



AASP NEWSLETTER

N. O. FREDERIKSEN, EDITOR

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JULY 1982

MIDYEAR BOARD OF DIRECTORS MEETING

The midyear Board of Directors meeting was held April 22-23, 1982, in Fairfax, Virginia. Some features of the meeting are reported in the following paragraphs.

Membership Report

	Id	Is	To
Paid for 1982	588	80	668
Delinquent for 1982	178	29	207
Non-paying members	5	1	6
Membership terminated by Board*	(24)		(24)
Total carried on roster	771	110	881

Id = Individual members

Is = Institutional members

To = Total

*excluded from total carried on roster

Treasurer's Report

Total assets, Sept. 13, 1981	\$20,756
Income since Sept. 13	18,282
Disbursements since Sept. 13	3,804
Total assets, Apr. 9, 1982	35,234

Palynology

Vaughn Bryant and Doug Nichols, Managing Editor and Journal Editor, respectively, reported that Volume 6 of Palynology should be ready to print by this summer and sent to the membership prior to the Annual Meeting. Volume 7 is still in the planning stage, and Vaughn and Doug urge members to continue to submit manuscripts to the journal.

AASP Foundation Report

Bob Clarke, Trustee and Treasurer of the AASP Foundation, reported to the Board that Volume 8 of the AASP Contributions Series, "Organic-Walled Microphytoplankton of the Middle Devonian Silica Formation of Ohio, U.S.A.," by Reed Wicander, was published in December, 1981. Six other manuscripts intended for submittal to the Foundation for possible publication in the Contributions Series are in various stages of completion.

Following is a summary of the annual financial statement of the Foundation:

Balance as of Dec. 31, 1980	\$ 3,885
Income	28,816
Expenditures	21,540
Balance as of Dec. 31, 1981	11,161

1981 Annual Meeting

Don Benson presented a final report to the Board on the 1982 Annual Meeting in New Orleans.

Final figures were:

Registrants: 163

Riverboat cruise participants: 150

Field trip participants

Delta: 31

Swamp and marsh: 21

Net profit to AASP: \$2,397.27

1983 Annual Meeting

Details about this meeting, to be held in San Francisco, will be presented in the October 1982 Newsletter along with a call for papers.

1984 Annual Meeting

Norm Frederiksen reported that a contract has been signed with the Hyatt Regency Crystal City Hotel, Arlington, Virginia. This is a brand-new hotel, very close to National Airport and downtown Washington, and the contract guarantees a single room price in 1984 of not more than \$60. Dates of the meeting are October 17-20, 1984.

1985 Annual Meeting

Bill Cornell formally proposed holding the 1985 Annual Meeting in El Paso, Texas. Dates of the meeting would be October 16-19, with the field trip on the 20th. Theme of the meeting would be Palynology on the Border. This proposal was accepted enthusiastically by the Board.

1986 Annual Meeting

Sarah Damassa reported that she is investigating the possibility of having the 1986 Annual Meeting in Boston, Mass.

AASP Newsletter is published quarterly by American Association of Stratigraphic Palynologists, Inc.

Awards Committee

The Board assigned the Awards Committee (Harry Leffingwell, Chairperson) the task of setting up and recommending the award of two \$250 student scholarships each year in addition to having responsibility for previously established awards.

Revision of Bylaws

You will remember that in the January 1982 Newsletter, proposed changes in the AASP Bylaws were specified, and a ballot was attached with which AASP members were supposed to vote yes or no to the proposed changes. Carol Chmura Meyer, Chairperson of the Ballot Committee, reported to the Board of Directors that she received a total of only 47 ballots, very far short of the majority vote needed to ratify the amendments. At the April Board meeting, an Ad Hoc Committee for Revision of the Bylaws was appointed, consisting of the following members: John Clendening, Chairperson; and Don Benson, William Cornell, and D. Colin McGregor. If you have ideas as to how the present Bylaws should be changed, or disagree with some of the proposed changes outlined in the January Newsletter, or wish to comment on why you didn't fill out and send in the ballot in that Newsletter, please send a letter to one of the committee members. Some members have already called or written their comments - thank you. Your comments will be given careful consideration.

Current Status of COSUNA

Barbara Whitney is the AASP delegate to the COSUNA (Correlation of Stratigraphic Units of North America) Steering Committee. She reported as follows: The COSUNA project is proceeding briskly, and is right on schedule. Several charts, such as the one for Roberts Shaver's Interior Basins (Lowland Basin and Arch Region), are already in the final drafting stage. The opportunity for further input by AASP members, therefore, is rapidly drawing to a close. I urge any members with last-minute comments to direct them to the appropriate regional coordinators as soon as possible. Please call me at 714-528-7201 if you need any further information. I have copies of the COSUNA Annual Report for 1981, if anyone would like one.

1982 ANNUAL MEETING

Geoff Clayton sent the following provisional program for the Dublin meeting: (*Invited Papers)

Monday, 13th, morning

*C. Deegan	Geological evolution of the North Atlantic.
D.G. Smith	A Lower Norian palynological assemblage from ammonoid-bearing strata in Svalbard.
S. Piasecki	Dinoflagellate cyst stratigraphy in Middle and Upper Jurassic sediments of East Greenland.

B.G.T. Van Helden

L.A. Riley

Palynostratigraphy of the Hibernia Field, East New Foundland Shelf, Canadian east coast offshore. Palynology, palynofacies and the "Base Cretaceous Unconformity" in the North Sea area.

Afternoon

P.A. Hochuli

E. Masure and B. Hasenboehler Lecocq

C. Azema,
E. Masure and J. Taugourdeau-Lantz

D.J. Nichols

D.J. Batten

R.A. Fensome

Palynostratigraphy of the Lower Cretaceous of the Rif (Northern Morocco).

La diversité des communautés de dinokyste albaopiens de la marge portugaise, site D.S.D.P. 398 leg 47 et Bassin Occidental Portugais, son utilisation paléocécologique et paléogéographique. La marge atlantique portugaise: Etude palynologique comparée du bassin et de sa marge.

Problems in correlation of Upper Cretaceous palynomorph zones of the North American Western Interior and Atlantic Margin. Problems connected with accurate comparison of North American and European Normapolles pollen assemblages. Dinoflagellate cysts from the Aptian-Cenomanian of the Scotian Shelf and their biostratigraphy.

Tuesday 14th, morning, Session A

K.L. Marshall and
D.J. Batten

A. Skarby

S. Odelsio

L.I. Costa

Palynology of Late Cretaceous 'black shale' sequences in N.W. Europe. T.E.M. investigations of Normapolles from anthers, Upper Cretaceous of Scania, Sweden. Clavatipollenites from the Upper Cretaceous of southern Sweden. Upper Cretaceous dinoflagellates from the North Sea and the Barents Sea.

- C. Kramer
Palynostratigraphy of the Upper Cretaceous - Paleogene Eureka Sound Formation, Arctic Canada.
- *G. Norris
Arctic Tertiary marine and terrestrial palynofloras; problems of correlation to lower latitudes and palaeoclimatic interpretation.

Afternoon, Session A

- *J.P. Bujak, E.H. Davies and G.L. Williams
S.B. Manum and T. Throndsen
Evolution of Peridiniacean Dinoflagellates. A palynological view of the problematic age of the Spitsbergen Tertiary.
- U. Biffi and D. Grignani
Stratigraphy of the Lemme Outcrop (North Italy); preliminary definition of the Oligocene/Miocene boundary based on dinoflagellates.
- J.A. Coetzee
Tertiary palynology of the eastern margin of the southernmost Atlantic.
- R.A. Laszleski
Title unknown:
Theme: "Tertiary Palynology".

Tuesday 14th, morning, Session B

- S.G. Molyneux
Initial results of palynological studies on the Lower Palaeozoic rocks of the Southern Uplands of Scotland.
- M. Vanguetstaine
Acritarch biostratigraphy of the Frasnian/Famennian boundary in the type-area of the Dinant Basin and in the Namur Basin, Belgium.
- A. Kimyai
Devonian acritarchs from Bolivia, South America.
- L.R. Wilson
Title unknown:
Theme: "Palaeozoic continental activity and palynology associated with the land masses Laurasia and Bengalia".
- C.J. Van Der Zwan and B.A. Duff
An attempt at palaeomagnetic validation of palynophytogeographic reconstructions of Laurasia in the Devonian and Carboniferous.

P.M. Van Veem

P. Pierart

Afternoon, Session B

- J.D. Burgess
Source rocks along continental margins. Processes of natural resource accumulation in ancient lake sediments in the Newark Rift System (eastern North America). Landmarks in Paleozoic palynology.
- E.I. Robbins and A. Traverse
Lower Devonian spore stratigraphy in Belgium.
- *H.J. Sullivan
The age and correlation of the Senni Beds (Lower Breconian) Brecon Beacons and Black Mountains (South Wales).
- P. Steemans
- J.B. Richardson and A. Hassan

Wednesday 15th, morning, Session A

- W.A.S. Sarjeant
P.J. Mudie and C.E. Keen
Title unknown. Dinoflagellate records of Quaternary glacial-interglacial cycles in the Northwest Atlantic and Baffin Bay.
- F.J. Rich
Paleoecology of an early Pleistocene swamp, northern Florida, U.S.A.
- R.A. Penney
A Holocene pollen record from the Highland Region of southwestern Ontario, Canada.
- *P.C. Reid
North Atlantic dinoflagellate cysts from continuous plankton records and implications to the fossil record.
- R. Harland and J. Sharp
Elongate Spiniferites cysts in North Atlantic bottom sediments.

Wednesday 15th, morning, Session B

- E. Turnau
Spore zonation of Middle Devonian deposits of Poland.
- S. Loboziak and M. Streel
Miospores from the 'Formation d'Hystreprent' (Upper Devonian, Boulonnais, France).

D.C. McGregor

J. Utting

G.D. Powis

Biogeography of Upper
Devonian spores.
Lower Carboniferous
miospores of Canada and
a comparison with those
from Western Europe.
The definition and
description of two late
Carboniferous spore-
pollen assemblage-zones
from Australia.

POSITION WANTED

Dr. Henry Hooghiemstra writes: I am a biologist-palynologist and have worked the last 5 years with Professor Van der Hammen, University of Amsterdam. At the end of this year my thesis "Vegetational and climatic history of the Bogotá high plain, Colombia" will be published (Diss. Bot., J. Cramer Verlag) in which I present a detailed vegetational history and climatic curve for the last c. 3.4 million years, based on palynological analysis of a 360 m deep section of lake sediments. Descriptions and illustrations of over 400 palynomorphs are added. In addition to a number of smaller publications, I started, in cooperation with Dr. Cleef, University of Utrecht, the preparation of a pollen atlas of recent Colombian páramo genera.

I planned to move to Bogotá, Colombia, the end of this year to work there at the Geological Institute (Ingeominas) on Tertiary and Quaternary palynology. Because of lack of funds of the Dutch Ministry of Foreign Affairs I had to cancel my provisional contract with this institute.

I am looking now for a job in Quaternary, Tertiary (or older) palynology. I am interested especially in tropical vegetational history as well as pollen morphology. I would like to know if there are possibilities for me to work in the United States or elsewhere. My address is: Hugo de Vries-Laboratorium, Universiteit van Amsterdam, Sarphatistraat 221, 1018 BX Amsterdam, Netherlands.

CONSULTANT AVAILABLE

Sarah Pierce Damassa would like to remind her overworked colleagues that she is available for employment as a consulting palynologist. Her greatest expertise is with Tertiary dinoflagellates; however, projects involving other ages and/or groups of palynomorphs also would be welcomed. Address: 3 Ridge Street, Winchester, MA 01890; telephone (617) 729-5297.

SCOLECODONT NEWSLETTER

Newsletter no. 1 of the C.I.M.P. Subcommission on Scolecodonts appeared in September, 1981. In this issue is a list of the members of the C.I.M.P. Scolecodont Working Group and a Bibliography of Scolecodonts for 1978-1980. For a copy, or to send in news items, write the editor: A.W. Van Erve, Institut fuer Palaeontologie der Freien Universitaet Berlin, Schwendenerstrasse 8, 1000 Berlin, West Germany.

CHITINOZOAN NEWSLETTER

No. 3 of the Chitinozoan Newsletter appeared in October, 1981. This produced by the C.I.M.P. Subcommission on Chitinozoa. If you would like copies of past Newsletters or have news items, write the editors: Florentin Paris, Institut de Géologie, Université de Rennes, 35042 Rennes Cedex, France; and Yngve Grahn, Geological Survey of Sweden, Box 670, S-751 28 Uppsala, Sweden.

CHITINOZOA

W.A.M. (Tony) Jenkins sent the following communication:

When "Chitinozoa" (Geoscience and Man 1, 1-21) was published in 1970, only twenty-five offprints were printed for the author to distribute to colleagues. Additional offprints are now available, however, thanks to the American Association of Stratigraphic Palynologists which acquired them and to Petro-Canada which generously agreed to pay for them. These are being sent to those who might be interested in having copies. Requests for copies should be sent to the author at Petro-Canada, Box 2844, Alberta, Canada.

RESEARCH SUPPORT PROGRAM

The Smithsonian Foreign Currency Program, a national research grants program, offers opportunities for support of research in Burma, Guinea, India, and Pakistan in the following disciplines: Anthropology, Archeology and related disciplines, Systematic and Environmental Biology, Astrophysics and Earth Sciences, and Museum Programs.

Grants in the local currencies of the above listed countries are awarded to American institutions for the research of senior scientists. Collaborative programs involving host country institutions are welcome. Awards are determined on the basis of competitive scholarly review. The deadline for submission is November 1 annually. For further information write the Foreign Currency Program, Office of Fellowships and Grants, Smithsonian Institution, Washington, D.C. 20560, or call (202) 287-3321.

FORUM

Comment, by William Chaloner

Bill Sarjeant's reply to A. Traverse stings me to answer his accusations against the "Committee for Fossil Plants" of the IAPT, of which I am the Chairman. This is one of the nine permanent nomenclature committees set up by the International Botanical Congress; its brief is to comment and advise the Nomenclature Section on any palaeobotanical proposals. Bill suggests that we did "a lousy job of acquainting ... other palynologists about proposed changes, and seeking our opinions." This smacks of someone who does not read the newspaper or watch TV and complains "why doesn't someone tell me what is going on?" (In this instance, the counterparts to the newspapers and TV are perhaps Taxon and the IOP Newsletter!). The

former is the "official" journal for public notification of proposed changes to the ICBN. If Bill "does not have access to Taxon," I am sorry, but that is hardly our fault. (Surely he could get sight of a copy somewhere at some time; or borrow one from a fellow Canadian?). North America and palynology are both well represented on the Fossil Plant Committee. An excellent review of its working methods was given by Traverse in the IOP Newsletter No. 9 of May 1979, pages 7-10. Over the last five years, that periodical carried numerous letters and notes on matters relating to the nomenclature of fossil plants. Jan Jansonius, who is a countryman of Bill's and a member of the Fossil Plant Committee, wrote a full review on the application of conventional binomial nomenclature to spores in Taxon 30 (2), 438-48 in May 1981.

Bill Sarjeant writes of "the threatened deletion of the form-genus (from the Code) - has it happened by now?" Did he read Traverse, in AASP Newsletter 15 (1)? (To save him checking, the form genus is still alive and well, and will figure, as before, in the "Sydney Code").

One final point, on Traverse's very fair and full commentary. He says that the Editorial Committee of IAPT is "writing the Sydney Code." In the interests of precision, I must record that we are simply editing it - there is a difference! The Nomenclature Section at Sydney "re-wrote" the Code (in small degree, only). Our job is simply to reconcile these changes with one another and with the totality of the Code. We do not have licence to "write it" with the freedom that that implies.

Comment, by Michael Boulter

Bill Sarjeant's confusion about the distinction of nomenclature and taxonomy (AASP Newsletter 15(2), April 1982, page 6) cannot be blamed on the inaccessibility of Taxon. The issues involved are discussed by J.M. Schopf in Tschudy & Scott, 1969, Aspects of Palynology, chapter 4, and more recently by him in IOP Newsletters 7 (pages 4-5 and 24-26) and 8 (pages 11-14).

If Bill subscribed to IOP Newsletter he would have seen more recent items still, written by the palynological representatives on the ICBN committees "acquainting us other palynologists about the proposed changes, and seeking our opinions" for the Sydney 1982 meetings. Back copies of IOP Newsletter only cost US \$2.00 each, and the current annual subscription to IOP (International Organization of Palaeobotany) is \$6.00 - much less than for Taxon.

OTHER SOCIETIES

Brazilian Paleobotanists and Palynologists

The 3rd (Brazilian) Meeting of Paleobotanists and Palynologists was held December 10-12, 1981, at the Institute of Geosciences, University of São Paulo, in São Paulo, Brazil, sponsored by the IG-USP and the Associação Latino-Americana de Paleobotânica e Palinologia (ALPP), and was attended by more than 60 professionals and students, including several foreign participants. Topics presented ranged from the stratigraphic use of Brazilian Precambrian stromatolites to an ecological study of territorial

dominance in modern bees based on pollen evidence. Five papers on paleobotany were delivered, of which four dealt with the Carboniferous-Permian of the eastern Paraná basin; seven papers dealt with paleopalynology (2 on the Neo-Paleozoic, 2 on the Mesozoic, and 3 on the Cenozoic), and six papers treated modern pollen and its use. A round-table discussion was held on the origin and evolution of the angiosperms, concluding with the prospects for eventual Brazilian breakthroughs in this field. Finally, researchers interested in the Neo-Paleozoic phytostratigraphy of the Paraná basin met to discuss the formation of a working group. Ten of the papers will be published in the IG-USP's Boletim, hopefully before October.

Of greatest interest to members of the AASP will be the palynological articles by Arguijo et al. and Gonzalez-Amicon & Volkheimer on the Argentinian Jurassic, Lima on the Brazilian mid-Cretaceous, Lima & Sundaram's review of Neo-Paleozoic palynology of Brazil, and Barth on modern Brazilian Rutaceae. These papers are in Portuguese or Spanish. For information on our next meeting (December, 1983) or to order this publication, contact Thomas R. Fairchild, IGUSP, C.P. 20899, São Paulo, SP, Brazil -- 01000.

Quaternary Research Association

The Quaternary Research Association held a meeting in Cambridge, England, on January 4 and 5, 1982. The theme of the meeting was: "Pollen Analysis and Quaternary Palaeoecology: Recent Developments." H.J.B. Birks kindly sent a list of the papers given. Abstracts can be obtained by writing Prof. Birks at the Botany School, Downing Street, Cambridge CB2 3EA, England.

- H.J.B. Birks - Introduction.
- R.H.W. Bradshaw - The selection of sites for palaeovegetational studies.
- Hilary H. Birks - The role of plant macrofossils in Quaternary palaeoecology.
- J.R. Flenley - Some recent and future developments in palynological techniques.
- I.C. Prentice - Numerical methods and pollen-vegetation calibration functions.
- B. Huntley - Mapping European pollen data and reconstructing tree-migration routes.
- H.F. Lamb - History of the major forest zones in Labrador.
- H.J.B. Birks - Flandrian tree-migration patterns within the British Isles.
- K.D. Bennett - Patterns of vegetational history in East Anglia.
- Winifred Pennington - The lakes of Highland Britain: an assessment of their contribution to palaeoecology.
- W.A. Watts - Vegetational history of The Burren, Co. Clare.
- J.J. Lowe and M.J.C. Walker - Pollen stratigraphy and patterns of deglaciation in Scotland.
- E.C. Grimm - Reconstruction of vegetation from historical records and pollen analysis in the Big Woods of Minnesota.
- P.D. Kerslake - Ecological history of wooded islands in Scottish lochs.
- Mary E. Edwards - Ecological history of oak-woods in Wales.
- H.J.B. Birks - Future prospects.

The Linnean Society of London

The Palynology and Palaeobotany Specialist Groups of the Linnean Society of London held a joint meeting on 25-26 March 1982 on the "Interaction of palynology and palaeobotany." Twelve papers were given:

- Moore, P.D. - Some pollen morphological problems facing the Quaternary palynologist.
Chapman, Jenny L. - Comparative morphology of Chloranthaceae and Cretaceous fossil angiosperm pollen - can biological species be identified in the fossil record?
Harley, Madeline M. - Fine surface ornamentation of Sapotaceae pollen: a preliminary survey.
Dickinson, H.G. - The different degrees of cytoplasmic involvement in the establishment of the principal features of exine morphology.
Blackmore, S. - Aspects of pollen function in Lactuceae (Compositae).
Ferguson, I.K. - Relationships between exine morphology and pollinators in subfamily Papilionoideae (Leguminosae).
Chaloner, W.G. - The interrelationships of palynology and palaeobotany.
Allen, K.C. - How dispersed megaspores help interpret Devonian floras.
Boulter, M.C. - Multivariate statistical analysis in palynology and its importance in palaeobotany.
Batten, D.J. - Kerogen particles and their application in exploration.
Hughes, F.N. - Early Angiosperm pollen.
Crane, P.R. - Early Angiosperm fossil flowers.

The aim of the meeting was to bring together workers in the fields of palaeobotany, palynology and plant taxonomy to describe and discuss current research with a view to stimulating mutual interests and discovering common problems. Some 60 people attended over the two days and among those who participated were Professor J. Heslop-Harrison and Professor T.G. Harris who contributed to the very active and stimulating discussions.

The Linnean Society of London specialist groups are informal. The only appointed official is a "convenor" who may arrange occasional meetings or symposia within the organisation of the Society. Currently the convenor for the palynology group is Dr. I.K. Ferguson, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB and for the palaeobotany group, Dr. B.A. Thomas, Biological Sciences Department, Goldsmith's College, London SE14 6NW. Visitors are very welcome at all meetings. Details of all meetings of the Society etc. can be obtained from the Executive Secretary, Linnean Society of London, Burlington House, Piccadilly, London W1V 0LQ.

I.K. Ferguson

BOOK REVIEWS

Vicariance Biogeography, a Critique: Symposium of the American Discussion Group of the American Museum of Natural History, May 2-4, 1979. Eds. G. Nelson and D.E. Rosen. 1981. Columbia University Press, 562 West 113th Street, New York, N.Y. 10025. \$35.00.

Vicariance biogeography is one of the models used in historical biogeography. Traditionally,

historical biogeographers map the present distribution of a group and then offer some explanation of the observed distribution. This practice developed long before there was a fossil record worthy of the name, so fossil evidence, if it exists, is usually used in a supporting role to the hypotheses generated from extant evidence. Palaeontologists please note: a biogeography based on fossil evidence is classified as paleobiogeography.

This book revolves around a controversy concerning two models. In the first, the centre of origin dispersal concept, a group evolves at the centre (area) of origin and increases its distribution by dispersal which may be constrained or channelled by barriers. An unsuitable region may be jumped over by long distance dispersal; another controversial topic. The centre of origin may be identified by the location of the most primitive members or the area of greatest diversity. This model was first proposed by Darwin.

Croizat noted similarities of the biota in separate areas and hypothesised that there was once a widely distributed biota which had become fragmented. His views were formulated before plate tectonics became accepted, so they were generally ignored at the time. Today, Croizat's views, with some modifications, are championed by the cladists. The phylogeny of a group is worked out using the cladistic method. The distributions of the segments of the cladogram are plotted and this then becomes the area cladogram. If the segments show a fragmented distribution, and since the cladogram has shown that they had a common ancestor, then the ancestral range was once much wider and has since become fragmented. This has become known as vicariance biogeography. The most obvious but superficial explanation of the disruption of a wider distribution is sought in plate tectonics. After all, the ease with which various maps of continental drift may be consulted cannot be compared with the laborious process of constructing an accurate record of climatic change (or some other factor) just to see if it fits the observed patterns. This explanation of the controversy is probably an oversimplification, but it will serve as an introduction to readers who are unfamiliar with historical biogeography.

There are twelve chapters, each followed by two or three discussions and a reply by the author. With this format and some forty-one contributors, almost every shade of view is presented. Many of the arguments put forward by the cladists and their strict insistence on method will be familiar to readers. Not all participants believe implicitly in cladistics. The more flexible authors use a wide source of evidence and point out the neglect of life histories and ecology. Indeed, some participants view the two models as extremes of a range of possibilities and not either/or propositions.

The attitude towards fossil evidence by historical biogeographers is rather curious. Of course it should be taken into account if it exists. It is, however, relegated to a supplementary role; perhaps extending the range of a taxon showing that it once occupied an area where it is now extinct, or perhaps it may give a minimum age

for a taxon, or be useful in choosing between geological causes of disjunction. To be fair, the zoologists have made some attempt to integrate the fossil record into their zoogeographies, but the botanists have largely ignored it. The vicariance biogeographers practically reject the fossil record as evidence and expect impossible standards as well. In the words of Brundin (p. 102-103):

...reconstruction of phylogenetic relationships and of important aspects of the history in time and space of a group is possible even if the relevant fossils are not available. But fossil findings may give significant and even decisive biogeographical information of a different kind, if the fossils are so well preserved and so complete that their position in the hierarchy (of extant taxa) can be established with precision.

Towards the end of the book, there are, however, two chapters on paleobiology written by palaeontologists.

I can never discuss the role of paleontology without recalling an encounter with one historical biogeographer when I was an impressionable student. Over coffee, he elaborated his ideas about the migrations of the taxa he was studying. I, foolishly and naively, said "Of course the fossil record will prove if you are right." "Fossil record!" he thundered at me. "I don't need any fossil record! I know I am right!"

Interest and readability vary with the author and the content of the chapter. I found the authors who presented a biogeography of a particular group the most interesting. This, however, was not the original intention which was to discuss methods. This strict insistence on methods, or I suspect, one method as the one and only true light, is rather curious. Organisms are so variable that the same ends may be accomplished by different means. This may be seen at almost any level, be it biochemical, physiological, life histories or ecological. To insist that there is only one way to unravel their biogeographies is unrealistic. To reject biogeographies based on a wide range of evidence simply because there has been no cladistic analysis of the group, as discussants have done, is narrow-minded to say the least.

I would nominate the chapter by J. Haffer, "Aspects of Neotropical Bird Speciation During the Cenozoic," as the best. Fossil evidence is not used, but the reconstructions of climatic changes during the Quaternary are particularly good. The alternate expansion/contraction of rainforest/woodland and the shifting of the altitudinal belts with the glacial cycles have had a profound effect on the birds and the rest of the biota as well. Both vicariance and dispersal are involved in a complex pattern. Other excellent chapters are T.L. Erwin: "Taxon Pulses, Vicariance and Dispersal: An Evolutionary Synthesis Illustrated by Carabid Beetles," and A. Solem: "Land-Snail Biogeography: A True Snail's Pace of Change." J.A. Wolfe: "Vicariance Biogeography of Angiosperms in Relation to Paleobotanical Data" presents the only biogeography from paleontological evidence. Using maples as an example, he shows vicariance as a result of climatic separation, rare

long distance dispersal and elimination as a result of competition. None of the disjunctions are related to plate tectonics and the biogeography of the maples does not support the fragmentation of one biota. Sadly, one discussant rejects this work simply because there has been no cladistic analysis of maples.

The chapter by A. Hallam, "Relative Importance of Plate Movements, Eustasy and Climate in Controlling Major Biogeographical Changes Since the Early Mesozoic," presents a general background of changes through geological time with limited biogeographical correlations. The background of change is too general to be useful for specific regions or purposes, but it illustrates the principles involved.

Other chapters include one on methods of paleobiology, which is an attempt to integrate fossils into cladograms. It is interesting to note that all the examples are zoological. However, the emphasis is on methods and the paleobiology is rather confusing. Two chapters on the lost continent of Pacifica are demolished in the discussions with up-to-date geological evidence which shows Pacifica as a most unlikely proposition. A chapter on dispersal is very superficial and adds nothing to the understanding of this problem. There is a chapter on statistical tests of cladistic biogeographical hypotheses, should adequate data become available. Another chapter develops Croizat's Panbiogeography into phylogenetic biogeography as practiced by the cladists. Croizat's chapter is disappointing in that he devotes most of it to berating Darwin for not recognising vicariance patterns in biogeography. This is most unfair. Darwin's centre of origin/dispersal hypothesis is consistent with his major contribution to science, i.e., evolution or the organic connection of organisms through time.

In summary, this book contains a wide range of views and lively discussions. It has something for everyone, but the whole book will not appeal to any one person. Only the most avid biogeographers should buy it. For those for whom biogeography is only one of several interests, recommend that your library buy it. For a good orientation in the subject, start by reading the summary at the back of the book, then select chapters which appeal most.

Helene A. Martin

Microfossils, by M.D. Brasier. 1980. Allen & Unwin, Inc., 40 Museum Street, London, England, and P.O. Box 978, Edison, NJ 08817, USA. Available in both paperback and hardcover editions. Price not stated; 193 p.

This publication represents an ambitious attempt at providing a concise and inexpensive introduction to the field of palynology and micropaleontology. The book is well-organized and replete with excellent line drawings of the various microfossil organisms which are discussed.

The introductory chapter provides a good discussion of the primary focus of palynological and

micropaleontological research. The discussions and definitions concerning the cells, organelles, etc. at first appear simplistic but serve as a simple reminder that all objects of this research were once living organisms. Definitions of these terms are found within the text with the terms highlighted by boldface type. Perhaps the terms could have been appended with more precise definitions as a glossary of terms, but the present arrangement actually serves the needs of the introductory student much better and facilitates the book's readability.

The remainder of the book is divided into two parts by cell type: Prokaryotes and Eukaryotes. The next 15 chapters are each devoted to the discussion of a particular group of organisms such as the Crysophyta, Tracheophyta, Sarcodina, Crustacea, and Chitinozoa. Each chapter is further divided into sections detailing: morphological characteristics of the living organism, including life cycles where appropriate; the present taxonomic classification and affinity of the group, ecological data on the group, a short geologic history of the group; and, finally, a short discussion of collection and extraction methods. At the end of the book is an appendix of various extraction techniques and procedures which is extremely useful, especially for students being introduced to these techniques for the first time.

The nomenclature used throughout this book is generally standard, although in some cases it is somewhat antiquated. The division of Schizomycophyta, for example, is used for the Bacteria, whereas today, many introductory textbooks prefer to use the form Schizophyta in order not to infer any relationships with the Fungi.

Discussion of a few groups appears to be conspicuously absent. "Spores" are also produced by members of the Bryophyta which unfortunately are not examined in this book. A short discussion would have been beneficial concerning the distinction between the spores which represent the sporophyte generation (Bryophyta) and those representing the gametophyte generation (Tracheophyta). Mention is also lacking concerning the Fungi. Although many problems occur in working with fungal spores, they are not nearly so "rarely present" as indicated in the book (p. 58). Recent studies have attempted to assign fossil fungal spores at least to the group level and some treatment of this taxonomic unit is, I believe, in order.

In the chapter dealing with pollen and spores (Chapter 10, Tracheophyta), the author defines sporopollenin as a "highly resistant waxy coat" (p. 65). This reveals the apparent unfamiliarity of the author with the structure of the pollen exine. Numerous articles dealing with this complex structure are currently available and should be consulted. Likewise, the author's description of how to calculate a pollen sum reveals his naivete in this area as well. While it is true that early researchers did calculate pollen frequencies separately for NAP and AP, this statistical aberration fortunately has not been in wide use for over a decade.

In spite of these minor flaws concerning some technical aspects of particular groups, overall,

this is an excellent book. It provides a good, basic understanding or overview of the field of micropaleontology. The aims of this book, as expressed in the preface, have been well met. This book is ideal as an introductory text, applicable to a wide variety of courses. Since professionals cannot always be proficient in all these areas, the book also should serve as a basic reference text for active researchers in the field. I heartily recommend its adoption for classroom use and for a spot on the shelf of the most active researchers in the field of palynology and micropaleontology.

Richard G. Holloway

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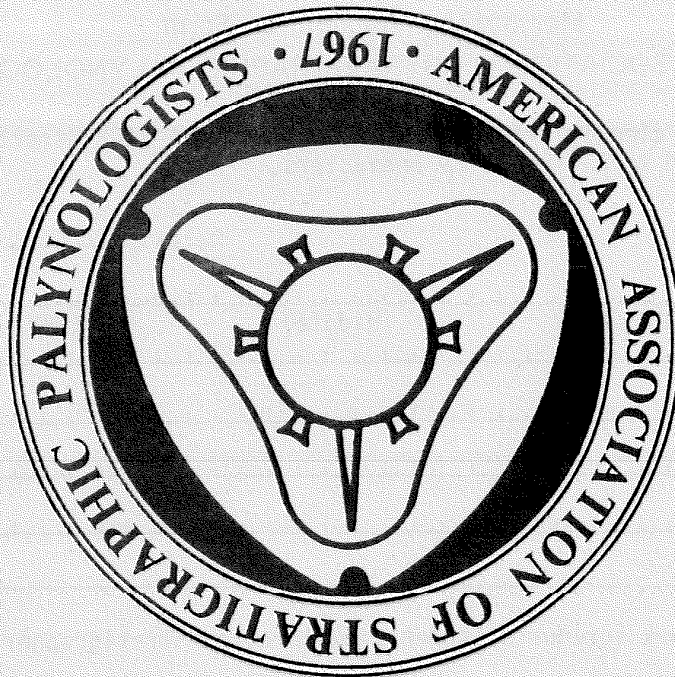
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