INTERNATIONAL ORGANISATION OF PALAEOBOTANY

IOP NEWSLETTER 53

DECEMBER 1994

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PLEASE MAIL NEWS AND CORRESPONDENCE TO YOUR REGIONAL REPRESENTATIVE OR TO THE SECRETARY FOR THE NEXT NEWSLETTER 54.

The views expressed in the newsletter are those of it's correspondents and do not necessarily reflect the policy of IOP.

REPORT OF A RECENT MEETING

INTERNATIONAL WORKSHOP ON THE BIOLOGY AND EVOLUTIONARY IMPLICATIONS OF EARLY DEVONIAN PLANTS

Munster, Germany, 14th-17th September 1994.

This was held at the Forschungsstelle fur Palaobotanik Westfalische, Wilhelms -Universitat and jointly funded by the university and the Deutsche Forschungsgemeinschaft.

Hans Kerp welcomed participants and introduced Muriel Fairon-Demaret who paid a moving tribute to Professor Suzanne Leclercq, University of Liege, to whose memory the workshop was dedicated.

Students of early land plants from 11 countries including China, South Africa, Russia, and South America gathered for a stimulating and productive exchange of data. Both materials currently under study and some published recently were subjected to critical examination. Papers covered such items as *Prototaxites* as a fungus, *Pachytheca* as an enigma, elaborate analyses of the growth, form, habit, and ecological setting of gametophytes and sporophytes from the Rhynie Chert, trimerophytes, *Spongiophyton* as a lichen, plant-animal interrelationships as shown by wound repair tissue, rotifer-like organisms, trigonotarbids, and coprolites, the life cycle and modes of nutrition of zoosporic fungi in the Chert, the relationships of barinophytes to zosterophylls, a report of the first *Archaeopteris* in South Africa, a new occurrence of chert like that at Rhynie discovered by bore-holes, enigmatic plants from Siberia, lycopsids from China, a cladistic analysis of early genera, and quantitative relationships between dispersed and in situ spores.

The mass of material presented was subjected to a concluding, spirited free-for-all discussion. As would be expected, disparate points of view were expressed and debated. Clearly, the new data on the flora and fauna of the Rhynie Chert and its significance in interpreting an early ecosystem have changed long-standing concepts of terrestrialization but participants agreed enthusiastically that we are witnessing an exiting and ever expanding panoramic view of early life on land.

H.P.BANKS & F.M.HUEBER, USA

NEWS OF FORTHCOMING MEETINGS

INTERNATIONAL CONFERENCE ON DIVERSIFICATION AND EVOLUTION OF TERRESTRIAL PLANTS IN GEOLOGICAL TIME.

Nanjing, China, September 4th-8th, 1995.

Up to now, the Organising Committee has received replies of the First Circular from 120 palaeobotanists, which 64 palaeobotanists are from 20 countries including Argentina, Australia, Austria, Brazil, Czech, Denmark, France, Germany, Grusia, India, Japan, Mexico, Mongolia, Netherlands, Poland, Russia, South Africa, Spain, United States and Viet Nam.

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INTERNATIONAL SYMPOSIUM OF ECOSYSTEM EVOLUTION

Moscow, September 26th-30th, 1995

The International Symposium on **Ecosystem Evolution** will be focused on palaeontological aspects of this interdisciplinary issue, though the extant ecosystem researchers are encouraged to participate.

The following problems will be addressed:

1. The origin and early evolution of marine and terrestrial ecosystems.
2. The origin of the modern type ecosystems.
3. Ecological successions in palaeo-ecosystems.
4. Co-adaptation and symbiogenesis.
5. Ecosystem crises and their causes.
6. Palaeoecology and ecological forecasting.

The Symposium will take place in the new building of the Palaeontological Museum of the Palaeontological Institute, Russian Academy of Sciences, housing a great wealth of palaeozoological and palaeobotanical collections, as well as relevant works of art.

The Provisional Programme includes three days of Scientific Sessions, September 26th- 29th, and one day Field Excursion to palaeontological sites in the outskirts of Moscow, September 30, as well as social events and Museum Visiting - Sightseeing Tours.

Abstracts of papers and posters should be in English or Russian and include: [1] title, [2] author, [3] text of no more than two printed pages. Abstract submission by e-mail or fax is recommended.

Registration fees: 70 USD [students 30 USD] payable at registration include participation in the sessions, social events and printed materials of the Symposium.

Field Excursion : Costs for participants and accompanying persons: 20 USD.

Accommodation : Russian Academy of Science Hotel "Uzkoye": approximately 50 USD per night.

Weather: normally cool and sunny with occasional rains, temperature range 10-16 degrees C.

Deadline:
for Pre-Registration Form: January 1st, 1995
for Abstracts: March 1st, 1995.

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PEABODY ON THE NET

The Peabody Museum of Natural History at Yale University is pleased to announce the availability of a Gopher server for Internet access to its collections. The Peabody Gopher was launched on 30th 1994, at the present time it contains data on over 1 million of the museum's approximately 11 million specimens / objects. Among the material on-line are 11 000 types from the collection in Palaeobotany (497) , Ichthyology (311) , Invertebrate Palaeontology (8270) , Invertebrate Zoology (826) , and Vertebrate Palaeontology (1194) . The material currently available includes:-

DISCIPLINE	CATALOGUE UNIT	TOTAL UNITS IN COLLECTION:	UNITS ON GOPHER
Anthropology:	lot/individual	267,000	60,824
Botany/Palaeobotany:	individual	360,000	16,809
Entomology :	lot/individual	900,000	5,705
Invert/Palaeontology:	lot	300,000	24,189
Invert/Zoology:	lot	300,000	8,584
Mineralogy :	individual	40,000	29,115
Scientific Instruments:	individual	2,000	573
Vertebrate Palaeontology:	individual	120,000	28,132
Vertebrate Zoology:			
Herpetology :	individual	14,400	14,400
Ichthyology :	lot	9,908	9,908
Mammology :	individual	4,806	4,806
Ornithology :	individual	113,648	113,648
Osteology :	individual	13,799	13,799

In addition, the Peabody Gopher offers a geographic name locator service, allowing you to look up the latitude, longitude, and county for over 1.2 million of the labelled features that appear on the 1:24,000 scale topographic maps published by the US Geological Survey. This abridged version of the USGS "Geographic Names Database" contains 133 ,813 records representing populated places (cities and towns), and 1 100 ,200 records representing other features (parks, ridges, rivers, mountains, etc.).
The Peabody Gopher's address is:
gopher.peabody.yale.edu, port 70.

Comments about the data are most welcome, and are best aimed via electronic mail at the Collections Manager (s) in the respective curatorial discipline (s) of your interest. See the "Staff Electronic Mail Addresses" file on the main menu of the gopher for further information.

DAMAGE FROM USING COMPUTERS ?

It was interesting to read Marjorie Muir's comments on "The future for palynologists and palaeobotanists" (IOP Newsletter 52), closely followed by Inna Dobruskina's remarks, entitled "Damage from using computers", on the paper by Ziegler et al. (1993). Dr. Muir rightly believes that one way "to reinvigorate a science is through the cross- disciplinary approach". Dr. Dobruskina criticises, "a reviewing paper by modern Americans - users of computers", stating that "the illusion is created that the computer itself gets new conclusions and it is not necessary to know the material itself. It permits work without any respect to predecessors, without any knowledge of what has been done before".

Firstly, the computer is not making any decisions - it is merely arranging data according to a set of rules, statistical procedures, that it is told to use. By making these rules explicit we are ensuring that everyone, even those of us who are not the intellectual giants that Dr. Dobruskina names, can obtain insight into the global patterns of plant geography through time. Secondly, it is regrettable that these methods and the interest of non-palaeobotanists in plant fossils is perceived as a threat.

What is the solution? To proceed with computer analysis of the rich plant fossil record (which treats fossil plants as invaluable tools in phytogeographic and palaeoclimatic interpretations), whilst always being aware of the limitations of the data and the enormous contributions made by generations of palaeobotanists? Or to leave the books and papers

written by palaeobotanists well alone, because they are subjective and require a lifetime of accumulated knowledge to synthesise, thus remaining obscure to other scientists? The problem with the latter option is that in the future there may not be palaeobotanists around to proceed with such studies!

Computers are not to be feared or blamed for misuse. They are only a tool. The blame, if any must be apportioned, lies either with people who do not understand what they are doing and lose sight of the limitations of the primary data - the fossil plants - when using computers, or else with those who cannot see beyond a fossil stem or leaf fragment to consider the broader implications of what they are doing. We feel that we lie some- where between these two extremes - exactly where is for others to judge. By working as part of a team (such as with Fred Ziegler), and by intcracting with other palaeo-geographers, climate modellers, structural geologists, sedimentologists, geophysicists, other palaeontologists, computer scientists and, yes, even with other palaeobotanists, we arrive at a more complete understanding of what our planet was like through geological time, how the vegetation was distributed and evolved and how climates changed.

As a community, we must surely adapt and evolve rapidly to meet the new challenges and changes, including those in technology. If not, then perhaps the damage will have been self-inflicted. At least computers cannot be blamed for that.

P.REES & R.A.SPICER, Milton Keynes, UK

We wish to respond to the comments made by Inna Dobruskina "Damage from using computers", (IOP Newsletter 52) on the paper by Ziegler et al. (1993). She is generally correct in believing that the conclusions in the paper may not seem, at first, any different to those made previously by her, Vakhrameev, Krassilov, Harris, etc. However, the important point is that we are applying multivariate statistical analyses to entire plant assemblages, instead of just selecting individual genera (e.g. distribution of *Dictyophyllum, Ginkgo, Frenelopsis*, etc.) and plotting their geographic and stratigraphic ranges as in previous studies. Thus, we are able to interpret biomes based on assemblages (which approximate more closely to the original vegetation and therefore climate). Furthermore, the use of the "biome concept" provides a standard means of comparing floras and climates throughout time, whether Palaeo-, Meso-, or Cenozoic, instead of having different names for provinces, regions etc. in different time intervals.

We are well aware of the immense contributions made previously by numerous palaeobotanists and the fact that we are benefiting to a large extent from their labours. We are also well aware of the numerous potential problems involved when using fossil plants to interpret palaeoclimates (taphonomic bias, stratigraphic control, taxonomic inconsistency, etc.). In fact, it is only by the use of explicit rules (statistical analyses) that we can evaluate the importance of the potential problems. An example of the way in which political/cultural boundaries may have influenced taxonomic philosophy is presented by Spicer et al. in the same volume as the Ziegler et al. paper. It is important to recognise the weakness' and limitations of using fossil plants, but it is as equally important to utilise their potential to the fullest extent possible. The fact that our methodology and initial results "confirm" previous work shows that ours is a robust and promising approach. It is simply a step forward in improving our understanding of fossil plants and climate through time. Indeed, our kind of work provides a powerful argument for the continuing development of taxonomic expertise, something under threat these days!

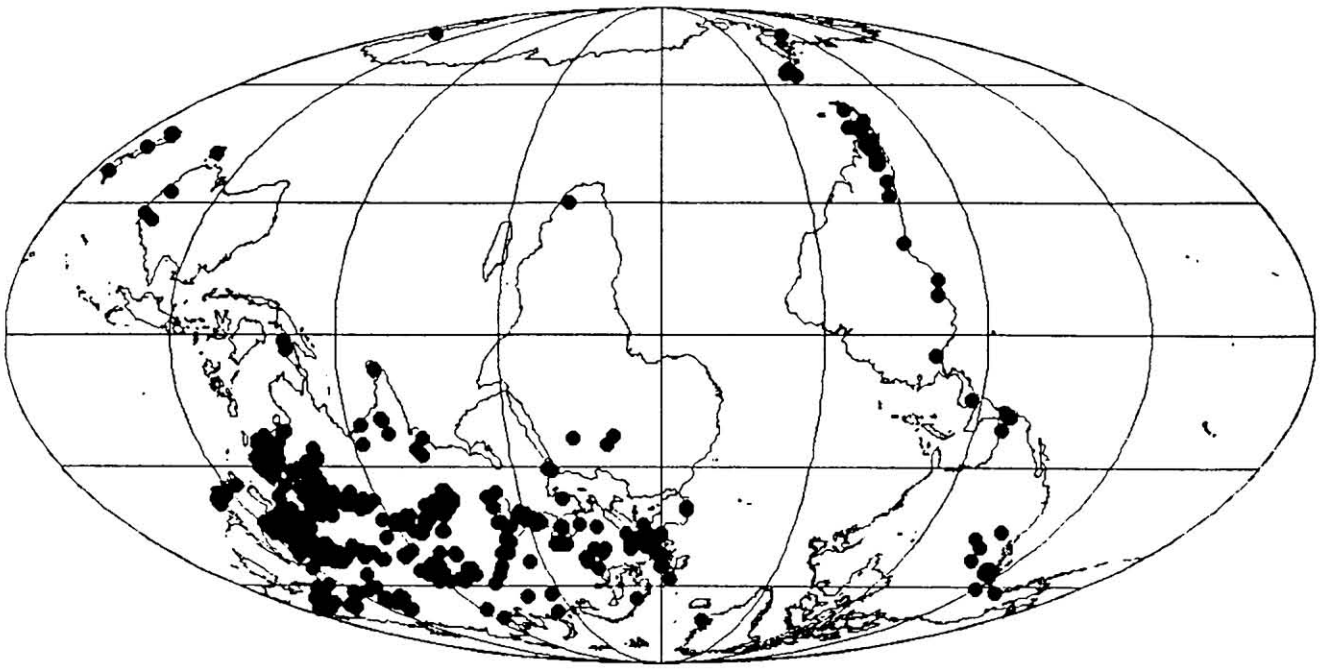
It was stated in the Ziegler et al. paper that "Our goal in the present study is to introduce some rigor into phytogeography by subjecting all this data to a modern statistical treatment". Firstly, this provides a test of the Russian work and, more importantly, the statistical methods give us the ability to extend the work as more floral lists become available, in China and the Southern Hemisphere, for instance. We have recently finished a second paper that will provide workers with the ability to place any floral list on the equator-to-pole gradient without having to resort to an ordination study. So, the paper by Ziegler et al. is just a preliminary one to provide the foundation for much more extensive work.

At the moment we have processed 600 Permian lists, 450 Triassic lists, and 850 Jurassic lists. These data are from throughout the world and will allow for much more extensive coverage than available before. Our options for identifying the biome that each list represents include ;

1. Make subjective judgements based on the limited criteria provided by Vakhrameev and others,
2. Get a member of the Russian School to examine the lists and make the determinations for us,
3. Use the Russian work as the standard and apply the statistical methods. Obviously, we have been forced to choose the last option.

We do take issue with some of the points made by Dr. Dobruskina. Krassilov and Vakhrameev differed in their opinion of the nature of the Siberian ginkgophyte forests, as to whether they represented cool- or warm-temperate biomes, respectively. We agree with Krassilov, but because Vakhrameev's book is the more recent, some western scientists are using Vakhrameev's conclusions. This is creating a potential problem when comparisons are made with General Circulation Model studies, for instance.

We also take issue with her contention that the point made, "that climate changes, perceived locally,



appear to be the result of continental motion, rather than true global change" contradicts the statement that "the transitions between biomes remained at relatively constant latitudes, from the Late Triassic to the Early Cretaceous, suggesting climatestasis over a long interval". The question is whether the continent moves and the climate transition remains at the same latitude, or vice versa. We support the former idea. The matter is certainly within the resolution of the technique since large portions of Eurasia move south about 20 degrees in the Jurassic alone. We point out that while this was happening, North America was moving poleward, so a sort of balance was achieved in the amount of area representing each biome. We would subscribe to the view that this represents plate tectonic change, but not global climate change.

We are in the final stages of assembly of our world-wide Triassic and Jurassic database and, in a spirit of co-operation, we are seeking help in identifying references to localities that we might have missed. The map of Jurassic localities gives an idea of the present data coverage. The Triassic coverage is similar. Information from stratigraphic as well as taxonomic papers is acceptable for our purposes because we are trying to obtain as broad a coverage as possible. The main requirement is that the full range of megafloral taxa is treated. The geographic sampling interval is about 100km and the stratigraphic interval is the formation. Therefore some spatial and temporal grouping of lists is tolerated, and even considered desirable, because we are mainly interested in broad climatic and geographic patterns.

Please take a minute to peruse the map, and if you can help us to fill any of the gaps, send the references to:

A.M. Ziegler, Dept. of Geophysical Sciences, Univ. of Chicago, Chicago, IL 60637, USA, **or**

P.McA. Rees, Dept. of Earth Sciences, The Open University, Walton Hall, Milton Keynes MK7 6AA,

We can provide a complete list of our references to anyone prepared to help.

A.M.ZIEGLER & P.REES.

NOMENCLATURE

A DRAFT GLOSSARY OF TERMS USED IN BIONOMENCLATURE

In July 1994 the International Union of biological Sciences published its Monograph 9: **A Draft Glossary of Terms Used in Bionomenclature** by DL. Hawksworth.

The objective of this draft glossary is to include definitions of terms used in all five current Codes or Rules of nomenclature, nomenclatural terms used outside the officially adopted Codes, and other technical words encountered in nomenclatural discussions. A preliminary version of this draft was prepared as a background document for a joint IUMS/IUBS Exploratory Meeting on "Harmonisation between Codes of Nomenclature" held at the International Mycological Institute, Egham, on 16-18 March 1994 (Hawkesworth et al., 1994). At that meeting, it was agreed that the preliminary version be revised and distributed as a Draft Glossary of Terms used in Bionomenclature to form the basis of future discussions between the authorities responsible for the different Codes.

In due course, it is envisaged that included definitions will be revised and subsequently approved by the relevant Commissions, Committees, and Congresses. A new edition, not a **Draft,** will then be prepared and it is anticipated that after that review period the approved definitions taken out of the agreed Glossary will be employed in the glossaries of the individual Codes. At that time a clear typographic separation between "official" and "unofficial" terms will be made. As that process will inevitably take several years the Egham Meeting felt that a Draft should be distributed as the basis for future discussion.

Notice of omissions and corrections would be most welcome so that they can be taken note of in future discussions and also accommodated in the future more definitive Glossary. Send them to Prof D L Hawksworth, International Mycological Institute, Bakeham Lane, Egham, Surrey TW29 9TY, UK.

A selection of palaeobotanical terms follows:

artificial: a group consisting of specimens that are judged to be too incomplete for taxonomic disposition, but are brought together for convenience by the available characteristics, and treated for nomenclatural purposes as a taxon of a particular rant, e.g. an---genus; used principally for fossils and for the anamorphs of pleomorphic fungi; cfr.form genus.

extant: (1) of a taxon, one having living representatives, as opposed to fossil. (2) of a specimen, one still in existence.

extinct: of a taxon, one having no living representatives.

family: [pl.families]: (1) (bact., bot., vir.) a taxon at the rank of family, the principal rank between order and genus. (2) (zool.) a rank within the family-group between superfamily and tribe. --- - group: (zool.) the assemblage of categories from tribe to super-family inclusive, and any other rank below super-family and above the genus group that may be required (e.g.subtribe); the highest-ranking group of taxa whose names are regulated by the Code. --- name: see name.

genus: (bot., zool.) an artificial taxon of fossils assigned the rank of genus, of which only relatively small but comparable parts are known (e.g.spores, leaf impressions, skeletal elements); the complete individual plants when known may be belong to entirely different genera; also sometimes used to anamorphs of pleomorphic fungi (q.v.) special ---. see special form.

fossil: an organism, or a part of an organism, of which the nomenclatural type is a fossil, preserved by some natural means; or the impression or petrifaction left in rock upon the decomposition of such an organism; see subfossil.

genus: the principal category of taxa intermediate in rank between family and species in the nomenclatural hierarchy. --- group: (zool.) the categories genus, subgenus, and other infrageneric but supraspecific ranks. nominal ---: see time slot.

ichnotaxon: (zool.) a taxon based on the fossilised work or trace of an organism (e.g. footprints and other animal trails, bite marks in leaves).

microfossils: fossil remains, whether entire organisms or parts of organisms (e.g.spores), so small that they cannot be studies with the unaided eye.

organ genus, --- taxon: (bot.) a genus of fossils, assignable to a family, of which the characters are derived principally from a single organ; see form-genus.

palaeobiogroup: (unoff.) a major morphological and non-hierarchical grouping of types of fossils.

palaeotaxon: (unoff.) a kind of immutable base taxon of fossils developed from a biorecord.

parataxon, [pl.parataxa]: (unoff.) a taxon, usually of fossils, based on some part less than the whole organism; includes form genera (q.v.) of fossil plants based on dispersed spores, detached leaves, etc., names applied to individual fossil teeth, etc., and any ichnotaxon (q.v.).

Period classification: (unoff.) a classification of fossils confined to records from a named geologic period (e.g. the Cretaceous Albian Period classification is a 100-classification; see also subtroop.

species, sp. [pl.spp.] the category of taxa of the lowest principal rank in the nomenclatural hierarchy.

specimen: an organism or part of an organism, or a number of small organisms, preserved as a unit for scientific study.

subfossil: fossil (q.v.), but geologically young, generally soft in texture and organic in composition (but including e.g.subfossil shells), and usually found in a soft deposit, such as peat; the equivalent of fossil for nomenclatural purposes.

subtroop: (unoff.) the term for a unit in a Period classification (q.v.), incorporating about 100 paleotaxa or species; see troop.

synonymy: (1) the situation where two or more names have been applied to the same taxon. (2) the relationship between any such two names. (3) the names considered to apply to a given taxon other than its correct name. (4) a list of synonyms.

time slot: (unoff.) proposed as a substitute for a fossil taxon of generic rank consisting only of the name of a stratigraphic time-scale division.

troop: (unoff.) a term for a large unit in a Period classification (q.v.), incorporating notionally about 1000 paleotaxa or species; see also subtroop.

A NEW AND INVIGORATING LIBERAL SPIRIT PERMEATES BOTANICAL NOMENCLATURE; IS ANARCHY WAITING IN THE WINGS?

Just over a year has passed since the typhoon struck International Botanical Congress in Tokyo, but the haze has yet to lift from some of its results. A resolution adopted at the meeting and repeated in the Preface of the new Code (Greuter et al., 1994) states: "... the XV International Botanical Congress urges plant taxonomists ... to avoid displacing well established names for purely nomenclatural reasons, whether by change in their application or by resurrection of long forgotten names."

Mycologist David Hawksworth (1994) cited the above resolution in his contention that "Any taxonomist finding that an earlier name threatens one in use should formally propose it for rejection [sensu I.C.B.N.]. If that fails, no change need be made pending the 1999 Congress by citing the 1993 Congress Resolution. Priority of publication thus now counts for little in botanical nomenclature."

To use a well known expletive: Yikes!! Botanist R.K. Brummitt (1994) was similarly dismayed and wrote a commentary on Hawksworth's article. While clearly agreeing in principle with the new liberalism reflected by revised conservation and rejection articles in the I.C.B.N., which we discuss below, Brummitt concluded that "Those who push too hard for maintaining what they regard as names in current use will do a disservice to taxonomy and nomenclature. Stability will not be achieved by encouraging everyone to do what they like. Anarchy leads only to instability."

To paraphrase a dinosaur conference title, a cool look at this warm-blooded issue is in order, though we emphasize that the following represents our personal views and not that of the Fossil Plant Committee. Firstly, the Articles of the Code are the definitive reference points for all botanical taxonomists. Nowhere among these Articles is there recognition of the validity of such a resolution as the one quoted above. Indeed, the Preface to the 1994 Code, while noting this resolution, asks "Does this mean that the present Code is a document of little consequence, to be set aside each time its application leads to results felt (by some) to be disagreeable?" And answers "Certainly not. The Code now offers generous new ways to avoid nomenclatural changes by proposing the conservation or rejection of names, and these opportunities are to be used."

Nicolson and Greuter (1994) have briefly reviewed the changes to the conservation and rejection Articles in the Tokyo code - now published as Greuter et al. (1994). With the approval of the Tokyo Congress, the second sentence of Article 14.2 of the 1988 Code ("Conservation of specific names is restricted to species of major economic importance and to ... [other fairly restricted and specific] cases ....") has been dropped for the 1994 Code. Now names at the principal ranks, from family down, can be the subject of a conservation proposal.

Additionally, it is now possible to propose formal rejection of "... any name that would cause a disadvantageous nomenclatural change ..." irrespective of rank (Article 56, 1994 Code).

Now is the chance, therefore, for any palaeobotanist, previously discouraged by the old conservative policy, to try her or his hand at a conservation or rejection proposal. If you have a worthy proposal that is: Nicolson and Greuter warn that authors should carefully consider the merits of their case before deluging Taxon and the nomenclatural committees with proposals. However, somehow we can't imagine the new regulations being a cause of such a deluge from palaeobotanists.

Anyone interested in making a proposal should refer to Greuter and Nicolson (1993), Nicolson and Greuter (1994) and Greuter (1994) for discussion, guidelines and an example.

One problem with proposals for conservation or rejection is that they are, indeed, only proposals, not ratified decisions. Final ratification will have to await the next Botanical Congress in 1999. What should we do in the interim? Go ahead and use the proposed "conserved" name and avoid the proposed "rejected" name, as appropriate. Or follow the I.C.B.N. rules strictly and use the "legitimate" names in the interim. The latter course of action would seem to defeat the point of having a new liberal policy.

It would be helpful to cite a possible palaeobotanical example to illustrate the dilemma (although readers should note that the following is not a formal proposal and no such proposal is currently planned as far as we are aware). There is ambivalence in Mesozoic palynological literature over the use of the names *Corollina* Malyavkina, 1949 and *Classopollis* Pflug, 1953. The latter name was almost universally used until Cornet and Traverse, 1975 "rediscovered" the earlier name proposed by Malyavkina, which is based on a very simple line drawing. This drawing shows the type of *Corollina* to be reasonably clearly a "*Classopollis*" grain, but some authors have been reluctant to use the earlier name *Corollina* because of the extremely poor illustration of the type, rendering its species relationships obscure and because of the widespread use of the name *Classopollis*. Under the old philosophy, it would have been practically impossible to have rejected *Corollina* or conserved *Classopollis*.

However, times seem to have changed and it might now be possible to plot *Corollina*'s demise.

But what would researchers do between the time of this hypothetical proposal and the next Congress in 1999? Be good law abiding citizens, respect priority and use *Corollina*; or take a risk that the proposal will succeed and use the name *Classopollis*. There is no definitive way out of this dilemma, but the Fossil Plant Committee can reduce the risk by deliberating on conservation proposals referred to it as they arise (or perhaps annually). The Congress rarely declines issues recommended by committees, and this would give palaeobotanists early, if not final indication of the outcome of their proposals. Indeed, Article 14.14 (1994 Code) states that, in the case of a conservation proposal, approval by the General Committee after study by the specialist committee (the Fossil Plant Committee in our case) renders the name "authorised subject to " a decision at a subsequent Botanical Congress. In other words, if a proposal to conserve *Classopollis* were to be - firstly - published in Taxon, - secondly - referred to, studied by and recommended by our committee, and - thirdly - approved by the General Committee, we could go ahead and use *Classopollis* (cited as *Classopollis* nom. cons. prop. to make it clear that the name has been approved but not fully ratified) as the "authorized" name. Such events would, of course, be reported in the IOP Newsletter.

We would like to thank Martin Head for bringing to our attention the Hawksworth and Brummitt items in his report in the Canadian Association of Palynologists Newsletter and for supplying these two items.

The new ICBN can be purchased from Koeltz Scientific Books, P.O. Box 1360, D-61453 Königstein, Germany, price DM 60 (+ postage).

Taxon subscribers should refer to the back of the August issue for discount information.

Brummitt, 1994, The Linnean, v.10(2), p.13-15.
Cornet & Traverse, 1975, Geoscience & Man, v.11, p.1-33.
Hawksworth, 1994, The Linnean, v.10(1), p.12-15.
Greuter, 1994, Taxon, v.43, p.127-128.
Greuter & Nicolson, 1993, Taxon, v.42, p.925-927.
Greuter et al., 1994, International Code of Botanical Nomenclature. Regnum Vegetabile, v.131. (See above for ordering details.)
Malyavkina, 1949, Trudy VNIGRI, no 33, 139pp.
Nicolson & Greuter, Taxon, v.43, p.109-112.
Pflug, 1953, Palaeontographica 95B, p.60-171.

R.FENSOME (Chair) & J.SKOG (Secretary), I.A.P.T. sponsored Fossil Plant Committee.

(Other members of the Fossil Plant Committee are as follows: S. Archangelsky, D.J. Batten, K. Faegri, M. Fairon-Demaret, J. Jansonius, H.K. Maheshwari, D.J. Nichols, G. Playford, R.L. Ravn, F. Schaarschmidt, A. Traverse, B.S. Venkatachala, V. Wilde, Zhou Zhiyan.)

THE CENTENARY OF THE DEATH OF JOHANN SCHMALHAUSEN

In 1994 a hundred years has passed since Ivan Fedorovich Schmalhausen's death. He was an outstanding Russian botanist, the author of the *Flora of South-West Russia* [Kiev 1886], and the *Flora of Middle and South Russia, Crimea and North Caucasus* [Kiev, 1895, 1896], published after his death. J. Schmalhausen was an eminent palaeobotanist as well. He studied fossil plants ranging from the Upper Devonian to the Upper Tertiary, from archaeopterids to angiosperms. A N Kryshtofovich, in his book *History of Palaeobotany in Russia* [Moscow 1956] wrote: "Schmalhausen's papers stood out so much by their level and importance for the 70-80th years of the XIX century that other researchers' studies were accidental against Schmalhausen's ones". He published about 20 papers on palaeobotany, he was the author of several fossil plants families including Archaeopteridae, Dolerophylleae, Salisburiae etc., more than 10 genera *Bromelites, Cyclopitys, Dimeripteris, Leptospermites, Palaeopyrum, Rhipidopsis, Sciadopityoxylon, Synarpites, Zamiopteris*, and about 50 species of fossil plants. Most of taxa by Schmalhausen have been accepted but some of them have been revised and their names have been included into synonyms. 1994 is the centenary of Archaeopteridae described by Schmalhausen as the special group distinct from ferns in 1894. In his paper "Ueber Devonische Pflanzen aus dem Donets Becken" [Mem.Geol.1894.Vol.8.N 2] he wrote: *"Archaeopteris* bildet einere beson dere Gruppe, fur welche an stelle von Palaeopteridae Stur emend. die Bezeichnung Archaeopteridae in Vorschlag kommen mag". The paper was published in Russian and German. Schmalhausen published in Russian a "Short textbook on botany for students of medicine and beginner naturalists" [1887 Kiev, 314pp]. The Text book and his papers on botany and palaeobotany were illustrated by original drawings prepared by himself. He was a good painter and when he was young he had to choose between painting and natural sciences, and he selected the second.

Schmalhausen was born in 1849, on April 3 [old style] in St Petersburg. He was the youngest in the family of Johann Ditrich and Dorotea Schmalhausen who came to Russia from Bremen. Johann, the elder was the librarian assistant in St Petersburg University and Imperial Academy of Sciences. Johann Ditrich was a mathematician graduating from Berlin University. He stimulated an interest of Johann junior to natural sciences, painting, music, languages. Johann Ditrich in Russia received Russian name

Fedorovich. His son Johann was named Ivan [Russian version of Johann] and received the patronymic Fedorovich. But he did not use it in his publications. Johann junior first entered the Medical-Surgical Academy in St Petersburg but could not work in an anatomical theatre and changed it for St Petersburg University, Physico-Mathematical Division. He learned in Botany Department, was absorbed in systematics, morphology and especially anatomy of plants, modern and fossil. In 1871 he graduated from the University, in 1874 received Magister Degree having presented the thesis "On plant hybrids, Observations from Petersburg flora" [Trudy St Petersburg Obshchestva Estestvoispytat, 1874.Vol 5 in Russian and short version in German - Beobachtungen uber waldwachsende Pflanzenbastarde. Bot. Zeitung 1875]. J Schmalhausen presented his commentary in Russian and German on the eminent paper by G Mendel on plant hybrids. Some years later J Schmalhausen spent abroad in Strasburg - in the Laboratory of A De Bary and studied fossils plants in the Palaeontological Laboratory of W Schimper, in Zurich - under O Heer auspices. He visited Berlin, Munchen, Vienne and Prague. In 1876 Johann was married to Luisa Ludwig from Bremen. They have three children: a daughter and two sons. The youngest Johann became the eminent Russian biologist, zoologist, Ivan Ivanovich Schmalhausen [1884-1963]. Johann [Ivan Fedorovich] received a Doctor Degree in 1877 for the thesis "Beitrage zur Kenntniss Milchsaftbehalter der Pflanzen" [Mem.Acad.Imp.1877.Ser.7.Vol.24.N.2]. The same year he received the position of the Private-Docent in St Petersburg University. He read lectures on systematics, morphology and palaeobotany [the first in Russia]. Simultaneously he began to study fossil plants in the Geological Committee and the contemporaneous flora of Turkestan in St Petersburg Botanical Garden by invitation of E von Regel, who was a director of the Garden [now Komarov Botanical Institute]. The main researches on palaeobotany were made by J Schmalhausen from 1877 to 1890. He studied fossil plants from Kusnetzk, Petchora and Tunguska basins using materials collected by geologists. The activity of Schmalhausen coincided with the foundation of the Geological Committee in St Petersburg. One of the tasks of the Committee was the collection of fossils during the geological surveying. Schmalhausen was invited to the Committee to study fossil floras and to define the geological age of the deposits. In 1878 he was invited to Kiev to be a head of the Plant Morphology and Systematics Department in St Vladimir University. He accepted the positions of the Extraordinary Professor of the Department and of the Director of the Botanical Garden in Kiev too. In his eighties the health of J. Schmalhausen became worse. He went to Switzerland for the treatment and then he continued to teach, to study fossils and contemporary plants. In 1886 his eminent "Flora of South-West Russia" was published. He began to prepare "Flora of Middle and South Russia" for publication. In December, 1893 Schmalhausen was elected as a Corresponding Member of the Imperial Academy of Sciences in biology. That year he took part in the expedition to the Donets basin and collected together geologists fossil plants from Devonian. In April 7 [old style] 1894 Johann Schmalhausen - Ivan Fedorovich Schmalhausen died because of the perforation of a duodenal ulcer. He passed away at the peak of his creative ability and with dreams of future researches. Particularly, he dreamed to publish a Flora of Russia.

Brilliant works by Ivan Fedorovich Schmalhausen on botany and palaeobotany are the monument of the Russian Scientist. Some his publications on palaeobotany are

- Die Pflanzenrests aus der Ursa-Stufe im Flussgeschiebe des Ogur in Ost. Sibirien. Bull.Acad.Imp.,Phys.Chim.1877, 9-10, 1877.
- Beitrage zur Jura=Flora. Russlands.Mem.Acad.Imp. Ser.7., 27, `879
- Pflanzenpalaeontologische Beitrage: a] Nachtrage zur Jura Flora des Kohlenbassins von Kusnetzk an Altai; b] Pflanzenrests aus der nordwestlichen Mongoli. Bull. Acad. Imp., Biol., 11, 1883.
- Pflanzenreste der Steinkohlenformation am ostlichen Abhange des Uralgebirges. Mem. Acad. Imp., 31, 1883.
- Beitrage zur Tertiarflora Sud West Russlands. Palaeontol. Abh., 1, 1884.
- Uber Tertiare Pflanzen aus dem Thale des Flusses Buchtorma am Fusse des Altaigebirges. Palaeontographica., 33, 1887.
- Die Pflanzenrests der Artinskischen und Permischen Ablagerungen im Osten des Europaischen Russlands. Mem. Com. Geol., 2, 1887.
- Tertiare Pflanzen der Insel Neusibirien. Mit einer Einleitung von Baron Toll. Mem. Acad. Imp., 37, 1890.

Memorial Sessions in May 1994, dedicated to the centenary of J Schmalhausen's death were held at the Komarov Botanical Institute, the Russian Botanical Society in St Petersburg and at the Cholodny Institute of Botany in Kiev. The first number of the Botanichesky Zhurnal [St Petersburg] in 1995 will be a memorial publication.

N.SNIGIREVSKAYA, St. Petersburg, Russia.

WINFRIED REMY - FIRST RECIPIENT OF JONGMANS MEDAL

The first recipient of the W. J. Jongmans Medal is Professor Dr. Winfried Remy, Abteilung Paläobotanik am Geologische-Paläontologischen Institut und Museum, Westfälische Wilhelms-Universität Münster, Germany. The announcement of the Jongmans Medal was made during the 4th European Palaeobotanical/Palynological Congress held in September in Heerlen.

Winfried Remy was born on March 21, 1924 in Breslau, Silesia, but grew up in East Berlin, and began studying geology at the Humboldt University. Among his teachers were Hans Stille and Walther Gothan. Because of the political climate at the time Remy obtained his doctorate in 1952 at the University of Tübingen, and three years later his "habilitation". After Gothan's death Remy became the leader of the research institute of palaeobotany and coal science in East Berlin. During the 1950's and 60's he published numerous papers on Carboniferous and Permian plants, that included studies ranging from biostratigraphy to in situ pollen and spores. In addition, two richly illustrated books were published on the floras of the paralic and limnic basins. An updated version of these volumes was co-authored with his wife Renate in 1977. These three volumes are generally regarded as standard references for Palæozoic compression floras.

With the construction of the Berlin wall Remy left the city and moved to Münster where he became a lecturer in geology and initiated a program in palaeobotany. In 1965 he was appointed Professor and three years later the head of the newly instituted "Forschungsstelle für Paläobotanik", the institute where he is active today despite officially retiring in 1989. In 1968 he and his wife published the first issue of the journal - Argumenta Palaeobotanica.

His publications from the late 1970's demonstrate a wide variety of research interests. It is at this time in his career that the first of a long series of papers on the Rhynie chert were initiated. In collaboration with Hagen Hass, Renate Remy, students and colleagues, Winfried Remy has greatly expanded our understanding of the structure and morphology of the Rhynie chert plants. Perhaps most notable was the discovery of free living gametophytes, some including sex organs containing flagellated gametes. In addition the Münster palaeobotany group has continued to uncover new features and aspects of the life history biology of the Rhynie chert plants. Most recently these studies have been extended to fungi.

As a result of his work we have a far better understanding of Devonian, Carboniferous and Permian floras. Remy's studies demonstrate a broad interdisciplinary approach that incorporate both a geological and biological perspective to the work. Winfried Remy was trained by Gothan, a close friend of Jongmans. One might say that he worked in Jongmans' tradition, but perhaps it is more accurate to state that he worked in Jongmans' spirit. Jongmans graduated in botany, but became famous as a palaeobotanist and geologist. Remy was trained as a geologist, but his work has the most profound impact on botany. They both practised the necessary interaction between these two disciplines.

As a result of his numerous scholarly contributions to the study of fossils plants the first Jongmans Medal is awarded to Winfried Remy.

T.N.TAYLOR & H.KERP, GERMANY

NEWS OF INDIVIDUALS

R.A. SPICER spent three months earlier this year with David Ferguson as Guest Professor at Vienna University. The Viennese experience included a most enjoyable field trip in the Czech Republic hosted by Zlatko and Jiri Kvacek. After that Bob joined Alexei Herman in Magadan where they spent two weeks with Dr Galina Philippova, Sergei Shczepetov and Prof. Vassiliyi Belyi. During what was a most fruitful visit Bob and Alexei studied and photographed Cretaceous collections from N.E Russia. Alexei and Bob are continuing to work together on a Royal Society funded Joint Project, but this time in Milton Keynes. Robert Spicer has moved from Oxford to take up a Chair at the Open University where he is head of Earth Sciences. His new address is;

Dept. of Earth Sciences, The Open University,
Walton Hall, Milton Keynes MK7 6AA, UK.
e-mail address: R.A.Spicer@open.ac.uk.

T.M. JONES & V. MOSBRUGGER at the University of Tuebingen have new e-mail addresses.
PROF.V.MOSBRUGGER:- epimo01@uni-tuebingen.de
DR.T.JONES:- jones@uni-tuebingen.de

OBITUARIES

JEANNE DOUBINGER (1921-1994)

The members of the International Organisation of Palaeobotany will certainly learn with a great sadness that Dr Jeanne Doubinger passed away in Strasbourg on July 16, 1994, at the age of 73.

Dr Doubinger was 'Directeur de Recherche' at the 'Centre National de la Recherche Scientifique (CNRS)' and from 1960 to 1986 she was the head of the laboratory of palynology of the 'Centre de Sedimentologie et Geochimie de la Surface', at the Geological Institute of Strasbourg.

All those who were fortunate enough to know her, either by working on her side or during scientific collaboration and meetings, could appreciate, besides her scientific expertise, her great kindness and care to the others, either researchers, students or technicians, and above all her great modesty and discretion.

Originally paleobotanist of the Permo-Carboniferous and then, palynologically trained at the school of R Potonie in Krefeld, she was one of the pioneers in the palynology of the Permo-Carboniferous in France. The lot of works she carried out and guided in this field, the knowledge she acquired during her numerous field trips in France and abroad, the prominent part she played in the bosom of several scientific organisations got her an international audience, not only in paleobotany and palynology but also in the stratigraphy of the Permo-Carboniferous.

Convinced that palynology contained numerous potentialities, Dr Doubinger extended her field of palynological researches to other geological periods, particularly the Triassic in which she became an authority internationally recognised. Microfossils other than spores and pollen grains, such as acritarchs, chitinozoans and dinocysts, were another subject of her researches.

It is not possible to quote here all the works of Dr Doubinger and the results they brought on the knowledge in continental and marine microfloras, on the stratigraphy, paleoecology, paleogeography and geology in general. The works she leaves to us, after about 50 years devoted to research, is considerable: more than 300 publications, many thesis which she directed or to which she participated, here contribution to many national and international scientific programs, without forgiving the numerous students she initiated and trained and who are set on continuing the work of her 'patronne', in this genius for seriousness and efficiency she was equal to impress them.

Without any doubt, paleobotany and palynology have lost an eminent researcher who, in spite of her great modesty, contributed through her works, to the rise in popularity of these scientific disciplines.

THE PALYNOLOGICAL AND PALAEO-BOTANICAL TEAM, GEOLOGICAL INSTITUTE, STRASBOURG.

NORMAN F. HUGHES (1918-1994)

The death of Norman Hughes in mid September came as a shock to his many friends and colleagues. Despite having had some health problems during the past couple of years, until recently he was still very active. Following his 'official' retirement nearly ten years ago, he wrote two books on his favourite topics: data handling in palaeontology (Hughes, 1989: *Fossils as information*) and early angiosperms (Hughes, 1994: *The enigma of angiosperm origins*), both published by Cambridge University Press. He also added several papers to his list of publications including three in collaboration with E.P.F. Rose (Royal Holloway, University of London) on a very different theme: "sapper geology". These were published in the *Royal Engineers Journal* during 1993 (volume 107). They make fascinating reading because they reveal not only another side to Norman's life of which many of his palaeobotanical and palynological colleagues will have been only vaguely aware (if at all), but also much of historical interest.

Norman began his university career just before the Second World War, taking part 1 of the Tripos examinations at Cambridge in 1939 and part 2 in 1947, excelling in both. He was appointed to a lectureship in geology at Bedford College, London in his graduating year. He remained in this post until 1953 when he returned to Cambridge as a University Lecturer in Geology. He was made a Fellow of Queens' College, Cambridge in 1962, and a Life Fellow on retirement. His published contributions on palaeobotany, palynology and stratigraphy led to the award of a D.Sc. degree in 1977.

Norman was an active member of a number of geological and other societies and organisations from the 1950s until his retirement. He was, for example, a founding member and twice vice-president of the Palaeontological Association, and helped to establish the journal *Palaeontology*, of which he was senior editor from 1962-1972. He also served at various times on the Stratigraphic Committee of the Geological Society of London, on two subcommissions of the Commission of Stratigraphy of the International Union of Geological Sciences, and as President of the International Commission for Palynology (now the International Federation of

Palynological Societies). The organisation of the 5th International Palynological Conference in 1980 benefited considerably from his leadership. He particularly enjoyed being able to accommodate many of the participants in Queens' College.

Unquestionably Norman was a 'special person'. In all the years I knew him (from early 1966) he seemed hardly to change physically at all. He could appear authoritarian to some, and stubbornly argumentative, particularly on the subjects of data handling in palaeontology and the origin and early evolution of the flowering plants. He could annoy, and perhaps be annoyed by, those who did not agree with his solutions to the various problems common to much of palaeontology. Nevertheless, he could also be a good listener, and laughed readily when the mood suited. He was noted for being prepared to help students with their problems, both academic and personal.

During the tenure of his Cambridge lectureship he guided the research of some 25 postgraduate students, of whom I was one. I found him to be a good supervisor. Once we had agreed on the general approach to my project he was happy to leave me to my own devices for much of the time. His availability most mornings at 'coffee break' rendered formal appointments to discuss any problems largely unnecessary. For several months during my first year he was away in Thailand in his capacity as a geologist with the Territorial Army (TA), but that mattered little because he had made sure I knew what I was doing before he departed. I found him to be particularly helpful when writing up the results of my research.

Norman's work in Thailand and elsewhere with the TA was one manifestation of his involvement with matters affecting the world in general. He was especially concerned about improving the lot of poor people in the 'developing' countries and in those in the grip of oppressive dictatorships. More recently he was equally concerned about the rising tide of nationalism that has been sweeping through many countries. Socially he enjoyed good wine and conversation; for many years he was Wine Secretary for Queens' College. He is survived by his wife Pam, a talented artist and companion of 50 years.

An obituary by one of Norman's colleagues, Brian Harland, was published on October 7 in *The Independent*, a British 'quality' daily newspaper. Some additional facts and observations pertaining to his career may be found in the introduction to *Special Papers in Palaeontology* 35 (1986), which comprises a collection of papers published to mark his retirement, and in *Geologists' Association Circular* 907 (Rose, 1994, p. 23-24).

D.J.BATTEN
Aberystwyth . UK

BOOK REVIEW

ULTRASTRUCTURE OF FOSSIL SPORES AND POLLEN. Edited by M.H.Kurmann & J.A.Doyle. 221pp. Royal Botanical Gardens, Kew. £20.70

This book contains the papers presented during a symposium held at the 8th International Palynological Congress in Aix-en-Provence in September 1992. As the subtitle indicates, the main focus is on evidence from ultrastructure and its bearing on relationships among fossil and living groups. There are twelve papers concerned with studies ranging from the earliest land plants to the angiosperms. Each contribution makes comparisons between fossils and extant plants based on transmission electron microscopy and other methods of observation.

The first chapter, by Alan Hemsley is concerned with the spores of some enigmatic Devonian plants and raises the difficulty of interpreting the affinities of spores that lack triradiate marks. He questions the extent to which the spore wall material of some algae and 'transitional land plants' such as *Parka and Protosalvinia* may be considered to be sporopollenin and points out that little information is available on the composition of the exine material in bryophytes. Whilst this is so, one could argue that at least within embryophytes the spore walls may be meaningfully compared as homologous components in the life cycle regardless of any differences in chemical composition that might be regarded as additional characters.

Warren Kovach provides a brief but informative review of exine structure in Mesozoic megaspores. Some extant forms resemble those of Mesozoic plants but the fossil record also includes forms not found in extant megaspores and there are Recent plants with megaspore ultrastructure not known from fossils. Megaspore ultrastructure clearly has the potential to contribute more to systematics but as Wilson Taylor, emphasises in the following chapter this is not without difficulties. Fossil megaspores that have undergone excessive compression cannot always be discriminated between and assigned accurately. Taylor poses the important question of whether ultrastructural differences in spore walls reflect evolutionary changes within groups or ecological changes linked to habit and reproductive strategy. This is a fundamental issue in palynology where the range of structural variation frequently shows high levels of convergence but where functional significance is hard to demonstrate and ontogenetic factors are very incompletely known.

Bernard Lugardon, the pioneer of comparative spore ultrastructure, and Claudine Brousmiche Delcambre present detailed investigations of three Upper Carboniferous sphenopsid spores, identifying several aspects in which they resemble filicopsids rather than modern Equisitaceae. This is perhaps the

most elegantly illustrated paper in the volume. The figures provide light, scanning and transmission electron micrographs together with interpretative diagrams. The diagrams can be directly compared with the micrographs so that the reader is left in no doubt about how to relate shading and lines to changes in electron density in the spore walls. Other authors have provided interpretative diagrams without the micrographs, which always leaves me feeling cheated!

Exquisite micrographs are also a feature of the chapter on Mationaceae by Johanna van Konijnenburg-van Cittert and Marie Kurmann which demonstrates that spores of this family of ferns are more diverse in the fossil record than in the two extant genera.

Clinton Foster and Basil Balme present a detailed study of spore ultrastructure in *Teichertospora*, the oldest saccate palynomorph. A key question is whether the spores are eusaccate or protosaccate and this hinges around the interpretation of spaces in the reticulate outer exine. These spaces are interpreted as having arisen as artefacts of compression, rather than as spaces formed during development. Despite the intensity of investigation the authors conclude that ultrastructure alone cannot determine the systematic affinities of the palynomorph. It is interesting that the transmission electron micrographs in this paper have been enhanced by computer and can be accessed over the Internet, a medium that will undoubtedly grow in significance.

The two reviews of gymnosperm pollen, by Jeffrey Osborne and Tom Taylor on fossils and Marie Kurmann and Michael Zavada's on extant taxa, are certain to become standard references. Osborne and Taylor discuss the preservational and developmental complexities to the interpretation of pollen characters. Their Figures 14 and 15 show dramatically different staining properties in walls of an ephedroid palynomorph that are, in themselves, sufficient to sound a note of caution about reliance on staining criteria for the recognition of exine layers. In angiosperms such changes have been noted in the final stages of pollen maturation. The two chapters present concise introductions to characters, particularly of exine stratification and sacci, and the issues that complicate their interpretation.

The final four chapters deal with angiosperm pollen. Kaj Pedersen, Else Marie Friis and Peter Crane summarise the ultrastructure of in-situ pollen grains in a range of Cretaceous anthers. The scanning electron micrographs look like herbarium specimens and it is easy to forget just how recently the three authors opened up the study of Cretaceous flowers. Increasingly, the pattern that emerges is of great diversity with the early appearance of many forms that are considered derived.

This well exemplified by Jerome Ward and James Doyle's paper on mid-Cretaceous porate grains with affinities to Ranunculaceae and Proteaceae. In the final chapter, Linda Milne investigates the Proteaceae further with a detailed comparison between extant *Xylomelum* and the fossil *Propylipollis*. She concludes that the two morphological types of pollen in *Xylomelum* imply either that a taxonomic revision of the genus is needed or that the modern species are relicts of a once more diverse genus. Many genera contain a diversity of pollen types and provided that there are synapomorphies that define the genus, variation in pollen characters between the species is not cause for taxonomic alarm.

The penultimate paper, by Carol Hotton, Harry Leffingwell and John Skvarla focuses on *Panadanites* pollen and presents careful comparisons with a range of extant taxa concluding that it combines characters of both *Pandanys* and *Freycinetia* of the Pandanaceae. The level of comparison in this paper is exemplary and the micrographs, once again, are suitable for framing and hanging on the wall.

The editors, Marie Kurmann and Jim Doyle, assisted by Mike Zavada, have produced an excellent volume that will be essential reading for everyone concerned with ultrastructure of fossil pollen and spores. The book itself is well produced and in my opinion Kew are to be congratulated for finding an ideal format for symposium publications, making them affordable without compromising on quality.

S.BLACKMORE, London, UK.