NEWSLETTER

Volume 3 Number 1

SUMMER 1980

CAP MEMBERSHIP

The C.A.P. Membership of 58 is listed at the end of this newsletter. Outstanding C.A.P. dues for 1980 ($2.00) or for 1980-81 ($4.00) should be sent to the Secretary-Treasurer, Jocelyne Legault, Department of Earth Sciences, University of Waterloo, Waterloo, Ontario, N2L 3G1.

NOMINATIONS FOR THE 1981 EXECUTIVE COMMITTEE

The C.A.P. Nominating Committee has nominated the following members for the 1981 Executive Committee:

Richard Hebda, President-Elect
Jocelyne Legault, Secretary-Treasurer
Jonathan Bujak, Newsletter Editor
Jan Jansonius, the present President-Elect, will automatically become President for 1981.

The Nominating Committee will accept alternative nominations from the membership. Nominees and their nominator must be members of C.A.P. in good standing and each nomination must be supported by the signatures of four C.A.P. members. Please submit any nominations, to be received no later than AUGUST 1, 1980, to: Graham Williams, Atlantic Geoscience Centre, Bedford Institute of Oceanography, P.O. Box 1006, Dartmouth, N.S., B2Y 4A2. The Nominating Committee will mail out ballots on September 1, 1980, and will have the results tabulated and available for the Winter Newsletter.

PALYNOSCENE

National Museums of Canada
National Museum of Natural Sciences
(received from D.M. Jarzen and G.J. Whalen)

Present work in progress involves a survey of the fossil occurrences of the monocotyledon genus *Pandanus* (Pandanaceae). The pollen of *Pandaniidites* Elsik, *Spinamonoporites* Sah and other monoporate, spinulate pollen. At least 16 reports of pollen comparable to the Pandanaceae are recorded in the literature. Some are quite doubtful, yet others need further examination to confirm or deny their suggested affinity. SEM and light microscopic investigations are under way, examining modern pollen of numerous species of *Pandanus* as well as taxa with similar pollen morphology (e.g. Lemnaceae, some Palmae, Araceae, Liliaceae and others). Through cooperation with Benjamin Stone (Malaysia) and Kim-Lang Huynh (Switzerland) samples of modern *Pandanus* pollen are being made available.

The ubiquitous occurrence of "pandanaceous-like" pollen in the Upper Cretaceous and some Lower Tertiary strata of the Western Interior makes the identification of this pollen type to at least family level desirable. The ecological parameters and present-day geographic boundaries associated with the genus would supply additional data relevant to the paleoenvironment of the Canadian Western Interior during the Cretaceous/Tertiary transition.

Final preparations are being made on a manuscript describing the palynoflora from Tendaguru Hill, Southern Tanzania. The Jurassic dinosaur fauna, well described and used to correlate North American Jurassic faunas, is to judge from the associated palynoflora, contained within sediments that may be as young as lower Cretaceous.

The Palynology Laboratory of the National Museum of Natural Sciences maintains a modern pollen and spore reference collection. Prepared by standard techniques, and mounted onto microscope slides, the collection represents 8,000 species in more than 200 families of the plant kingdom. Although the emphasis is on angiosperm families of tropical or subtropical habitat, the collection includes a cosmopolitan sampling of algal zygospores, fungal, bryophyte and fern spores, as well as gymnosperm and angiosperm pollen. In conjunction, there is exchange material of preparation duplicates.

The main purpose of the collection is to enable palynologists to make comparisons between fossil and modern pollen and spores. In doing so a better understanding of paleoenvironments can be obtained. The collection has potential use in other areas such as archeology, biosystematics, aerobiology and ecology.

We invite visitors to use the collection and would welcome the establishment of an exchange programme with individuals or institutions. In particular we would like to improve our representation of Canadian flora.

References that may be useful to those interested are: "The Pollen and Spore Reference Collection at the National Museums of Canada", D.M. Jarzen (1977) Syllogeus No. 13, and "Catalogue of the Pollen and

Spore Exchange Collection National Museum of Natural Sciences", D.M. Jarzen and G.J. Whalen (1978) Syllogeus No. 16.

SOCIETIES

AMERICAN ASSOCIATION OF STRATIGRAPHIC PALYNOLOGISTS, INC. (A.A.S.P.)

Volume 13, numbers 1 and 2 of the A.A.S.P. Newsletter were ciruclated in January and April, 1980. These included details of past and forthcoming A.A.S.P. Annual Meetings and several reviews of recent books. A new column, "Focus", began in the April newsletter and carried news about palynological activities at various laboratories and universities in North America. The April issue included news from North Texas State University and Virginia Polytechnic Institute and State University.

As of October, 1979, A.A.S.P. had 658 members including 94 institutional members.

ASSOCIATION DES PALYNOLOGUES DE LANGUE FRANCAIS (A.P.L.F.)

The March, 1980, issue of the A.P.L.F. Newsletter was recently circulated and included details of forthcoming meetings and three recently completed palynological thesis in France.

The 1980 Annuaire of the A.P.L.F. was also circulated and listed the A.P.L.F. Executive Committee, A.P.L.F. members with their addresses and specializations, and the following working groups:

Aeropalynology (P. Cour)
Melissopalynology (J. Louveaux)
Morphology and nomenclature of spores and pollen (B. Lugardon)
Upper Cretaceous palynology (C. Azema)
Neogene palynology (H. Meon)
Pleistocene and Archeology in Europe (J. Renault-Miskovsky)
Holocene of Europe (G. Jalut)
African palynology (R. Bonnefille)
Marine palynology (M. Strick-Rossignol)

ASSOCIATION QUEBECOISE POUR L'ETUTE DU QUATERNAIRE (A.Q.Q.U.A.)

Volume V, numbers 3 and 4 of Bulletin - A.Q.Q.U.A. were circulated in September and November, 1979. Further details about the Association may be obtained from the Secretary-Treasurer, Jean-Marie Dubois, Département de Géographie, Université de Sherbrooke, Sherbrooke, Québec J1K 2R1.

BRITISH MICROPALAEONTOLOGICAL SOCIETY (B.M.S.)

Newsletter No. 12 of the B.M.S. was circulated in April 1980 together with the 1980 Directory of Members of the Society, which lists 142 members and their micropaleontological interests.

CANADIAN QUATERNARY ASSOCIATION (CANQUA)

Newsletter 1 of CANQUA was circulated in May 1980. Details about the Association are available from CANQUA, 5 Birchview Court, Nepean, Ontario, K2G 3M7.

COMMISSION INTERNATIONALE DE MICROFLORE DU PALEOZOIQUE (C.I.M.P.)

C.I.M.P. Newsletter 22 was circulated in November, 1979, and listed the present C.I.M.P. Comité Executif with their terms of office:

President	S. Jardiné	(1976-1980)
Vice-President	J. Doubinger	(1976-1980)
Past President	B. Alpern	(1976-1980)
Secretary General	B. Owens	(1977-1981/2)
Past Sec. General	M. Streel	(1976-1980)

Other members of the Comité Executif are connected with various specialist groups:

Stratigraphic Working Groups

Permo-Trias	H. Visscher
Stephanian-Autunian	J. Doubinger
Westphalian	S. Loboziak
Namurian	B. Owens
Dinantian	G. Clayton
Famennian-Tournaisian	M. Streel
Eifelian-Frasnian	W. Riegel
Silurian-Lower Devonian	J.B. Richardson
Pre-Silurian	C. Downie

Morphological Working Groups

Miospores	W. Riegel
Megaspores	P. Pierart
Spores *in situ*	J.P. Laveine
Acritarchs	P.J. Hill
Chitinozoa	S. Laufeld
Scolecodonts	A. Van Erve

S.J. Morbey has also proposed that a new working group be established on Permian, Triassic and Early Jurassic phytoplankton.

Chitinozoa Newsletter No. 1 (August, 1979), edited by Sven Laufeld and Yngve Grahn, was circulated by the C.I.M.P. Subcommission on Chitinozoa. It gives details of workers on Chitinozoa: address, publications, projects and fields of interest, forthcoming meetings which various Chitinozoa workers plan to attend.

INDIAN ASSOCIATION OF PALYNOSTRATIGRAPHERS (I.A.P.)

The second newsletter of the I.A.P., "Patrika", was circulated in December, 1979. This lively issue included details of recent meetings and palynological research in India, 28 publications relating to Indian palynology, and the Objectives, Rules and Regulations of the Association.

INTERNATIONAL ASSOCIATION FOR AEROBIOLOGY (I.A.A.)

The International Aerobiology Newsletter number 11 was circulated in November, 1979, and included information on forthcoming meetings, conferences and recently published books. The eighth meeting of the Executive Committee was held in Paris from October 14

to 16 at Laboratoire de Palynologie of the Muséum National d'Histoire Naturelle.

The Newsletter is published by Joanne Rowley, Swedish Museum of Natural History, Palynological Laboratory, S-104 05 Stockholm 50.

INTERNATIONAL ASSOCIATION OF ANGIOSPERM PALAEOBOTANY (I.A.A.P.)

The Latin American members of I.A.A.P. met in Buenos Aires during April 27-28, 1979, for a meeting organized by Dr. E. Romero. Members from Brazil and Argentina gave brief accounts of their current work, with 22 specialists being present. For details of this and planned meetings of the Latin American members write to Dr. E. Romero, Ciencias Biologicas, Pabellon 2, piso 4, Ciudad Universitaria, Nunez, Buenos Aires, Argentina.

The first Miscellaneous Publication of the I.A.A.P., "Bibliography of Angiosperm Paleobotany", was compiled by Gary Dolph, Indiana University at Kokomo, 2300 S. Washington Street, Kokomo, Indiana 46901, and is available from him for $4.00 U.S.. It lists work in progress, work in press and publications from data collected from the membership.

INTERNATIONAL COMMISSION FOR PALYNOLOGY (I.C.P.)

Volume 2, number 2 of the I.C.P. Newsletter, circulated in December, 1979, included notices of forthcoming meetings, particularly The Fifth International Palynological Conference, Cambridge, news from affiliated societies, proposed amendments to the I.C.P. Constitution and By-Laws, and several book reviews.

INTERNATIONAL ORGANIZATION OF PALAEOBOTANY (I.O.P.)

I.O.P. circulates a newsletter three times a year. Newsletter 10 (November, 1979) included details of several recent conferences and a variety of book reviews:

"The Whole Fungus", 1979; two volumes edited by B. Kendrick and reviewed by P.H. Smith.

"The Carboniferous of the U.S.S.R.", edited by R.H. Wagner, A.C. Higgins and S.V. Meyen and reviewed by W.H.C. Ramsbottom.

"To the Problem of Phytogeography in the Carboniferous", by E.O. Novik and O.P. Fissunenko, 1979, reviewed by S.V. Meyen.

"Leafy Mosses of the Permian of the European North of the U.S.S.R.", by L.A. Fefilova, 1978, reviewed by S.V. Meyen.

"Flora and Phytostratigraphy of the Upper Carboniferous of the North Caucasus", by E.O. Novik, 1978, reviewed by S.V. Meyen.

"Flora and Stratigraphy of the Middle Carboniferous of the North Caucasus", by O.I. Anisimova, 1979, reviewed by S.V. Meyen.

"The Application of an Information Retrieval System in Palaeopalynology for the Solution of some Taxonomical and Stratigraphical Problems", edited by M.V. Oshurkova, 1978, reviewed by S.V. Meyen.

"The Upper Palaeozoic of Middle and South Tien-Shan", by A.S. Masumov, O.M. Borisov and F.R. Bensh, 1978, reviewed by S.V. Meyen.

"Climate and Evolution", by R. Pearson, 1978, reviewed by M.E. Collinson and reproduced in the present C.A.P. Newsletter.

Membership in I.O.P. is open to any paleobotanist who is anxious to help promote international exchange and cooperation. Membership costs $6.00 U.S. and can be arranged through Prof. D. Dilcher, Department of Plant Sciences, Indiana University, Bloomington, Indiana 47401.

MICROSCOPICAL SOCIETY OF CANADA (M.S.C.)

Atlantic Section

The Atlantic Section of the M.S.C. held its second annual meeting at Dalhousie University on June 6, 1979. Seventy-eight persons registered for the one day meeting on scanning electron microscopy and plastic sectioning techniques for light microscopy.

Membership in the M.S.C. costs $12 annually. For further details write to Dr. D. Howard Dickson, Department of Anatomy, Dalhousie University, Halifax, N.S. B3H 4H7.

PALAEONTOLOGICAL ASSOCIATION

Palaeontological Association Circulars 98, 99 and 100 were recently sent out and include details of forthcoming meetings, book reviews and a variety of information relating to the Association. Details of several of these items are listed elsewhere in the C.A.P. Newsletter.

PALYNOLOGICAL AND PALAEOBOTANICAL ASSOCIATION OF AUSTRALIA (P.P.A.A.)

The P.P.A.A. was founded at a meeting held in Brisbane during November, 1978, and interested persons in Australia, New Zealand, Singapore, Malaysia and Indonesia were invited to join the Association. Present members of the Interim Committee are N.J. de Jersey (Chairman), J.F. Rigby (Secretary-Treasurer), G. Playford (I.C.P. Councillor for Australia), D.C. Mildenhall (N.Z. representative), P.L. Price (Industrial representative) and J.G. Douglas (I.O.P. regional representative for Australia). The first general (plenery) meeting of the P.P.A.A. was held in Wellington during February, 1980, when the Executive Committee was elected.

The Association recently published a "Bibliography of Australasian Palynology and Palaeobotany 1977-1978" which includes the following:

Bibliography of Material (published and unpublished paper) completed during 1977-1978;
Bibliography of material in press;
Personal news and work in progress;
List of addresses of 51 palynologists and paleobotanists.

TURKISH COMMISSION FOR PALYNOLOGY (T.C.P.)
(received from Volkan S. Ediger, President of the T.C.P., T.P.A.O. Arastirma Merkezi, Palinologi Lab, Ankara)

Palynological studies have been carried out in Turkey since 1933 by Prof. Ibrahim A.C. Okay, who studied for his Ph.D. under R. Potonié. There are presently about 15 Turkish palynologists working at Universities, institutions or companies. The largest palynological laboratory is at the Research Centre of the Turkish Petroleum Company in Ankara which employs six palynologists. Another important laboratory was established as a branch of the Coal Division of Mining Research and Exploration Institute of Turkey (M.T.A.) in Ankara where four palynologists work on the biostratigraphy and correlation of coal seams. Three other palynological laboratories are located at the University of Istanbul, The Agean University in Ixmir, and Hacettepe University in Ankara.

The Turkish Commission for Palynology was recently established and held its first meeting in Ankara on March 6, 1980. The T.C.P. will work as a branch of the Geological Society of Turkey. The following were elected at the Ankara meeting:

Mr. Volkan S. Ediger (President)
Miss Hatice Kutluk (Secretary-Treasurer)

Scientific Committee:

Prof. Dr. Ibrahim A.C. Okay (Retired Univ. of Istanbul)
Prof. Dr. Samime Artuz (University of Istanbul)
Prof. Dr. Erol Akyol (Agean University, Izmir)
Prof. Dr. Eran Nakoman (Agean University, Izmir)
Dr. Gulden U. Gitmez (Hacettepe University, Ankara)
Mr. Ugur Erkman (Turkish Petroleum Co., Ankara)

HERITAGE PERDU
NEW CALEDONIA SEPTEMBER/OCTOBER, 1979
(received from Dave Jarzen, National Museum of Natural Sciences, Ottawa)

New Caledonia, an island in the Coral Sea of a mere 17,000 sq. km of emergent surface, can be termed a truly unique botanical paradise.

Before relating a sampling of my botanical observations of New Caledonia, perhaps a brief summary of the geologic setting of the island would be appropriate. The island is extremely mountainous, rich in nickel and subsidiary chromite deposits and geologically complex. The stratigraphic range of rocks extends from the Permian to the Miocene. Stratigraphically the Permian and Mesozoic rocks can be closely correlated with those of New Zealand, and in fact the similarity of faunas between these two islands during the Upper Triassic and the marked differences from those of other areas has led to the recognition of a "Maorian Province" for the whole of the Mesozoic (Grant-Mackie, Paris *et al.* Abstr. 25th Int. Geol. Congr., Sydney 1976, 1:268-270).

The sedimentary strata of Triassic to Cretaceous age are confined for the most part to a narrow zone a few kilometres broad on the west coast from the Baie de Boulari to Koumac. The Upper Cretaceous rocks represent a period of transgressive and discordant fossilized structures; a period of land-formations and associated deposition of sandstones, conglomerates, and coal bearing silts. In places, the coals are extensive enough to make mining profitable, and thus the Senonian strata bearing the coal are termed the "formations à charbons".

It was the similarity of faunas including ammonoids, gastropods and bivalves and the much desired correlation between New Caledonia and New Zealand which led to the establishment of Project No. 8 - Mesozoic Correlation, New Zealand - New Caledonia, as a part of the international Geological Correlation Programme (I.G.C.P.) under the direction of Dr. J.A. Grant-Mackie (Auckland) and involving participation between New Zealand, New Caledonia and France, with specialized investigations being carried out by scientists from the U.K., Sweden, Japan and Canada. Eventually the question of correlation of the New Zealand and New Caledonian Mesozoic palynofloras surfaced, and through correspondence with Dr. Grant-Mackie, it was agreed that indeed a study of the Upper Cretaceous pollen and spore floras would greatly enhance the overall objectives of the project.

Soon after my request to have an opportunity to collect and examine palynologically the Upper Cretaceous outcrops, I corresponded with Dr. Jean-Pierre Paris, resident geologist for the Bureau de Recherches Géologiques et Minières, Nouméa, whom I am sure is one of the most amiable and helpful persons I have yet met. His knowledge and ability to relate that knowledge made my three weeks in New Caledonia profitable and enjoyable.

But, I'm getting a little ahead of myself. During the preparations for my trip to the island, I corresponded with Dr. Peter Raven (Missouri Botanical Gardens, St. Louis) to learn a bit more of the botany of New Caledonia. He informed me that the Gardens had hired Dr. Gordon McPherson (Saskatoon) to carry out a long-term collecting programme for the Missouri Botanical Gardens, and that he was certain Gordon would be most helpful. Indeed he was! My meals, sleeping quarters and field excursions both geological and botanical were shared with Gordon. Several weeks which I will not soon forget.

However beautiful the blue Pacific and aqua Coral Sea may be, no matter how clear and fresh the air, and even though my eyes found it difficult to absorb all in view, my first impressions of New Caledonia were feelings of disappointment. The main industry of the island - nickel mining - has literally destroyed thousands upon thousands of hectares of forest. The extremely unique and endemic flora (estimates of up to 92% endemic) is rapidly being diminished and to be certain Gordon McPherson will need to work overtime to record what remains.

Man's needs for ore, extensive as they are, have not totally depleted the floristic treasures of New Caledonia. Soon after our tour of the island began, I realized that the mountain ridges, especially those of the east coast, still maintain evergreen beauty beyond description. Perhaps eluding words, the beauty was real and rewarding.

The regions I found of particular interest were along mountain trails (roads?) in the Massif du Panié in the northeast region; the Col des Roussettes (pass of the bats) centrally located on the island, and in

the southern part of the island the region known as Montagne des Sources. In all three areas, podocarps, araucarias, *Agathis*, and other lesser known gymnosperms endemic to New Caledonia occur. *Neocallitropsis, Austrotaxus, Decussocarpus* similar in physiognomy to closely related gymnosperms, yet unique in strobili and detailed anatomical features were a real treat to examine. Search as we would, Gordon and I were unable to locate a truly unique gymnosperm, *Parisitaxus*, the only known parasitic conifer (I have since learned from Gordon that he located the single locality of *Parisitaxus* and described the plant as a "weird, wee, scaly, purple plant with glaucous fleshy female cones").

Perhaps New Caledonia is reknown botanically for the number of vesselless angiosperms found on the island. Of the ten genera of vesselless angiosperms, six are native to the island, three of which *Amborella, Exospermum* and *Zygogynum* are endemic. In a forest opulent with tree ferns, tall palms and massive dicotyledons, it was nearly apologetically that I first saw *Belliolum* one of the primitive vesselless angiosperms of the Winteraceae. Small, lean, and barely branching, the small pale yellow flowers appeared "behind the times". Only a matter of time I though, and then forgotten.

It would not be difficult for me to write several more pages of my thoughts on New Caledonia. I have easily become victim of the quiet addiction botanists discover in the stillness and emerald beauty of this isolated Pacific mystery. I wrote to Dr. Harold Moore, Jr. (noted expert on Palmae; Ithaca, N.Y.) to ask of his impressions of New Caledonia after having made several trips to the island. His three page reply stressed several of the points I've included in the foregoing, but his closing remarks seem apt here ....."If you do have a chance to visit the mountains in the northeast, however, I would certainly do so if for no other reason than to get the flavor of a relatively unspoiled and extremely lovely part of the world. Just dictating this letter to you makes me intensely homesick for the island".

Palynologically the trip was not as rewarding as it was botanically. Through the cooperation and guidance of Dr. Paris, I visited five localities of well dated Upper Cretaceous (Senonian) outcrops. Of the fifty samples of coal, silts and silty-clays collected, the vast majority are barren. Several samples however will need to be reprocessed and examined carefully before final determination can be made. It is interesting to note however that a few years previously, Dr. Paris had sent several samples to the Palynology Laboratory in Marseille for palynological analysis. The results from France indicated the lack of palynomorphs. Should all the samples I collected be barren, the discouragement of this fact will not overshadow my enthusiasm and appreciation for the days I spent on the unique, and intriguing island of New Caledonia.

SEEDS?

If anyone knows of, or has a collection of seeds and epidermal fragments in Canada, could they write to Adele Crowder, Department of Biology, Queen's University, Kingston, Ontario, K7L 3N6?

COMPUTERIZED PALEONTOLOGY

(reprinted from the G.A.C. Paleontology Division Newsletter Number 7)

Paleontologists sometimes fail to appreciate the potential and versatility of computers in the manipulation of large volumes of data. A conscientious biostratigrapher can generate imposing tomes of analytical information through the eons, but may never fully benefit from this vast storehouse of knowledge. This first becomes obvious in the inadequate records that most micropaleontologists (and I include here palynologists) keep of the initial analysis of a sample. The favourite technique for recording taxonomic data is an old notebook or scraps of yellow paper, often illegible to all but the writer. This is a tragedy since the first record is critical to all subsequent stages of information manipulation and as such should be given more attention.

The micropaleontologists in industry are routinely faced with the need to analyse numerous samples from one well. To ensure standardized record keeping several companies have designed analysis sheets which are modified load sheets. The name of the well, locality number, sample information and species identifications are all recorded on the one sheet, unless of course the sample is particularly rich. Since all fossil groups are dominated by taxa with unpronouncable names, it is obviously going to impose a severe strain on a keypunch operator to type such names in full. A simple and essential solution is the adoption of an abbreviated format such as writing down the first four letters of each genus and each species. This reduces the demands on the keypunch operator and results in fewer errors.

The key to the "abbreviated" approach is the species dictionary. This lists species names in full, with each species having a unique number. The dictionary is periodically updated so that the latest generic assignment is printed out regardless of the entry. Thus one avoids the confusion resulting from one species being assigned to separate genera, according to the date of the analysis or the inclination of the author. The original intent when developing the above system was to always load the unique number of each species. This approach has been discarded since only a known selective group have the same first four letters in both the generic and specific name. Consequently the unique number is loaded only where there is duplicity.

Once the data on all the analyses sheets from an individual well have been run through the necessary edit programs, the computer is in a position to repay your devotion to duty. The first and obvious request is for a range chart, the nemesis of all those who have spent days plotting data manually. The choice of plotting on "tops" (youngest occurrence), or "bases" (oldest occurrence) depends in part on preference, but at least involves no input from the hard working paleontologist. Other subtilties, such as associations, pairs, stacking order, or relationship to lithology, are then readily available and often reveal significant trends.

The integration of data from two or more wells provides the basis for quantitative biostratigraphic studies such as those espoused by Shaw (1964), Hay

(1972), Hazel (1977), Miller (1977) and Edwards and Beaver (1978). The key to success in using any of these techniques is the reliability of the original analyses and the manipulation of this data using the computer. Such studies fall within the sphere of interest of I.G.C.P. project 148, "Quantitative Stratigraphic Correlation Techniques". Canadian activity in this project is considerable and falls under the leadership of F.P. Agterberg of the G.S.C., Ottawa. In conjunction with Felix Gradstein, he has developed a probabilistic biostratigraphic zonation for the Tertiary of the Labrador Shelf. The applicability of this zonation has been subsequently demonstrated in routine operations. Similar techniques are also being attempted using palynomorphs, with a data base of approximately 850 taxa, 9200 samples and 750,000 ft. of offshore east coast well sections.

Computer programs are also invaluable in the cataloguing and retrieval of literature information. An excellent example of the versatility in this field is the Kremp Palynological Computer Research Project, funded by a consortium of oil companies and the G.S.C. The Kremp Project contains the abstracted data from over 8,000 publications in palynology. The basic information includes geographical location, lithology, taxa (new or otherwise) and age. The abstracting is the responsibility of Gerhard Kremp of the University of Arizona who provides each member of the consortium with the necessary data sheets. Members are then responsible for having a specific number of documents keypunched and put on tape. The tapes are distributed to each member after they are clean, meaning when they have run through an edit program. What then happens to the tape is the responsibility of the individual members. The G.S.C. has developed its own retrieval system using System 2000. Palynologists within the Survey can now ask a range of questions such as individual species occurrences, papers on particular stages and/or areas, associations and lithological relationships, and receive answers within a few seconds or minutes. The data base is unrivalled including all Western, much Russian and some Chinese papers.

The expense of developing and running the Kremp Project means that it is accessible only to Consortium members. It is however possible for anyone with the requisite funds to apply for and receive membership. The benefits are impressive and should result in both considerable time saving and refinement of existing studies. Why has the same procedure not been followed with other fossil groups? Such questions are particularly worrisome with the exponential increase in paleontological publications. It is physically impossible with any of the more widely studied groups such as foraminifera, ostracods, lamellibranchs, cephalopods and corals for one person to maintain an all encompassing taxa file. Unfortunately the organization and operation of a system such as the Kremp Project involves considerable time and money and, above all, first class cooperation. If we are not to succumb to the literature deluge, however, we must begin to develop computer taxa inventories. Otherwise we shall all find ourselves with decreasing knowledge in an expanding world.

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Miller, F,X., 1977. The graphic correlation method in biostratigraphy. In Concepts and methods of biostratigraphy. Edited by E.G. Kauffman and J.E. Hazel, Dowden, Hutchinson and Ross, Inc., pp. 165-186.

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Graham L. Williams
Bedford Inst. of Oceanography
Dartmouth, N.S.

XIII INTERNATIONAL BOTANICAL CONGRESS

The XIII International Botanical Congress will be held on the 21st to 28th of August, 1981 in Sydney, Australia. The Congress, sponsored by the Australian Academy of Science, will provide an opportunity for discussion of all branches of plant science and particularly interdisciplinary subjects and aspects of wider significance.

The scheduled programme accommodates several common interests and includes plenary sessions (to be held at the Sydney Opera House), Symposia (invited), contributed papers, public lectures, youth programme, workshops and time for other international associations to meet. The International Commission for Palynology will conduct activities in association with the 13th I.B.C.

Thirty-nine field trips are planned, ranging in cost from Aust. $50 to a superb trip of Northern Australian woodlands and landscape in monsoon and semi-arid zones with 9 stops between Perth and Sydney, for Aust. $1200.

The first circular with Congress details, costs, sessions and field trips was distributed in July 1979. The second circular will be mailed upon request in August of this year.

Correspondence on general matters relating to the Congress should be addressed to the Executive Secretary, Dr. W.J. Cram, 13th International Botanical Congress, University of Sydney, N.S.W. 2006, Australia, phone (02) 692-1122, Telex 20056, Telegraph: Botcong, Sydney. To receive the second circular send your name and address to: XIII International Botanical Congress, Australian Academy of Science, P.O. Box 783, Canberra City, 2601, Australia.

CALENDAR OF EVENTS

1980

June 29-July 6: Fifth International Palynological Conference (VIPC), Cambridge, England. Details from Mrs. G.E. Drewry, Department of Geology, Sedgwick Museum, Downing Street, Cambridge CB2 3EQ, England.

July 7-12: First International Palaeobotanical Conference, England. This conference, which is scheduled to immediately follow VIPC, will be hosted by the Linnean Society. **The program will include field excursions and lecture sessions, the latter held in Reading. Details from Peter** Crane, Department of Botany, Plant Science Laboratories, University of Reading, Whiteknights, Reading RG6 2AS, England.

July 19-25: British Micropalaeontological Society Symposium on "The Micropalaeontology of Shelf Seas, Fossil and Recent", Hull University, England. Details from Dr. M.D. Brasier, Geology Department, The University, Cottingham Road, Hull HU6 7RX, England.

July 17-18: Chitinozoa and Paleomycological Colloquium, Paris, France. This meeting will discuss the fungal affinities of Chitinozoa or Chitinomycetes and other *incertae sedis* chitinous organisms from the Upper Precambrian to the Devonian. **Details** from the Laboratoire de Micropaleontologie, Ecole Pratique des Hautes Etudes, 8 rue de Buffon, 75005 Paris.

August 18-20: Sixth Biennial Meeting of AMQUA in Orono, Maine. Details from Hal Barns, Deptment of Geological Sciences, University of Maine, Orono, Maine.

September 25-27: Le Quaternaire du Québec IV, sponsored by the Association québécoise pour l'étude du Quaternaire and the Centre d'études nordiques (Université Laval), and held in Quebec. **Details** from Serge Payette, Centre d'études nordiques, Université Laval, Ste-Foy, P.Q., E1K 7P4.

October 14-18: Annual Meeting of the American Association of Stratigraphic Palynologists, Keystone, Colorado. Details from Joe Guennel, Marathon Oil Company, P.O. Box 269, Littleton, Colorado 80120.

October: Workshop on Cenozoic Palynology in India: Past, Present and Future. Details from Dr. H.P. Gupta, Birbal Sahni Institute of Palaeobotany, Lucknow, India.

December 17-20: Annual Meeting of the Palaeontological Association, Edinburgh.

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May: Symposium on Concepts and Methods in Palaeontology, University of Barcelona. Details from Dr. J. Martinell, Departmento de Paleontologia, Universidad de Barcelona, Gran Via de les Corts Catalanes, 585 Barcelona 7, Spain.

August 21-28: XIII International Botanical Congress, University of Sydney, Australia. **Details from** Dr. W.J. Cram, 13th International Botanical Congress, University of Sydney, N.S.W. 2006, Australia.

September: Hexrose Conference on Modern and Fossil dinoflagellates, Tübingen, Germany. This conference will follow similar themes to those of the Penrose Conference on dinoflagellates held in Colorado Springs in April 1978. These will include dinoflagellate morphology, biology, morphogenesis, ecology/paleoecology, classification, evolution, and methods and techniques. Details from Dr. Hans Gocht, Institut und Museum für Geologie und Paläontologie, Sigwartstrasse 10, D-7400 Tübingen 1 or Dr. Harald Netzel, Institut für Biologie III der Universität Tübingen, Auf der Morgenstelle 28, D-7400 Tübingen 1.

October 7-10: American Association of Stratigraphic Palynologists (A.A.S.P.) 14th Annual Meeting, Monteleone Hotel, New Orleans, La. Details from Don Benson, Amoco Production Company, P.O. Box 50879, New Orleans, La., 70150, U.S.A.

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July 21-26: Fourth Colloquium on Paleobotany and Palynology, Mexico City. Details from Eloy Salas, Inst. Mexicano del Petroleo, Av. Cien Metros #152, Apartado Postal 14-805, Mexico 14, D.F.

August 5-11: Third North American Paleontological Convention (NAPC-III), Montreal. Details from Colin Stearn, Department of Geological Sciences, McGill University, 3450 University Street, Montreal, H3A 2A7.

August: Second International Conference on Aerobiology, Seattle. Details from Dr. R.L. Edmonds, College of Forest Resources, University of Washington, Seattle, Washington 98195, U.S.A.

September: Meeting on the "Palynology of the North Atlantic Margin", at Trinity College, Dublin. This meeting, which will be jointly organized by the American Association of Stratigraphic Palynologists and the Commission Internationale de Microflore du Paléozoique, will include three days of technical meetings followed by one to two days of excursions to the Paleozoic rocks of Eire. **Details from either Geoff Clayton or Ken** Higgs, Trinity College, Dublin, Eire.

CONFERENCE REPORT

THE CHANGING CLIMATE AND ITS IMPACT ON MAN
(reprinted from the Geological Society of New Zealand Newsletter No. 48)

About two hundred delegates, mainly climatologists and historians gathered at Norwich in England at an International Conference on Climate and History. They came from as far afield as China, Japan, Peru and New Zealand to try and share knowledge and techniques in ascertaining climate in historical times from their particular portion of the globe. This was the first gathering of its kind where an attempt was made to build an inter-disciplinary bridge between the two subjects through the common questions of historical

climate. The climatologists came brimming with results whereas the historian was more concerned with the methods of his science, yet progress was evident by the middle of the week.

The meeting was initially concerned with the tools of the trade and a number of scientists reviewed the contributions that could be made from their field. Professor Hal Frits, from Tuscon, kicked off the day by explaining how trees could be used to reconstruct climate several centuries back. **Many species of trees** put on annual growth rings and by selecting suitable trees in the right places, measuring their growth rings, and calibrating these with the present climate the widths of the older rings could be used to deduce the weather going back several centuries. In fact, one tree, the Bristle Cone pine, has rings that are a few thousand years old and these have given clues on the Californian climate for about 3500 years ago. **Because** the growth rings are annual, the dates can be determined to the year. **Professor Steve Porter from Seattle** discussed the importance of the fluctuations of glaciers. Although some of the glaciers in our latitudes respond more to temperature than rainfall, that is they advance when the climate cools and retreat when it warms, this relationship is not too clear even in the European Alps. **So we must use this method with care and there** are very real dating problems for tying down the precise time when they started to advance or retreat. Dr. Birks, a botanist from Cambridge elaborated on the uses of fossil pollen for climatic reconstruction. Pollen accumulates through time in bogs and lake sediments and these slowly build up in layers with the years. **By analysing the various layers the types of** plants that existed in a certain locality and the changing mixture through the centuries can be determined. **This can give us an idea on a time scale of 100 to 500 years.** Before we can use pollen the weather tolerances of each plant in the mixture must be deduced. The resulting mixture then places a limit on the warmth or coolness and the wetness or dryness of the climate that could have occurred. **Two historians,** Martin Ingram and David Underhill from the Climatic Research Unit, Norwich, demonstrated how careful scientists had to be when using historical documents to reconstruct climate. Statements as "the greatest flood in living memory" usually refer only to a few years and extreme events such as floods or extremes of heat can be documented in different chronicles and for slightly differing times, which gives a false impression of the importance of the event. Dr. Christian Pfister working in Switzerland showed that there is a wealth of information using the right indicators - such events as snow-cover, freezing of lakes, the emergence of leaves of beeches, first flowering of sweet cherries, and vines together with vine harvest, barley harvest dates and alpine glacial variation. He has been able to reconstruct the weather in Switzerland from the early 1500's. The field of archaeology could also provide information on the changing climate as Robert McGhee from Ottawa showed. He described recent work on the northern islands of Arctic Canada where prehistoric occupation was conditioned by the amount of sea ice. He found that this harsh area supported life 4000 to 3500, 3000 to 2500, and 1500 to 300 years ago. Professor Hubert Lamb, now retired, summed the section up by demonstrating how in certain epochs climate had influenced the affairs of men. The importance of this can be seen in the Little Ice Age period in Europe, from about the mid 1500's to 1700 when temperatures were almost a degree cooler than they are today. The sea ice in the North Atlantic extended over a greater area and this was a period when the alpine glaciers were more advanced; one effect was to close the prehistoric gold mines in the Austrian town of Hohe Tauern. **The upward limits of** marginal cultivation fell as instanced by the abandonment to the forest of the farm village of Hoset at about 500 metres above sea level, in central Norway. Professor Lamb can be regarded as the father of investigations into climatic change.

Many of the historians gave very interesting accounts too numerous to document here but the most impressive stories came out of cultures that were dwelling on the margins of survival, of which a few can be mentioned. **Where agriculture is climatically** marginal such as on higher ground or areas which have cold climates, the year to year weather fluctuations are detectable. This is because the annual climate is only just warm enough to mature crops so a bad year spells disaster for the settlement. **Martin Parry, an** agricultural geographer from Birmingham has studied cropping on the Lammermuir hills in southeast Scotland. He notes a falling of the upper limit of cultivation between the thirteenth and seventeenth centuries of almost 200 metres and subsequent settlement desertion with a decrease in the length of the growing season during the Little Ice Age by about one month. **Since** then there has been a recovery. Dr. Grove from Cambridge examined tax relief records from an area in western Norway between 1667 and 1815. **Many applications** for tax reductions, justified by detailed accounts of severe physical damage to farmlands caused by a reduction in income were made after 1670. Damage was caused by landslides and flooding indicative of a stormier and more temperamental climate of the Little Ice Age. Incidence of damage was particularly marked between 1740 and 1760. Anthropologist Dr. McGovern examined the economics of extinction in Norse Greenland. Scandinavian settlement occurred in West Greenland about 950 AD and died out after 1500 AD, the main cause being deteriorating weather leading to a decreased abundance of seals to hunt, which was the staple diet for the colony. In all these studies it was demonstrated that settlements could withstand about two bad seasons in a row but the third usually spelt disaster.

Some of the climatologists were concerned with piecing together the temperature record from their particular country in the last one hundred years. There is little information on this but the records show that the warmest times since the Little Ice Age (about 1550 to 1700 AD) occurred around 1945 in Europe and between 1930 and 1940 in the United States. This contrasts with that of New Zealand where our warmest weather has occurred since 1950. **Much emphasis was** placed on Europe and North America and too little time was devoted to information from Asia, Africa and countries south of the equator, a fact that tends to reflect where the scientific funding and institutions are.

As well as looking at what the past climatic fluctuations were, and how these can be detected, a final group of papers was concerned with the impact on human populations for we can use this as a clue to the implications of the changing climate to come. Professor Smith demonstrated the stresses imposed upon Maine agriculture by the climate, and Martin Bowden with Bob Kates from Clark University examined the effects of droughts in the Tigris-Euphrates river valley where there is 6000 years of archaeological

data. Cultivation here is irrigation dependent; they compared this to the U.S. Great Plains. One of the ideas proposed by their work was because of the technology, human settlement and agriculture are insulated from the relatively small short term variations in the weather but are increasing their vulnerability to catastrophe from the extreme climatic events such as severe droughts. The same can be extended to New Zealand pastoral farming where, through the higher incomes earned during the 1960's and higher stocking rates achieved via technological innovations our farming sector is far more exposed to the effects of a severe drought as instanced in the summers of 1972/73 and 1977/78 than previously.

The conference ended on the note that we still have much to find out, and many areas of the planet where there is little information, but that it is the impact of climate on history and the affairs of men which we must assess for the future. The conference was successful in welding together scientists from widely differing fields in the common assault on this problem.

M.J. Salinger
Geography Department
Victoria University,
New Zealand

RECENT PUBLICATIONS

Bones, T.J., ?1979, "An Atlas of fossil fruits and seeds from the Eocene Clarno Formation of Oregon", with 70 photographs. **Available for $2.50 U.S.** from O.M.S.I. Research Center, 4015 S.W. Canyon Road, Portland, Oregon 97221 (cheques payable to "OMSI").

Boyko-Diakonow, Maria, 1979, "The laminated sediments of Crawford Lake, southern Ontario, Canada". *In* "Moraines and Varves", edited by C. Schlüchter, Proc. INQUA Symposium on Genesis and Lithology of Quaternary Deposits.

Bujak, J.P., 1979, "Proposed phylogeny of the dinoflagellates *Rhombodinium* and *Gochtodinium*". Micropaleontology, vol 25, no. 3, pp. 308-324.

Bujak, J.P., Downie, C., Eaton, G.L. and Williams, G.L., 1980, "Dinoflagellate cysts and acritarchs from the Eocene of southern England". Special Paper in Palaeontology No. 24, 82 pp., 22 pls. Details of availability from B.H. Blackwell Ltd., P.O. Box 40, Hythe Bridge Street, Oxford OX1 3EU, England.

Brasier, M.D., ?1980, "Microfossils". Published by George Allen and Unwin, P.O. Box 18, Park Lane, Hemel Hempstead, Herts, HP2 4TE, U.K., for about £12.00 hardback and **£6.50 paperback.**

Collinson, M.E., 1980, "A new multiple-floated Azolla from the Eocene of Britain with a brief review of the genus". Palaeontology, vol. 23, part 1, pp. 213-229.

Dörhöfer, G. and Davies, E.H., 1980, "Evolution of archeopyle and tabulation in Rhaetogonyaulacacean dinoflagellate cysts", Royal Ontario Museum, Life Sciences Miscellaneous Publication, pp. 1-91, 40 figs. and plates.

Edmonds, R.L., ed. 1979, "Aerobiology, the Ecological Systems Approach". US/IBP Synthesis Series 10. Dowden, Hutchinson & Ross, Inc., Stroudsburg, Pennsylvania. $20 U.S.

Fenton, J.P.G., Neves, R. and Piel, K.M., 1980, "Dinoflagellate cysts and acritarchs from Upper Bajocian to Middle Bathonian strata of central and southern England". Palaeontology, vol. 23, part 1, pp. 151-170.

Harington, C.R., ed., 1980, "Climatic change in Canada". National Museums of Canada, Syllogeus Series No. 26, pp. 1-246. Available from the National Museum of Natural Sciences, Ottawa, K1A 0M8.

Hideaux, M., 1979, "Le pollen données nouvelles de la microscopie électronique et de l'informatique. Structure du sporoderme des rosidae-saxifragales étude comparative et dynamique". **Agence de** cooperation culturelle et technique, 19 avenue de Messine, 75008 Paris. Includes 81 pages with numerous text-figures, transmission and scanning electron micrographs.

Knox, R.B., 1979, "Pollen and Allergy". The Institute of Biology's Studies in Biology no. 107. Contents: The pollen grain. Formation of pollen. Dispersal of pollen. Pollen and fertilization. Aerobiology of pollen. Pollen and man. Experiments with pollen. Further reading. Edward Arnold (Publishers) Ltd., Berkshire SL6 5BS. **$1.80 net** approx. Paper 0 7131 2736 8.

Kuprianova, L.A. and Alyoshina, L.A., 1978, "Pollen dicotyledonearum Florae Partis Europaeae U.R.S.S. Lamiaceae-Zygophyllaceae" (in Russian). 183 p., 72 pl., "Nauka" Leningrad. 2 R.

Lejoly-Gabriel, M., 1978, "Recherches écologiques sur la pluie pollinique en Belgique". 284 p., 69 fig. et tabl. Acta Geogr. Lovaniensia 13, B-1348 Louvain-la-Neuve, Belgique.

Martin, F., 1980, "Quelques Chitinozoaires et Acritarches ordoviciens supérieurs de la Formation de White Head en Gaspésie, Québec", Canadian Journal of Earth Sciences, 17(1), 106-119.

Moore, P.D. and Webb, J.A., 1978, "An illustrated guide to pollen analysis". Hodder and Stoughton Publ., P.O. Box 702, Dunton Green, Sevenoaks, Kent TN13 2YD. **Hardcover £8.50; Paper £4.95.** 133 p. 48 pl.

Palynology, Volume 3, published in October 1979, contains 300 pages, 40 plates and 2 fold-out charts. Fourteen articles are included with abstracts of papers presented at the Tenth A.A.S.P. Annual Meeting (Tulsa, 1977).

Richards, A.J., ed., 1978, "The pollination of flowers by insects". 213 p., 23 pl. Linnean Society Symposium Series 6. Academic Press, London NW1 7DX. £12.60; $26.00 U.S.

Saenz de Rivas, C., 1978, "Polen y esporas (Introduccion a la palinologia y vocabulario palinologico). 219 p., 39 pl., H. Blume Ediciones, Rosario 17, Madrid 5.

Schafer, C.T. and Mudie, P.J., 1980, "Spatial variability of foraminifera and pollen in two nearshore sediment sites, St. George's Bay, Nova Scotia". Canadian Journal of Earth Sciences, 17(3), pp. 313-324.

Terasmae, J., 1980, "Some problems of late Wisconsin history and geochronology in southeastern Ontario". Canadian Journal of Earth Sciences, 17(3), pp. 361-381.

Ueno, J., 1978, "Study of Palynology" (in Japanese). Kazama Shobo Publ. Co., Tokyo. 253 p., 162 pl.

REVIEWS

The following review is reprinted from the International Organization of Palaeobotany Newsletter 10.

R. Pearson, 1978. *Climate and Evolution.* Academic Press, London. 274 pp., 14.00 (U.S. $29.40).

Almost 15 years have passed since publication of the last major texts on palaeoclimatology: two edited by Nairn, "Descriptive Palaeoclimatology" (1961) and "Problems in Palaeoclimatology" (1964) and the other written by Schwarzbach, "Climates of the Past" (1963). Pearson's book now brings us up to date with progress in this interesting field. Although the book complements the others it cannot be considered to replace them as the problems are approached more from an evolutionary viewpoint. Pearson reviews the major changes which have been recorded (or postulated) in geology, climates, faunas and floras during both prehistoric and Recent time. Sections are devoted to Recent climatic changes, geomagnetism, vulcanicity, glaciations, continental drift and major theories such as that by Lagrange, Croll and Milankovic which have been put forward to explain climatic change. Many of these topics are mentioned again in chapters devoted to the Palaeozoic, Mesozoic and Tertiary, where major faunal and floral changes are considered. **The Quaternary and** Recent occupy the last three chapters of the book. One chapter is devoted to changes following the last glaciation and another to the effect of changing climate on the spread of different cultures over the last 25 centuries.

In a book of this wide coverage it is inevitable that some will feel that their particular subject deserved a fuller treatment. **It is hard to find** quoted data that is not fully referenced, and frequently opposing theories are presented within a few paragraphs or pages. The Palaeozoic palaeobotanist will be saddened to see that the all important topic, the rise of the land plants, is dealt with in just over half a page.

Points of botanical interest are scattered through the text, including aspects of dendrochronology, phytoplankton maxima, van der Hammen's *Monocolpites* periodicity and the palynological evidence for Angiosperm **diversification. One of the most lengthy sections is** devoted to Tertiary palaeobotany where more than four pages discuss such interpretations as Axelrod & Bailey's (1969) view of palaeoclimatology. **Concepts such as the** Geoflora are not mentioned - perhaps they should be, since they are still in frequent usage. **The Antarctic** Ross Sea palynological studies presumably refers to the work of Kemp & Barrett (Nature, 258, 507 - 8, 1975) though this is one of only a few important references omitted. **A large part of the chapters on Quaternary** factors are concerned with summaries of data from pollen sequences.

The book serves as an excellent review of trends and conclusions. The reader is left to follow-up cited references using the text as a basic conceptual framework. **Pearson quotes a number of fascinating state-**ments, e.g. page 137: "...the distribution of Mesozoic and Tertiary cherts implies the existence of trade winds" which must entice all but the most uninterested reader away to discover why. **But the book is a very** useful and up to date review of established conclusions within palaeoclimatology and describes most current fields of advancement. As the dust cover claims it is essential reading for the undergraduate and research worker studying palaeobotany.

Margaret E. Collinson
British Museum (Natural Hist)
London, England

The following review is reprinted from the British Micropalaeontologist, Number 11.

John Flenley, 1979. *The Equatorial Rain Forest: a geological history.* 162 pp., Butterworths, 25.00.

The sequence of post-glacial vegetational history of north-west Europe as first expounded in the pollen diagrams of Von Post is familiar to all palynologists interested in the underlying relationship of vegetation and climate. **The very different story of the response** of plants to Quaternary climatic fluctuations in equatorial latitudes is much less familiar to most of us; indeed it has only been reconnoitred in the last twenty years. **It is this reconnaissance of the Quater-**nary history of equatorial vegetation which forms the subject of Dr. Flenley's review. The book opens with a summary of the present vegetation of the tropics, followed by a brief chapter dealing with the pre-Quaternary palaeobotanical story. This is followed by chapters summarizing research in the vegetational history of each of the three major equatorial regions - Africa, Central and South America, and Indo-Malasia (the latter being that to which Flenley has made important contributions in his own work). There are then chapters dealing with vegetational succession in the tropics, and the evidence of Man's impact on equatorial forest. **One of many surprises in this area of the** subject is the discovery of 9,000 year old drainage channels in a New Guinea peat bog, believed to be associated with agricultural exploitation. Evidence is emerging that Man has been engaged in forest clearance since at least 3,000 years B.P. in Africa, 7,000 years B.P. in South and Central America, and since 9,000 years B.P. in India and New Guinea.

The title of this book is a little misleading in its implied time-span, for the bulk of evidence presented relates only to the last 10 - 20 thousand years, but it is over-modest in a different respect, for it deals with a wide range of equatorial vegetational history, and not only that of areas now covered by tropical rain forest.

Several of the "maxims" of tropical ecology are challenged by Flenley's analysis. Firstly, the supposed "stability" of rain forest does not stand up to

the palynological evidence of post-glacial events. There is growing evidence that it has suffered major vicissitudes of distribution and in lesser degree, of composition, during this period. **Unlike the predominantly** "latitudinal" migration evident in the changing vegetation of northern Europe, the most striking changes in the tropics are seen in proximity to major mountains, with vertical movements of 1000 - 1500 m in the vegetational belts. The old concept of pluvial periods coinciding with high-latitude glacials is also called to question by Flenley, as the evidence now suggests rather that there was increased aridity in tropical latitudes at the times of maximum glaciation. But he has no illusions about the still rather fragile nature of climatic interpretation of pollen sequences. As he remarks, "it is necessary..... to bear constantly in mind that our interpretations of former vegetation in terms of climate depend absolutely on our understanding of the present relationship between vegetation and climate. **Near the equator this understanding is unfortunately** all too uncertain.

The book as a whole is most pleasingly set out, with much use of a range of pictograms, annotated maps and all those embellishments dear to the heart of biogeographers. **However, a few of the diagrams (cf.** 1.8, 2.12) have their legends abbreviated to the point of total obscurity, leaving at least one reader groping for the diagrams' lost meaning.

But this is only a plaintive murmur in parenthesis to warm praise for a scholarly and challenging book. It would be an overstatement to claim "that it should **be on the bookshelf of every palynologist". Nevertheless,** it certainly should be read by any palaeobiologist (from any latitude!) who tries to construe his results in terms of palaeogeography and palaeoclimate.

W.G. Chaloner
Bedford College
London, England

The following review is reprinted from the International Commission for Palynology Newsletter, Volume 2, Number

Kendrick, W.B. (ed.), 1979. *The whole fungus: the sexual-asexual synthesis.* **Proceedings of 2nd Int.** Mycological Conf., Nat. Mus. Nat. Sci., Nat. Mus. of Canada and Kananaskis Found., Ottawa, Canada, 2 vols., 793 pp., many line drawings, photomicrographs and SEMicrographs, paperback. **(Obtainable by mail from** W.B. Kendrick, Department of Biology, Waterloo University, Waterloo, Ontario, Canada N2L 3G1. Price $18.00.)

These two nicely-printed volumes present 26 papers by participants at a conference on the Fungi, held at the Environmental Sciences Centre, University of Calgary, Kananaskis, Alberta. There is also a witty introduction and an informative summary - postscript by the editor, Bryce Kendrick, of the University of Waterloo, Ontario. The title, "The Whole Fungus", may be a little presumptuous, inasmuch as the papers deal almost entirely with morphology anatomy and taxonomy - but there certainly is a wealth of information on those subjects! As is usual with collections of papers by different people, differences in style, especially in illustrations, are noticeable, and there is the inevitable overlap of matters between the various papers. The illustrations and glossary material will be of great interest to paleopalynologists who encounter fossil fungal spores, as well as to all palynologists - for example aerobiologists - who study the morphology of extant fungal spores. Pirozynski and Weresub's paper on the history of the Ascomycetes presents two plates of Early Cretaceous "fungus-like" fossils, most of which are certainly fungal, albeit very near the beginning of the record of chitinous fungal remains. Kendrick and Raj's paper, "Morphological Terms in Fungi Imperfecti" and von Arx's "Ascomycetes as Fungi Imperfecti" both present valuable material for the identification of fossil fungal spores. Pirozynski and Weresub's "The classification and nomenclature of fossil fungi" is an important contribution on the subject, though I would dispute some of the statements about fossil plant nomenclature. All in all, this is a publication that palynologists will want to get, study thoroughly, and use.

Alfred Traverse
Pennsylvania State University

Sarjeant, W.A.S., 1978, *A guide to the Identification of Jurassic Dinoflagellate Cysts*, School of Geoscience Miscellaneous Publication 78-1, Louisiana State University, 107 p., 11 fig., 8 tables.

Evolving from notes and charts distributed at the 8th Louisiana State University short course in palynology (1975), the guide was intended to facilitate the practical identification of Jurassic dinoflagellate cysts and summarize their known stratigraphic ranges. **An enormous amount of data was compiled and** synthesized by the author in an attempt to form "a sort of 'spotter's guide' equivalent to an ornithological field guide".

The book begins with 27 pages of text intercalated with eleven range charts followed by eight **tables. Each chart shows the stratigraphic ranges** of species in a specific interval and six of the figures include useful drawings of the taxa. The first section dealing with Lower Jurassic dinoflagellate cysts has little discussion reflecting the lack of published work.

The second section on Middle and Upper Jurassic dinoflagellate cysts is subdivided morphologically into eight parts, similar to Sarjeant and Downie's (1966) suprageneric classification scheme. Topics such as determinant specific and generic characteristics, temporal assemblage characteristics, shape groupings and stratigraphic correlation potential are reviewed and synthesized. **The sections on non-tabu**lated cysts with apical archeopyles, simple chorate or proximochorate cysts, and sundry unrelated genera contain generic and specific descriptions, but lack corresponding tables in the appendices.

Also listed are four taxonomic recombinations: *Energlynia collaris* (Dodekova) Sarjeant, p. 14.; *Ellipsoidictyum reticulatum* (Valensi) Sarjeant, p. 18; *Endoscrinium gochtii* (Pocock) Sarjeant, p. 28; and *Endoscrinium klementii* (Pocock) Sarjeant, p. 28. **A** few taxonomic-morphologic discussions are included such as *Lithodinia* Eisenack versus *Meiourogonyaulax* Sarjeant; endoblasts versus pseudoendoblasts in *Netrelytron* Sarjeant and *Paranetrelytron* Sarjeant; and apical and/or precingular archeopyles in *Chytroeisphaeridia* Sarjeant.

More than half the publication comprises six tables which list the morphologic features of most Jurassic dinoflagellates. These tables and the charts are truly the essence of the publication and are well worth the purchase price. All dinoflagellate workers will find this a welcome and very practical guide which will prove extremely useful in resolving many of the difficulties in zoning the Jurassic.

The guide may be ordered by sending $6.50 U.S. to: Publications, School of Geoscience, Louisiana State University, Baton Rouge, U.S.A., 70803. The Sarjeant Collection of Jurassic Dinophyceae and Acritarchs Colour Transparencies associated with the publication is available through George Hart at the same address.

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Sarjeant, W.A.S. and Downie, C., 1966, *The classification of dinoflagellate cysts above generic level.* Grana Palynologica, vol. 6, no. 3, pp. 503-527.

Ed Davies
Atlantic Geoscience Centre
Dartmouth, N.S.

Palinologia: Numero Extraordinario I: I Coloquio Internacional de Palinologia. Editors: F.H. Cramer, M. del C.R. Diez and M. Gutierrez. 503 pp., 2,500 pesetas.

The ubiquitous book review now covers a variety of publications that are hard to categorize. According to one dictionary definition, a book is a literary composition or treatise of some length. Such a definitive statement would not appear to cover the above publication edited by Cramer, Diez and Gutierrez, since the "book" is actually a collection of English, French and Spanish papers, whose only relationship is that they were given at the First International Symposium on Palynology. An alternative and more appropriate definition, with regards to Palinologia I, is that a book is, "a number of sheets of paper, bound or stitched together; especially a printed and bound volume". This neatly and concisely summarizes these proceedings of the International Symposium on Palynology which was held in Leon in September, 1977; volume 1 of Palinologia was published in December, 1978. This is a remarkable achievement by the editors, considering the size and scope of the volume.

The proceedings of any conference or symposium are of necessity a mixed bag, unless a specific topic is covered. Palynology, to the amazement of most geologists, is an exceedingly diverse science in which few, if any, palynologists can claim to be proficient in all aspects. A palynology symposium lacking a common theme would attract papers dealing with various groups and covering most of the Phanerozoic time scale. This is precisely the scope of Palynologia I. I shall not specify the total number of papers in the volume, although I counted and subdivided them into categories (one of the usual exercises in futility practised by experienced book reviewers). Suffice it to say that there are an impressive number of contributions with papers on chitinozoa, spores and pollen, acritarchs, dinoflagellates, plus others which are less readily labelled.

The volume, in part, reflects the interests of the editors, with the emphasis being on Paleozoic palynology. There is also a preponderance of papers on biostratigraphy, a much maligned prerequisite to other more exotic studies. The stratigraphic synthesis by Clayton et al., on the zonation of the British Dinantian is a compelling demonstration of the value of palynology in the broader field of geology. Other equally significant contributions in the Mesozoic-Cenozoic, such as Morbey's paper on the Late Triassic-Early Jurassic palynostratigraphy of northwestern Europe, are sufficiently good reasons for purchasing this volume.

One surprising aspect of Palinologia I is the inclusion of several taxonomic papers in which new genera and species are erected; sometimes this is done in a rather haphazard fashion with incorrect citations or extremely brief diagnoses. I would have preferred to see such papers published elsewhere, although the approach is perhaps preferable to a proliferation of informal taxa with alphabetic or numeric designations. Raynaud's very commendable study of Upper Jurassic dinoflagellate assemblages includes several new and important taxa which many specialists may have overlooked. I have not made a tally of all the genera and species erected in this publication, but do recommend that all taxonomists examine it with care. Since taxonomy is the basis for our science, I believe each and every author must exercise extreme care in giving complete, correct citations. The range of styles encountered in Palinologia I presumably reflects the necessity for prompt publication, a commendable goal in these times of increasing delays.

Biostratigraphy and taxonomy are not the only aspects of palynology covered; there are also some pertinent and thought provoking papers on paleoecology. Wright demonstrates that Middle Devonian chitinozoans of the midwestern U.S.A. show maximum diversity in normal-marine carbonate facies. Van der Zwan and van Veen integrate palynological and paleogeographical data across the Devonian Carboniferous boundary. They find that different palynomorph assemblages occur in alluvial fan, alluvial plain and coastal-deltaic sediments; thus precise predictions on depositional environments are possible. Studies of this nature, unfortunately still in their infancy, will immeasurably enhance the value of palynology in paleoenvironmental models.

Provincialism is a theme discussed by several authors, including Fenton and Fisher, and Kyle and Fasola. The former authors note that Bajocian dinoflagellate assemblages are cosmopolitan. Bathonian assemblages from southern England, eastern England plus the North Sea, and from Germany show marked differences; these, they believe, reflect regional control rather than different depositional environments. Kyle and Fasola, in studies of Triassic palynomorphs from Antarctica, demonstrate affinities with previously described assemblages from Australia. Such fascinating investigations relate directly to paleogeography, including plate tectonic reconstructions.

Some of the papers included in Palinologia I appear to be inappropriate. De Coninck's discussion of the mores and consciences of palynologists in the petroleum industry would be more appropriate in the popular geological press such as Geotimes. Also Brooks's very practical discussion of the diagenesis

of sedimentary organic matter loses much of its impact because it is hidden away. One cannot, however, criticize the editors for digressing, since this is a proceedings volume.

It is difficult to contrast and compare this publication with others in the field since there is no common meeting ground. The order of the chapters presumably reflects the position of the author's name in the alphabet, although there are some discrepancies. I would have preferred some structuring within the text, so that the order of papers followed that at the symposium, or was based on stratigraphic position or palynomorph group. It would have been beneficial to give the complete Symposium program in the Introduction of Palinologia I, plus abstracts of all papers which were presented orally but not published. The list of symposium participants is informative, but of lower priority to knowing which papers are missing.

The abstracts in the individual papers show some interesting variations. They are always given in English and Spanish, and occasionally in French; the latter does not reflect the language in which the paper is given, since some French contributions lack a French abstract. The figure and plate reproductions are of reasonable quality although some plates are of low contrast. The lack of standardization in the individual papers probably resulted from the pressing deadlines and speed of publication. Fortunately this does not detract from the overall appearance of Palinologia I, including the general quality of the printing. It is all too easy to criticize any publication, especially one produced under pressure, and to overlook its strengths. Palinologia I contains some invaluable biostratigraphic information as well as key papers on paleoecology and provincialism, and reflects considerable credit on the editors. All palynologists should either buy this volume, or have access to a library copy, if they wish to increase their knowledge of their science.

Graham L. Williams
Atlantic Geoscience Centre
Dartmouth, N.S.

Palynologist talking to an
Invertebrate Paleontologist

CORRECTION

Volume 2, Number 2 of the C.A.P. Newsletter incorrectly listed a thesis by William Spachman as relating to Canadian palynology. A thesis dealing with the palynology of the Brandon Lignite of Vermont was completed by Alfred Traverse, Professor of Palynology at Pennsylvania State University ("Pollen and Spores of the Brandon Lignite", 1951, Ph.D. thesis, Harvard University).

ADDRESS CHANGES

Ed Davies recently joined the Eastern Petroleum Geology Subdivision of the Geological Survey of Canada in Dartmouth, N.S., where he is working on Mesozoic-Cenozoic spores, pollen and dinoflagellates of offshore eastern Canadian wells. He was formerly with Phillips Petroleum Company in Bartlesville, Oklahoma and obtained his Ph.D. under the supervision of Geoff Norris at the University of Toronto.

Robertson Research (North America) Limited changed their address last November to Robertson Research Canada Limited, Third Floor, Lougheed Building, 604 First Street Southwest, Calgary, Alberta, T2P 2M8, phone (403) 233-7750. Members of C.A.P. affected by this change are Beatrice Awai-Thorne and Graham Dolby.

Richard Hebda changed his address on January 1, 1980, to Archaeology Division, British Columbia Provincial Museum, Victoria, British Columbia, V8V 1X4.

PALYPUZZLE

The answers to the puzzles in the last newsletter are:

"It's the pits".....FOVEO
"Good Humour Man".....NORRIS

The 74 English words beginning with the letter "D" formed by using the letters in the word DINOFLAGELLATE are:

DALE	DEN	DITE
DAFT	DENIAL	DIT
DAG	DENOTE	DOE
DAGO	DENT	DOG
DANGLE	DENTAL	DOGE
DATA	DENTIL	DOGIE
DATE	DETAIL	DOING
DEAF	DETAIN	DOIT
DEAFEN	DIAGONAL	DOLE
DEAL	DIAL	DOLING
DEALT	DIALLEL	DOLL
DEAN	DIE	DOLT
DEFEAT	DIED	DON
DEFILE	DIEL	DONA
DEFINE	DIENE	DONATE
DEFLATE	DIET	DONE
DEFOG	DIG	DONEE
DEFOLIATE	DILATE	DONG
DEFT	DILL	DON'T
DEIGN	DIN	DOT
DELATE	DINE	DOTAGE
DELE	DING	DOTAL
DELFT	DINGO	DOTE
DELL	DINT	DOTING
DELTA	DIOL	

Theme: Atlantic Continental Margin

S	N	O	T	K	N	A	L	P	O	T	Y	H	P	R
E	G	A	M	P	E	R	I	D	I	N	I	U	M	E
Y	G	O	L	O	N	Y	L	A	P	A	R	G	O	N
H	E	A	I	T	O	C	S	A	V	O	N	S	S	N
P	D	I	N	O	F	L	A	G	E	L	L	A	T	E
I	U	G	S	M	S	E	N	O	Z	G	U	L	A	R
D	Z	O	N	A	T	I	O	N	S	O	O	T	N	B
C	X	Z	R	C	S	K	N	A	B	D	N	A	R	G
I	U	A	N	G	I	O	S	P	E	R	M	A	E	O
S	A	M	B	R	R	J	S	P	A	T	A	R	T	S
S	E	L	Y	O	D	O	O	E	O	C	E	N	E	E
A	D	D	B	U	J	A	K	I	R	R	G	M	I	T
I	I	A	C	P	T	S	E	T	D	O	E	R	P	A
R	R	Y	S	Y	N	N	E	P	E	E	C	S	A	E
T	B	D	O	W	I	L	L	I	A	M	S	A	C	Y

Solution 8 letters: Hint: "To be or not to be, that was the time".

All of the words and names in the list below are to be found in the above puzzle, in a horizontal, vertical or diagonal direction. **Some letters are used in more** than one word. Find the words and circle each letter individually. When complete, the remaining letters will form a word suggested by the hint provided.

AGE
AMB
ANGIOSPERMAE
ARGO (the Formation)
BRENNER
BRIDEAUX
BUJAK
CAP
CORES
DINOFLAGELLATE
DIPHYES
DOYLE
DYAD
EOCENE
GRAND BANKS
GRAY
GROUP
GULA
I.U.G.S.
JOIDES
N.A. (for North America)
NOVA SCOTIA
ORG. (as in organ genus)
OS
PALYNOLOGY
PENNY
PERIDINIUM
PHYTOPLANKTON
POTOMAC GROUP
SAC
SALT
SEM
SETAE
SPORES
STRATA
TEM
TEST
TRIASSIC
WILLIAMS
ZONATE
ZONATIONS
ZONES

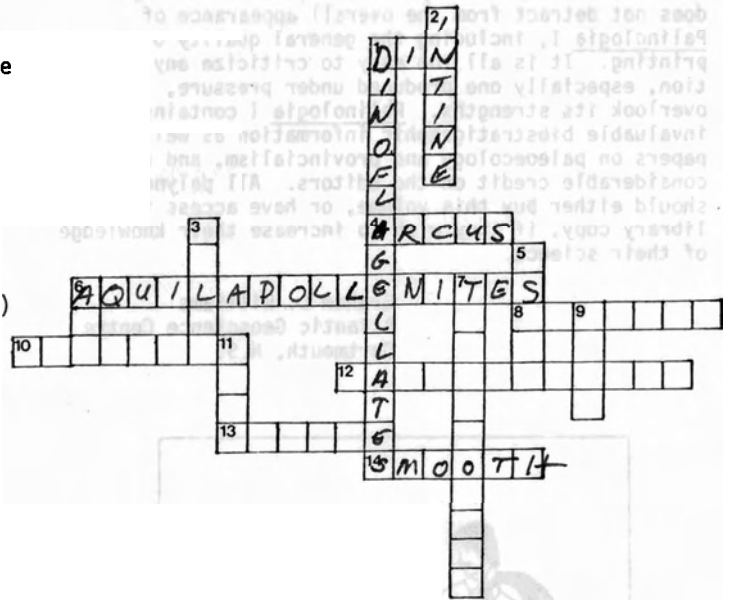
A MICRO-CROSS-WORD PALYPUZZLE

ACROSS

1) akin to ASA
4) garland-like according to Thomson & Pflug
6) suggested by this puzzle
8) as an oriental fan
10) apes, *Betula*, and epiphytes
12) away, the furthest point or surface
13) without a "pit or slit"
14) lacking; psilate

DOWN

1) mobility, armoured and cosmopolitan friends
2) tightly attached to cell plasma
3) top of the heap
5) a shield
6) the shape of things
7) not our Liberal leader, but nonetheless common in the east
9) group looking at the early roots (abbr.)
11) money to some, to us an "edge"



PALINOLOGIA

Palinologia volume 1, December 1979, contains seven papers on acritarchs and spores of Spain, acritarchs and chitinozoa of Paraguay, a bibliography of Spanish palynology and Spanish-English list of definitions of acritarch morphology. **The volume may** be purchased from the Instituto Palinologico, Apartado 543, Leon, Spain (2500 pesetas + 140 pesetas banker's charge + 150 pesetas surface mail or 500 pesetas airmail).

PaLyNoLoGiCaL JuMbLe

Rearrange the letters in each of the four words below to spell common English words used by palynologists to describe collection localities and/or techniques. Then using the circled letters, rearrange these to give the final word below.

DOCER
_ _ _ (O) _ _

PISCH
CH I (P) S

GOBS
B (O) (G) (S)

TARATS
(S) T (R) A TA

CLUE: A single letter, when added to the beginning and the end of a word meaning orifice, gives the final word.

S P O R E S

NIGHTCAP

THE ART OF NOT GIVING A PAPER

Organizations are requesting prospective speakers at their meeting to submit abstracts of their paper for acceptance earlier and earlier before the meeting. It thus becomes necessary to seek acceptance of a paper before the actual work is accomplished. It then often happens the paper is accepted and the proposed work is not done or the results are at variance with the accepted paper and are not worth speaking about. The speaker nonetheless has a given time slot at the meeting and is forced to appear before the group and not present his paper. **I have just returned from a** major meeting in my speciality and have heard numerous nonpresentations. It seemed appropriate to review the numerous techniques available to speakers caught in such a predicament.

In the worst case where no work has been done and no information at all can be conveyed, the simplest solution is making a slide that says "In Summary" and placing this upside down and backwards as the first slide in your slide tray. **A ten minute talk can** easily be given consisting of a discussion between you and the projectionist as to how to find and orient the **first slide. If a longer talk is necessary it is** suggested that the slide be made with thick glass coating that will jam the projector. **Another** effective technique is combining one of the "not presenting slides" techniques given below with a "not presenting talk" technique. These techniques consist of: (1) Having the paper presented by a foreign visitor to the department who speaks English with a quaint, but unintelligible accent; (2) Fumble with the microphone. Under this could be placed a variety of techniques consisting of pulling out the microphone plug, speaking in a whisper several feet away from the microphone, or creating deafening screeches by putting the microphone to your lips; (3) Consume the first part of the talk with an amusing anecdote, a summary of other people's work and only when the signal to conclude is given do you race so rapidly through your own presentation that it becomes unintelligible.

Numerous techniques are available for the not showing of slides: (1) A common practice is to use **color.** By having your slides with yellow printing on an orange background or navy blue printing on a black background they become invisible to virtually everyone; (2) Five pages of data and graphs are reduced to one 35mm slide. **The lettering should be too small** for even those in the first row to read without binoculars. **This technique is often combined with the** sweeping statement "One can read the results on this slide by oneself, so I will not go into it further"; (3) One of my favorite techniques involves the subtle distraction of the audience by diverting their attention from what is being said or presented on the slide. Slides can be made of material calculated to burn after a prescribed number of seconds of being shown. The audience attention will invariably be focused on the slowly darkening and subsequent burning areas on the slide. **Even the simple trapping of** moisture within glass slides creates endless patterns of movement in the water droplets that not only prevent any material from being read, but create enough fascination in themselves that the audience does not miss not being able to see the data.

These are only a few of the many techniques available. As you attend your next meeting and listen to the presentations, I am sure you will pick up many more useful techniques for the next time you too have had a paper accepted and find yourself with nothing you want to say.

Solon Finkelstein, M.D.
Reprinted from the Journal of the American Medical Association, vol. 218, no. 4, p. 603.

FACIES - A NEW JOURNAL

The journal FACIES will publish articles dealing with the interpretation of ancient biotopes and depositional environments by means of detailed facies analysis. This may include details of microfacies and ultrafacies, paleoecology and paleobiogeography as well as systematic paleontology related to facies studies. **Syntheses of paleontological and sedimento**logical data are particularly welcome. High quality reproduction of photographs is a feature of the journal.

Enquiries should be addressed to the Institut für Paläontologie, Universität Erlangen-Nürnberg, Loewenichstrasse 28, D-8520 Erlangen, West Germany.

C.A.P. MEMBERSHIP, MARCH 31, 1980

ACHAB, Aicha
ANDERSON, Thane W.
AUDRETSCH, Anton P.
BARSS, M. Sedley
BASSETT, I. John
BOURGEOIS, Jocelyne
BOYKO-DIAKONOW, Maria
BRAMAN, Dennis R.
BUJAK, C. Anne
BUJAK, Jonathan P.
CAMFIELD, Martha
CRILLEY, Bernard J.
DAVIES, Edward H.
ELSON, John A.
FENSOME, Robert A.
FITZGERALD, W.
FORD, Jancis
GILL, Leanne D.
GUNTHER, Paul R.
HEBDA, Richard J.
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MCANDREWS, John H.
MCGREGOR, D. Colin
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MELLAR, Gillian
MOTT, Robert J.
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THOMPSON, Renée D.
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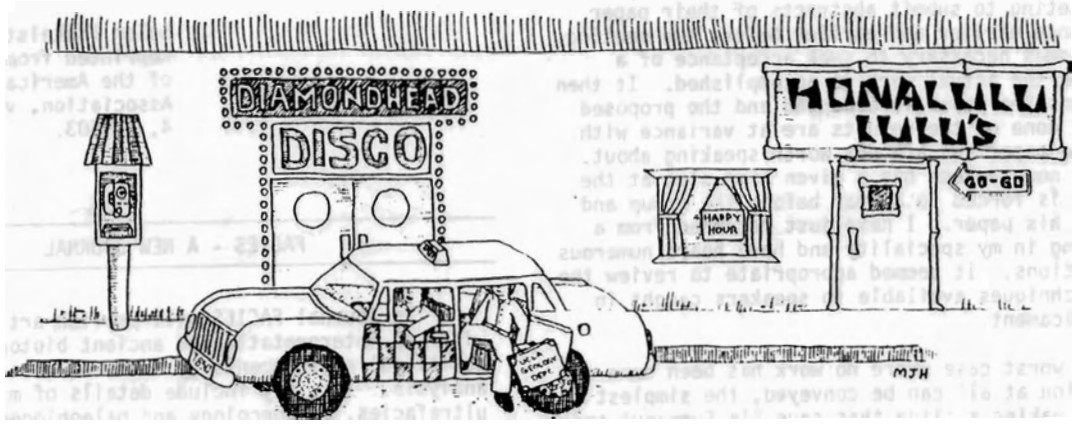
VAN HELDEN, Bert G.T.
WALTON, Huon S.
WARNER, Barry G.
WILLIAMS, Graham L.
WILSON, Malcolm A.

Corresponding Members

NAMBUDIRI, E.M.V.



"So what's the problem? I thought you wanted to see the hot spots?"