pointed, it must be asked, "Is the popular version of the evolution controversies any better?" Far too frequently it is wrongly stated that Lyell was the first to put forward the great age of the earth and that in 1859 most church leaders still believed in 4004 B.C.

A creationist historiography of science is evolving and Bowden is typical of several (1). This stems from their "Two Model Approach of origins; either Divine Creation in about 4000 B.C. or atheistic evolution by chance. This stark polarisation ignores other alternatives, but many wittingly or unwittingly adopt it. It is a superb debating tactic as it precludes any middle ground (2). In one sense Creationists are merely following Thomas Huxley in his simplistic dichotomy - Evolutionist or Creationist, but reversing the roles of hero and villain. Dov Ospovat's appeal for a shift away from this dichotomy needs to be heeded both for the history of science and for today's con-

troversies (3).

In dealing with philosophical issues Bowden relies on Popper, concludes that Evolution is unscientific and atheistic, but makes no distinction of Evolution as scientific theory and as world view (he is not alone here!) The allegedly fearful results of evolution in Communism, Racism (Apartheid?) and Immorality have a great appeal for religious moralists, but the picture is much more complex than any Creationist would allow. One can hardly ascribe Agassiz's racist views to his evolutionary outlook! The book concludes with evidence for "Creation" which gives "scientific confirmation" of Usher's (sic) date of 4004 B.C. or more precisely 4040 B.C. + 20 (p. 209). It is tempting to treat this with some levity, but it is this type of Science which forms the basis of both American and British Creationism, and we know of its influence in the States. Hatchet jobs on Creationism are easy but, without sympathetic understanding, will prove counterproductive. We must await a positive response (4). The reason why a book like "The Rise of the Evolution Fraud" is important, is not because of its virtues - it has none - but because it is an attempt to give historical underpinning to Creationism, by using the ever popular "Warfare" view of the history of science.

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- 1) e.g. H.M. Morris. *Men of Science, Men of God*. San Diego, 1982. Creation-Life, or S. Baker. *Bone of Contention*. Welwyn 1976. Evangelical Press.
- 2) see H.M. Morris. *Scientific Creationism*. San Diego, 1974. Creation-Life, and "Creationism in Schools", *Science* 19 Feb. 1982, 215, pp. 934-943. (The Arkansas Judgement).
- 3) Dov Ospovat, *Studies in the History of Biology*, 1978, No. 2 esp. pp. 49-52.
- 4) Most useful are:
R.H. Dott. *The Challenge of Scientific Creationism*. *Journal of Paleontology*, March 1982, 56, No. 2, pp. 267-270.

R.L. Numbers, *Creationism in 20th Century America*, *Science*, 5 Nov. 1982, 218, pp. 538-544, and for the diversity among American Fundamentalists see *Christianity Today*, 8 Oct. 1982, XXVI, No. 16, pp. 22-45.

THE ROYAL SOCIETY OF EDINBURGH (1783-1983).
THE FIRST TWO HUNDRED YEARS, 1983, Neil Campbell and R. Martin. S. Smellie, Royal Society of Edinburgh (22, 24 George Street, EH2 2PQ), 186 pp., £7.50.

It would be unfortunate if the year 1983 was to pass by without any record in this journal of its also being the bicentenary year of the Royal Society of Edinburgh - a society with major significance for the history of the Earth Sciences. We can ensure it does not by a review of this bicentenary history; a publication well worthy of the event it celebrates, and including 8 portraits in colour (including that of James Hutton). Its authors make clear that they do not intend to provide a "complete annalistic account of the Society" but instead to give "a conspectus of some of the main events in the Society's history" mainly as viewed through the personalities of the Society.

When the Society was founded "for the advancement of learning and useful knowledge" travel from Edinburgh to London took two days with an overnight stop. With this foundation Edinburgh then became the only city in Britain to possess both an active society devoted to science and a university. The Scots had early learned how "useful" geological knowledge was and this is confirmed in this history which emphasises the role Hutton, Hall, Playfair, and Jameson played in the early development of the Society's Physical Class. The twin attractions of society and university helped make Edinburgh a world centre for geological research attracting many, both students and visitors, to the city including many from outside the British Isles. In the words of the authors this early geological activity "also established the reputation of the Society in the scientific world".

Throughout these 200 years the Society has concerned itself with all aspects of science and many outside it. The treatment in the book is not arranged chronologically but thematically. The first two chapters concern "Origin, Aims and Development" and "Meetings, Publications and Library". Chapter 3 "Sage Councillors" provides details of the Society's administrators and staff while Chapter 4 discusses the important contributions made to the Society by the amateur. Chapter 5 concerns the debates and controversies which have surrounded the Society including those of some importance in which Hall and Hutton were involved. A notable achievement for this style of treatment is the very good cross referencing the authors give between the chapters.

The longest chapter, 6 intriguingly entitled, "Angular Fragments" discusses the separate subjects which have concerned the Society and in which geology is allocated 6 pages. Recent history is covered in the seventh chapter.

Through all this the authors have succeeded well in charting the Society's progress down the years. However amid the understandably congratulatory tone I was sad to find the discussion of the Museum of the Society - one of major significance for earth scientists - relegated to two pages only of a final proper chapter.

labelled as "Miscellanea". As so often we find the publication side investigated but the collections which accompanied them neglected. Neglect is surely the key word of these Royal Society of Edinburgh collections whose dismemberment could have been documented in more detail here. However Jean Jones has work in progress on the sorry story of the Hutton collection which the Society acquired in 1797 (and neglected thereafter!). None the less even in these two pages the authors succeed in publishing some useful information including news that their Ure collection was passed to Glasgow University in 1910. This historic collection - of Rev. David Ure (died 1798) the Father of Scottish Palaeontology (not Dr. Andrew Ure as misidentified in the index) - was acquired by the R.S.E. in 1843 and as recently as 1982 wrongly recorded as "lost".

Despite such minor quibbles this is a most useful volume and one can only hope that the sponsorship which has enabled it to be produced at such an economic price, will also ensure it is as widely read and used as it deserves.

H.S. Torrens

Nicolaas A. Rupke, 1983. The Great Chain of History: William Buckland and the English School of Geology, 1814-1849. Oxford University Press, xii + 322 p. £22.50

Overall, there has been surprisingly little primary research on Dean William Buckland (1784-1856) over the past $1\frac{1}{4}$ centuries considering his undoubted prominence and importance in the scientific life of Regency and Early Victorian England. Of the limited number of studies that have been published, the great majority have been analyses of Buckland's role within particular scientific controversies using mainly or exclusively secondary sources.

Apart from obituaries, such as those of Portlock (1857) for the Geological Society of London, or Phillips (1857) for the Royal Society, and Murchison (1857) for the Royal Geographical Society, the main biographical source was (and to some extent still is) the substantial "Memoir" added by his son, Frank Buckland, to the posthumous third edition of Buckland's *Bridgewater Treatise* (F.T. Buckland, 1858).

The traditional "life and letters" volume or volumes with which most eminent Victorians were honoured did not appear until 1894, 38 years after Buckland's death, and even then this was a very slight work written by the second (surviving) daughter, Elizabeth (Mrs. Gordon, 1894). This is on quite a different scale to the substantial two-volume biographies of such close associates of Buckland as Sedgwick, Murchison, Lyell or Agassiz. In marked contrast with so much Victorian biography, which so frequently attempts to portray the subject in sycophantic and exaggerated terms, Elizabeth Gordon tended to draw a character that is much smaller than life by minimising or omitting altogether Buckland's many well-documented (and by 1890, already published) eccentricities, buffoonery and decidedly un-clerical coarse language. It is quite conceivable that the timing and approach of the book were at least

partly in response to the unbalanced presentation of the more colourful side of Buckland's character that was by then current.

It seems quite clear from internal evidence in the Buckland family papers at the Devon Record Office, Exeter (registration no. 138M), that Mrs. Gordon's son, Prof. M.A. Gordon FRS, planned a more substantial and scientifically-oriented biography, but towards the end of his life realised that he would not achieve this and instead passed all the William Buckland and associated material to the the Devon Record Office (and some Frank Buckland material to the Royal College of Surgeons Archives).

The late James Edmonds worked on Buckland for many years, from a centenary review (e.g. Edmonds, 1956) right up to his death, but his projected major biographical review of Buckland was similarly left unfinished. However, two important, meticulously researched, studies of how by means of patronage Buckland was able to progress to Oxford in the first place, and on his role in persuading the Crown to establish a regius chair in geology (to which he was himself immediately appointed) appeared during the final years of his life (Edmonds, 1978 & 1979).

There have been a few substantial review papers of Buckland's work, such as Frederick J. North's unravelling of the confusion surrounding Buckland's investigations of Kirkdale and Paviland Caves (North, 1942), a review of Buckland's role in the development of cave science (Boylan, 1967), and the substantial analysis of the origins of the glacial theory by Gordon Davies (1969), as well as some shorter studies. However, even today much that is written and said about Buckland and his immediate circle (such as Conybeare and Greenough) is still dominated by decidedly whiggish views of "right" and "wrong" sides of what are now perceived as the major geological issues of the time, for example Diluvialists against the Fluvialists or Catastrophists versus Uniformitarians, in a way that would be totally unrecognisable to any of the participants in the great geological debates of the 1820s and 1830s, such as those over Lyell's "Principles of Geology" (Lyell, 1830).

Buckland was certainly critical of the first volume of Lyell's "Principles", despite the fact that Lyell was the most successful of his geological pupils and remained a life-long close friend, but because Buckland was some kind of Bible-thumping religious fundamentalist and literalist but because of rational and scientifically-based doubts about the very speculative 18th century-like synthesis of Lyell, and the near-impossibility of accommodating the observed phenomena of the British Quarternary (of which Buckland was the undoubted master) into a theory of strict uniformitarianism. For example, on 22 May 1832, Buckland opened his Oxford Geological lecture course with a discussion of recommended books, and in his detailed lecture notes, J.E. Jackson recorded "Lyell. (Fellow of Exeter) his book excellent for those who are read in Geology: hard for beginners. Theories in 1st volume have not Buckland's assent & are not sufficiently proven." (Institute of Geological Sciences, London, manuscript collection,

accession number IGS 1/635 - J.E. Jackson lecture notes). So far as the Quaternary of cool temperate latitudes are concerned, it is hard to envisage anything more catastrophic in both the literal and the geological senses than a rapid succession of large-scale terrestrial glaciations, with the possible exception of the impact of a giant meteorite or small asteroid, and it was certainly no accident or coincidence that led Buckland to be much the most enthusiastic advocate of the glacial theory, save Agassiz himself (Boylan, 1981B).

Even if Buckland's own contributions to original scientific research had been worthless (and in fact the opposite was the case), he would still have been a major figure in British science of the first half of the 19th century because of his critically important work in the promotion of scientific institutions and the popularisation of science. In the former, his efforts to achieve political and royal patronage for first the establishment of a regius chair in geology at Oxford, and then the granting of a royal charter of incorporation to the Geological Society at a time when only the Royal Society was so chartered and was naturally jealous of its position, were of crucial importance; in the latter, his role in the development and promotion of the British Association for the Advancement of Science and the readability and popularity of his own works, most notably the *Reliquiae Diluvianae* and the *Bridgewater Treatise* (Buckland, 1823 & 1836) brought science, especially geology, before a widely dispersed and largely non-academic public.

Consequently, even if I had disagreed with every work of Nicolaas Rupke's new book (which I certainly do not), I would have most warmly welcomed its appearance, and commended it to both historians of science and working geologists in the relevant fields alike.

Despite the fact that in terms of length this is much the most substantial work on Buckland ever published, Rupke has, wisely in my view, chosen to cover only a limited range of themes, concentrating on Buckland's place in the broad scientific and cultural history of the 1820s and 1830s in particular. Thus, there is no attempt to present any sort of biographical review, nor are Rupke's four main themes covering in turn Oxford and the "English School" of geology, the Quaternary, historical geology (much the longest section) and the concept of Divine Providence in relation to geology, even dealt with in chronological order.

Most of the book was written in Oxford, and I fear that this has to some extent coloured Rupke's view of Buckland's place in geology. In his preface (p. vii) he states quite categorically: "Buckland and his circle belonged to Oxford and Cambridge, and this institutional connection influenced the content of their geology." Yet from the retirement of Kidd from geology (which opened the way for Buckland to obtain his first University appointment as Reader of Mineralogy in 1813), of Broderip to the Law, and Conybeare to ecclesiastical advancement, Buckland as a geologist was very isolated indeed in Oxford, hence Murchison's favourite and much quoted story of the distinguished don who said: "Well Buckland is gone to Italy, so, thank God, we shall hear no more of

this geology!" (Murchison, 1857: cv). Almost two decades later, in 1832, Oxford as a whole appears to have been distinctly unimpressed by the first full meeting of the British Association under Buckland's presidency (following the inaugural meeting in York in 1831), even to the extent of deliberately choosing one of the most unsympathetic dons in the University to preach at the official Service that was grudgingly offered to the British Association. Buckland himself became increasingly disillusioned with Oxford, and by 1847 described the possibility of natural history making progress in Oxford as "utterly hopeless" (as Rupke himself points out, p. 273-274).

So far as Cambridge is concerned, during Rupke's key period of the 1820s and 1830s, Sedgwick was almost as isolated as was Buckland in Oxford, and the common link and unifying force between the two were the national scientific institutions, including the Royal Society and the British Association from about 1832 or 1833 onwards, but above all the Geological Society of London. Although the early attendance books of the Geological Society have not survived, and no one appears to have seen the journal of his wife, Mary Buckland, since Mrs. Gordon wrote her biography in 1894, Buckland's movements can be reconstructed to a considerable extent from letters to a very wide range of correspondents and from recorded comments of other Fellows of the Society. Throughout the whole of Rupke's period Buckland only rarely missed a fortnightly meeting of the Geological Society, despite the fact that each meeting involved 10-12 hours of travelling time by coach or on horseback together with an overnight stay in London. (One of the most famous apocryphal stories about Buckland was based on his familiarity with every inch of the Oxford to London road: travelling in thick fog and uncertain as to his location, Buckland got down from his horse, smelt a small handful of roadside earth, and exclaimed to his companion "Ah, Uxbridge!"). It was in London (and later a succession of unlikely provincial commercial and industrial towns visited by the British Association) that the geology professors of Oxford and Cambridge came into contact with not only each other on a regular basis, but also the other leading geological figures of their day, such as Conybeare, De la Beche, Greenough, Lyell, Murchison, Darwin and many others. Perhaps Dr. Rupke's recent translation from Oxford to the Metropolis will in due course temper his Oxbridge-centred view of early 19th century geology.

Throughout the work, Rupke relies mainly on contemporary published and manuscript sources, and gives little space to the sort of *ex post facto* judgements in terms of scientific "rights" and "wrongs" or perceived controversies, that predominate in more general histories of science of the past century or so. As a general principle, Rupke's approach should be thoroughly applauded. Using archaeology as an analogy, for most of the geological issues and individuals of Rupke's period we are still at the stage of careful and systematic excavation, and the definitive interpretation and synthesis will not emerge until the primary sources are more fully investigated and understood. Rupke's "trial trenching" of some of the important issues of the 1820s and 1830s has enabled him to throw new light on many issues.

On the more positive side, Rupke breaks completely new ground in several areas, particularly the relationship between geology and the arts, suggesting fruitful areas for future research. For example, he examines the influence of diluvialism on the latter part of the Romantic movement in English painting as exemplified above all in John Martin's masterpiece "The Deluge", as well as the popular literature, particularly Tennyson. However, he misses the finest literary tribute of all to Buckland's environmental and palaeontological reconstructions: the opening lines of "Bleak House" by Dickens, first published in 1853. ("London. Michaelmas term lately over, and the Lord Chancellor sitting in Lincoln's Inn Hall. Implacable November weather. As much mud in the streets, as if the waters had but newly retired from the face of the earth, and it would not be wonderful to meet a Megalosaurus, 40 feet long or so, waddling like an elephantine lizard up Holborn Hill.")

Whether one agrees with the interpretations and conclusions or not, Rupke's study of Buckland and aspects of English geology during the second quarter of the 19th century must be regarded as required reading for all who are interested in the history of English geology of any period. Let us hope that it will not be another 89 years before there is a further book-length study of this major, but frequently misrepresented and misunderstood, figure.

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96 New Walk
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England
- NATURAL HISTORY MANUSCRIPT, RESOURCES IN THE BRITISH ISLES, 1980, compiled by G.D.R. Bridson, Valerie C. Phillips, and A.P. Harvey Mansell, London and R.R. Bowker Company, New York, pp. XXIV, 473 p., £97 or \$245

That this book should still be thought worthy of reviewing at all here, four years after its publication, is a measure of the importance this reviewer attaches to it. Historians have become so used to the availability of compilations such as the British Library or National Union Catalogues of Printed Books, that we forget the difficulties of those who seek the basic raw manuscript materials of history discussed here?

The present volume is a highly welcome compilation for the whole of natural history and the whole British Isles. 443 repositories from Aberdeen to York and encompassing the Channel Isles and Ireland are listed. As in all such compilations, based to a large extent on the returns sent in by those holding archives, the coverage is very variable. Details "of a large quantity of records not fully sorted" in for example Cardiff appear beside very detailed returns for, as one example, the Linnean Society in Lon-

don. But it is a marvellous quarry which continually throws up surprises in unexpected places, and should be a standard source for all working on the history of science. Apart from the uneven returns, I fear the natural history connection of geology emphasised in the title has to some extent obscured the links that geology also shares with mining and technology. Major mining archives all over the British Isles contain geological material which is not listed here in sufficient detail.

This minor quibble apart, the compilers deserve our thanks for such a herculean task so well performed. But they have been betrayed by their publishers. At the price demanded I cannot see any individuals being able to afford this book and this quite simply angers me. 5 pages per pound is not enough, and I hope scholars will think carefully before considering the present publishers for any future projects they may have in hand.

Hugh S. Torrens

INTERESTING PUBLICATIONS

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CALENDAR OF EVENTS

1984

4-14 August - International Geological Conference, Moscow. (Organizing Committee of the 27th Geological Conference, Institute of the Lithosphere, 22 Staromonetnyi, Moscow 109180, USSR).

Section C.21. History of Geology
Conveners: R. Hooykaas (NL), V.V. Tikhomirov (SU), T. Vallance (AU)

Themes:

Development of Concepts of the Earth's Composition.

Consideration of the evolution of the study of theoretical lithology and geochemistry of sedimentary rocks. The significance of comparative lithological and historical geological methods in understanding lithological theory.

Chairmen: C. Amstutz (DE), V.N. Kholodov (SU)

Evolution of Concepts of the Dynamics and Structure of the Earth's Crust and Upper Mantle.
Analysis of the development of ideas about the Earth's interior dynamics. Concepts of correlation between deep-seated structures and surficial tectonics, both recent and ancient and areas of mineral formation. Improvements in methods of research into deeper portion of the crust and mantle.

Chairmen: Yu. K. Schukin (SU), T. Watanabe (HP)

Intersectional Symposia:

History of Mineralogy (XI INHIGEO Symposium)

The main stages in the development of mineralogical sciences.

The history of formation of various scientific schools of thought and concepts in mineralogy.

Chairmen: G.P. Barsanov (SU), M. Guntau (DDR)

In collaboration with Section Mineralogy; International Mineralogical Association; International Commission on the History of Geological Sciences.

Excursion:

History of Geology:

Directors: M.M. Romanova, O.A. Sobolev, I.A. Tugarinov

Route: Moscow-Leningrad-Petrozavodsk-Moscow.

In Moscow: visit to the Mineralogical Museum named after A.W. Fersman, the Museum of Earth Sciences of the Moscow State University named after M.V. Lomonosov, the Memorial Museum-study room of V.I. Vernadsky, the Museum of Palaeontology of the USSR Academy of Sciences and the Memorial Museum of M.V. Pavlov and A.P. Pavlov.

In Leningrad: the collections of the Dunstkamera, the Mining Museum of the Mining

Institute named after G.V. Plekhanov, the Central Scientific Institute of the Geological Survey named after F.N. Tchernyshov, gems and precious stones in works of art from the collections of the Hermitage.

In the suburbs of Petrozavodsk: geological objects illustrating the history of the study of the Earth's crust: sanatorium "Marcial Waters," Peter the Great Museum, water falls, and Kivatch Museum. An excursion to the Kizhi Island will be arranged.

26-31 August - 7th Australian Geological Convention. Symposium on "Perceptions, people and practice-evolution of the geosciences in Australia." Specialist group on history to be formed (Dr. J. Cooper), South Australia Dept. of Mines and Energy, P.O. Box 151, Eastwood, South Australia).

26-28 September - On the occasion of the 150th anniversary of its founding, the Virginia Division of Mineral Resources is sponsoring a symposium on the Quaternary of Virginia and nearby areas, in Charlottesville. The technical sessions will be followed by a field trip on September 29 to vertebrate fossil sites on Saltville in southwestern Virginia.

On the evening of September 26 and on the 27th, invited speakers will discuss the region's ancient plant and vertebrate communities, megafaunal extinctions, archeology, upland geomorphology, and Quaternary zoogeography. The larger fossil vertebrates will be emphasized to commemorate Thomas Jefferson's interest in them.

(S.O. Bird, Virginia Division of Mineral Resources, P.O. Box 3667, Charlottesville, VA 22903; phone: (804) 293-5121.)

12-13 October - (Tentative) Symposium on "Origins of the Earth: Views on the Continent in the 18th Century" Linda Hall Library, Kansas City. (Dr. W. Ashworth, Linda Hall Library, 5109 Cherry Street, Kansas City, Missouri 64110).

3-7 December - The newly organized History and Heritage of Hydrology Committee of the American Geophysical Union's Hydrology Section will sponsor a half-day symposium on historical aspects of the geological and geochemical study of surface and ground water at the 1984 AGU Fall Meeting in San Francisco. The symposium, "History of Hydrology: Earth Science Aspects," will follow a selected topics-type format. Because this is a first-time effort by the committee, no initial restrictions as to scope have been imposed in order to span a range of interests and to identify a population of individuals with historical interests. Areas of interest include the work of individual scientists, the evolution of concepts, and the development of techniques and methodologies. Persons interested in the symposium may contact Edward R. Landa, (U.S. Geological Survey, 413 National Center, Reston, Virginia 22092; phone: (703) 860-6971).

27-30 December - History of Science Society, Chicago, Illinois. (Tentative) Session on Geology in Europe in the Nineteenth Century. (Mary Jo Nye and David Kitts, History of Science, University of Oklahoma, Norman, Oklahoma).

1985

9-12 April - The Evolution of the European Lithosphere, 4th Meeting of European Geological Societies Edinburgh, Session on the History of the Geological Sciences. Keynote address by Prof. G.L.H. Davies, Trinity College, Dublin, Eire. (organized by the History of the Geological Sciences Subcommittee of the British National Committee for Geology).

Excursion:

Scottish Classical Geology, a general excursion to classical geological sites throughout Scotland (3 days).

(Megs 4, British Geological Survey, Murchison House, West Mains Road, Edinburgh, EH93LA, Scotland).

1-8 August - International Union on History and Philosophy of Science, Berkeley, California. (Michelle Aldrich, AAAS, 1976 Massachusetts Avenue, NW, 20036).

1985 - Sesquicentennial Virginia Division of Mineral Resources (Robert Milici, Director, VDMR, Box 3667, Charlottesville, VA 22903). Events are being planned for 1985.

1985 - Sesquicentennial Institute of Geological Sciences (Brian Kelk, IGS).

1987

September - IV International Congress on the History of Oceanography, Hamburg, West Germany. The following topics are proposed:

1. History of international cooperation.
2. Experiences in interdisciplinary research.
3. Economic aspects in and their influence on marine sciences.
4. Scientific and technical assistance in marine research.

Further suggestions are welcome.

(Deutsche Gesellschaft für Meeresforschung, -ICHO-IV-, Bundesstrasse 55, D-2000, Hamburg 13, FRG).

(Please send items to R. Laudan, Center for the Study of Sciences in Society, VPI & SU, Blacksburg, VA 24061, USA)