

IOP NEWSLETTER 8

INTERNATIONAL ORGANIZATION OF PALAEOBOTANY

INTERNATIONAL UNION OF BIOLOGICAL SCIENCES
-SECTION FOR PALAEOBOTANY
President: Prof. T. DELEVORYAS, USA
Vice Presidents: Prof. E. BOUREAU, FRANCE
Dr. S. ARCHANGELSKY, ARGENTINA
Dr. S.V. MEYEN, USSR

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JANUARY 1979

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PLEASE MAIL NEWS AND CORRESPONDENCE TO YOUR REGIONAL REPRESENTATIVE OR TO THE SECRETARY FOR THE NEXT (MAY) NEWSLETTER. The views expressed in the newsletter are those of its correspondents and do not necessarily reflect the policy of IOP.

ANNUAL DUES FOR 1979 SHOULD BE PAID BY FEBRUARY 14TH: PLEASE USE THE FORM ON PAGE 20 OF THIS NEWSLETTER WHEN SENDING MONEY.

IOP NEWS

NEW PRESIDENT OF IOP

Two rounds of correspondence between the IOP Executive Committee and the secretary during October and November last year made the unanimous selection of Professor Ted Delevoryas as the new President in succession to the late Dr Jim Schopf. His term of office will last until the next meeting of IOP, at Sydney in 1981, when he will be eligible to stand for election to a full term of office. Professor Delevoryas's address is: The Department of Botany, The University of Texas at Austin, Austin, Texas 78712, USA.

The selection was made with full regard to Article III 2 of our newly adopted Constitution (see IOP newsletter 3). At the same time as selecting a new President, the Executive took the opportunity to make itself fully constitutional for the first time, particularly within the context of Article V 3. Thus, the current membership of the committee is:

President: Prof T. Delevoryas, USA
 Vice Presidents: Prof E. Bourreau, France
 Dr S. Archangelsky, Argentina
 Dr S.V. Meyen, USSR
 Secretary: Dr M.C. Boulter, UK
 Members at large: Prof D. Dilcher, USA
 Dr R. Weber, Mexico
 Dr S. Zhilin, USSR
 Congress member: Dr J. Douglas, Australia.

Though there is some overlap, this membership is distinct from the group of regional representatives which is listed on the last page of this newsletter. The Executive Committee has a Constitutional responsibility while regional representatives serve to feed information to the secretary for inclusion in the newsletter, and to help with its distribution.

IUBS SUBVENTION

Last May the secretary made an application to the International Union of Biological Sciences in Paris for a grant of US\$1,000 to help with the cost of production and distribution of newsletters and with other functions described in our Constitution. Details were submitted to explain how our present income fails to cover costs, as can be seen from the ANNUAL ACCOUNTS 1978 item below. The application was considered by the Union's Executive Committee in November, when our Vice President Professor Bourreau was kindly in attendance to support our case. Regretfully, only half the sum requested was granted for 1979, so our financial crisis persists and the full aims of IOP cannot be undertaken. Nevertheless, thanks are due to Professor Bourreau and to the IUBS Executive Committee for their help to obtain the grant of US\$500 for 1979.

ANNUAL ACCOUNTS 1978

Due to the huge cost of overseas mailing, IOP finances continue to be stretched. The fall in the international exchange rate of the American dollar has made a further deterioration to our financial credibility, so that the reserve that was recorded last year has been eroded. This happens despite very generous contributions to postage costs made by North East London Polytechnic and other institutions. In addition Prof Bill Schopf made a generous contribution of US\$300 to help with the production and distribution of newsletter 7.

To aid our savings, subsequent newsletters will be duplicated in two versions, one of which will be reduced to half the size of the present A4 version; this will make a substantial saving in postage costs to areas far from London, and will enable a delay to the forthcoming rise in membership dues. Most of the IUBS subvention of US\$500 is planned to be used to defray increased costs of newsletter production and distribution, and will allow three newsletters about this size to be produced during the current year.

INCOME:	275 membership dues of US\$4	1,100
	contribution from J.W. Schopf	300
	cash reserve at January 1978	86
		<hr/>
		US\$1,486
EXPENDITURE:	Envelopes and notepaper	120
	typing three newsletters etc	290
	duplicating three newsletters	300
	postage (part)	850
		<hr/>
		US\$1,560

LOSS OVER 1978: US\$74

Copies of the annual report of IOP for 1977 are available from the secretary; the annual report for 1978 should be available in February 1979.

IOP NEWSLETTER

A reduced size version (A5) of this newsletter 8 will be distributed to IOP members in South Africa, Australia, South America and other countries. Members in Europe and countries which reproduce their own copies from an original supplied from London will receive the usual A4 version. Please contact the secretary if there are any difficulties with this new arrangement. It is designed solely to

save money on long distance air mail postage, but may present difficulties for those who wish to make photographic copies.

If they can afford the money IOP members have a chance of meeting together only once every five or so years at each International Botanical Congress. It is therefore particularly important that the newsletter serves as a full medium through which to exchange ideas on palaeobotanical progress in an informal way. Its rapid production and distribution can provide a means of communicating views and new ideas to a large number of palaeobotanists. The secretary has been aware for some time of the importance of this function, yet problems of the validity of publication make the status of the newsletter a difficult thing to resolve. Its present format is very much in the spirit of a newsletter, informally produced to a limited audience with little institutional circulation. But increasingly, items are submitted for inclusion which, it might be argued, should really be published within the scientific literature. One solution to this difficulty is to change its status to that of a scientific periodical, with a style based on its present content, but more like the format of *Nature*, *Science*, or even *Time* magazine. The present low quality and cheap text reproduction could be accompanied by high quality plates, and each issue folded to an A5 size, stapled and trimmed: this may cost only two or three times more than the present newsletter. Correspondence about this would be warmly welcomed for inclusion in future IOP newsletters. Since it is also a Constitutional matter, no changes of style can be made before the matter is debated by the Organization at Sydney 1981, even if there were general approval.

NEW REGIONAL REPRESENTATIVE FOR CHINA

Professor Chao King-koo has written to explain that Professor LI Xing-xue has been selected as the new regional representative for the Peoples' Republic of China. Professor Li will be pleased to aid all contact between members of IOP and palaeobotanists in his country; his address is: Nanking Institute of Geology and Palaeontology, Academia Sinica, Chi-Ming-Ssu, Nanking, China.

LONDON OFFICE OF IOP

The secretary of IOP will be working in South Africa during February and March 1979. Please do not expect any letters to be answered during this time.

EXPRESSIONS OF SYMPATHY ON THE DEATH OF J.M. SCHOPF

Messages of sympathy to IOP on the death of our former President have been received by letter or telegram from: Boureau, Andrews, Douglas, Zhilin, Bonnel and IUBS, Stafieu, Lundblad, Manum, Takhtajan, Snigirevskaya, Banks, Norris, Traverse and Lacey. An obituary written by Henry Andrews appears in this newsletter; further solicitations are welcome.

REPORTS OF RECENT MEETINGS

SOCIETE GEOLOGIQUE DU NORD

A special meeting devoted to recent contributions to Gondwana geology, particularly palaeogeography and palaeobotany, was held at Lille University during December 1977. More than twenty papers were presented to an audience of about 100 scientists, and these were published in July 1978. Send your order, with 150F to: Societe Geologique du Nord, Sciences de al Terre, B.P. 36 - 59650 Villeneuve d'Ascq, France.

LINNEAN SOCIETY OF LONDON

Prof W.S. Lacey, Bangor, Wales, has written to correct an omission from the last newsletter 7: "I note that in reporting the Linn. Soc. meeting of April last you refer to six speakers but list only five, the missing paper being mine. This was actually read for me (during my absence owing to illness - mild heart attack just before Easter - I am back in harness again now) by my research assistant Roger Lucas MSc. Please correct this omission in newsletter 8 by including a brief reference to 'A new Triassic flora from the South Shetland Islands, Antarctica' by Prof W.S. Lacey and R.C. Lucas."

PALAEBOTANY AND PALYNOLOGY IN BRAZIL, 1978

Some volumes of the publication 'Advances in Palaeobotany and allied Sciences in Brazil' that resulted from the last December meeting of palaeobotanists in Sao Paulo (as announced in IOP Newsletter 5 page 4) are reserved for IOP members, and can be obtained from: Prof O. Rösler, DPE-IG-University of Sao Paulo, Cx.P.20899, 01.000 - Sao Paulo - SP - Brazil. It is published as part of volume 9 of the Boletim IG, Instituto de Geociencias, Universidade de Sao Paulo, pages 57-152, 1978.

BRITISH MICROPALAEONTOLOGICAL SOCIETY

A meeting on Palynofacies and Palaeoecology was attended by about 100 specialists at Imperial College London on December 13th 1978. There were 8 lectures:
 M. Fisher (BIOC, Glasgow) - Kerogen distribution and palynofacies
 R. Harland (IGS, Leeds) - Marine palynofacies of the Quaternary
 L.O. Allen (Paleoservices Ltd, Watford) - Lower Tertiary palynofacies
 C.N. Denison (Robertson Research, Wales) - North Sea Paleogene: deep or shallow?
 D. Batten (Aberdeen University) - Palynology of the Hastings Beds
 N.F. Hughes (Cambridge University) - Wealden palynofacies and palaeoecology
 L. Riley & R. Tyson (Robertson Research) - U. Jurassic marine palynofacies of the North Sea and environs
 M.A. Butterworth (Aston University) - Carboniferous continental palynofacies.

PALAEONTOLOGICAL ASSOCIATION DEVONIAN SYMPOSIUM 1978 (PADS 78)

1. Palaeobotanists at PADS 78

The meeting at Bristol England in September 1978 provided unequivocal evidence that Devonian palaeobotanical research is thriving and arousing widespread interest. Professor W.G. Chaloner, presented with the unenviable and daunting task of briefly reviewing macrofloras at a time jam-packed full of evolutionary activity, was splendidly entertaining and informative in his key-note address. Those who perhaps may be considered more involved with the 'accountability' of palaeobotany - the palynologists - were led by C. McGregor, who in his key-note paper discussed the role of spores in stratigraphic correlation and attempts at unifying zonal schemes from various parts of the world. The macroplant short papers covered a wide range of topics. There were descriptions of floras (eg C. Alvarez-Ramio from Spain, C-Y. Tsai from China, A. Lejal-Nicol from Libya, L. Matten et al from Eire), descriptions of new taxa (D. Zdebska and P. Gense), and the redescription of more familiar ones (D.S. Edwards on the sporophytic status of Rhynia gwynnevaughanii, M. Fairon-Demaret on Protolpidodendron scharianum from Germany = Leclercqia). The slightly more esoteric anatomical papers concentrated on petrified xylem (Y. Lemoigne et al, D. Edwards and H.P. Banks). Banks also provided some evolutionary speculation. All friends of the Devonian and palaeobotany in general will be delighted to learn that, although now considered too old to lecture to undergraduates at Cornell, he will continue with his palaeobotanical research.

Perhaps the most controversial papers of the palaeobotanical session were presented by J. Tims and M. Garrett. New graptolitic evidence suggests that the age of the earliest Baragwanathia flora in Victoria, Australia, is Ludlovian. Because of the very full programme there was little time for discussion of these and the remaining contributions, although naturally considerable extra-session debate eventually followed. Another disappointment was the comparatively small numbers of papers on Middle and Upper Devonian plants, in particular on the North American progymnosperms. But these were minor grievances in an otherwise thoroughly enjoyable meeting; in common with all the more botanically oriented palaeobotanists, I found it especially rewarding to be part of such a distinguished geological gathering.

Dianne Edwards, Cardiff, Wales.

2. Palynologists at PADS 78

Memories of the Devonian conference at Calgary in 1967 still leave a warm after-glow, and the wealth of knowledge stored in the two magnificent conference volumes will keep Devonian researchers busy for many years to come. Only time will show what will be published and what will last from the Bristol conference, but to the palynologist there is a striking difference between the two symposia. Partly it is

in the increased palynological and palaeobotanical contribution, and partly in the much greater involvement between sedimentologists, stratigraphers and invertebrate palaeontologists on the one hand, and palynologists on the other, and also in the closer links between palynologists and palaeobotanists. It seems that palynologists might at last become respectable. On this positive side there are signs of this increased collaboration in the work of Chlupac, Laufeld and Paris on Chitinozoans from the Silurian-Devonian stratotype in Bohemia, or again, and perhaps more strikingly, in the impact that palynology is having in solving stratigraphic problems. For instance, the Old Red Sandstone sequences in Ireland are the subject of useful palynological work by many contemporary authors: the message has certainly got through to many Irish stratigraphers and sedimentologists that palynology, like any branch of science has pitfalls, but it can be made to work. Why then is palynology not more accepted? How is it that important stratotypes for boundaries are chosen without taking fully into account their palynological potential? Surely if we are to ever correlate between marine and continental successions such stratotypes should only be chosen from facies which include abundant land-derived palynomorphs mixed with marine faunas, namely Rhenish facies. McGregor, in his key-note address touched on many of the problems of palynologists and showed what could be done by a rigorous approach to the literature and research. His extreme caution in evaluating palynological data is a model that could be emulated with profit. The Devonian palynological literature is bedevilled with taxonomic misidentifications and poor stratigraphic documentation, we are better able to spot wrong age assignments than we were ten years ago but we still have a long way to go.

That, in spite of these difficulties, palynology is a healthy and flourishing sapling could clearly be seen by the papers of Loboziak and Streeel on 'Miospores from Givetian to Lower Frasnian sediments dated with conodonts in the Boulonnais (France)'; Streeel, Fairon-Demaron, Vanguestaine and Otazo on 'Miospores and acritarchs from the Siegenian beds of the Dinant Basin (Belgium)' and Thomas on the stratigraphy and palynology of the fluviatile Lower Old Red Sandstone Coshester Group, south west Dyfed, Wales. The first of these papers has helped to "key-in" what I like to think of as important spore "events" into the marine succession, and the second two papers illustrated some close similarities between south west Wales and Belgium deposits. Thomas's work exemplifies the sort of approach to palynology that is vital if the sapling is to become a tree. That is a combination of careful stratigraphical, sedimentological and palynological work. This type of approach can only properly be achieved by teamwork and it is good to see palynologists becoming more involved in this way. Richardson and McGregor suggested that the sort of detailed work outlined above can be used to establish 13 successive palynozones from late Silurian through the Devonian to the base of the Carboniferous, which are applicable over the whole of the Old Red Continent. Flowering too are the more botanical aspects of Devonian palynology with work on in situ spores. Gensel discussed plants from the Early Devonian of Canada and in situ spores of the genus Apiculiretusispora from psilophytes. Allen reviewed in situ Devonian spores which incidentally highlighted the considerable amount of work done by Banks and his students. Finally, Marshall successfully crammed in a useful seven minutes talk on 'A method for the successful oxidation and subsequent stabilisation of high rank, poorly preserved spore assemblages' and Whiteley gave an account of Frasnian and Givetian miospores from Key Point well, Parry Islands, Arctic Canada. Unfortunately I did not hear the latter paper, which leads to my only quibble about the conference. If you are going to change the programme, then these changes should be announced both verbally and outside each lecture hall. As it was there was some confusion on the last day of what was otherwise an excellent meeting. Professor Dineley and all his colleagues at Bristol deserve our warmest thanks. The meeting was a great success.

One final observation: although the number of palynologists had increased since Calgary, in fact the number giving palynological papers had doubled, there was no Chinese or Soviet palynologist present. There was a Chinese palaeobotanist, but no palynologist. Scientists from both China and the USSR are making significant contributions to our knowledge of Devonian palynofloras and one sincerely hopes

that they will be represented at the 5th International Palynological Conference to be held at Cambridge in 1980. Dare we hope that by the next Devonian symposium the tree will have borne a fruitful harvest?
John B. Richardson, London, UK.

FORTHCOMING MEETINGS

IUBS XX GENERAL ASSEMBLY, HELSINKI 1979

This will be held from August 20 - 26 and will include a programme of scientific papers (not connected to palaeobotany) and a business agenda. As a section of IUBS, IOP has voting rights at this assembly if a member nominated by our President is able to attend. Some financial assistance with travel expenses may be available from the Union: please contact the IOP secretary for further details.

PALAEOMYCOLOGICAL COLLOQUIUM, PARIS 1980

The fungal affinities of living and fossil Chitiniomycetes and other incertae sedis chitinous organisms from the upper Precambrian to the Devonian period will be discussed over the two days of this meeting, some time in July. It will be held at the Laboratoire de Micropaléontologie, Ecole Pratique des Hautes Etudes, 8 rue de Buffon, 75005 Paris, France, from which address further details can be obtained. There will be introductory lectures by P. Taugourdeau and M. Locquin, and these and other discussions will be published before the end of 1980 in the 'Cahiers de Micropaléontologie'.

Chitinozoa have been successively compared with testaceous Rhizopodia, various kinds of Metazoa, Graptoliths, Hydrozoa and Fungi. The aim of this colloquium is to discuss in groups these hypotheses to try and define correctly Chitinozoa and related groups.

26TH INTERNATIONAL GEOLOGICAL CONGRESS, PARIS 1980

The first centenary of the Congress meets from July 7 - 17 in the Centre International de Paris - Palais des Congrès. The Congress excursions date from June 27 to July 5 and from July 19 to July 27 inclusive. Further details can be obtained from the Secretary General, 77 rue Claude Bernard, 75005 Paris, France.

SECOND INTERNATIONAL CONGRESS OF SYSTEMATIC AND EVOLUTIONARY BIOLOGY, VANCOUVER 1980

This will take place at Vancouver from July 17 - 24 on the campus of the University of British Columbia. There will be two plenary sessions and 12 $\frac{1}{2}$ day symposia: four of these are likely to be of particular interest to palaeobotanists - origins and evolution of the North Pacific biota, evolution of reproductive strategies, green algae and land plant origins, palaeobiology of the Pacific rim. Further details can be obtained from Dr G. Scudder, Department of Zoology, University of British Columbia, 2075 Westbrook Mall, Vancouver B.C. V6T 1W5, Canada.

PALAEOBOTANICAL SYMPOSIUM, OTTAWA 1979

A symposium on the theme 'Landmark events in the evolution of plants' will be held at Carleton University, Ottawa, Canada, on Thursday June 21 1979. The symposium is sponsored by the Canadian Botanical Association (CBA) and the Canadian Association of Palynologists, and will be part of the programme of the 14th annual meeting of the CBA. Early evolution of land plants, origin and evolution of conifers and the early evolution of conifers will be among the topics to be presented. Further information can be obtained from Dr D. McGregor, Geological Survey of Canada, Ottawa, Ontario, K1A 0E8.

LINNEAN SOCIETY OF LONDON, LONDON 1979

The annual meeting of the palaeobotany section will be held on Thursday April 5th somewhere in London. It is hoped that as well as there being lectures of topical interest there will be a parliamentary style debate on a motion concerning the 1978 Leningrad ICBN Article 3.2. Contact Peter Crane, Department of Botany, University of Reading for details.

OBITUARIES**SIR EDWARD SALISBURY 1886 - 1978**

Sir Edward Salisbury, who was once Director of the Royal Botanic Gardens at Kew died on November 10th 1978, aged 92. Early in his distinguished academic career he had worked with F.W. Oliver on pteridosperm seeds, and between 1911 and 1916 he published four papers in the Annals of Botany dealing with trigonocarpalean and lagenostomalean seeds in Carboniferous coal balls. His work on trigonocarp seeds formed the basis of his doctoral thesis. Salisbury was a student at University College London, where later he was to study with Oliver and eventually to succeed him as Quain Professor of Botany. Throughout his remarkable career, in which ecology and a particular interest in weeds remained a central theme, his work on seeds and their role in what would now be called reproductive strategy was steadily maintained. With his death we lose not only one of the great personalities of British botany, but also the last personal link with F.W. Oliver and that golden age of coal ball palaeobotany which saw the discovery of the pteridosperms. W.G. Chaloner, London, UK.

DR H. DUESDEN 1893 - 1978

Dr Duerden, who died aged 85 in January 1978, was born in 1893 in Burnley, Lancashire. He left school at the age of 14 and went to work in the cotton mills. He subsequently obtained a scholarship to Imperial College London, and later went on to work at Birkbeck College where he obtained a PhD in 1931. The title of his thesis was 'On xylem elements of certain Pteridophyta', and W.H. Long was his external examiner. Duerden's interests were diverse, and in the same year as gaining his PhD he completed a legal training and was called to the Bar to become a practising lawyer. Between 1930 and the 1950's he published a number of papers on fossil and living lycopods, and with B.F. Barnes developed an improved version of the celloidin peel technique for sectioning coal ball plants. W.G. Chaloner, London, UK.

ANNA M. BLAZER 1910 - 1978

Miss Blazer was born in June 1910, in Atlanta, Georgia, and died on June 28, 1978 at Alexandria, Virginia. Most of her working life was devoted to the United States Government, and particularly to the U.S. Geological Survey. Her work with the Survey was varied and distinguished, but she is best known for the last ten years of her career to 1976 when she maintained and managed the palaeobotany library and its compendium index of names of fossil plants. Miss Blazer was always available for cheerful assistance. A climax to her career came with the publication under her sole authorship of the U.S. Geological Survey Bulletin 1396 (1975) 'Index of Generic Names of Fossil Plants, 1966-1973'. This is the first supplement to H.N. Andrews' Bulletin 1300 'Index of Generic Names of Fossil Plants, 1920-1965'; it attests to her complete dedication to a mission in palaeobotany. S.H. Mamay, Washington D.C., USA.

DR J.M. SCHOPF 1911 - 1978 (IOP PRESIDENT 1975 - 1978)

For many botanists and geologists of my own generation as well as others of more recent vintage Jim Schopf was, as one of his colleagues recently said, "a very special person". He was in fact special in several different ways. It seems but a short time ago that I walked into his laboratory at Urbana, Illinois, for the first time, but it was actually just 40 years ago. I had recently returned to St. Louis from a year's study in England; palaeobotanists were not especially abundant in those days in this country and I needed someone with whom I could discuss research problems and aspirations. I found what I was looking for, and through the next four decades he supplied me with advice, specimens, leads to good 'diggings' and a friendship that continued to grow as the years went by. In this vein I know that I speak for many others throughout the world.

Jim was an individualist with a great fund of knowledge and strong opinions; like others who have worked with him closely we did not always agree but also (as some of them have told me) Jim was usually right!

Schopf was born at Cheyenne, Wyoming on 2 June 1911. He received his undergraduate education at the University of Wyoming, taking his bachelor's degree in 1930, and while there he had the advantage of studying botany under one of the leaders of the time, Professor Aven Nelson. He continued on at the University of Illinois at Urbana where he received an MS degree in 1932 and the PhD in 1937. His botanical interests remained strong and his doctoral dissertation, which was carried out under the direction of Professor John T. Buchholz, dealt with the embryology of Larix; this work was published in the Illinois Biological Monographs in 1943. However, his graduate education included a good deal of geology and, recognizing the study of coal as an important and unique link between the two sciences, with obvious practical implications, he began to study coal microscopy, a subject which occupied much of his time for the remainder of his career.

I think it is high praise, but accurate, to say that through much of his scientific career no one else exceeded him in his breadth of knowledge in both botany and geology. His mastery of the subject material in the two areas and his ability to synthesize them was phenomenal. This was evident in his publications, but especially in the way he contributed his knowledge and services to both botanical and geological organizations. Palaeobotany has rarely had such a fine ambassador and we of the IOP were especially fortunate to have had him take the presidency in 1975.

Perhaps the most outstanding formal honor that Jim received was the Mary Clark Thomson gold medal, awarded to him by the National Academy of Sciences in 1976. I well remember his response - genuine surprise - when he was first informed of this: "But my best works still remain unpublished!"

Of very special importance was his 'scientific generosity'. He was an extraordinarily sharp field worker and had a knack for finding far more fossil plant localities than he had either the time or inclination to work on himself. Where a lesser man would have kept quiet and reserved them for his own use later his inclination was to immediately report them to those who he thought would put them to the best use. Thus he was responsible, in a very real way, for starting many others on highly rewarding investigations. A few striking examples may be mentioned:

While exploring Upper Devonian outcrops near the town of Valley Head in West Virginia in the early 1960's he discovered some beautifully preserved material of Rhacophyton and promptly led Tom Phillips and me to the area. We later found Archaeopteris there, and the locality must rate as containing some of the best preserved Upper Devonian plants that have ever been found.

Rather early in the 1940's, if I recall correctly, the now famous Berryville coal ball locality was discovered in a stream exposure in a woodlot in southern Illinois. It was discovered by Illinois Geological Survey geologists and I believe that Jim was the first palaeobotanist to visit the site. Again, he could have retained his treasure for himself, but instead he took several of us to visit the outcrop and an incredible number of new and finely preserved fossil plants have been found there.

As a third example, and one that started me and several of my students on a most exciting and productive research program, was an invitation to investigate a newly discovered early Devonian plant locality in northern Maine. This originated with Professor Ely Mencher and Dr William Forbes who were engaged in stratigraphic work in the area. Mencher brought in Schopf who in turn invited me to participate. In the course of this investigation Professor Mencher arranged one summer to have some heavy equipment brought in to investigate an early Silurian site where it was hoped that plant remains might be found. It did not prove to be very productive, but by simply refusing to give up Jim eventually found upright axes scattered through the sediments which were suggestive of land plant vegetation. In line with this same characteristic another colleague says of Jim: "As a scientist I think the most remarkable thing about him was his uncanny ability to see into a rock and get out of it the most unforeseen sorts of material."

In 1934, several years before completing his graduate studies, Schopf was appointed assistant geologist in the Coal Division of the Illinois Geological

Survey, under the supervision of Gilbert H. Cady. This developed into a close and lasting friendship which included Jim's wife Esther and their two sons. But like many or most of Jim's personal relationships there were occasional frank and somewhat heated discussions on the scientific problems of the moment. One of his associates at the Illinois Geological Survey has sent me the following comments in this connection: "The frequent and loud discussions between Jim and Dr Cady were well known because they permeated the building. Both were stout defenders of scientific positions (although both could be convinced, but by more than words). Jim worked very long hours in those days, but labors in the small hours of the morning invariably had him arriving at work considerably late daily. Dr Cady was well aware of Jim's long hours, but the irregularity of the hours was also the subject of vigorous discussions of a character only possible by two men with the highest regard for each other." The Cady relationship culminated in a sense in 1973 when the Coal Division of the Geological Society of America bestowed upon Jim the first Gilbert H. Cady Award at the national meeting in Dallas.

Jim served with the Coal Division of the Illinois Geological Survey until 1943 when he accepted a position with the U.S. Bureau of Mine at Pittsburg. The Bureau was engaged in an effort to develop reserves of western coking coal and he took up the work of core processing and petrologic studies of coal samples obtained by exploration drilling. The general conclusions of this work were given in a well known paper in 1948, entitled: "Variable Coalification; the Processes Involved in Coal Formation". In recognition of this work he was awarded a commendation by the U.S. Department of the Interior for civilian service during World War II.

He transferred to the Palaeontology and Stratigraphy Branch of the U.S. Geological Survey in 1947 and much of the next two years were spent in Washington. I saw a good deal of him during this period, and it was shortly after he started work there that he introduced me to the Compendium Catalogue of fossil plant names that had been started many years before by Lester Ward. It is rather a long story, but Jim 'sold' me on the idea of getting out a Generic Index of fossil plant names based on the Compendium. Thus I spent a good deal of time in Washington during the next few years working on the Index and enjoying the aid and companionship of Jim and Roland Brown. It was a pleasant experience and one from which I learned much about paleobotany and paleobotanists. I am grateful to Jim for giving me the opportunity. At that time the paleobotanical facilities of the Survey were located on the top floor of the National Museum: air conditioning was for the future and in the summer months the heat was something less than temperate. I spent some days with a wet towel wrapped around my head, and wondering how Jim had maneuvered me into the venture.

For six months during 1947 he was on leave to serve as Senior Research Associate to the South African Geological Survey in Pretoria. His duties there were to demonstrate the application of coal petrographic techniques on South African coal. In 1949 the P. & S. Branch of the Geological Survey established a coal geology laboratory at Ohio State University in Columbus with Jim in charge, and he remained there for the rest of his career. He had many duties but they centered around the structure and origin of coal. Shortly after the war considerable attention was directed to studies of the possible association of particular fossil plants in coal relative to uranium content. He found some time to get back to his Carboniferous megafossil studies, served as a part-time Professor of Geology at the University, and also became associated with the Polar Institute that is located there.

He became very much interested in exploration in the Antarctic and spent four field seasons there: 1961-2, 1964-5, 1965-6 and 1969-70. Several publications resulted from these trips, and what may well prove to be the most important fossil plant 'find' ever made of the southern continent. I refer to his discovery of permineralized or petrified peat, seemingly quite similar to coal ball petrifications of the northern hemisphere. This was discovered on his last trip and some of the plants have been described in preliminary papers published in Science (1970) and the American Journal of Science (1971). It is most fitting that the highest mountain in the Ohio Range in Antarctica was named for him in recognition of his explorations there: Mount Schopf.

The precise way in which Jim's mind operated, with the most careful attention to minute details, is well shown by his interest in nomenclatural problems and the services that he rendered to paleobotany in general in this way. He was a member or chairman of many national and international committees that were concerned with the problems of plant names. Different botanists display quite different reactions to the intricacies of plant nomenclature. Jim approached the subject very seriously, perhaps a little too much so; one colleague has said that his opinions were more legalistic than functional.

It may be permissible to include here a couple of personal anecdotes that bear on the distinctive and interesting aspects of Jim's character. The first comes from Esther and is in reference to his willingness to deliver unscheduled comments and talks at meetings. His lucid and knowledgeable questions and answers offered after a colleague had delivered a paper sometimes baffled and impressed an audience, in view of the sometimes obvious fact that he slept soundly through many talks when the lights were out and the slides were being shown. It may be that he made a habit of reading carefully the abstracts before going to meetings, and was thus often - but not always - well informed without having to listen and watch.

The second relates to Jim's interest in music, which as far as I know was strictly confined to very fast moving Dixieland jazz. I did not know this at the time and once when I stopped with my family at the Schopf home in Columbus on our way east, I brought into the house a few records of classical music - records that I had recently acquired and which I thought he might like to hear on his new phono set. We got about a quarter way through one of Liszt's Hungarian rhapsodies and I could see that something was dreadfully wrong with Jim. I stopped the record and he said, rather quickly I thought: "Let's try one of mine." For me to say that it was wild would be an unscientific understatement. I did not venture to discuss music with him again after that.

It has been my intent here to draw a picture of Jim Schopf that in some degree would do justice to him as a great human being and as one who gave so freely of his time to help others and advance botanical and geological knowledge. I have mentioned a few of his publications but there are others that should be noted. Among the 100 or more articles several are of special importance. In 1939 he described a new species of Medullosa and this was a start of a considerable number of contributions by American paleobotanists on the Medullosan pteridosperm remains found in our coal balls. Ten years later he brought out his memoir on the male fructifications - Doleriotheca - which is a model of paleontological reporting and one of the finest studies dealing with the Carboniferous pteridosperms that we have. He was one of the founders of Carboniferous palynology and his earliest papers, of 1938, on 'Spores from the Herrin Coal Bed in Illinois' and the 'Annotated Synopsis of Paleozoic Fossil Spores' (in collaboration with L.R. Wilson and Ray Bental) are among the most important basic studies in American Paleozoic palynology.

Aside from other honors, the following are among the recognitions that his colleagues have bestowed upon him: he served as secretary and chairman of the Palaeobotanical Section of the Botanical Society of America, and was one of those who established the Section as one of the most effective fossil plant organizations in the world. He received the Merit Award from the Botanical Society of America in 1969, the Distinguished Paleobotanist Award from the Palaeobotanical Section in 1977, the Fellowship Scroll and Medal from the Palaeobotanical Society of India in 1977 and the Medal of the Paleontological Society was awarded posthumously in the autumn of 1978.

The IOP has never been served more effectively than by our late President. We have suffered a double tragedy in the loss of our late secretary Hans Trau, and now our President. But they have left us with strength and courage and we shall recover from the losses.

Jim Schopf is survived by his two sons, Thomas J.M., who is a professor of geology at the University of Chicago, and J. William, a professor of geology at the University of California. And by his wife Esther who has made possible, contributed to and shared so much of the great heritage that Jim has left us.

Henry N. Andrews, New Hampshire, USA.

(Thanks are due to several friends who have contributed information)

NOMENCLATURE

IF YOU WITHDRAW THE ORGAN-GENUS FROM THE CODE, GIVE IT TO ME

Having read the discussion on the genus concept in IOP Newsletter 5 I am taking the liberty to state my opinion on this question, as I am deeply grieving that the concept of the organ-genus was abolished by the Leningrad Congress in 1975. It seems evident to me that plants may be classified in many ways, according to the particular characters that different taxonomists prefer. In particular, every classification of fossil plant remains may be treated as a classification of whole plants. This does not contradict Principle IV of the ICBN, since the question there is of a "taxonomic group with a particular circumscription, position and rank" and not of a particular plant. So each plant can principally bear more than one correct name according to its position in different and independent classifications. Fossil miospores are a good example of this flexibility.

Traditionally however, botanists built only one classification for whole plants - a so called 'natural' system, with species, genera, families, orders etc, and only the necessity involved by the imperfection of plant remains made them apply other classifications ('artificial systems' with form taxa or turmae etc). Besides miospores, such classifications are already proposed for dispersed cuticles (Meyen, 1965) and the remains of leaves without cuticles (Maheshwari & Meyen, 1975). The need of such classifications is conditioned by the absence of a simple correlation between the different organs or characters of a plant. For example, different sporangia can produce identical spores, and on the contrary different spores can be produced by one sporangium. So if we find dispersed spores we cannot assign them to any taxon of the classification based on sporangia and are forced to build independent classifications based on spores.

Although I believe that objectively all such classifications are equal in rights, it may be useful to have one privileged classification for a universal botanical language. Hence, each plant will have many names, but only one main name corresponding to its position in the privileged classification. Taxa of generic rank will be called genera in this privileged classification, and form-genera in all other classifications.

The concept of the organ-genus is automatically involved with the concept of the genus, and breaking a set of plant organs in palaeobotany as a projection of a genus to a certain type of organ: two plant remains are assignable to one organ-genus if they belong to one type of organ, such as a leaf, a stem, fructification, miospore and so on. The plants which produced them belong to one genus. If parent plants belonged to different genera and their organs show a certain similarity, they may be united into a form-genus. In practice, I think, the question of whether a taxon of generic rank is a form-genus or an organ-genus must be solved by the following rule: every new taxon of generic rank established for incomplete remains must be regarded as an organ-genus, until it can be proved that it is a form-genus. Eg Pollen grains of Vesicaspora were extracted from sporangia assignable to two genera Callandrium and Idanothekion. Consequently, Vesicaspora has proved to be a form-genus. Somebody however can unite Callandrium and Idanothekion on the grounds of similarity of their pollen grains, but this action concerns taxonomy rather than nomenclature. Thus, the very question whether a certain taxon is an organ-genus or a form-genus is a taxonomic one, just as is the question of rank. Is the ICBN aimed to clarify taxonomic problems? I am not sure.

A.V. Gomankov, Moscow, USSR.

UNSTATED REQUIREMENTS IN NOMENCLATURE FOR PLANT FOSSILS

This item was submitted for inclusion in the IOP Newsletter early last year, but was withdrawn until the publication of the 1978 Leningrad ICBN.

The manner in which scientific names are used in systematic study of taxonomic groups (taxa) is a specialistic field usually referred to as nomenclature. It involves agreed upon practical principles (such as the hierarchical model) and technical details that may involve only matters of convenience. Most of all, the conventions of nomenclature express consistent and accepted methods of using nomenclatural language. Experience has shown that nomenclatural pitfalls exist which can lead to misunderstanding and, as a minimum effect waste time or lead to more serious consequences. If our method of treating names is consistent it provides a means of discussing substantial questions about the relationships of taxa; otherwise discussion is most likely to lead only to wordy digression about subjective matters of expression. The correct use of nomenclature facilitates discussion of taxonomic relationship.

One of the principles of greatest concern involves the authoritative relevance of words used as names; in other words, the decision whether a name or class of names is appropriate for formal treatment within the nomenclatural system. Some obvious requirements of form and presentation are established in the International Code of Botanical Nomenclature but some requirements are only implied. Essentially these unstated requirements go without saying in the taxonomy of plants, such as the fact that scientific names apply formally only to groups of one or more individual organisms, that an individual organism consists of all parts of its life cycle with all parts equally entitled to its name wherever recognized, and that the same connected specimen cannot properly be assigned simultaneously to more than one taxon of the same rank. Normally the unstated requirements pose no problem among modern plants but they are likely to cause confusion for those studying fossil organic remains where the organismal relationship is less obvious. I do not believe a Code of Nomenclature should attempt to cover every contingency but a greater appreciation for the unstated requirements in scientific nomenclature may aid in understanding and rationalizing the application of names for groups of fossil plants.

It is a common practice in palaeobotany to speak as if stems, or leaves or spores were directly given names. This view is incorrect nomenclaturally because stems or leaves or spores or other parts of plants all represent portions of some kind of organic life cycle which in its entirety comprise the individual plant. Any isolated spore coat carries the definite botanical implication of existence of other phases that complete its life cycle, whether or not details or even the main events within the cycle can presently be suggested. The existence of the life cycle, as predicated on a spore (or a leaf, or a stem), is one of the essential considerations that justifies applying scientific nomenclature to a group of organisms represented only by a spore. Certainly if no such life cycle could be inferred the whole biological basis for taxonomic treatment would be demolished; fossil spores in that case could only be classed as 'inexplicable objects'. This obviously is not true and I conclude that some elision of expression commonly occurs in stating the nomenclatural operation as applied to fossil plants. Actually a group of similar life-cycle organisms generally is implied for every taxon that bears a scientific name. A taxon may be represented by an individual specimen but useful and significant taxa generally are represented by more abundant evidence, usually evidence derived from several or many individuals showing the same segment of the organic life cycle. Comparable stages provide the only source of comparable hereditary characters by which identification is made. Incomparable life-cycle stages, howsoever "wishful" in association they may be, cannot be identified by the same name without much supporting and objective evidence. Ordinarily such evidence is rare and prudence indicates caution

regarding their identity. Whenever question arised one may reflect that two names, rather than one, will provide a satisfactory and unambiguous means of characters inherited (biocharacters) is such that use of only a single name will best convey all essential information. Regardless of this, scientific names apply only to taxonomic groups; they do not apply directly to the organic parts for which morphologic terms are appropriate.

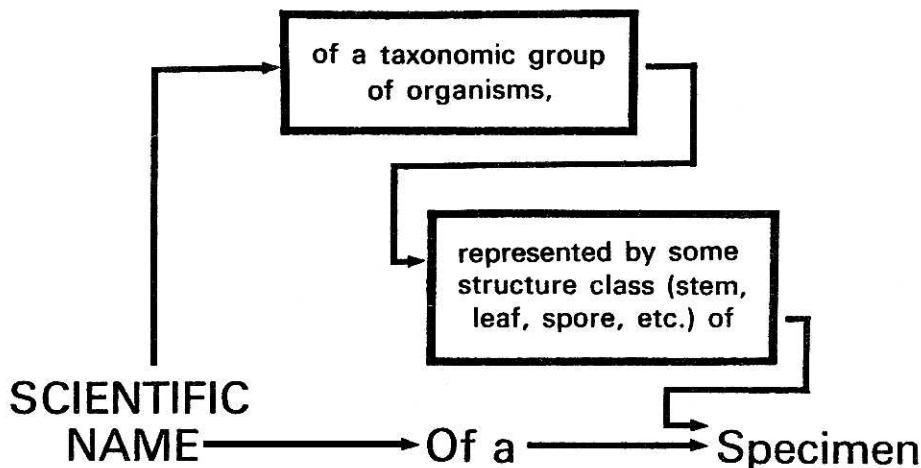


Figure. - Verbal expression of the relationship of name to specimen:

- (1) Above, fully implied elements of expression
- (2) Below, common form of expression, with elision

The essence of verbal functional elision in naming is suggested by the accompanying diagram. I do not suppose use of the abbreviated form will ever be eliminated and it is not important whether it is or not. The only important consideration is to recognize such an expression for what it is - an abbreviation of an expressed nomenclatural relationship - not an expression of literal truth. Even if an author seems to insist that a name applies only to a leaf (or similar plant part) it seems to me the more appropriate procedure is simply to regard this as a mistake subject to correction and to treat the name as legitimate, provided other requirements are complied with. Not only is this procedure most likely to be acceptable to the author of the name but it is the most likely course of interpretation by others. However, there is no question that a scientific name applies to a group of organisms (not to a group of plant parts) if it is to qualify as a relevant scientific name subject to provisions and treatment according to the Code.

All fossils are incomplete representations of life cycle stages of an organism but some specimens occasionally show an unusual assembly of parts which convey significant information. Sometimes attempts are made to apply different taxonomic names to different parts of the connected fossil assembly. Such procedure, of course, results in taxonomic nonsense. T. M. Harris' classic treatment of *Naiaidita* (Brit. Mus. (N.H.), 1938) is an example in which such a practice was not followed. Even though few other kinds of fossils can provide a similar demonstration, his practices as shown by this example should, wherever possible, be emulated. As a different type of example, consider that the fruits of genus *Quercus* cannot possibly occur in organic connection with the foliage of genus *Acer*. Anything suggesting that two taxa of generic rank could have grown within the same life cycle contradicts biogenetic law. Organic connection of plant parts serves as proof of a biocharacter correlation for one individual plant. The connected specimen can bear only a single legitimate name and be assigned to only one taxon, even though biocharacters characteristic of several genera may be shown in connection. Such specimens serve to indicate the close and overlapping relationship between some types of fossils that usually occur in separation. A choice of taxonomic assignment is possible in such instances; preference for the taxon having the greater botanical significance is advised. Question always arises as to the time period that the specific hereditary features of such specimens have or will remain in a consistent correlation. One specimen may indicate an intimately overlapping phyletic relationship existed between taxa usually treated as separate, but it does not define the duration of the alliance. Caution must be advised; duration is of essential importance in synonymy of taxa based on fossils. Until duration has been determined in detail it is most hazardous to imply that all of the less complete specimens, wherever found, are similar and should be identified together. Specimens showing the correlation of multi-structural parts are extremely important in determining relationships of structural features but it takes more than one specimen of organic connection to show the duration of correlated persistence of specific characters. Much correlational evidence is needed to relegate one name to disuse (positive synonymy) and actually show that the same taxon can be generally identified by use of only a portion of its diagnostic features. Common types of fossils are best identified by use of names that apply definitely and specifically. Definitive taxonomy cannot be based on conjectural and extended correlation of various plant parts.

There are other unstated corollaries in nomenclature. For example a species name does not require consideration as legitimate if there is no indication that it ever had a nomenclatural type. Prior to 1953, type specimens need not to have been cited, so type specimens of older names may be obscure but the names can still be typified. By the same token, a generic name is illegitimate if it lacks at least one assigned species. Genera only exist as a taxonomic group of one or more related species; if there are no species there can be no genus. The problem of generic categories much referred to in palaeobotany, the form genus, the organ genus and regular genus, is a topic that may be discussed more fully later. I take the view that these kinds of genera are a good deal less important than some seem to think, because they continue to be subject to the varying interpretation of any taxonomist. A little research will show diversity and irregularity of usage but this diversity has not been an impediment. The point of critical importance, however, is that taxa of all of the generic categories are designated without preference by legitimate nomenclature. It should be a great source of satisfaction to know, whether or not there is a divergency of opinion about how these categories should be interpreted, that nomenclatural legitimacy can be objectively determined in every case and with this conclusion disagreement is unlikely.

J.M. Schopf.

THE PROBLEM OF ORGAN-GENERA AND FORM-GENERA

I believe that these two original concepts stemmed from the two strategies of systematic palaeobotany: fossil plants have been classified either 'backwardly' in respect to extant taxa (eg Adiantites, Taxites - the ites strategy) or by their intrinsic qualities (eg Lepidodendron, Sphenophyllum - the dendron-phyllum strategy). These two strategies have been reflected in the Paris Code and the Seattle Code through the definitions of organ-genera (belonging to a family: ites) and form-genera (not belonging to a family: dendron-phyllum). The ites strategy was blending and often misleading. The dendron-phyllum strategy was labelled 'purely morphological', as opposed to the 'natural' classification of extant plants. However, this latter is also morphological and the dendron-phyllum strategy is not immune against phylogenetic speculations. Why then should there be distinct organ-genera and form-genera?

In Leningrad, the general spirit was like this: let scholars argue over the concept of the organ-genus. But the concept of the organ-genus may prove to be useful in studying single trait evolution. Even though the philosophical reasons for retaining both the organ-genus and the form-genus are rather weak, there remains the practical necessity to cope with separate organs and various kinds of fossilisation. I feel that one special taxon, the organ-genus, is enough, and I would propose the following definition:

An organ-genus in palaeobotany is a taxon for shedded, dispersed or disintegrated parts of plants. Different organs, cells or tissues of a single plant, and differently fossilized organs of the same category may belong in different organ-genera. Establishing connections between fossilised items and their different preservational forms does not invalidate respective organ-genera.

Examples: the leaves, male organs and fruits of the Caytonia plant belong respectively in the organ-genus Sagenopteris Presl., Caytonanthus Harris and Caytonia Hamshaw-Thomas. Though Taeniopteris vittata Brongniart, the type species of the organ-genus Taeniopteris Brongniart yielded cuticular characters of the organ-genus Nilssoniopteris Nathorst, the name Taeniopteris is still applicable to the ribbon shaped leaves when only gross morphological characters are available.

V.A. Krassilov, Vladivostok, USSR.

NURSERY RHYMES FOR PALAEOBOTANISTS

These quotations from the 'Book of Bonk' were submitted for inclusion in Newsletter 8 by Dr J. Douglas, Melbourne, Australia - to test your sense of Hueber.

LITTLE JACK HORNEA

Little Jack Hornea rubbed his sore cornea
So tired and fammenished was he;
For this fossilised vascul - ah such a rascal
Was the first of his family (tree).

SIMPLE SORUS

Simple Sorus met a chorus girl going to the fair,
Said simple Sorus "Are you for us, or rich girl, maiden-heir?"
But simple Sorus he was spurned, not though he was so (s)-poor
But because he was so gradate ferned, with dictostelic core.

LITTLE MISS MUFFT

Little Miss Mufft, cycadophyte tuft, lived on the Aptian Way,
Till Zamites espied her and so sorely desired her
He phytoned Miss Mufft away.

HICKEY DICOT DOC

Hickey, dicot Doc, leaf fossils in a rock,
So the rock was reticulo, domo-reticulo,
Hickey, dicot Doc.

BARRY BARRY BLACKSHEEP (ON BARAGWANATHIA)

Barry Barry black sheep
 Have you any wood?
 Maybe, maybe - but it isn't any good.
 Even if you're Lyco, it's still in vein,
 Face up to Bill Chaloner: you're not Silurians.

OLD KING CLEM

Old King Clem has a meri meri stem
 A meri meri stem has he;
 Call it a bole, or whatever its role,
 It all leafs me-so-thryll free.

JACK AND JILL

Jack and Jill went up the hill
 To fetch their pailobotany.
 Alas they were Precranium:
 Cried Jill: "We haven't got any."

NEWS OF PALAEOBOTANISTS

- B.A. THOMAS of Goldsmith's College London is spending the first three months of 1979 at the University of Cape Coast. He will be teaching palaeobotany and collecting specimens.
- D. EDWARDS of the University of Cape Coast is on an exchange visit to Goldsmith's College London until April.
- R.H. WAGNER of the University of Sheffield, England, presented a paper on the biostratigraphy of the Carboniferous and Permian in South America at the Field and General Meeting of the IUGS subcommission on Carboniferous stratigraphy, which was held in Turkey during May 1978. He also presented a report on the Cathaysian flora of Venezuela.
- F.P. JONKER retired from his academic duties in the State University of Utrecht in The Netherlands on September 1st 1978. He will continue his scientific career and will be working chiefly at home: Brugstraat 2, 4147 Ax Asperen, The Netherlands.
- S. SENGUPTA can now be contacted at the Palynology Section of the Bose Institute, 93/1 Acharya Prafulla Chandra Road, Calcutta 700 009, India. Recently she revisited London and the USA.
- J. MULLER recently gave a lecture entitled 'New palynological evidence for the origin and differentiation of the Angiosperms' during a visit to Stockholm. He was a guest of the Riksmuseum and the University.
- M. DURANTE from the Geological Institute of the Academy of Sciences at Moscow plans to visit the Riksmuseum in Stockholm to study material from the Late Palaeozoic of China.
- E.O. NOVIK from Kiev, who is a corresponding member of the Ukrainian Academy of Sciences celebrated her 80th birthday on 14th December 1978. She is well known for her work on the Carboniferous floras of the Donets and Lvov-Volyn basins and of the northern Caucasus, and is still very active.
- J. DOUGLAS of the Geological Survey of Victoria has nearly completed work on a manuscript describing the fossil floras of Victoria. It is intended for field naturalists, schoolchildren and the general public. In the August 1978 edition of Victorian Naturalist he published a paper entitled 'Victoria's oldest flowers'.
- D. CHRISTOPHEL of the University of Adelaide, together with students BOB HILL and DAVE BLACKBURN are gaining momentum with their studies on the Early Middle Tertiary floras of South Eastern Australia. Their first publications on the Anglesian brown coal floras are well advanced.
- M.C. BOULTER of London will be visiting the Institute for Environmental Sciences at the University of the Orange Free State, South Africa, during February and March 1979. He will help pioneer studies on Tertiary pollen and spores from boreholes off-shore.

NEW RESEARCH UNIT IN ARGENTINA

Dr S. Archangelsky has written to explain that a new Research Unit of Palaeobotany and Palynology has been established in Buenos Aires, CIRGEO (Centro de Investigaciones en Recursos Geológicos), under the auspices of the National Research Council, Education, Science and Culture Foundation and the Miguel Lillo Foundation.

"We have moved to the new laboratories a few months ago and are again continuing with our current research. My old colleagues and friends J.C. Gamarro, E.J. Romero (part-time), R. Leguizamon and A. Baldoni de Moreno (part-time) form part of the team, together with research students, three technicians, two librarians and a secretary. All of us continue with the same research programmes as before." The new address is: CIRGEO, F.R. Velasco 847, 1414 Buenos Aires, Argentina.

HOW TO OBTAIN RUSSIAN LITERATURE

In response to a number of requests from IOP members Dr S.V. Meyen (109017 Moscow, Pyzhevsky per. 7, Geological Institute of the Academy of Sciences of the USSR) has written: "There is a special Soviet organisation 'Mezhdunarodnaya kniga' (International books) for selling our literature abroad. I contacted them recently and was informed that in many countries there are booksellers distributing Russian literature and which have relations with Mezhdunarodnaya kniga. In order to obtain literature please apply to these bookshops. This indirect method is the only one possible (I do not mean that there is no possibility to apply to an author directly - that is of course possible and I will gladly provide the address of any author when anybody needs to know it)."

BIBLIOGRAPHIES

BIBLIOGRAPHY OF AMERICAN PALEOBOTANY, 1977

This 97 page bibliography was published during October last year and is available from Dr C.N. Miller, Botany Department, University of Montana, Missoula, Montana 59812, USA. As usual it is compiled by A.D. Watt and contains information organized in the same way as in previous editions. The front and back covers carry the personal bibliography of the late Professor Chester A. Arnold.

BIBLIOGRAPHY OF LATINAMERICAN PALAEOBOTANY AND PALYNOLOGY 1977 - 1978

Bulletin 5 of the Asociacion Latinoamericana de Paleobotanica y Palinologia was published during December 1978 and contains a twelve page bibliography of recent work. Copies can be obtained from the president of ALPP (who also serves as an IOP vice president) Dr S. Archangelsky at CIRGEO. The address appears above.

REQUEST FOR BIBLIOGRAPHIC INFORMATION

Dr R. Weber, Instituto de Geologia UNAM, Ciudad Universitaria, Mexico 20 D.F. has written asking for help from IOP members:

"I am working on an extensive bibliography of palaeobotany and palynology. This documentation was planned and started due to the somewhat fragmentary information available in the public libraries of Mexico which hampers our research work very much. I cancelled the project when I heard about the plan of Dr Tralau to compile not only the contemporary bibliography in this field but also one for palaeobotany before 1950. After Tralau's death I began work on the project again. I do not plan to compile a complete bibliography of publications before 1950. I also do not wish to produce some kind of "World Report" which other more influential people cannot publish. My idea is to compile a bibliography of bibliographies (regional, special topics, authors etc), annotated bibliographies, abstracting journals and catalogues, and to list currently available documentation centres covering palaeobotany and palynology.

At present I am actively searching for obituaries to palaeobotanists and palynologists and would welcome help from IOP members who may know of useful sources.

BOOK REVIEWS

INDEX OF FIGURED PLANT MEGAFOSSILS: CARBONIFEROUS, 1971 - 1975. M. Boersma and L.M. Broekmeyer, 1979. Publications of the Laboratory of Palaeobotany and Palynology University of Utrecht. 190pp. 40Dfl. Copies of the index may be obtained by sending an international money order for 40 Dutch guilders, which includes the cost of surface mail, made out in favour of "kp. 714.724.830" to Mr A.J. Goslings, Department of Palaeobotany & Palynology, Heidelberglaan 2, De Uithof, Utrecht, The Netherlands.

This important new contribution to the 'data recovery' sources of palaeobotany enumerates all the Carboniferous plant megafossils of which illustrations have been published during the five years 1971-75 inclusive. The decision to limit the treatment to figured specimens makes good sense to a palaeobotanist; for the same reason that the Code of Nomenclature requires an illustration as the basis for valid publication of a new fossil plant taxon, so for most of us the publication of a figure puts before the reader a (usually) adequate basis for judging the reliability of the identification of a plant fossil.

The literature available to help palaeobotanists in their research has taken some serious blows over the last decade; particularly, the cessation of Boureau's World Report of Palaeobotany, the final up-dating to 1973 of the U.S.G.S.'s Index of Generic Names of Fossil Plants, the probable demise of the Fossilium Catalogus (Plantae) and the uncertain future of Hans Trautau's splendid Bibliography following his untimely death. This sad record makes the publication of this new venture from Utrecht particularly timely and its appearance is a welcome boost to palaeobotanical morale. The starting date of Boersma and Broekmeyer's compilation coincides with the closing date of Trautau's opus; and for the five year time interval that it covers this work offers, for the Carboniferous period at least, much more detailed information than any of the sources cited above. For each species of Carboniferous megafossil plant figured in any journal or book between 1971 and 1975, the authors cite the literature source and figure reference, the location to a country, state or province, and the appropriate stratigraphic unit. The latter is given at the level of the customary stage names of Namurian, Westphalian and Stephanian, for example, of the Upper Carboniferous of Europe, and as far as possible to equivalent units elsewhere. All references are cross-indexed three ways, on the basis of the plant's systematic status, on a geographical basis and in its stratigraphic occurrence. For example, one can see all records of the species of Alethopteris for which figures were published in that period (there were 52 different species illustrated); or of the seven reputedly Upper Carboniferous plant species which were figured from Antarctica. The scope of the work involved is shown by the fact that within this five year period 206 new megafossil plant taxa were described from rocks of Carboniferous age, including 29 new genera.

The work unquestionably sets an example of a very high order of detailed bibliographic documentation. If this volume can be followed by its planned successors (the next volume scheduled deals with Triassic plants) the palaeobotanical community will have been well served. We can only wish this enterprising publishing venture the good success it deserves. W.G. Chaloner, London, UK.

COASTAL SEDIMENTARY ENVIRONMENTS. (Ed.) R.A. Davis, 1978. Springer-Verlag, New York. 420pp. US\$22.

This new compilation book is advertised as being "primarily aimed at students of Geology". It is a pity, therefore, that the overall emphasis in the book is one of a two dimensional look at this important area of sedimentation. For the most part the occurrence of animal and plant material is ignored both from the point of view of interactions of living forms with the sediment and also that such dead and broken material may be considered as a sediment in its own right. Exceptions to these criticisms are perhaps the chapter by Wright on 'River Deltas' where a number of composite stratigraphic columns are included (from the published work of Coleman and Wright) and the chapter by Frey and Basan on 'Coastal Salt Marshes' who amply illustrate environmental conditions and marsh zonation, and discuss the associated animals and plants at some length. Their Table 9 on characteristic sedimentary structures in Mugu lagoon marsh, which includes an analysis of environment as well as physical and biogenic structures, could and should have been made a standard for

other authors to follow, enabling a geologist to characterise his sediments at a glance. It is a pity that little reference is made to Coleman's classic work (Coleman, J.M., 1966. Recent coastal sedimentation: Central Louisiana coast. Coastal studies series, Louisiana State University Press, Baton Rouge, 17, 73pp). The final chapter on 'Coastal Stratigraphic Sequences' does try to give a three dimensional picture, but the sections are rather too general. The book is quite long with a lot of illustrations, and at £22 is well priced. I recommend it only for libraries.

A.C. Scott, London, UK.

PALYNOLOGY. The journal of the American Association of Stratigraphic Palynologists Inc., Volume 1 1977 and Volume 2 1978. Annual subscription for individuals US\$15. Mail orders to R.T. Clarke, Mobil Research and Development Corp., Field Research Laboratory, P.O. Box 900, Dallas, Texas 75221, USA.

The introduction of any new journal on palynology must be controversial, for there are so many already, and some are good and many less so. In that this replaces Geoscience and Man there is perhaps less to complain about; the more understandable title of the new journal must show some progress in itself, even if it does encourage us to think of palynology as a subject discipline rather than as a tool to help study botanical and geological problems.

In establishing their format and style the editors have been influenced by their experience with Geoscience and Man and have opted for a very high quality product. These first two volumes have a very high standard of paper, typography and illustration, which is matched by the usefulness of the articles they contain. The series of five papers in volume one on organic maturation for instance give concise accounts of currently presentable knowledge on this topic, which is useful for both research and teaching. As well as the usual spread of articles on systematic palynology, both volumes contain papers of substantial originality for their demonstration of method and objectivity. It is high quality work and shows that palynologists are achieving high intellectual standards.

In addition to the new journal AASP also publish a Contributions Series, printed to the same high standard as the journal, but with a crude plastic ring binding. The articles in this series are based on a particular theme for each number and doubtless have a more specialised appeal.

There is one major factor that concerns me about publications of this kind. It is that they are so very expensive to produce. Recent inflation in western economies has meant that publishing costs have soared, often with the result that students of science have greater difficulty in gaining access to knowledge. I suppose it is a phenomenon that will influence our lives for the rest of this century. If the objective of journals of this kind is to propagate ideas then surely less sophisticated and more utilitarian presentations would have a wider circulation. Connected with this view is a peculiarly palynological problem. There is an increasingly respected approach developing that illustration has a very major role in the process of palynology. The recent work of Anderson (reviewed in IOP newsletter 5 and discussed in newsletter 6) demonstrates this methodology in an extreme way: it illustrates about 5,000 specimens and has only 67 pages of text. Publications with standards of reproduction like Palynology (let alone Palaeontology and Palaeontographica or even the cheaper looking organs from Elsevier and others) cannot hope to accept work in the Anderson mould unless the author is able to make a very substantial financial contribution. Very cheap reproduction of the text, together with very high quality plates, can be achieved very economically. If we could settle for such less exclusive quality our work might progress a little further more quickly.

M.C. BOULTER, London, UK.

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