BOOK REVIEWS

Gretchen Luepke, BOOK REVIEW EDITOR

GIOVANNI ARDUINO (1714–1795): IL CONTRIBUTO DI UNO SCIENZIATO VENETO AL DIBATTITO SETTECENTESCO SULLE SCIENZE DELLA TERRA. *Ezio Vaccari. 1993. Biblioteca di Nuncius: Studi e Testi VIII. Leo S. Olschki, Firenze. 407 p. Softcover, L. 85,000.*

I entirely agree with Vaccari that in the not too distant past, intense frustration was the overwhelming feeling of a historian of geology whenever he wished to reach some understanding of eighteenth-century Italian geologists which would go beyond the statements found in the "classical" books of Archibald Geikie, Karl Zittel, or Frank D. Adams. Indeed, with the exception of the latter, second-hand and even third-hand sources were the rule and the worn out cliché of "works quoted by title but not actually read" appeared all too often.

This frustration led Vaccari to search for the publications of modern Italian geologists interested in the past history of their field. Unfortunately they turned out to be few and either of general character or restricted to short introductory comments to scientific textbooks for college use.

Unquestionably, untouched archives had to exist in numerous Italian librairies. When eventually found, they had not been catalogued and hence still remained essentially useless as basis for any specific study of a particular individual or a given subject matter.

Fortunately, the new generation of Italian historians of science, exemplified by Vaccari, took upon itself to change these historiographic "Dark Ages" into a real "Renaissance." This indispensable inventory is still in progress and has yielded treasures of immense value. The publications of Ezio Vaccari, among which is an inventory of Arduino's correspondence (Nuncius, 1990, 5, pp. 79–126) and then a more encompassing paper entitled "*I manoscritti di uno scienziato veneto del Settecento: notizie storiche e catalogo del fondo "Giovanni Arduino" della Biblioteca Civica di Verona*" (Atti Istituto Veneto di Scienze, Lettere ed Arti, Tomo CLI,1992–1993-Classe di scienze fisiche, matematiche e naturali, pp. 271–373) are perfect examples of these first endeavors, which hold an exciting promise for a wealth of new data. In the latter paper, Vaccari tells us of the painstaking task of inventoring for the first time the content of six boxes containing more than one thousand handwritten papers representing Arduino's correspondence, his notes, the rough drafts of his writings, and his geological sketches and drawings. Vaccari's publications present now this *corpus* in subject matter folders under the headings of geology, mineralogy, chemistry, metallurgy, mining, hydraulics, and agriculture. Following this systematic organization of the materials, a general index and a detailed catalog were written and preserved at the Biblioteca Civica di Verona.

The example was set and more inventories were to follow by others. Of particular interest to geologists is the one pertaining to the correspondence of Anton Lazzaro Moro, *Carteggio (1735–1764)* organized by M. Baldini, L. Conti, L. Cristante, and R. Piutti, 1993, 176 pp. (Archivio della Corrispondenza degli Scienziati Italiani).

Although the above discussion might appear, at first glance, merely a lengthy introduction to set the stage for Vaccari's biography of Giovanni Arduino, which is the subject of this review, I felt that the unusual circumstances of this background warranted a detailed introductory statement.

Vaccari's biography of Arduino is a monumental achievement based on extensive quotations of his letters, manuscripts and articles published in Italian periodicals often of difficult access. These documents nicely blend into the detailed portrait of a man whose career began as a mining engineer and blossomed into geological theories, technology of mining and metallurgy, mineralogy, chemistry, and agriculture, ending in administrative duties for the Republic of Venice.

This book describes in great detail the various phases of Arduino's struggles during his unusual ascent from a mere mining technician to a naturalist trying to grasp the fundamental problems of stratigraphy and mountain building processes of his time and attempting a general synthesis.

We see how his scientific training gradually developed from his mining experience in the mines of Schio into the observations of the surrounding mountains. His professional reputation expanded through his activity as a mining consultant in Tuscany, in the region of Modena, through his reading of Buffon, Wallerius, and de Maillet, and eventually in the fruitful correspondence with Giovanni Vallisnieri Jr. This exchange of ideas led to the two letters in which Arduino outlined his new stratigraphic classification in 1759 (*Due lettere del Sig. Giovanni Arduino sopra varie sue osservazioni naturali,* published in 1760) in four general

subdivisions, not in three as often erroneously repeated by subsequent authors.

Arduino distinguished the highest primitive or primary schistose mountains (metalliferous) overlain by fossiliferous secondary limestone mountains of lesser elevation, in turn covered by low-altitude tertiary mountains or passes (*colli terziari*) consisting of cemented fossiliferous sands and clays with reworked debris of primary and secondary ones. Finally, at the lowest elevation lies the fourth subdivision, namely, the alluvial plains consisting of stratified torrential deposits with rounded pebbles. In this original fourfold subdivision, Arduino recognized the traces of ancient volcanoes in the tertiary mountains, and although he understood the importance of volcanism he did not stress his ideas any further being afraid of the negative reactions of his peers.

In subsequent years, Arduino underwent a gradual realization of the importance of past volcanic action and intrusion of igneous rocks in the sedimentary column which he incorporated in the final version of his ideas published as the *Saggio Fisico-Mineralogico di Lythogonia e Orognosia* in 1774. This was the seminal work through which his ideas reached the European scientific community. His fourfold classification of the stratigraphic record began to assume the more grandiose aspect of a theory of the earth in which sedimentary processes were continuously interrupted by violent revolutions, dislocations, intense foldings, and earthquakes related to igneous and volcanic activity originating from the interior of the earth.

Vaccari wrote that this attitude was further expanded in an unfinished and little-known manuscript entitled *Risposta allegorico romanzesca . . . sopra la Genesi della presente faccia della Terra* addressed to J. J. Ferber whose writing might have started in 1771 and was continued synchronously with the *Saggio.* In this metaphorical manuscript, the formation of the surface of the earth is presented clearly as a theory of the earth consisting of a succession of epochs corresponding to Arduino's four stratigraphic subdivisions in which slow sedimentary processes are blended with catastrophic events of volcanic and igneous origin. This actualistic view fits well his scientific position of following a "moderate middle road" based on field observations and therefore refusing to take a position in any aspect of the controversy between neptunists and plutonists.

Vaccari has allowed us to know Arduino as a fascinating scientist within the Italian and European context of his time. He clearly states that he wanted to write a biography which would be the base for further studies on Arduino dealing with the history of chemistry, metallurgy, mining techniques, agriculture and naturally geology. Unfortunately, Vaccari succumbed to the temptation of indulging in geological discussions which appear to the present reviewer (who would like to call himself a geologist-historian) as rather superficial because they are either unsupported or supported by an excessive number of references which do not explain the geological context from a professional viewpoint. For instance, when talking at length about rocks which Arduino called "primitive schists," Vaccari tried to explain the problem of 18th-century terminology to the reader by referring to a dictionary of earth sciences and to the confusing interpretations of Arduino's contemporaries. In Vaccari's place, a geologist-historian would have studied the rocks themselves. How can Arduino's contribution be understood without following him in the field? Only then would it become necessary to analyse the jungle of contradictory terminologies of "schists" in the 18th century, a result of insufficient knowledge of chemistry and mineralogy at that time.

Nevertheless, Vaccari's superb biography is an unquestionable challenge for geologists to write on *Arduino the geologist* who definitely ranks among the greatest of the18th century.

Albert V. Carozzi, Department of Geology, NHB 245, University of Illinois at Urbana-Champaign, Urbana, Illinois, 61801-2999

GEOLOGY AND MINERALOGY AT OXFORD 1860–1986. *E.A. Vincent. 1994. Privately published from Dept. of Earth Sciences, University of Oxford, Parks road, Oxford OX1 3PR, England, 245 p. Softcover, price not included.*

To the history of British geology, the contributions of the University of Oxford have been considerable, yet they have also been unexpectedly inconsistent. William Buckland was appointed Reader in Mineralogy in 1813, adding a Readership in Geology in 1818. Unfortunately his lectures, though accounted brilliant, attracted few students of whom only one, Charles Lyell, was to prove lastingly important. Indeed, Buckland became "disillusioned with Oxford's lack of interest in science" (p. 1) and, in his latter years, devoted his energies instead to his duties as Dean of Westminster.

Hugh Strickland, acting as Buckland's Deputy in giving both series of classes at Oxford, was killed in a train accident in 1853. Thereafter, the Readerships were split and were long to remain sundered. Nevil Story-Maskelyne took up that in Mineralogy and John Phillips, nephew of the Great William Smith and a distinguished geologist in his own right, became Reader in Geology; together they inaugurated the University Museum which was long to be the home of both disciplines. Story-Maskelyne devoted most of his energies to his other position, as Keeper in Mineralogy at the British Museum (Natural History); during his long tenure of these two appointments (till 1895) he taught few students, though some of those few were to have distinguished careers. John Phillips, a livelier teacher, died through a fall down the stairs of All Souls' College in 1874. He was succeeded by the Qua-

ternary geologist Joseph Prestwich. Already 62 when appointed, Prestwich held the Oxford Professorship for thirteen years; his classes in lecture-room and field attracted good attendances, from women as well as men, but he found his duties arduous and retired in 1887. His successor, Alexander Green, suffered from ill-health throughout his short tenure, dying in 1896.

As the turn of the century approached, then, both Readerships gained new incumbents. One of Story-Maskelyne's students, Henry A. Miers, succeeded him, while a much more colourful and enigmatic figure began a long tenure in the Chair of Geology—William Johnson Sollas. He was to occupy it for almost forty years (1897–1936), becoming at once famous for his scholarship and notorious for his eccentricities. Though Sollas's responsibility for the Piltdown forgery has been proclaimed by L.B. Halstead (1978: discussed on p. 36), this is unlikely ever to be convincingly proven. Certainly Sollas is a much likelier candidate than any other whose name has yet been put forward and infinitely likelier than Sir Arthur Keith who, despite the claims of Spencer (1990), would surely never have devoted so much of his life to, and risked so much of his reputation on, a forgery for which he was himself responsible! Whatever his attainments and whatever his eccentricities, Sollas unquestionably held the Chair too long; he was a poor teacher, undertook less and less research as the years passed, and allowed the Department to stagnate.

Despite Sollas's failure to provide strong leadership, there were notable geologists in the Department throughout those forty years. Arthur Vaughan, a distinguished stratigrapher, died too young to exert any lasting influence, but Kenneth Sandford and Stuart McKerrow maintained distinguished programmes in palaeontology and stratigraphy, not only in England but also in the Arctic and Middle East (Sandford) and Ireland (McKerrow), while J.V. Harrison undertook pioneer geological studies to prime importance in the Peruvian Andes and W.J. Arkell explored the Jurassic geology of the whole World.

When J.A. Douglas became Professor in 1937, it was clear that new life needed to be breathed into the Oxford Department; in particular, new laboratories and lecture-rooms were urgently required. Douglas had all the right ideas and, indeed, had convinced the University of the need for a new building when the onset of the Second World War caused construction to be deferred. It was during this tenure of the Chair that the independent Readership in Mineralogy—by then become the Waynflete Professorship of Mineralogy & Crystallography—was abolished, the two hitherto-separate disciplines being both placed under Douglas's aegis in 1941. When, at last, the new Department building was opened, it was as the Department of Geology and Mineralogy—but that was not till 1949, when Douglas had only one year to go before retirement.

Since Douglas was a petrologist and geochemist, he must have been gratified when Lawrence Wager, a distinguished researcher in those fields (albeit a Cambridge man!), was elected to the Oxford Chair. That the appointment was much less welcome to the existing staff of the Department is abundantly demonstrated in Vincent's account. Certainly, though Wager's appointment did not spell an end to Oxford research in palaeontology and stratigraphy, it shifted the focus of the Department; for Wager was "extremely tough, single minded and tenacious" (p. 65) and made no secret of the fact that he aimed "to build up a research school centred on his own interests and enthusiasms" (*idem*).

Since Professor Vincent was a long term colleague of Wager (and eventually his successor), it is inevitable that he should be in accord with Wager's aims and portray him sympathetically. The recent life of Wager, meticulously assembled from mostly unpublished sources by his daughter (Hargreaves, 1991), naturally gives an even more positive view of him. However, Professor Vincent is honest enough to admit that Wager had his faults. For example, we learn that:

> He was a shy man, with a reserve that could often be mistaken for brusqueness or even a certain arrogance. (p. 173)

and that:

> As a very serious and purposeful man, Wager seldom made jokes and did not greatly appreciate them; embarrassingly, the punch line often had to be explained to him. Nevertheless, there were occasions when he could display a marked sense of humour and fun, and a keen wit. (p. 126)

I do not believe I would have enjoyed field classes led by Wager, remembering (even now, with a shudder) the harsh field regimen so often imposed by British professors of geology upon their students. They appeared to value hardihood in adversity very much higher than scientific understanding, their aim seemingly being to cover as much ground—horizontal and vertical—each day as was humanly possible, regardless of weather and with lunch always taken in the bleakest possible spot. Wager's field classes were very definitely of that ilk:

> . . . they were tough excursions, both mentally and physically; days were long and creature comforts of no account. (p. 123)

Though the author considers Wager to have been a good teacher, again there is cause to question that judgement:

> The patient and dedicated student could derive enormous profit from Wager's lecture courses, but his delivery was generally surprisingly hesitant. There was no easy, natural flow of words, though his use of language could at times be extremely effective. Partly this was probably due to his inherent shyness, but the lack of fluency was certainly compounded by the way in which his mind was continually thinking out the topic even as he was speaking, fresh ideas tending to interrupt the natural flow. Poorer students thought him a poor lecturer; the good ones recognised that patience with his lecturing style brought its own rewards. Histrionics when lecturing, and indeed any form of showmanship, were alien to his nature, and generally to be deplored in others. (p. 124)

Is a teacher who can reach only the good and dedicated students to be considered a good one—a teacher, moreover, who eschews any methods of enlivening his

classes? I wonder. Indeed, I would be interested to read an assessment of Wager, written by a colleague (say, Stuart McKerrow) less bound up with his aims.

Whatever one's personal concepts of geological priorities, Professor vincent's account of the development of the Oxford Department, from its origins to the time of Wager's sudden death in 1965, is not only comprehensive, but also well-written and fascinating. In the latter part of this work, however, the author is describing the events occurring when he himself occupied the Chair of Geology and Mineralogy. This is a much solider and—let's face it—duller account, for the good reasons that Professor Vincent feels it necessary to pay all proper tributes to colleagues and students and to refrain from comments or criticisms that might disturb or distress those persons. Consequently, though an extremely useful historical document, it ceases to be such good reading and becomes little more than an annotated listing. Perhaps, in papers to be published posthumously, Professor Vincent may some day reveal his true thoughts and insights?

Worthy of note, however, are the splendid poetic parodies quoted on pp. 155–157, their authors (Peter Jackson and Vivien Chamberlain) here exemplifying the highest qualities of of what we, who are destined forever to remain outsiders, style an "Oxbridge education."

All in all, then, this is a most valuable work for all earth science historians, telling as it does the story of a Department whose influence has not been merely confined within Britain's shores but has been truly universal.

William A.S. Sarjeant, Department of Geological Sciences, University of Saskatchewan, 114 Science Place, Saskatoon, Saskatchewan S7N 5E2, Canada

---

NEW VIEWS ON AN OLD PLANET. A HISTORY OF GLOBAL CHANGE, SECOND EDITION.
Tjeerd H. van Andel. 1994. Cambridge University Press, 439 pages. Hardcover: $59.95. Softcover: $24.95.

Van Andel has written what I would argue is the most lucid and accessible summary of earth history in print. The first edition of the book received a major award from the Association of American Publishers and it would not surprise me to see the second edition garner an award or two. Van Andel has added discussions and figures describing several aspects of the earth's evolution that were absent from the first edition, including the early earth and the history of life. The additions have yielded a more complete and satisfying read, all served up with the same economy of words and wit that made the first edition such a remarkable piece of writing. Even the *Preface* is a joy to read and sets the lively conversational style of the volume as a whole. The book was not written as a text but it could be used as such in conjunction with the recommended supplementary readings listed for each of six general topics covered. The second edition has the somewhat trendy subtitle *A History of Global Change,* but it is entirely appropriate given the dynamic course of events discussed.

Van Andel begins the book by gently infusing the reader with basic insights into how the record of earth history is assembled, followed by an easily digested explanation of the geological time scale. Earth history proper is first dealt with in Chapter 3 and, as is his forte, van Andel views things from a completely different perspective. The traditional approach to describing earth history is to begin at the beginning some 4.5 billion years ago, of which we know little. Van Andel's far more logical, enlightening, and engaging approach is to start with what we know best, the just concluded last Ice Age, and then move back in time to explore global environments and events entirely different from those characterizing the modern world. Van Andel was among a handful of leading marine geologists who pioneered modern deep sea research and forged the emerging disciplines of plate tectonics and paleoceanography during the 1960s, 70s, and 80s. Hence, his discussions of the birth of ocean basins, the deformation of continental margins, and the changing patterns of ocean circulation over time have a first-person vitality. The final chapters of the book deal with the evolution of life and the consequences of this process over the past 4.5 billion years. Van Andel sets the stage by describing what is known regarding the birth of the planet and then highlights key events during "The years when almost everything began." Later biologic events from the appearance of metazoans to dramatic mass extinctions also receive his special attention with an entire chapter devoted to "Crises and Catastrophes," including the controversy surrounding the demise of the dinosaurs. The book concludes with a brief but profoundly thoughtful view of how humankind has and continues to deal with evidence and prospect of major environmental change on earth.

It is clear that van Andel relishes talking about the ups and downs of doing earth science as much as he enjoys describing the results of this endeavor, and the book is rich in historical anecdote and nuance. The evolution of ideas is emphasized, making the book equally attractive to professional earth scientist and layperson alike. Although the book is aimed at a general audience, there is not a hint of condescension in the writing but rather an obvious and uncommon respect for the reader. If I could pick only one book to distribute to the public at large about how we think the earth has evolved, this is the book I would choose—it stands unique in its clarity, scientific honesty, and accomplishment of purpose—a rare volume indeed.

James C. Ingle, Jr., Department of Geological and Environmental Sciences, Stanford University, Stanford, California 94305

ZOOGEOMORPHOLOGY: ANIMALS AS GEOMORPHIC AGENTS. *David R. Butler. 1995. Cambridge University Press, Cambridge. 231 p. Hardcover, $49.95.*

This book provides an extensive review of recent research on the role of many animals (excluding human beings) as geomorphological process agents. The emphasis on current research is evident from a bibliography of over 600 entries in which only 35 predate 1960. The book also avoids attention to the geological reasoning used to infer past manifestations of geomorphological processes. Referring to possible hypotheses about pre-late Holocene zoogeomorphology, the text states (page 6): "Without modern-day observations or a sufficient historical data base, such speculations must necessarily remain outside the confines of this book." The book also avoids a fascinating and significant historical component with the statement, " . . . coral reef formation is beyond the scope of this book." Interestingly, fish erosion of coral reefs is a topic that receives attention.

By excluding an immense literature on coral reef geomorphology and sedimentology the book is able to claim, " . . . the role of animals has been ignored in most twentieth-century geomorphology." Zoogeomorphological neglect is attributed initially to the macroscale concerns of the Davisian paradigm up to 1950, and subsequently to the physical science training emphasis for the process geomorphologists who have dominated the subject in recent decades. Presumably more biological training would rectify this situation. The physical bias problem is ascribed particularly to geologists (who incidentally performed most of the coral reef studies). On page 2 it is observed, "A certain parochial attitude among some geologically trained geomorphologists may also be a factor [in zoogeomorphological neglect], reflected by an unfamiliarity with, or unwillingness to utilize, literature sources from outside the earth sciences. The cross-disciplinary nature of the discipline of geography makes geomorphologists trained in that tradition perhaps more aware of, and attentive to, scientific literature in the biological sciences." (This attitude about biology seems to be restricted to zoology, as evidenced by numerous geological geomorphological process studies of the role of plants in aeolian, fluvial, mass movement, coastal, and karst processes.)

The author, a geographer at the University of North Carolina, Chapel Hill, devotes considerable attention to his own research on the geomorphological effects of mountain goats (10 pages), grizzly bears (9 pages), and beavers (36 pages). Animal erosion generally receives much more treatment than does deposition. Though some attention is given to feral animal trampling, there is little summary of the large body of research devoted to the process effects on soil bulk density, increasing runoff, etc. The book presumably excludes overgrazing and related topics by exempting from discussion animals that are kept for agricultural purposes. On the other hand, one finds fascinating accounts of the feeding excavations made by the California gray whale and burrowing activity by an immense range of animals, including crocodilians, tortoises, birds, badgers, aardvarks, otters, armadillos, rabbits, porcupines, muskrats, marmots, prairie dogs, ground squirrels, rats, moles, gophers, and mole-rats.

Surprisingly, the immense guano accumulations on certain oceanic islands are not considered. These would presumably have considerable interdisciplinary geographical interest. Peruvian islands, for example, are strongly influenced by the time variation of the El Nino-Southern Oscillation phenomenon. The impact of this oceanographic and climatological system on fish populations and sea birds would profoundly impact guano accumulation. In general, the book avoids the broader influences of climate variation, land-use change, and other large-scale impacts on animal distributions and resulting processes. Instead the focus seems to be on the types of erosion generated by given animal species or genera. In the concluding remarks, however, some broader concerns of time and space are briefly introduced. Animal extinctions and habitat changes are now severely limiting the locations where zoogeomorphological process studies can be conducted. The author is concerned that modern process studies may no longer be appropriately representative to understand the spatial importance of zoogeomorphology. Perhaps some studies of ancient animal geomorphic effects, using geological reasoning would be helpful here by showing the magnitudes of change between present observations and the past conditions, prior to human impact on the animal distributions. Such studies are not a topic in the book.

Zoogeomorphology summarizes some really fascinating animal erosion hypotheses. I did not realize that the Carolina Bays, which have been attributed to meteor impacts and to Pleistocene wind effects, are conjectured to be the product of excavation by vast schools of spawning fish. An even more complex set of hypotheses surrounds the Mima-type soil mounds common on many flat geomorphic landscapes, and alternatively attributed to wind or water erosion, wind deposition, periglacial freeze-thaw dynamics, soil translocation by gophers or other rodents, and seismic activity. However, the discussion of this topic parallels that of others in this text by conspicuously ignoring nearly all historical perspective on this subject. As stated on page 144, "Readers interested in early references to Mima mounds from the late 1800s and early 1900s are referred to the bibliographies of the publications listed above, most of which summarize those qualitative early descriptions."

Vic Baker, Department of Geosciences, University of Arizona, Tucson, Arizona 85721

ANCIENT MINING. *Robert Shepherd, 1993. Published from the Institution of Mining and Metallurgy by Elsevier, London and New York and distributed by Chapman & Hall, $110.50.*

MINING IN LATIN AMERICA. CHALLENGES IN THE MINING INDUSTRY/MINERÍA LATINOAMERICANA. DESAFÍOS PARA LA INDUSTRIA MINERA. *Institution of Mining & Metallurgy, 1994. Published for the Institution of Mining and Metallurgy by Chapman and Hall, London and New York, $149.50.*

These two substantial volumes are both sponsored by, and one of them produced directly by members of, the Institution of Mining and Metallurgy. They are priced at a level appropriate, perhaps, to the expense accounts of mining companies, but high enough to deter, in these days of penny-pinching, both the academic librarian and the private purchaser. Both are printed on quite good paper; the quality of photographic reproduction in the second is better than in the first, while text and text-figures are uniformly clear and legible. However, to this reviewer at least, their cost seems unduly high in relation to their quality and size. Perhaps it reflects the anticipation of a restricted market, but surely it will further restrict that market!

Of the two, the first will unquestionably be of greatest value to historians of the earth sciences. Mr. Shepherd summarizes his aims admirably in his "Preface" (p.v.):

> In this book, an attempt is made to survey the history of the extractive industries throughout a period commencing with the dawn of history and ending with the final years of the Roman Empire in the west. The term "ancient mining" can be defined as embracing the extractive industries from the time of the earliest appearance of the written word, i.e. the end of prehistory, to the beginnings of the Middle Ages. Throughout the ages, the mining of minerals and, to a lesser extent, the quarrying of rocks have been a vital importance to the economy and even to the culture of a country. Outside influences, such as overseas conquests and invasions, together with internal strife and rebellions, all affect the economy and the social development. Accordingly, any study of ancient mining would be of less value if all these vicissitudes were neglected and the work more or less confined to a mere cataloguing and description of holes or excavations in the ground.

The book commences with two chapters on "Mining Practice in Ancient Times" which serves as an admirably lucid introduction to the ensuing geographic accounts. These embrace continental Europe (chapters III–VI), the Middle East (VIII), southwest Asia (VIII), north Africa (IX) and Great Britain (X), with a final section on ancient quarrying techniques and sources of stone. They are supplemented by five appendices; this reader found especially helpful the listing of ancient units of money and weight and the listings of classical authors. All in all, this is an excellent reference work.

The second work is, no doubt, of greater practical importance to present-day mining executives and investors, but of less interest to geological historians. It consists of a series of thirty-one papers treating with current mining exploration, technology and investment, in particular in Brazil, Argentina, Chile, Ecuador, Bolivia, Peru and Mexico; the other countries of Central and South America gain little mention. Certain of the case histories will be useful to future mining historians, but that is all.

William A.S. Sarjeant, Department of Geological Sciences, University of Saskatchewan, 114 Science Place, Saskatoon, SK S7N 5E2 Canada

MURCHISON IN MORAY: A GEOLOGIST ON HOME GROUND, WITH THE CORRESPONDENCE OF RODERICK IMPEY MURCHISON AND THE REV. DR. GEORGE GORDON OF BIRNIE. *Michael Collie and John Diemer. 1995. Transactions of the American Philosophical Society, Philadelphia. Volume 85, Part 3. 263 pp. Softcover, $20.00.*

This book has unity of time, place, and action in presenting a minor drama that is well worth reading by anyone interested in the history of geology. The time is set by the 88 letters whose transcript constitutes the second part of the book. All but one are dated within the period, September 1858 to December 1867, 49 of them from the first 15 months of this period. The place is set by the Firth of Moray in the North East of Scotland, along whose margins were key outcrops, in a region where Gordon had a living and Murchison had his family's former home. The action is the interplay of events inevitably forcing Murchison to recognize that the widespread sandstone he considered Old Red was really two lithologically similar, but paleontologically distinct, sandstones of Devonian and Triassic ages.

The first letter from Gordon to Murchison (14 September 1858) will resonate with any geologist who has done field work: Gordon transmits the pocket compass that Murchison lost when in the Moray area. Does this mean that Murchison is just like any of us? Not quite. The letter back from Murchison to Gordon identifies the lost compass as one he had borrowed from Mr. Peach, the comptroller of customs at a port on the Moray shore. The cast of characters is limited. By next year, Murchison, in a characteristic action, arranged for the geologic education of Mr. Peach's son, Benjamin. It later fell to Benjamin to help undo much of Murchison's Scottish geology, especially in the North West. In their book, the authors show the many ways by which Murchison assisted the scientific work of Gordon and Huxley, and thus helped undo his own over-simple geologic interpretation of the North East.

Here is a selection to give the reader a flavor of the correspondence. A fossil crocodile identified by Huxley is the key evidence: "As I am *toto coelo* opposed

to the doctrine of transmutation of species so I rejoice in seeing . . . as elaborately developed a reptile as the earliest trilobite of my Silurian rocks was as wonderful as any subsequent Crustacean" (M to G, 5 Dec 1858, under the impression that a Triassic reptile came from Devonian sediments). "I beg to assure you that I still am, after all that I have seen and heard, *un*converted to the belief that the Elgin fossil Reptiles belong to the Trias" (M to G, Oct 1859). "We have been much startled by the apparition of Darwin's book" (M to G, 1 Dec 1859). "In reference to these markings (No. 3) Mr. Joass further adds that he set 7 or 8 crabs arunning sideways on damp sand" (G to M, 21 Nov 1862). "But in truth, all must give way to such fossil evidence . . . On the whole I rejoice at the discovery. It suits my creed as to the succession of geological creation" (M to G, 24 Jan 1867).

The authors (who are father and son-in-law) intend more than just retelling a geologic incident. They want to polish the reputation of Murchison, which they consider to have been tarnished in the acid of recent books on nineteenth century geology. They are also clearly in sympathy with the character of Reverend Gordon, whose life and work they wish to bring before a wider audience. In their first aim, they do not succeed in changing my basic impression of Murchison gained from earlier reading, although they do add considerably to an understanding of how Murchison kept alive his interests in science in spite of the demands of his positions. In their second aim, Gordon does come off as an attractive figure, about whom it is well worth learning more.

The book could have benefitted from closer editing. On page 24, two papers become one within the span of one sentence; on page 28, the 17% slope would require a 12-inch rather than 22-inch drop; on page 48, the last sentence from a passage by Murchison gets incorporated into the text. There are similar minor problems elsewhere in the text of Part 1.

I enjoyed reading this book, learned from it, and would recommend it to anyone interested in the history of geology.

Cyril Galvin, Coastal Engineer, Box 623, Springfield, Virginia 22150, USA

A STUDY OF FOSSIL VERTEBRATE TYPES IN THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA. TAXONOMIC, SYSTEMATIC, AND HISTORICAL PERSPECTIVES. *Earle E. Spamer, Edward Daeschler, and L. Gay Vostreys-Shapiro. 1995. The Academy of Natural Sciences of Philadelphia, Special Publication No. 16. 434 pages. Softcover, $38.00 (postpaid U.S.A. & Canada, add $5.00 airmail postage elsewhere).*

The most important natural history institutions of the American British colonies and early United States were in Philadelphia. The American Philosophical Society, established in 1743, became a repository for scientific collections, and the Academy of Natural Sciences, founded in 1812, became by the 1830s the first American institution specifically devoted to the study of natural history. Its holdings of vertebrate fossils include many collections from the Atlantic Coastal Plain, and from early explorations east of the Appalachians, the Great Plains, and Rocky Mountains. A majority of the Type Specimens in the catalogue were described by Joseph Leidy and Edward D. Cope, pioneer American paleontologists during the latter half of the 19th century.

This volume begins with a brief history of vertebrate paleontology at the Academy, emphasizing its historically significant collections, including those of Thomas Jefferson, and a "long-lost" ichthyosaur type of Richard Owen. "Type Specimen" is the technical term for the material upon which a biologist or paleontologist bases and describes a new species. Type localities—the places where the type specimens were collected—in the Academy collections include Big Bone Lick; many sites on the Atlantic Coastal Plain; the Triassic of Gwynedd, Pennsylvania; the Big Badlands of Dakota; Bridger Basin of Wyoming; and Port Kennedy Cave, Pennsylvania. This historical section concludes with an account of conserving and cataloguing the vertebrate fossil collections of the Academy.

Part II, "A study of the type specimens of fossil vertebrates in the ANSP," analyses the type collection in seven tables which list 440 valid types by author, systematic class, and category of type, species for which the ANSP has plaster casts only of type specimens, and species for which types are missing. Collectors and donors of types, Geographic and stratigraphic data, Systematic classification of specimens are also provided.

The catalogue itself (pp. 81–293) is arranged in sections for Pisces, Amphibia, Reptilia, Aves, terrestrial Mammalia, marine Mammalia, and Ichnofossilia. Entries are by the *original nomenclatural combination* and arranged alphabetically by the species group name. This is followed by author, citation to original description, catalogue number, kind of type specimen, description of elements, locality and stratigraphy, collector and donor, original material, bibliographic references, a "census" and comments on types including multiple elements, and remarks including supplementary data concerning the record and problems of interpretation.

The analytical tables and catalogue contain information useful to scholars concerned with the history of paleontology or with problems of paleontological systematics, and students of scientific exploration in western North America.

Part III discusses the authors' rationale for accepting or rejecting various type specimens, and proposes guidelines for preparing catalogues of type material. Type catalogues are used in many disciplines besides

systematics, for example in faunal censuses or studies of ecological or paleoecological conditions. Such catalogues often omit much information of use to museum collection managers and historians.

A comprehensive study of type specimens should preserve data that accompany the specimens, record the present condition of the specimens, and adhere strictly to the International Code of Zoological Nomenclature. The citation of the original publication of each name must be verified, including determination that the description meets the requirements of the code. Mixing of specimens through careless curation may lead to loss of data concerning the identity of a nomenclatural type. These and a variety of related problems are illustrated by examples from the ANSP collections described in the catalogue. These guidelines are well worth study and application by others dealing with such material.

Bibliographical criteria for the validity of nomenclatorial publication, particularly as directed by the International Code, are stressed, and methods of citation are discussed in some detail. Privately published articles, such as Cope's *Paleontological Bulletin* provide problems concerning their availability under the Code.

A main purpose of the International Code is to promote stability of zoological nomenclature. Sometimes strict adherence to the letter of the Code leads to absurdity. The authors propose (p. 183–184) a new name, *Merycoidodon culbertsoniorum,* to replace *Merycoidodon culbertsonii* Leidy, 1848 for probably the most common oreodont in the White River badlands, because Leidy named the fossil "in honor of the [Culbertson] family, . . . " Emending this long and widely used name to meet the requirements of latin grammar, only mandated over a century later, hardly contributes to stability of nomenclature.

Earth sciences historians will find this a useful reference for the role of the Academy of Natural Sciences in vertebrate paleontology not only during the 19th century, but continuing down to the present.

Joseph T. Gregory, Department of Integrative Biology, University of California, Berkeley, CA 94720-3140

JOHANNES WALTHER ON REEFS: PIONEERING CONCEPTS OF BIOGEOLOGY 1885-1910. *Robert N. Ginsburg, Eberhard Gischler, and Wolfgang Schlager, editors. 1994. The Comparative Sedimentology Laboratory, Division of Marine Geology and Geophysics, Rosenstiel School of Marine and Atmospheric Science, University of Miami. 141 p. Softcover, $25.*

The Geological Milestones series from The Comparative Sedimentology Laboratory of the University of Miami have constructed a synthesis of Johannes Walther's works on reefs that is insightful and a joy to read. This publication includes translated versions of four papers, in chronological order, that Walther published on reefs from 1885 to 1910. The first paper (1885) deals with the general geology, ecology, and paleontology of mainly the algal deposits from the Gulf of Naples and uses this information to interpret the genesis of Tertiary and Triassic algal limestones. A subsequent classic paper (1910) about the ecology and sedimentology of Dove Bank in the Gulf of Naples documents the rapidity of ecologic and sedimentologic change over a quarter of a century. Additional papers focus on the sedimentology, ecology, and developmental controls of coral reefs from the Sinai (1888) and the Adam's Bridge area between India and Ceylon (1891). In general, the papers in this volume include detailed descriptions of modern and ancient carbonate deposits and show how Walther used the method of actualism to interpret the genesis of ancient carbonate rocks. These papers established Walther as the pioneer in the study of comparative ecology and sedimentology in reefs, but his work was largely ignored in his own time.

It is apparent from these papers that Walther recognized the importance of fundamental (paleo)ecological concepts such as limiting factors, which provide the basis for the distribution of flora and fauna in time and space. He described the influence that substrate had on the development of coral reefs, the penetration of light and the distribution of calcareous algae, and even the favorable positioning of oceanographic currents and its relationship to enhancing food resources. In his Gulf of Naples study he describes in detail the biotic interactions within an algal deposit. Walther recognized the basic guild structure of coral reefs, emphasizing the importance of sediment binders such as calcareous algae in reef formation and the importance of bioeroders in the selective destruction of reef components. In fact, in this volume it is stated that crabs are the natural sanitary guardians (engineers) of the sea. From his early Sinai work, Walther realized that the majority of a reef complex is loose sediment that accumulates in gullies between intact coral colonies. Additionally, in a period when paleontology was mainly confined to taxonomy, Walther had remarkably modern insights into areas such as functional morphology, taphonomy, and biotic succession.

Walther was primarily interested in the three-dimensional relationships between facies (bio and litho). As a consequence his ideas were not very popular with many of his contemporaries. It is not until comparatively recent times that Walther's law of correlation of facies has been recognized as important by the sedimentologic community. Walther was keenly aware of such modern concepts as accommodation space and its influence on the geometry of reefal deposits. Additionally, Walther was interested in defining the concept of a geological reef, although his reef definition was too limited because of its genetic connotations involving the dominance of bafflers in reef building.

Additionally, Walther was concerned with delineating primary versus secondary (diagenetic) features

preserved within carbonate rocks. Many consider Walther to be the father of the concept of diagenesis. Walther's approach to tackling diagenetic problems is surprisingly modern and involved an holistic approach using biotic, chemical, and lithologic (both field and microscopic scale) evidence. Walther's diagenetic conclusions are similar to modern interpretations in many instances despite the faulty mechanisms (*e.g.* extensive dissolution of limestone by sea water) he on occasion invoked to arrive at these interpretations. This is a true tribute to the intuitive genius of the man.

The Introduction at the beginning of the volume and Biography at the end nicely place Walther's work into an overall historical context. Also helpful are the editorial footnotes, which modernize outdated terminology and correct rare statements from Walther that we know now not to be true. Additionally, editorial summaries present particularly in Section IV probably eliminate some repetition with material presented in a related paper in Section I. Editorial comments at the end of each section are very helpful in providing a historical context for the preceding paper and relating Walther's conclusions to what is now known. Additionally, the line drawings (some of which have been added by the editors) and water color reproductions enhance the clarity of Walther's arguments. This volume is significant to all workers interested in the geology of reefs and I highly recommend it.

Kenneth J. Tobin, Department of Geological Sciences, University of Tennessee, Knoxville, TN 37996-1410, U.S.A. (e-mail: KTOBIN@UTK.EDU)

EARTH'S FIRST STEPS. TRACKING LIFE BEFORE THE DINOSAURS. *Jerry MacDonald. 1994. Foreward by Martin Lockley; introduction by Nicholas Hotton II. Johnson Books, Boulder Colorado. xiv + 290 p. Hardcover, $22.95.*

Over thirty years ago, I was one of the prime movers in a successful attempt to form a new geological society in the English midlands. At that time, one of my University of Nottingham colleagues reprimanded me: "You shouldn't be letting a lot of amateurs get involved in geology. We're professionals; we should keep our science professional. We don't want a lot of amateurs messing things up for us."

Those were not his exact words, perhaps, but they express pretty exactly his attitude and that of many other earth scientists. I disagreed with him at the time, remembering the immense contributions made to our science by amateurs: in England, to mineralogy by such persons as A.W.G. Kingsbury and Bob King, to palaeontology by such persons as F.C. Stinton, J.H. Sykes and Justin Delair, to stratigraphy by so many members of the London-based Geologists' Association—the list goes on and on. I am proud that the East Midlands Geological Society and its journal *The Mercian Geologist,* both of which I helped to found, have flourished so strongly and contributed so much to the knowledge of British regional geology.

What is the relevance of this preamble to a book on U.S. Palaeozoic footprints? For the matter, why should a volume on footprints be considered of interest to historians of geology? Why, for this reason; that it tells of the strivings of an enthusiastic amateur palaeontologist to interest suspicious professionals in a major find he had made and to convince them of his own competence to exploit that discovery.

The title is, in some measure, misleading, for the footprints discovered by Mr. MacDonald in the Robledo Mountains of southern New Mexico are of Early Permian date, while vertebrate tracks occur much earlier in the geological record (back to the Late Devonian, in fact). However, the Robledo footprints constitute the earliest truly rich terrestrial ichnofauna yet to be discovered—supplemented, moreover, by plant and arthropod remains at certain localities.

The distrust that Jerry MacDonald encountered was not only because he was an amateur, but also because his discoveries were made before the resurgence of interest in terrestrial traces—in particular, vertebrate footprints—was truly gaining momentum. The attitude was still "Since we have bones, why should we bother with footprints?" Nowadays it is clearly realized why: because such records show the animals of past times, not as dead relics, but in dynamic action. Moreover, footprints are preserved in many situations where bones are not; they tell us a great deal about the fauna of past times that we could not learn otherwise.

This story, then, is a salutary one—of how an altruistic concern with the fossils discovered, allied with sheer determination, progressively overcame the obstacles of bureaucratic dilly-dallying and distrust, adverse publicity (including even accusations of forging the footprints!) and an initial rejection by professional paleontologists, followed by an acceptance that long remained hesitant. Ultimately came triumph for MacDonald; recognition by many first-rank vertebrate palaeontologists within and outside the U.S.A., strong support from the Smithsonian Institution and the New Mexico Museum of Natural History (in that order!), and advocacy at Senate level of the protection of the Robledo Mountains sites. However, it took years and it cost Mr. MacDonald much, in financial, emotional and physical terms.

This is not an account of the invertebrates, amphibians and reptiles that made those immensely numerous, splendidly preserved tracks in the Permian sediments of southern New Mexico; though many are illustrated, the identification of the trackmakers is a task for the future. Instead, it is a recounting of an arduous personal campaign.

Was the long battle worth fighting? Yes, perhaps; but it is not a story to encourage any amateur geologist less committed than Mr. MacDonald. For earth-science historians, it furnishes a fresh viewpoint on the diffi-

culties delaying the development of our discipline. For geologists at large, it should cause a reconsideration of the obstacles we place in the path of enthusiastic amateurs. Yet it is such persons who, because of their deep interest in the earth's history, should be our supporters and aides during a time when all the sciences are under hostile public scrutiny.

William A.S. Sarjeant, Department of Geological Sciences, University of Saskatchewan, 114 Science Place, Saskatoon SK S7N 5E2 Canada

INTERESTING PUBLICATIONS

Since the start of this journal, Founding Editor Gerald M. Friedman has prepared this column. Contributors wishing to list recent books and papers of interest to our members are requested to send them to Gerald M. Friedman, Brooklyn College and Graduate School of the City University of New York, c/o Northeastern Science Foundation, Inc., Rensselaer Center of Applied Geology, P.O. Box 746, Troy, NY 12181–0746 U.S.A.

Agricola, G., 1992, Briefe und Ürkunden.—U. Horst and H. Prescher (eds.). Mit Ubersetzungen von G. Fraustadt.—Heidelberg, Berlin, Leipzig (Georgius Agricola. Ausgewälte Werke. Bd. 9).—Sign.: WA 93.4272/2.

Ainley, M. G., 1995, Women's work in geology: a historical perspective on Gender Division in Canadian science: *Geoscience Canada,* v. 21, p. 140–142.

Alberstadt, L. P., 1995, The rise of medical education and the decline of geology—Vanderbilt University—A case study? (1875–1995): *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-39.

Amacher, P., 1993, Der "Engländer". Frederik Nöel Ashcroft—Wissenschaftler, Sammler und Freund der Urner Berge, *in* Mineralientage München 1993. Aktuelle Geoinformaiton. Offizieller Katalog der 30. Mineralientage München, 29.–31. Oktober '93, p. 65–78.

Ambraseys, N. N., Melville, C. P., and Adams, R. D., 1994, The Seismicity of Egypt, Arabia and the Red Sea: A historical review. Cambridge University Press, Cambridge, New York, Port Chester, Melbourne, Sydney, 181 p.

Amundson, R. and Yaalon, D. H., 1995, E. W. Hilgard and John Wesley Powell: Efforts for a Joint Agricultural and Geological Survey: *Soil Science,* v. 59, p. 4–13.

Annutsch, R., 1993, Entwicklung des Gezeiten—und Windstau-Dienstes, *in* Meeresforschung in Hamburg. Von vorvorgestern bis übermorgen.—Hamburg.—p. 15–126.

Anonymous, 1995, Alberta Geological Survey celebrates its 75th anniversary: *CSPG Reservoir,* v. 22, no. 9, p. 13.

Anonymous, 1995, Where in the World? Finding the first oil well: *Oil field Barker,* v. III, issue 4, p. 1, 9.

Anonymous, 1995, Jamaica celebrates the de la Beche Bicentennial June 1996: Geologists' Association Circular, no 912, p. 6.

Anonymous, 1995, France: The geology of World War II (and earlier): *GEOLOGY TODAY,* v. 11, no. 3, p. 93.

Anonymous, 1995, Polar science and rudbeck: *Uppsala Newsletter, History of Science,* no. 23, p. 7.

Asselborn, E., 1993, Noch vieles unerforscht: Die Geschichte der Mineralogie in den französischen Alpen, *in* Mineralientage München. Aktuelle Geoinformation. Offizieller Katalog der 30. Mineralientage München, 29–31 Oktober '93.—München, p. 108–112.

Badash, Laurence, 1996, The discovery of radioactivity, *PHYSICS TODAY,* v. 49, no. 2, p. 21–26.

Balan, Bernard 1994, Développement, Progression, Evolution: La vie, la terre et le temps au XIXème siècle: Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. 83–106.

Bamlett, Michael, 1995, Remembering Ron Roberts: *Geologists' Association Circular,* No. 913, p. 8.

Bärnighausen, E., 1993, Ernst F. F. Chladni: Nomade der Wissenschaft.—In: Damals.—Stuttgart v. 25, no. 2, p. 60–64.

Bassett, T. J., 1994, Cartography and empire building in 19th-century West Africa: *Geogr. Rev.,* v. 84, p. 316–335.

Bassett, M. G., 1995, Charles Darwin in Wales, The Darwin project, National Museum of Wales, unpaginated.

Baumann, L., 1993, Die Entwicklung der Lagerstättenlehre an der Bergkademie Freiberg: *Geschichte der Geowissenschaften in den deutschen Ländern,* Berlin, p. 431–440.

Bauzá, C. A., 1994, Alejandro de Humboldt y Felipe Bauzá Una colaboración científica internacional en el primer tercio del siglo XIX: *Rev. Indias,* v. 54, p. 83–106.

Beck, W., 1993, Glückwunsch zum Hundertsten an Erwin Phol., in VFMG Aktuell, Bonn, 6, p. 16.

Beck, H., 1993, Alexander von Humboldt—eine Strukturskizze, in Mitt. Humboldt-Gesellschaft, Mannheim 30, p. 1256–1257.

Berger, H.-J.; Geißler, E.; Leonhardt, D., 1993, Sächsische Geologische Landesaufnahme—Tradition und Zukunft, in Nachr. Deutsche Geol. Ges.—Hannover 50, p. 35–36 u. s. 80.

Berkner, A., 1993, Das Gongga-Shan-Gebiet (Minya—Konka/VR China)—geographische Charakeristik und Entdeckungsgeschichte: *Peterm. Geogr. Mitt.*, Gotha 137, p. 361–379.

Berner, R. A., 1995, A. G. Högbom and the developments of the concept of the geochemical carbon cycle: *American Journal of Science,* v. 295, p. 491–495.

Berry, Angull, 1995, Kingston University celebrates 50 years of geology teaching: *Geoscientist,* v. 5, no. 5, p. 2–3.

Bertie, D. M., 1995, A history of (geological) museums in Peterhead, Grampian Region, Scotland: *The Geological Curator,* v. 6, no. 4, p. 149–155.

Biagioli, Mario, 1993, Galileo, Courtier: The practice of science in the culture of absolutism. Univ. Chicago Press, 402 p., $16.95.

Bork, K. B., 1995, A Franco-American episode in the maturation of geology: The exchange between Alexander Brongniart and Parker Cleaveland in the early Nineteenth Century: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-39.

Boulaine, Jean, 1994, La triple carrière de Carl Ludwig Giesecke, comédien et rédacteur dopéras, géologue de terrain et professeur de géologie à Dublin: Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. 1–6.

Brice, W. R., 1996, Gilbert Dennison Harris: A life among fossils: *Bulletins of American Paleontology,* No. 350, $30.00 plus shipping and handling.

Brook, Timothy, 1994, Mapping knowledge in the 16th century: The gazetteer cartography of Ye Chunji: *East Asian Libr. J.*, v. 7, p. 5–32.

Brüderle, R., 1993, Ansprache, in 40 Jahre Geologisches Landesamt Rheinland-Pfalz. Begrüßung, Ansprache, Grußworte und Festvortrag der Jubiläumsveranstaltung an 2. Juni 1993 im Eltzer Hof in Mainz.—Mainz, p. 6–10.

Brunton, E. V., 1994, The Challenger Expedition, 1872–1876: A visual index. (Historical studies in the life and earth sciences, 2.) Natural History Museum, London, 189 p.

Brush, S. G., 1996, A history of modern planetary physics: Volume II,

Transmuted past: The age of the Earth and the evolution of the elements from Lyell to Patterson, Cambridge University Press, 152 p.
Brush, S. G., 1996, A history of modern planetary physics: Volume 1: Nebulous Earth: The origin of the solar system and the core of the Earth from Laplace to Jeffreys, Cambridge University Press, 320 p.
Brust, M., 1993, Alfred Berg (1876–1945) und Friedrich Stolberg (1892–1975)—ihre Verdienste um die Erforschung der Zechsteinhöhlen des Südharzes und Kyffhäusers, in Fundgrube, Berlin 29, p. 112–115.
Buntebarth, G., 1993, Symposium "Geschichte der Geowissenschaften in den deutschen Ländern" in Freiberg, in Nachr. Deutsche Geol. Ges.—Hannover 50, p. 146.
Buntebarth, G., 1993, Symposium "Geschichte der Geowissenschaften in den deutschen Ländern" in Freiberg, in Mitt, Alfred-Wegener-Stiftung., Bonn 23, p. 249.
Büttner, M., 1993, Zur Bedeutung der Reformation für Mercator und dessen Neuaustichtung der Kosmographie/Geographie im 16. Jahrhundert, in Nachrichtenbl. Deutsche Ges. Gesch. Med., Naturwiss. u. Technik, Alzey 43, p. 84–85.
Byers, C. W., 1995, Dana's Manual of geology—A "perfect system under law": *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-200.
Carozzi, A. V. and Newman J. K., 1995, Saussure's manuscript oration on earthquakes and electricity (1784) influenced by William Stukeley and Benjamin Franklin: *Archs Sci. Genève,* v. 48, p. 209–237.
Carramolino, David, 1994, La "ley degiro" (Drehungsgesetz) de Dove (1827) y el nacimiento de la dinamica atmosférica en Alemania: *Éndoxa,* v. 3, p. 95–119.
Carter, H. B., 1995, The Royal Society and the voyage of the HMS Endeavour 1768–71: *Notes Rec. Roy. Soc. Lond.*, v. 49, p. 245–260.
Cereso Martínez, Ricardo, 1994, El meridiano y el antemeridiano de Tordesillas en la geografía, la náutica y la cartografía: *Rev. Indias,* v. 54, 509–542.
Christie, N. J., 1994, "Pioneering for a civilized world": Grifftith Taylor and the ecology of geography: *Sci. Canadensis,* v. 17, p. 103–154.
Cole, Douglas and Lockner, Bradley, (ed.), 1993, To the Charlottes, George Dawson's 1878 survey of the Queen Charlotte Islands. UBC Press, Vancouver, 213 p.
Čolić, Krešimir, 1992, Ruder Bošković (1711–1787) als Geodät und Geophysiker. (Mitteilungen der Geodätischen Institute der Technischen Universität Graz, 75.) var. pag., illus., notes. Graz: Geodätischen Institute der Technischen Univ.
Collie, Michael and Diemer, John, 1995, Murchison in Moray: A geologist on home ground with the correspondence of Roderick Impey Murchison and the Rev. Dr. George Gordon of Birnie (Transactions of the American Philosophical Society, v. 85, Pt. 3). American Philosophical Society, Philadelphia, 263 p.
Coope, G. R., 1994, Frederick William Shotton, 8 October 1906–21 July 1990: *Biogr. Mem. Fellows Roy. Soc.*, v. 39, p. 419–431.
Couzinet, Marie-Dominique, 1995, Fonction de la géographie dans la connaissance historique: Le modèle cosmographique de l'histoire universelle chez F. Bauduin et J. Bodin: *Corpus,* v. 28, p. 113–145.
Daniel, P. L., 1995, The history of Sigma Gamma Epsilon Honor Society for Earth Scientists: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-39.
Dassel, W., 1993, Auf den Spuren des niederlandischen Arztes und Palaontologen Eugene Dubois—Vor 100 Jahren: Die Entdeckung des aufrecht gehenden Affenmenschen (*Pithecanthropus erectus*), in Der Niederrhein, Krefeld 60, p. 163–173.
de Nave, F., 1994, Gerard Mercator en de geografie in de Zuidelijke Nederlanden (16de eeuw). Gerard Mercator et la géographie dans les Pays-Bas Meridionaux (16e siècle). Museum Plantin-Moretus en Stedelijk Prentenkabinet, Antwerpen, 175 p.
DeSanto, Jerry, 1995, Foundation for a park: Explorer and geologist Bailey Willis in the area of Glacier National Park: *Forest Conserv. Hist.*, v. 39, p. 130–137.
Devis, G. L. H., 1996, North from the Hook: 150 years of the Geological Survey of Ireland. The Geological Survey of Ireland, Beggars Bush, Dublin 4, Ireland, 356 p.
Dommer, I., 1993, Ernst Kirste. Lehrer und Naturwissenschaftler aus Leidenschaft 1872–1955, in Altenburger Geschichts-u. Hauskalender, Altenburg N. F. 2, p. 179–180.
Dondin-Payre, Monique, 1994, La Commission d'Exploration Scientifique d'Algérie: Une héritière méconnue de la Commission d'égypte. (Mémoires de l'Académie des Incriptions et Belles-Lettres, 14.) Boccard, Paris, 142 p.
Dott, R. H., Jr., 1995, Dana's old tectonics: Global contraction under Divine direction: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-200.
Durand-Delga, Michel and Moreau, Richard, 1994, La vie aventureuse de Jules Marcou (1824–1896), géologue franco-américain: Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. 55–82.
Dytrych, M. M. and Marino, T. A., 199?, (History of) the Department of Geology, Arizona State University. Dept. of Geology, Arizona State University, Tempe, Arizona 85287–1404.
Edney, M. H., 1993, Cartography without "progress": Reinterpreting the nature and historical development of mapmaking: *Cartographica,* v. 30(2–3), p. 54–68.
Edney, M. H., 1994, British military education, mapmaking, and military "map-mindedness" in the later Enlightnment: *Cartogr. J.*, v. 31, p. 14–20.
Edney, M. H., 1994, Mathematical cosmography and the social ideology of British cartography, 1780–1820: *Imago Mundi,* v. 46, p. 101–116.
Ellenberger Francois, 1994, Adresse présidentielle: Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. 111–115.
Engewald, G.-R., 1993, August Breithaupt (1791–1873)—ein Freiberger Mineraloge und Sächsicher Unternehmer, in Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 463–468.
Ernst, W, 1993, Voraussetzungen und Anfänge der geologischen Spezialkartierung im Mabstab 1: 25.000 in Mitteldeutschland, in Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 469–478.
Ernst, W., 1993, Vom Leben und Wirken Eisenacher Heimatgeologen: *Fundgrube,* v. 29, p. 100–107.
Falcone, B. F., 1993, Johann Rudolf Meyer d. J.. aus Aarau/Schweiz—ein Werner-Schüler: *Nachrichtenblatt zur Geschichte der Geowissenschaften,* no. 3, p. 85–86.
Felber, Hans-Joachim, 1994, Alexander von Humboldt; Friedrich Wilhelm Bessel. Briefwechsel zwischen Alexander von Humboldt und Friedrich Wilhelm Bessel. Akademie Verlag, Berlin, 248 p.
Fichtel, J. E.. Von, 1993, Die Mineralogen gegen das Ende des achtzehnten Jahrhunderts. Nachdruck des 1792 in Frankfurt und Leipzig erschienenen Originals.—Leipzig u. Stuttgart, 84 p. (Freiberger Forschungshefte D 199).
Filliozat, Manonmani, 1994, D'Après de Mannevillette, captain and hydrographer to the French East India Company (1707–1780): *Indian J. Hist. Sci,* v. 29, p. 329–342.
Fleming, J. R., and Goodman, R. E. (eds.), 1994, International bibliography of meteorology: From the beginning of printing to 1889, Diane Pub., Pa., 704 p.
Fogg, G. E., 1992, A history of Antarctic Science.—Cambridge, Sign.: WA 93.3293/2.
Foster, Mike, 1994, Strange genius: The life of Ferdinand Vandeveer Hayden. Niwat, Colo., Roberts Rinehard, 443 p.
Frank, H., Grundmann, G., 1993, Die Sammlungen Mathias Flurls—

Geschichte, Bedeutung und Bestand, in Mathias von Flurl (1756–1853). Begründer der Mineralogie und Geologie in Bayern. Ausstellung im Gäubodemuseum. 19 November 1993—14 Februar 1994. G. Lehrberger u. J. Prammer (eds.), Straubing, p. 302–316.

Freyer, G., 1993, über die Mitarbeit von Lehrern an der geologischen Landskartierung Sachsens: *Fundgrube,* v. 29, p. 120–124.

Freyer, G., 1993, Angewandte Paläontologische Untersuchungen für die Geologie von Sachsen in den letzten vier Jahrzehnten (1953–1993): *Geol. Jahrbuch.*, v. A 142, p. 131–147.

Freyer, G. 1993, Die Entwicklung des "Sächsischen Geologischen Landsamtes" von 1872 bis 1961, in Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 479–484.

Friebe, H. and Goldhahn, C., 1993, Abraham Gottlob Werner und die Freiberger Münzauktionen von 1774/1777: *Freib. Münzbl. Freiberg,* v. 2, p. 22–27.

Friebe, A., 1993, Sächsische Gesteinenamen. Herkunft, Bedeutung und Weiterentwicklung, in Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 485–493.

Friedman, R. M., 1994, The expeditions of Harald Ulrik Sverdrup: Contexts for shaping an ocean science, Calif.: Scripps Institution of Oceanography, San Diego, 49 p.

Fritscher, B., 1993, A. G. Werner (1749–1817) als Lehrer der deutschen Naturphilosophie—Zum Werk von Henrik Steffens (1773–1845), in Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 495–502.

Fritz, Mary, 1995, (Historic) Yellowstone work rescued: *AAPG Explorer,* v. 12, no. 12, p. 20–23.

Frost, O.W., 1994/95, Vitus Bering and Georg Steller: Their tragic conflict during the American expedition: *Pacific Northwest Quart.*, v. 86, p. 3–16.

Fuchs, R. L., 1995, GSA beneficiary of Pardee and Kelly Estates: *GSA TODAY,* v. 5, p. 169–173.

Futuyma, D. J., 1995 reprint of the 1982 edition, Science on Trial: The case for evolution. Sinaur Associates, Sunderland, Mass, 223 p. $15.95.

Garlicka, Katarzyna, 1992, Maurycy Pius Rudzki a roczatki geofizyki na Uniwersytecie Jagiellońskim. (Marcel Pius Rudzki and the beginning of geophysics at the Lagiellonian University): *Kwart. Hist. Nauk Tech.*, v. 39(2), p. 61–68.

Gaudant, Jean, 1994, Analyse d'ouvrage F. ELLENBERGER: "Histoire de la Géologie", Tome 2, Technique et Documentation (Lavoisier), Paris, 1994, 225F: Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. 123–126.

Gerstner, Patsy, 1995, Henry Darwin Rogers, 1808–1866: American Geologist. University of Alabama Press, Tuscaloosa/London, 311 p., $49.94.

Gèze, Bernard, 1994, Analyse d'ouvrage: "Cent ans de spéléologie francaise", Spelunca Mémoire, n°l 7, 1993, 198F: Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. 117.

Gèze, Bernard, 1994, La ruée vers le phosphate dans les cavernes du Midi de la France: Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. 41–54.

Ginsburg, R. N., 1995, Formative years of the scientific career of T. Wayland Vaughan: *GSA TODAY,* v. 5, no. 11, p. 233–234.

Göbel, V. W., 1995, Ferdinad Roemer in North America (1845–1847): Travels of the father of the geology of Texas and scientific achievements: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-40.

Goethe, J. W. von, 1994, Die Metamorphose des Granits: Substanz- und Gestaltbildung des Erdorganismus. Zusammengestellt und bearbeitet von Dankmar Bosse.Verlag Freies Geistesleben, Stuttgart, 380 p.

Gohau, Gabriel, 1994, Analyse d'ouvrage: G.W. LEIBNIZ "Protogaea—De l'aspect primitif de la Terre". Edition, introduction et notes de J.-M. Barrande (Presses universitaires du Mirail, Toulouse, 1993, 112F): Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. 119–121.

Gohau, Gabriel, 1995, Joseph Durocher et la naissance du métamorphisme: *Sci. Tech Persp.*, v. 31, p. 29–32.

Goldhahn, C., 1993, Zur Geschichte der Wernerschen Münzsammlung an der Technischen Universitat Bergakademie Freiberg: *Freib. Münzbl,* v. 2, p. 17–21.

Gotte, Wolfgang, 1993, Anekdoten, die sich um die Professoren Von Bubnoff, Gothan, Deubel, Pietzsch und Stille renken: *Nachrichtenblatt zur Geschichte der Geowissenschaften,* no. 3, p. 134–137.

Gotte, W., 1993, Erinnerungen an Kurt Pietzech, den Senior der sachsischen Landesgeologen, *in* Beiträge zur Biographie sächsischer Geowissenschaftler: *Abhandlungen des Staatlichen Museums für Mineralogie und Geologie zu Dresden,* v. 39. P. 109–124.

Gotte, W., 1993, Theodor Arldt (1878–1960). Ein Pionier der Paläontologie, in Beiträge zur Biographie sächsischer Geowissenschaftler: *Abhandlungen des Staatlichen Museums für Mineralogie und Geologie zu Dresden,* v. 39 p.125–130.

Gould, S. J., 1995, Dana's minimal accommodation to Darwinism: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-201.

Gould, S. J., 1995, The anatomy lesson: The teaching of naturalist Mendes da Costa, a Sephardic Jew in King George's Court: *Natural History,* v. 104, no. 12, p. 10–15, 62–63.

Gould, S. J., 1995, A sea horse for all races: When Huxley battled Owen about human brain structures, the debate grew convoluted: *Natural History,* v. 104, no. 11, p. 10–15, 72–75.

Gould, S. J., 1995, The great western and the fighting temeraire: *Natural History,* v. 104, no. 10, p. 16–19, 62–65.

Gould, S. J., 1996, What separated Darwin's transcendent greatness from James Dwight Dana's: *Natural History,* v. 105, no. 2, p. 23–28, 88–93.

Gould S. J., 1996, Triumph of the Root-Heads: *Natural History,* v. 105, no. 1, p. 10–17.

Gowing, Ronald, 1995, Halley, Cotes, and the nautical meridian: *Hist. Math.*, v. 22, p. 19–32.

Grieve, Wolfgang (ed.), 1993, Alexander von Humboldt: Die andere Endeckung Amerikas (Loccuner Protokolle, 10/92). Evangelische Akademie, Loccum, 380 p.

Grandchamp, Philippe, 1994, Deux exposés des doctrines de Cuvier antérieurs au "Discours préliminaire": les cours de Géologie professés au Collège de France en 1805 et 1808: Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. 13–26.

Grundmann, G., 1993, Professor, Bergrat und Schüler. Flurls Reisen nach Sachsen und Böhmen, *in* Mathias von Flurl (1756–1823). Begründer der Mineralogie und Geologie in Bayern. Ausstellung V im Gäubodemuseum. 19. November 1993—14. Februar 1994. G. Lehrberger and J. Prammer, eds. p. 60–75.

Grüner, W., 1993, 50 Jahre Erdölförderung im Emsland. Ein Abriß der historischen Entwicklung, Erdölgeologie, Regionalgeologie, Lagerstättengeologie, Fördertechnik der größten deutschen Erdölprovinz: *Der Aufschluß*, v. 44, p. 129–150.

Hagn, H. and Lehrberger, G., 1993, Das "steinreiche" Neubeuern am Inn, *in* Mathias von Flurl (1756–1823). Begründer der Mineralogie und Geologie in Bayern. Ausstellung im Gäubodemuseum. 19. November 1993—14. February 1994. G. Lehrberger and J. Prammer, eds., p. 169–174.

Hansen, G., 1993, Zur Frühgeschichte der Suche nach Kohlenwasserstoffen in Niedersachsen, in Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 515–524.

Harrold, F. B. and Eve, R. A., (ed.), 1995, Cult archaeology and

creationism: Understanding pseudo-scientific beliefs about the past. Univ. Iowa Press, 204 p., $13.95.

Hartmann, Olaf, 1993, Zur Geschichte der Geologie und Mineralogie in Thuringen, Sachsen und Sachsen-Anhalt, Berlin, 80 p. (Fundgrube Jg. 29, H. 3/4).

Hein, W.-H., 1993, Bemerkungen eines Sammlers zur Persönlichkeit Alexander von Humboldts, *in* A. von Humboldt: Natur als Idee und Abendteuer. Ausstellungsband. M. Guntau, P. Hardetert and M. Pape, eds., p. 1–4.

Hein, W.-H., Arnold, E., and Zürl, F., 1993, Alexander von Humboldts Generalbefahrungsberichte der fränkischen Gruben im Jahre 1795. Part II: Bericht über das Wunsiedler und das Goldkronacher Bergamts-Revier: *Archiv Gesch Oberfranken,* v. 73, p. 147–171.

Henning, K.-H., 1993, Emil Cohen (1842–1905) und sein Beitrag zur Entwicklung der Meteoritenkunde, *in* Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 525–530.

Henningsen, D., 1993, 100 Jahre Geologische Gesellschaft von Japan: *Nachr. Deutsche Geol. Ges.*, v. 50, p. 140–141.

Henze, D., 1978–1993, Enzyklopädie der Entdecker und Erforscher der Erde.—3 volumes—Graz, Austria.—Sign.: WA 93.4103, WA 93. 4104, WA 4105/1.

Hineline, M. L., 1994, The visual culture of the earth sciences, 1863–1970: *Diss. Abstr.Int.*, v. 55, p. 713-A. (Dissertation at Univ. of Calffomia, San Diego, 1993. Chair: Martin Rudwick. Univ Microfilms order no. 94–20724. 447 p.)

Hofbauer, G., 1993, Die Sinnliche Naturgeschichte des Abraham Gottlob Werner. An der Grenze zwischen Empirismus und romantischer Naturphilosophie, in Geschichte der Geowissenschaften in den deutschen Ländern: Zeitschrift für geologische Wissenschaften, v. 21, p. 545–558.

Hohlstein, Vera. 1994, James Huttons organische "Theorie der Erde", *in* Anton von Gotstedter (ed.) Ad radices: Festband zum fünizigjährigen Bestehen des Instituts für Geschichte der Naturwissenschaften der Johann Wolfgang Goethe-Universität, Steiner, Stuttgart, p. 481–493.

Hölder, Helmut, 1994, Goethe als Geologe: *Goethe Jahrb.*, v. 111, p. 231–245.

Holzhey, G., 1993, Hermann Credner—ein bedeutender Thüringer Geologe: *Mitteilungsbl. Thür. Geol. Verein,* v. 2, p. 9–10.

Home, R. W. and Livingston, K. T., 1994, Science and technology in the story of Australian federation: The case of meteorology, 1876–1908: *Hist. Rec. Aust. Sci,* v. 10, p. 109–127.

Hoppe, G., 1993, Henrick Christian Ström (1784–1836)—Schöpfer eines Bildnisses von Abraham Gottlob Werner: *Nachrichtenblatt zur Geschichte der Geowissenschaften,* no. 3, p. 30–32.

Hoth, K., Rusbult, J., Zagora, K, Beer, H., Hartmann, O., and Schretzenmayer, S., 1993, Die tiefen Bohrungen im Zentralabschnitt der Mitteleuropäischen Senke—Eine Dokumentation für den Zeitabschnitt 1962—1990: Schriftenreihe für Geowissenschaften, v. 2, 145 p.

Hsu, Kuang-Tai, 1993, Gabriele Falloppio's *De medicatis aquis* as a major source of Nicolaus Steno's earliest geological writing—*Dissetatio physica de thermis*: *Phil. Hist. Sci.*, v. 2, p. 77–104.

Huberland, Maurice, 1994, Josué Henry de la Lindi, géologue: Sa découverte de l'or au Congo en 1895: *Rev. Quest. Sci.*, v. 165, p. 37–52.

Humboldt, A. Von, 1993, Kosmos. Entwurf einer physischen Weltbeschreibung, Volume 1, von H. Beck ed.,. (A. v. Humboldt Studienausgabe, v. 7, part 1, Forschungsunternehmen der Humboldt-Gesellschaft. Nr. 40), 327 p.

Humboldt, A. Von, 1993, Kosmos. Entwurf einer physischen Weltbeschreibung, Volume 2, von H. Beck ed., (A. v. Humboldt. Studienauegabe, v. 7, Part 2, Forschungsunternehmen der Humboldt-Gesellschaft. Nr. 40), v. VIII, 427 p.

Humboldt, A. Von, 1993, Briefe aus Amerika 1799–1804. U. Moheit, ed.: *Beiträge zur Alexander-von-Humboldt-Forschung,* v. 16, 376 p.

Humboldt, A. Von, 1993, Natur als Idee und Abendteuer. Ausstellungsband, M. Guntau, P. Hardetert and M. Pape, eds., v. XVIII, 122 p.

Humboldt, A. Von, 1993, über das Universum. Die Kosmosvorträge 1827/28 in der Berliner Singakademie. von J. Hamel, K.-H. Tiemannn and M. Pape, eds.—Frankfürt am Main und Leipzig: *Insel Taschenbuch.* Nr. 1540, 235 p.

Huseman, B. W., 1995, Wild river, Timeless Canyon: Balduin Mollhausen's watercolors of the Colorado. Univ. Arizona Press, 256 p. $ 70.

Hussner, H., 1993, Der Aktualismus zur Zeit Johannes Walthers und aus heutiger Sicht: *Z. Deutsche Geol. Ges.*, v. 144, p. 255–263.

Insley, Jane, 1994, The origin of the Everest theodolite: *Bull. Sci Instr. Soc.*, v. 43, p. 22–23.

Insley, Jane, 1995, Making mountains out of molehills? George Everest and Henry Barrow, 1830–39: *Indian J. Hist. Sci.*, v. 30, p. 47–55.

Jacobs, F., Börngen, M., and Lange, E.: Zur Geschichte der Geowissenschaften in Leipzig, *in* Geschichte der Geowissenschaften den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 567–576.

Jahn, I., 1993, Alexander von Humboldt und sein Bild von der Welt: "Wer in der Welt hat wohl je mehr gefragt als ich Unglücklicher?", *in* A. von Humboldt: Natur als Idee und Abendteuer. Ausstellungsband, von M. Guntau, P. Hardetert and M. Pape, eds., p. 39–58.

Jones, Jean, Torrens, H. S., and Robinson, Eric, 1994–1995, The correspondence between James Hutton (1726–1797) and James Watt (1736–1819), with two letters from Hutton to George Clerk-Maxwell (1715–1784): *Ann. Sci,* v. 51, p. 637–653 (1994), v. 52, p. 357–382 (1995).

Jordan, W. M., 1995, An American entrepreneur: Albert C. Koch's exhibition of fossil vertebrates: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-39.

Jozeau, Manrie-Françoise, 1994, La mesure de la terre au XlXe siècle: Nouveaux instruments, nouvelles mèthodes, *in* Jean-Claude Beaune (ed.), La mesure: Instruments et philosophies, Champ Vallon, Seyssel, p. 95–106.

Jung, W., Mayr, H. and Schairer, G., 1993, 150 Jahre Paläontologie in München. Zur Geschichte der Bayerischen Staatssammlung für Paläontologie und historische Geologie, *in* Mineralientage München 1993. Aktuelle Geoinformation. Offizieller Katalog der 30. Mineralientage München, 29.-31. Oktober '93, p. 112–128.

Jung, W., 1993, 150 Jahre Paläontologisches Museum München: *Mitt. Bayer. Staatssammlung Paläontologie u. historische Geologie,* v. 33, p. 11–12.

Kahali, Manidipa, 1994, John Henry Pratt, Archdeacon of Calcutta, and his theory of isostatic compensation: *Indian J. Hist. Sci.*, v. 29, p. 23–30.

Kahler, M.L., 1993, Goethes geologisch-mineralogische Sammlungen in Weimar—ihre Erschließung und Katalogisierung, in Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 591–596.

Kirk, W. K., 1995, On the trail of the J. H. Vivian Collection: *The Geological Curator,* v. 6, no. 4, p. 167–170.

Krüger, Peter, 1993, Auf den Spuren Alexander von Humboldts in Rußland: *Nachrichtenblatt zur Geschichte der Geowissenschaften,* no. 3, p. 90–91.

Krupenikov, I. A., 1993, History of soil science: from its inception to the present. A. H. Balkema, Rotterdam, NL, $95.

Laitko, H., 1993, Alexander von Humboldt: Herkunft—Prägung—Souveränität, *in* A. v. Humboldt: Natur als Idee und Abendteuer.

Ausstellungsband, M. Guntau, P. Hardetert und M. Pape, eds., p. 5–18.

Lankford, John and Slavings, R. L., 1996, The industrialization of American Astronomy, 1880–1940: *Physics Today,* v. 49, p. 34–40.

Laurent, Goulven, 1994, Observations sur la communication de M. B. Balan: Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. l07–109.

Laurent, Goulven, 1995, Lamarck, Lyell et Darwin: *Sci Tech. Persp.*, v. 31, p. 33–48.

Le cartographe Gérard Mercator 1512–1594. Bibliothèque Royale Albert ler Bruxelles, Anbers Musée Plantin-Moretus, Saint-Nicolas (Waes) Musée Mercator, Crédit Communal, Bruxelles, 159 p.

Leh, M., 1993, Die Geschichte der geologischen Erforschung der Oberlausitz. Eine Übersicht, *in* Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 627–631.

Leh, M., 1993, Paul Ulbricht und Johannes Naumann—zwei Heimatgeologen der Oberlausitz: *Fundgrube,* v. 29, p. 134–137.

Lestringant, Fran (translat. By David Fausett), 1994, Mapping the Renaissance world: The geographical imgination in the age of discovery, Univ. of California Press, Berkeley, 197 p.

Liebowitz, R. P., 1995, The Air Force's geophysics directorate: A 50th anniversary retrospective: *Earth in Space,* v. 8, no. 4, p. 12–14.

López Piñero, José María, and Glick, T. F., 1993, E1 megaterio de Bru y el Presidente Jefferson: Relación insospechada en los albores de la paleontología (Cuadernos valencianos de historia de la medicina y de la ciencia, Serie A: Monograffías, 42.) Valencia, Universidad Valencia, C.S.I.C., p. 157.

Lovell, Jim, and Kluger, Jeffrey, 1994, Lost Moon: The perilous voyage of Apollo 13. Houghton Mifflin, $22.95.

Lucier, Paul, 1995, Commercial interests and scientific disinterestedness: Consulting geologists in antebellum America: *Isis,* v. 86, p. 245–267.

Maddison, Francis, 1992, A consequence of discovery: Astronomical navigation in 15th-century Portugal, *in* T. F. Earle and Stephen Parkinson (eds.), Studies in the Portuguese discoveries I., Aris & Phillips, Warminster, Eng., p. 71–110.

Mason, Brian, 1995, Dana's contribution to mineralogy: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-151.

Mathe, G., 1993, Geologiehistorische Arbeiten, am Staatlichen Museum für Mineralogie und Geologie zu Dresden, *in* Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 641–646.

Mathe, G., 1993, Hanns Bruno Geinitz und die Sächsische Kreide. Ein Beitrag des Staatlichen Museums für Mineralogie und Geologie zu Dresden, in Mineralientage München 1993. Aktuelle Geoinformation. Offizieller Katalog der 30. Mineralientage München, 29.—31. Oktober '93, p. 44–45.

Mathe, G., 1993, Ernst Kalkowsky (1851–1938). Geologe, Hochschullehrer und Museumsdirektor, *in* Beiträge zur Biographie sächsischer Geowissenschaftler: *Abhandlungen des Staatlichen Museums für Mineralogie und Geologie zu Dresden,* v. 39, p. 7–20.

Matteo Dell'Aquilla, 1990, Tractatus de cometa atque terraemotu. Cod. Vat. Barb. Lat. 268. A cura di Bruno Figliuolo. (Storia e scienze della terra, 2.) Laveglia, Salemo, 78 p.

Maul, G., 1993, Goethe und die Geologie—Thüringer Aspekte: *Fundgrube,* v. 29, p. 87–90.

Mayer, G., 1993, Französische und niederländische Naturaliensammlungen im 18. Jahrhundert: *Jahreshefte Ges. Naturkunde Württemberg,* v. 148, p. 53–59.

Michele, V. DE, 1993, Die "Mailander-Kristalle" und ihre Geschichte, in Mineralientage München 1993. Aktuelle Geoinformation. Offizieller Katalog der 30. Mineralientage München, 29.-31. Oktober, p. 83–89.

Miller, Hugh, 1995, Hugh Miller's memoir: From stonemason to geologist. Edited by Michael Shortland, Edinburgh Univ. Press, Edinburgh, 266 p.

Mills, E. L., 1994, Bringing oceanography into the Canadian university classroom: *Sci. Canadensis,* v. 18, p. 3–21.

Mizano, Hiroo, 1994, A. Imamura's views on anomalous seismic activities preceding the Nobi earthquake (1891) (In Japanese): *Kagakusi Kenkyu,* v. 33, p. 217–220.

Moheit, U., 1993, Alexander von Humboldt und seine Zeitgenossen: Zum schriftstellerischen Handwerk gehört Läuten, *in* A. von Humboldt: Natur als Idee und Abendteuer. Ausstellungsband, M. Guntau, P. Hardetert und M. Pape, p. 91–106.

Molander, A. B., 1992, Columbus and the method of lunar distance: *Terrae Incog.*, v. 24, p. 65–78.

Möller, D., and Thyssen, F., 1993, Die "Expedition Glaciologique Internationale au Groenland—EGIG" und die deutsche Folgeexpeditionen, in 125 Jahre deutsche Polarforschung. Ausstellungskatalog, Alfred-Wegener-Institut, p. 132–140.

Molnia, B. F., 1995, Stratified drift—who needs it?: *GSA TODAY,* v. 5, p. 169–172.

Monmonier, Mark, 1994, The rise of the national atlas: *Cartographica,* v. 31(1), p. 1–15.

Morell, Virginia, 1995, Ancestral passions: The Leakey Family and the quest for humankind's beginnings. Simon and Schuster.

Mucke, D., Friedrich Schuster—ein Leben für die Höhlen-und Karstforschung: *Fundgrube,* v. 29, p. 116–119.

Müller, G.H., 1993, Kommentar zu Goethes Schriften über Geologie und Mineralogie in J.W. Goethe. Die Jahre 1820–1826.—Hreg. von W. Oechslin et al., eds..—München 1993. (J.W. Goethe. Sämtliche Werke nach Epochen seines Schaffens. Münchner Ausgabe), v. 13.2, p. 784–802.

Müller, G. H., 1995, Friedrich Ratzel (1844–1904): Naturwissenschaftler, Geograph, Gelehrter, Stuttgart, ISBN 3–928186–10–8, DM 60.

Natland, J. H., 1995, Beginnings of planetary volcanology in the explorations of James Dwight Dana: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-151.

Naumann, von B. Plank, F., and Hofbauer, G. (eds.), 1992, Language and Earth. Elective Affinities between the Emerging Sciences of Linguistics and Geology. (Amsterdam Studies in the Theory and History of Linguistic Science. Series 3. Studies in the History of the Language Sciences. Vol. 66).—Sign. : WA 93. 3885.

Nebeker, Frederik, 1995, Calculating the weather: Meteorology in the 20th century. (International geophysics series, 60.) Academic Press, San Diego, 255 p.

Neev, David, and Emery, K. O., 1995, The destruction of Sodom, Gomorrah, and Jericho—Geological Climatological, and Archaeological background. Oxford University Press, 192 p.

Newell, J. R., 1995, Dana and the emergence of professional geology in the United States: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-200.

Oldroyd, D. R and McKenna, G., 1995, A note on Andrew Ramsay's unpublished report on the St. David's area, recently discovered: *Ann. Sci,* v. 52, p. 193–196.

Oldroyd, D. R., 1994, The Archaean controversy in Britain: Part IV-some general theoretical and social issues: *Arm. Sci,* v. 51, p. 571–592.

Organ, M. K., 1994, Bibliography of the Reverend W. B. Clarke (1798–1878), "father of Australian geology": *J. Proc Roy. Soc New South Wales,* v. 127, p. 85–134.

Ostmann, U., 1993, Die übernahme der historischen Landnutzungskarten aus Karten des 18. und 19. Jahrhunderts in das Niedersächsische Bodeninformationssystem, in Wissenschaftliche Berichte zum Niedersächsischen Bodeninformationssystem (NIBIS), (1. Folge): *Geologisches Jahrbuch, Reihe,* p. 145–183.

Paul, E. R., 1993, The Milky Way Galaxy and Statistical Cosmology, 1890–1924. Cambridge University Press, Cambridge/New York, 262 p.

Pe-Piper G., 1995, Women in Earth Science/Geology Departments of Canadian Universities: 1983–1992: *Geoscience Canada,* v. 21, p. 125–128.

Preece, R. C., 1995, Edward Forbes (1815–1854) and Clement Reid (1853–1916): two generations of pioneering polymaths: *Archives of Natural History,* v. 22, p. 419–435.

Prescher, H., 1993, Die Georgius-Agricola-Forschung am Staatlichen Museum für Mineralogie und Geologie zu Dresden in—Vergangenheit und Gegenwart, in Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 703–710.

Prescher, H., Schmidt, P., 1993, Johann Ehrenreich von Fichtel Leben, Werk und seine Schrift "Die Mineralogen gegen das Ende des achtzehnten Jahrhunderts", 1792, *in* J. E. von Fichtel: Die Mineralogen gegen das Ende des achtzehnten Jahrhunderts. Nachdruck des 1792 in Frankfurt und Leigzig erschienenen Originals: *Freiberger Forschungshefte,* v. 199, p. 61–84.

Puff, P., 1993, Der Beitrag von Heimatgeologen zur Buntsandsteinforschung in Ostthüringen: *Fundgrube,* v. 29, p. 83–86.

Pumfrey, Stephen, 1994, "These 2 hundred years not the like published as Gellibrand has done de Magnete": The Hartlib circle and magnetic philosophy, *in* Mark Greengrass et al. (eds.) Samuel Hartlib and universal reformation. Cambridge Univ. Press, Cambridge, p. 247–267.

Quade, H., 1993, Vorwort, in E.-R. Look: Das Karl August Lossen Denkmal bei Wernigerode. Wiederhergestellt zum 17. Oktober 1993, p. 5.

Rast, H., 1993, Alphons Stübel—ein bedeutender sächsischer Geologe, Vulkanologe und Forschungereisender des späten 19. Jahrhunderts, in Beiträge zur Biographie sächsischer

Geowissenschaftler: *Abhandlungen des Staatlichen Museunms für Mineralogie und Geologie zu Dresden,* v. 39, p. 55–86.

Reichel, W., 1993, August Robert Hausse l843–1924).—Markscheider, Geognost und Bergingenieur der Königlich-Sächsischen-Steinkohlenwerke im Plauenschen Grund bei Dresden, *in* Beiträge zur Biographie Sächsischer Geowissenschaftler: *Abhandlungen des Staatlichen Museums für Mineralogie und Geologie zu Dresden,* v. 39, p. 87–108.

Reif, W.-E., 1993, Antoni Hoffmann. 17.5.1950–7.11.1992, *in* Palaont. aktuell.—Frankfurt am Main, v. 27, p. 2–3.

Reinhartz, Dennis, 1994, In the service of Catherine the Great: The Siberian exploration and map of Sir Samuel Bentham: *Terrae Incog.*, v. 26, p. 49–60.

Reinke-Kunze, Christine, 1994, Alfred Wegener. Polarforscher und Entdecker der Kontinentaldrift, Birkhäuser, Basel, 188 p.

Reuter, F., Heise, G., 1993, Die Entwicklung der Ingenieurgeologie in Ostdeutschland (ehemalige DDR) sowie die Beziehung der Ingenieurgeologen zu den osteuropäischen Ländern, in

Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 711–718.

Rice, A.L., 1994, Forty years of land-locked oceanography: The Institute of Oceanographic

Sciences at Wormley, 1953–1995: *Endeavour,* v. 18, p. 137–146.

Riedel, G.-R., 1993, Förderer und Stifter der mineralogischen und paläontologischen Sammlungen am Naturkundemuseum Erfurt: *Fundgrube,* v. 29, p. 91–95.

Ries, Linda, Morrow, Dixie, and Stewart, Anne, (ed.) 1995, John A. Mather, 1995, The legacy of Pennsylvania's oil region photographer. The Colonel, Inc., Titusville, PA, $55.

Rodgers, John, 1995, James D. Dana and the Taconic controversy: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-151

Rodrigues de Areia, M. L. and Miranda, M. A. P., 1995, A philosophical journey to the Amazon 1783–92: The story of the gathering and dispersal of a collection: *J. Hist. Collect.*, v. 7, p. 59–71.

Rohrbach, K., 1993, Alfred Wegener. Erforscher der wandernden Kontinente. Stuttgart, 257 p.

Roman, Jean, 1994, Les vicissitudes des oursins fossiles de la collection Lamarck: Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. 7–11.

Ross, W. J. (ed.), 1993, The travels of George M. Dawson with the British North America boundary commission in the year 1873. Historic Trails West, Lethbridge, Alberta, 116 p.

Rossi, William, 1994, Poetry and progress: Thoreau, Lyell and the geological principles of A week: *Amer. Lit.*, v. 66, p. 275–300.

Rothenberg, Marc, (ed.), 1995, The papers of Joseph Henry, volume 7: The Smithsonian years, January 1847-December 1849. Smithsonian Institution Press, 704 p., $75.

Sachtleben, Peter, 1994, Hat Goethe die Eiszeit entdeckt? *Goethe Jahrb.*, v. 111, p. 299–302.

Samsó, Julio, 1994, Islamic astronomy and Medieval Spain. Aldershot, England/Brookfield, 335 p. $89.95.

Sánchez, J. P., 1994, Cartography, exploration and Spanish colonial perspectives on nature and curiosities in the New World: *Terrae Incog.*, v. 26, p. 1–8.

Santa Cruz, Alonso de (Translat. by J. Bankton), 1992, The book of longitudes. Terrenate Research, Brisbee, Ariz, 181 p.

Sariiz, Kadir, and Isik, Iskender, 1995, Meerschaum from Eskisehir Province, Turkey: *Gems & Gemology,* v. 31, p. 42–51.

Savoy, L. E., 1995, Linking environmental history and earth studies in an undergraduate seminar: *Journal of Geological Education,* v. 43, p. 534–539.

Schick, Rolf and Wielandt, Erhard, 1994, Zur Geschichte der instrumentellen Erdbeben-beobachtung und Erdbebenforschung in Württemberg und Hohenzollern: *Jahresheft Ges. Naturk. Württemberg,* v. 149, p. 75–98.

Schmidt, Peter, 1993, Wichtige Allgemeinbibliographien der im 16, Jahrhundert im deutschen Sprachbereich erschienenen Drucke—nützlich für Recherchen zur Geschichte der Gewissenschaften und ihres Umfeldes: *Nachrichtenblatt zur Geschichte der Geowissenschaften,* no. 3, p. 37–38.

Schmidt, Peter, 1993, Antiquariate: unentbehrlich für Geo-Historiker: *Nachrichtenblatt zur Geschichte der Geowissenschaften,* no. 3, p. 43–44.

Schmidt, Peter, 1993, Erinnerung an den 50. Todestag des Mineralogen Friedrich Ludwig Wilhelm Kolbeck (1860–1943): *Nachrichtenblatt zur Geschichte der Geowissenschaften,* no. 3, p. 116–119.

Schmidt, Peter, 1993, Zum 150. Geburtstag des um die Geologie und Seismologie im Vogtland verdienten Ernst Weise (1843–1941): *Nachrichtenblatt zur Geschichte der Geowissenschaften,* no. 3, p. 105.

Schouppe, A. Von, 1993, Episodes of the coral research history up to the 18th century, in Proceedings of the VI. International Symposium on Fossil Cnidaria and Porifera held in Münster, Germany, 09.—14. 09. 1991.—ed. by P. Oekentorp-Küster: *Courier Forschungsinstitut Senckenberg,* v. 164, p. 1–16.

Schröder, Wilfried, Colacino, Michele (eds.), 1994, Geophysics: Past achievements and future challenges, Bremen-Rönnebeck, Germany, 194 p.

Schubert, J., 1993, Nachruf für unser Vereinsmitglied Dipl.-Geologe Ulrich Hauthal (1939–1993): *Mitteilungshl. Thur. Geol. Verein,* v. 3, p. 16.

Schuette, O. F., and Schmidt, Peter, 1993, A short review of the life and work of Oscar Montgomery Lieber (1830–1862), an important South Carolina State Geologist: *Nachrichtenblatt zur Geschichte der Geowissenschaften,* no. 3, p. 87–88.

Schuette, O., 1993, Franz Lieber und Alexander von Humboldt, *in* Franz Lieber und die deutsch-amerikanischen Beziehungen im 19.

Jahrhundert, K. Schmitt and P. Schäfer, eds.—Weimar: *Jenaer Beiträge zur Politikwissenschaft,* v. 2, p. 121–133.
Schulte, K., 1993, Zur Geschichte der Eiszeittheorie vom Ende des 18. bis Ende des 19. Jahrhunderts: *Nachrichtenbl. Deutsche Ges. Gesch. Medizin, Naturwiss. u. Technik,* v. 43, p. 155.
Schulz, H., 1993, Gedanken zur Heraushildung der deutschsprachigen Geomorphologie im 19. Jahrhundert, *in* Geschichte der Geowissenschaften in den deutschen Ländern: *Zeitschrift für geologische Wissenschaften,* v. 21, p. 727–734.
Schwarzenbach, F. H., (ed.) 1993, Towards new horizons: John Haller 1927–1984. Verlag der Fachvereine an den schweizerischen Hochschulen und Techniken AG, ETH Zentrum, 8092 Zürich, Switzerland, 128 p., $59.
Seibold, I., and Seibold E., 1995, Walther Penck 1921: Pläne für eine deutsche Pazifik-Expedition: *Geol Rundsch,* v. 84, p. 860–864.
Share, Jeffrey, 1995, The oil makers. Rice University Press, P. O. Box 1892, Houston, TX 77251, $22.
Sharov, A. S., Novikov, I. D., 1993, Edwin Hubble: The Discoverer of the Big Bang Universe. Translated by Kisin, Vitaly. Cambridge University Press, Cambridge/New York, 187 p.
Shea, J. H., 1995 Forty-five years of *Journal of Geological Education*: *Journal of Geological Education,* v. 43, p. 450.
Sherriff, B. L. and Reuter, Shelley, 1995, Notable Canadian women in the history of geology: *Geoscience Canada,* v. 21, p. 123–128.
Shortland, Michael, (ed.), 1995, Hugh Miller's memoir: From stonemason to geologist. Edinburgh Univ. Press.
Skinner B. J., 1995, Presidential perspective: The Founding of the Society: *SEG Newsletter,* no. 23, p. 4.
Sörlinz, Sverker and Friedman, R. M., 1995, The Northern space Polar research and the Nordic Nations: *Uppsala Newsletter, History of Science,* no. 23, p.1–2.
Spencer, A. M., The meteorological instruments of John Jeffries: *Rittenhouse,* v. 9, p. 59–61.
Stanton, R. L., 1995, Potomac Journey: Fairfax stone to tidewater. Smithsonian Institution Press, 256 p., $ 14.95.
Stoddart, D. R., 1994, "This coral episode": Darwin, Dana, and the coral reefs of the Pacific, *in* Roy MacLeod, Philip F. Rehbock (eds.), Darwin's laboratory: Evolutionary theory and natural history in the Pacific, Univ. of Hawai'i Press, Honolulu, p,. 21–48.
Stoddart, D. R., 1995, Dana's achievement, Darwin's dilemma: Denudation and the development of landforms in the Pacific in the 1830s: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-151.
Suiter, M. J., 1994, Historical employment trends and future opportunities for sedimentary and paleontological geoscientists. SEPM/IAS Workshop, Applications of Sedimentary Geology and Paleontology into the 21st Century, p. 52–55.
Tracey, J. I., Jr., 1995, James Dwight Dana: Corals, corals reefs, and the ocean floor: *Geological Society of America Abstracts with Programs, New Orleans, Louisiana, 1995 Annual Meeting,* p. A-151.
Tagliaferri, G., and Tucci, P., 1993, P.-S. De Laplace e il grado di meridiano d'Italia: *F. Fis.*, v. 34, p. 257–277.
Talbert, R. J. A., 1994, Carl Muller (1813–1894), S. Jacobs, and the making of classical maps in Paris for John Murray: *Irnago Mundlt,* v. 46, p. 128–150.
Taylor, K. L., 1994, New Light on geological mapping in Auvergne during the 18th century: the Pasunot-Desmarest collaboration: *Rev. Hist. Sci.*, v. 47, p. 129–136.
Thölde, J., 1992, Haligraphia. Das ist: Grundliche und eigendliche Beschreibung aller Saltz-mineralien. Beneben einer Historischen Beschreibung aller Saltzwercke.—Mit einem Nachwort von H.-H. Walter.—Leipzig.—Sign.: WA 93.4439.
Tinkler, K. J., 1994, Déjà vu: The downfall of Niagara as a chronometer, 1845–1941, *in* H. J. Gayler (ed.), Niagara's changing landscape, Carleton Univ. Press, Ottowa. p. 81–109.
Torrens, Hugh, 1995, Trials, tribulations and attainments of an "amateur" geologist: The life of S.S. Buckman (1860–1929): Geologists' Association Circular no. 912, p. 4.
Toumey, C. P., 1995, God's own scientists: Creationists in a secular world. Rutgers Univ. Press, 280 p., $45; $15 paper.
Touret, Lydie, 1994, Les relations internationales de René-Just Haüy (1743–1822): Travaux du Comité Français D'Histoire de la géologie (COFRHIGéO), 3é serié, T. VIII, p. 2740.
Troost, Gerard, 1995, The beginning of geological exploration in northern Alabama: Gerard Troost's travels in 1834. Edited by James X. Corgan and Michael A. Gibson: *Alabama Rev.,* v. 48, p. 142–153.
Unterreitmeier, Erhard, 1993, Über 20 Jahre Seismographen im Museum Burg Ranis/Thüringen: *Nachrichtenblatt zur Geschichte der Geowissenschaften,* no. 3, p. 79–81.
Wallis, Helen (ed., assisted by McConnell, Anita), 1994, Historian's guide to early British maps: A guide to the location of pre-1900 maps of the British Isles preserved in the United Kingdom and Ireland. (Royal Historical Society guides and handbooks, 18.) Offices of the Royal Historical Society, London, 465 p.
Walter, Luts (ed.), 1994, Japan: A cartographic vision: European printed maps from the early 16th to the 19th century. The German East-Asiatic Society, Munich, Prestel, 232 p.
Warner, Deborah, 1994, Terrestrial magnetism: For the glory of God and benefit of mankind. *Osiris,* v. 9, p. 67–84.
Watelet, Marcel (ed.), 1994, Gérard Mercator cosmographe: Le temps et l'espace. Avant-propos de Hugo Weckx, Fonde Mercator (Paribas), Antwerpen, 445 p.
White, S. E., 1995, The influence of a geology teacher: A memorial to Robert L. Nichols, 1904–1995: *Journal of Geological Education,* v. 43, p. 572–573.
Wilson, W. E., 1994, The history of mineral collecting. The Mineralogical Record, P. O. Box 35565, Tucson, Arizona, 264 p.
Winslow-Spragge, Lois, 1993, No ordinary man: George Dawson—1849–1901, Bradley Lockner National Heritage/Natural History Inc., Toronto, 208 p.
Woodward, David, 1994, The Forlani map of North America: *Imago Mundi,* v. 46, p. 29–40.
Wyatt, J. F., 1995, George Bellas Greenough: A Romantic geologist: *Arch. Natur. Hist.,* v. 22, p. 61–71.
Yochelson, E. L., 1996, From farmer-laborer to famous leader: Charles D. Walcott (1850–1927): *GSA TODAY,* v. 6, no. 1, p. 8–9.
Zeller, Suzanne and Branagan, David, 1994, Australian-Canadian links in an imperial geological chain: Sir William Logan, Dr. Alfred Selwyn and Henry Y.L. Brown: *Sci. Canadensis,* v. 17, p. 71–102.
Zellmer, J. T., 1995, Uses of historical aerial photographs in environmental site assessment investigations: The *Professional Geologist,* v. 32, no. 10, p. 10–11.
Zwinger, A. H., 1995, Downcanyon: A naturalist explores the Colorado River through the Grand Canyon. Univ. Arizona Press, 335 p., $35.

CORRECTIONS from v. 14, no. 1 (1995)

Patrick, N.W.J. and Wyse J. P. N. should read Wyse Jackson, P. N. as follows:

Wyse Jackson, P. N. and Monaghan, N. T., 1994, Frederick M'Coy: an eminent Victorian palaeontologist and his synopses of Irish palaeontology of 1844 and 1846: *Geology Today,* v. 10, p. 231–232.
Wyse Jackson, P. N. (ed.), 1994, In Marble Halls: geology in Trinity College, Dublin. Department of Geology, Trinity College, Dublin, 135 p.

TREASURER'S REPORT FOR 1995

$18,478.15	**Carried forward from 1994**		
−$19,067.43	**Expenditures in 1995**		
		$18,373.21	to Allen Press for ESH v. 13(2) and 14(1)
		694.22	operating expenses (postage, mailing supplies, etc.)
		$19,067.43	total expenditures in 1995
+$23,437.58	**Income in 1995**		
		$20,737.23	membership dues and institutional subscriptions
		806.35	interest on checking account
		1,894.00	page charges, monetary gifts, sale of back issues
		$23,437.58	total income in 1995
$22,848.30	**Balance forward into 1996**		

EXPLANATION

Our financial situation is currently sound, but it is not quite as favorable as these figures might suggest. First, because Mott Greene has been doing a fine job of getting the journal caught up on its publication schedule, in calendar year 1996 (or 1997) we will be paying Allen Press for three issues of *Earth Sciences History* instead of the typical two. Thus, our upcoming expenditures will be higher than usual; we will be spending funds that we have, in effect, been banking since the year in which we only paid for one issue. Second, a portion of the balance forward from calendar year 1995 is actually 1996 subscription-year revenue, reflecting our in-progress shift from spring to late fall renewals. Sixty percent of our institutional subscribers and several individual members made their payments for 1996 before the end of 1995. Although this is a good trend, we need to keep in mind that part of the balance forward is not our cushion of savings per se, but next year's expense money. A third factor is the rising cost of paper, which is resulting in steadily increasing publication costs. In order to keep dues at their current rate into the foreseeable future while maintaining the fine quality of the journal, there are two simple yet very important things that each HESS member can do—pay dues as promptly as possible and generate additional members. Prompt payment of dues helps me to provide Mott with a realistic budget for each volume and therefore maximizes the return on each member's investment. Additional members will increase our net income and help us keep pace with rising production costs.

Several members, authors, and institutions generously contributed to *Earth Sciences History* and HESS in 1995 through page charges and financial gifts. Page charges were received from Charles Berkstresser, Léo Laporte, Leroy Page, Robert Silliman, David Stoddart, the Kansas State Geological Survey, the Royal Ontario Museum, the University of Maryland-Baltimore County, and Vanderbilt University. Kennard Bork, Sarah Newcomb, and Lester Zeihen very kindly gave voluntary financial contributions along with their dues payments.

I am grateful to everyone who has helped me during my first year as HESS treasurer. My predecessor, Tom Pickett, has been exceptional in this regard. I appreciate his kindness, availability, and patience in responding to my innumerable questions. Mott Greene, Ron Rainger, and Hatten Yoder also deserve a special thanks for their patience and support during my first year on the job. In addition, I am fortunate to be working with four competent assistant treasurers, Barry Cooper (Australia), Keith Tinkler (Canada), Jordi Martinell (Spain), and Stuart Baldwin (United Kingdom), who help make HESS membership more convenient for individuals residing outside the U.S.

Respectfully submitted,
Dorothy Sack

ANNOUNCEMENTS

Canadian paleontologist and geological historian Professor William Antony S. Sarjeant was one of two geologists elected this year to a Fellowship of the Royal Society of Canada. His citation read:

> William Sarjeant, University of Saskatchewan, has not only published numerous significant articles on fossil vertebrate footprints and fossilized microplankton but has also become a well-known authority on the history of geology. His book on fossil and living dinoflagellates is recognized as a leading text. Publications on acritarchs have received wide acclaim. His international bibliography covers all publications in the Latin alphabet pertinent to the history of geology from its beginnings to 1984. The only one of its kind, and one which has brief biographies of authors as well as references, it has become an invaluable research tool for geologists and historians alike.

Professor Sarjeant has been a member of the Faculty of the Department of Geological Sciences, University of Saskatchewan, since 1972. He was a joint recipient of a Golden Trilobite Award from the Paleontological Society for his participation in the writing of *A Classification of Living and Fossil Dinoflagellates* and has also received the Sue Tyler Friedman medal of the Geological Society of London, the Founders' Medal of the Society for the History of Natural History and the History of Geology Award of the Geological Society of America. Under the pen-name ANTONY SWITHIN, he has published four novels of historical science fantasy, under the series title, 'The Perilous Quest for Lyonesse'. A second Supplement to his bibliography of *Geologists and the History of Geology,* in three further volumes, is scheduled for publication early in 1996.

XXTH INTERNATIONAL CONGRESS OF HISTORY OF SCIENCE

A two-part symposium entitled *Development and Cultural Influence of Geological Sciences in an Age of Technological and Industrial Expansion* will be held within the framework of the XXth International Congress of History of Science at Liège, Belgium, 20–26 July 1997. The two themes of the symposium are: (1) *Geology and Mining in the Old and New Worlds,* and (2) *Use of Non-Written Sources for the History of Geological Sciences.* In accord with Congress guidelines, the symposium organizers plan to include contributed as well as invited presentations. Decisions on proposals for contributed papers will be made by Programme Committee referees on the basis of submitted abstracts. Prospective authors of contributed papers under either of the two themes are invited to contact one of the symposium organizers: Silvia F. de M. Figueirôa, Instituto de Geociências, Universidade de Campinas, C.P. 6152, Campinas-SP 13081-970, Brazil (tel. 55-0192-39-1097; fax. 55-0192-39-4717; email figueroa@ige.unicamp.br); Kenneth L. Taylor, Dept. of History of Science, University of Oklahoma, Norman, OK 73019-0315. U.S.A. (tel. 405-325-5416; fax. 405-325-2363; email ktaylor@uoknor.edu); and Hugh S. Torrens, Dept. of Geology, University of Keele, Staffordshire ST5 5BG, England (tel. 44-01782-583-183; fax. 44-01782-751-357; email gga10@cc.keele.ac.uk). Anyone planning to take part in the Congress should also request the first circular from the Congress Office: XXth International Congress of History of Science, Centre d'Histoire des Sciences et des Techniques, 15 Avenue des Tilleuls, B-4000 Liège, Belgium (tel. 32-(0)41-66-94-79; fax. 32-(0)41-66-95-47; email chstulg@vml.ulg.ac.bc).

STUDIES IN THE HISTORY AND PHILOSOPHY OF THE EARTH SCIENCES

Series Editor
Professor David Oldroyd, The University of New South Wales.

Editorial Board
Professor David Branagan, The University of Sydney
Professor Naomi Oreskes, Dartmouth College
Professor Nicolaas Rupke, Georg-August-Universität Göttingen
Dr James Secord, The University of Cambridge
Dr Hugh Torrens, The University of Keele
Dr Ezio Vaccari, Università degli Studi di Genova

The Series offers an outlet for the publication of authoritative texts relating to the history of geology and related sciences, and philosophical problems that arise in connection with such sciences. It will be concerned with, for example, studies of the history of geological work in particular countries or geographical regions, specific geological controversies, the sociology and/or social history of geology, methods of representation in the earth sciences, geological travels, the spread of geological knowledge (and also its integration), the history of geological collections, the use of physical instruments in geological research, histories of fieldwork and mapping, studies of specific geological systems or units (e.g. the Jurassic or the Old Red Sandstone), 'neglected' histories such as sedimentology or petrology, the 'economic history' of geology, the histories of geological societies, biographical (or autobiographical) works, environmental geology, etc. In appropriate cases, edited collections of related pa-

pers may appear in the Series, or possibly translations of classic texts.

The intention is to publish books that are cognisant of the latest developments in the history, philosophy, and sociology of science yet also succeed in appealing to a wide readership, including historians and philosophers of science, earth scientists, and others.

Persons interested in contributing to the series are invited to contact the Series Editor, or any member of the Editorial Board. Professor Oldroyd may be reached at the School of Science and Technology Studies, The University of New South Wales, Sydney, NSW 2052, Australia. E-mail address: D.Oldroyd@unsw.edu.au

THE 1997 HUTTON-LYELL BICENTENNARY

The year 1997 will mark one of the more bizarre coincidences in the history of geology, the 200th anniversary of the death of James Hutton and the birth of Charles Lyell in the same year. This singular occasion offers the opportunity to reflect upon the profound contributions made to our science by both individuals and to review the history of the earth sciences on a broader front. It also could offer a timely catalyst for contemplating the future of our discipline at a critical time of great change—a look into the 21st Century, perhaps. The purpose of this letter is to urge that your organization plan some appropriate activities to commemorate the 1997 Bicentennary.

In Britain, a double-header symposium will celebrate the Bicentennary in the summer of 1997. A Lyell meeting will be held in London (July 30–August 3) followed by a Hutton meeting in Edinburgh (August 5–7). Both of these sessions will consider both past and present aspects of earth science; field excursions to classic localities are also planned. Here in North America, the Geological Society of America's History Division will sponsor its annual symposium on a Lyell-Hutton theme at the 1998 Annual Meeting in Toronto. This event is being organized by Gerard V. Middleton (McMaster University) and Keith Tinkler (Brock University). The Toronto venue will offer the opportunity for a field trip to Niagara Falls and Lake Ontario elevated beach terraces, which were of great interest to Lyell during his first of four visits to North America in 1841–42. The impact of Hutton's and Lyell's ideas upon early American geology will be addressed in the symposium. Because Hutton never visited North America, the emphasis inevitably will favor Lyell, who came four times.

At the regional level, we hope that various geographic Sections of the GSA, GAC, AAPG, and SEPM, as well as other regional organizations in eastern Canada and the United States, will devote special sessions (either oral or poster) and/or organize field trips around the Hutton-Lyell theme, or use the Bicentennary as an occaison to treat other aspects of the history of geology. Meetings held during the next two or three years in any eastern state or province visited by Lyell between 1841 and 1853 might include an excursion to localities that he visited and commented about. Because he and his wife travelled so widely in America, almost every regional organization has the potential for such involvement.

For more background on Lyell's visits, see his two published travel journals (1845 & 1849) and *Charles Lyell On North American Geology,* a reprint collection of journal articles as well as eight lectures presented by Lyell in New York City in 1842. (H. Skinner, editor, 1977, Arno Press).

We are already aware of a few plans for some regional Bicentennary activities, for example at the 1997 Northeastern Section of GSA to be held near Philadelphia. We urge all of you to join the parade by giving your imaginations free rein to help celebrate geology, its past, present and future! Please tell us about any plans in your organization.

R.H. Dott, Jr., William Jordan, William Brice (Bicentennary Committee)

ANTILIA

Revista Espanola de Historia de las Ciencieas
de la Naturalezay la Tecnologia
Spanish Journal of History of Natural
Sciences and Technology

ANTILIA is a new magazine, that has been published in Spain in 1996; it is dedicated to the History of Natural Sciences (Physical, Chemistry, Biology and Geology) and Technology. The geographycal interest area of the articles is mainly Spain and Latin-American countries. As editors say in the presentation: "At present the historiographic contributions on the scientific and technical past of Spain and Latin America are known in the international community very partially. One of the causes is the lack of specialized means with wide and rapid diffusion."

The journal has two outstanding characteristics, the first one is a bilingual texts (Spanish-English) that can be read by a wide community. The Second one is an electronic support which you can network freely throught INTERNET address: http://www.ucm.es/OTROS/antilia/index-sp.htm.

It is also possible to request that the publishers send you computer support or paper.

The volumes have three sections: Articles, Reviews on published books of this speciality and short Notes that, by their interest, are suitable for wider circulation. The first volume has four articles, two of them are very interesting for geologists: Silvia Figueirôa: Engineering Schools as institutional "loci" for Geological sciences in Brazil during 19th century. Francisco Pelayo: The land conexion between Cuba and American continent: a paleontological alternative to the continental drift. Editors address: Joaquin Fernandez-Perez and L. Alfredo Baratas-Diaz (ANTILIA), Historia de la Biologia (Planta 12). Facultad de Biologia, Universidad Complutense. Ciudad Universitaria, 28040 Madrid, SPAIN, Tel.: 34-1-3944982 y 3945067, Fax: 34-1-3945060.