PALYNOS

Volume 19, No. 2 - December, 1996

NEWSLETTER of the INTERNATIONAL FEDERATION of PALYNOLOGICAL SOCIETIES

A MESSAGE FROM THE PRESIDENT

It is indeed an honor to acknowledge the support of the IFPS Councillors in electing me President of IFPS. I have developed a good understanding of the workings of IFPS while serving as Secretary-Treasurer, and I have acquired a strong belief that IFPS plays a central role in the development of palynology.

Palynology is a science that continues to diversify and grow. Perhaps palynology originated in 1881 in the laboratory of Reinsch, who used KOH, HF, and other reagents to remove spores from coal. In 1944 it grew beyond the bounds of "just" pollen when Hyde and Williams proposed the term"palynology" in response to Antevs' (1944) criticism that the label "pollen analysis" was too narrow -- both in terms of the fossils studied and the problems addressed (see the following article by Bill Boyd). And, palynology continues to grow in the number of its practitioners. Published in 1988, the First Edition of the IFPS Directory contained 4760 entries; the Second Edition, published this year, contains 5823 entries.

Where did the 1000 "new" palynologists in the Second Directory come from? In part, the ranks of IFPS have swelled due to the tireless efforts of Jim Canright, IFPS Past President, who recruited two new societies to IFPS. But, nearly all of the IFPS affiliate societies have grown in the last eight years. Why? In large part because palynologists have provided useful information to the scientific community and, therefore, to society. To that extent, the efforts of IFPS affiliate societies have been successful. But what parts have these societies played in educating the 1000 new palynologists?

I believe that most palynological societies have succeeded in supporting the research of interested students, but have generally failed in recruiting new students and in providing materials for palynological education. These two aspects have traditionally been left up to educators and institutions -- with mixed results. In the next four years, I propose that the IFPS affiliate societies take a more active role in education -- in three areas.

First, I urge our societies to distribute simple, attractive "fact sheets" to primary and secondary educators, and to present talks in secondary schools on their area of expertise. "Palynology" is not a household word. By reaching young students we will both increase public awareness of palynology, and attract future palynologists.

Second, societies should support the publication and distribution of palynological texts. The rising cost of textbooks has lead to a crisis in palynological education. Recent "textbooks" have been offered for more than $150.00 (U.S.), and new textbooks are soon out-of-print or in short supply. I particularly urge the linguistic societies (ABLE, PSJ, RPC...) to promote publication of palynological texts in their languages. Society newsletters should regularly carry information on the source and costs of available texts.

Third, all palynological societies should establish a presence on the Internet. Web pages are an inexpensive and increasingly popular means to advertise each society's presence, educate the electronic public, and distribute information to other palynologists.

I'm sure we all appreciate the growth and development of palynology, and I hope we can join together in promoting palynological education. Our future depends on it.

Owen Davis, President IFPS

References

Ernst V. Antevs 1944. THE RIGHT WORD? Pollen Analysis Circular No. 6, p. 2

Hyde H. A. and Williams D. A. 1944. THE RIGHT WORD. Pollen Analysis
Circular No 8 p 6.

LANDMARKS ON THE FRONTIERS OF PALYNOLOGY: THE ROOTS OF THE WORD "PALYNOLOGY"

W.E. Boyd

Associate Professor in Geography, Centre for Coastal Management, Southern Cross University, Lismore, New South Wales 2480, Australia

Introduction

The following is an abstract from the keynote lecture at the New Frontiers and Applications in Palynology Symposium at the IX International Palynological Congress, held in Houston, Texas, in June, 1996. That lecture is included in the introductory paper in a Special Issue of Review of Palaeobotany and Palynology, entitled "New Frontiers and Applications of Palynology". (Boyd and Hall, in press), in which attention is drawn to the expanding frontiers of palynology and the various landmark events which have marked that expanding frontier. From the 1682 publication of Nehemiah Grew's The Anatomy of Plants in which pollen grains were first described, through to the late 20th century with increasingly sophisticated analytical ability and the spread from microscopic to macroscopic (from SEM to WWW) , palynology has been marked by seminal events which define the contemporary limits or frontiers of the discipline. Boyd and Hall (in press) identify recent emerging frontiers as being defined in several ways: (i) by a major advance in the increasing sophistication in the statistical analysis and numerical modelling, and in the power of computer-based palynological data management; (ii) by an increasing diversity of application, spearheaded by, but certainly not exclusively confined to, the explosion of interest in climate and climate change; (iii) by an increasing interest in palynomorphs other than pollen, and by the increased integration of studies using different palynomorphs; and (iv) by a miscellany of increasingly refined preparation techniques and specific applications. The New Frontiers and Applications Symposium Special Issue of Review of Palaeobotany and Palynology contains a selection of papers from four symposia held during the IX International Palynological Congress, Houston, 1996 -- New Frontiers and Applications in Palynology, Tephra-linked Pollen Analytical Studies, Forensic Palynology, and Phytoliths and Pollen -- considered to represent some of the contemporary frontiers of palynology. However, regardless of the directions in which palynology is expanding, one seminal event stands out above all else ... the coining of the term "palynology". It is this event which is the focus of this short article.

Defining the term "palynology"

What is "palynology"? Whereas it may seem rather impertinent to ask such a seemingly simple question, its answer helps us to define the frontiers that we are pushing back. What is palynology? There are, of course, many published definitions. Palynology was originally defined as the study of pollen grains and spores from higher plants and cryptograms respectively, and this definition still holds for the area of palynology known as "pollen analysis". However, as this area of scientific endeavor expanded, the study of other microscopic fossils and organisms, such as unicellular and multi-cellular algae, fungal elements and calcareous and siliceous microfossils such as coccoliths, diatoms, dinoflagellates and radiolaria, has become part of the palynologist's field of investigation (Muir and Sarjaent, 1977).

The term "palynology" was proposed by Hyde and Williams in 1944 in volume 8 of the journal Pollen Analysis Circular, and its inception is of considerable importance within the history of the discipline in that it focused on the practice and concepts of the then emerging discipline. The journal Pollen Analysis Circular was edited and produced by P.B. Sears between 1943 and 1954, and served as a valuable discussion journal over these years, attracting comment from many eminent palynologists. On February 18th, 1944, Ernst Antevs asked the following question:

"Is 'pollen analysis' the proper name for the study of pollen and its applications? The word 'pollen analysis' (meaning, I suppose, analysis of peat for pollen) was from the beginning used in Sweden to signify the identification and percentage-determination of the pollen grains of the principal forest trees in peat bogs and lake beds. However, its inadequacy was soon obvious, as shown for instance by Gunnar Erdtman's titles 'Literature on pollen-statistics ...' and, beginning in 1932, 'Literature on pollen-statistics and related topics'. Even the combination 'statistical pollen analysis' refers only to the method of getting certain data which in itself has little purpose and which does not apply to or cover all the branches of the pollen studies, much less the application of the direct results to climatic conclusions, etc. It is the knowledge gained from the pollen studies, be these statistical or morphological, or be they concerned with pollen-induced diseases such as hayfever, etc., that has purpose and significance.

"In this case the international combining form -logy (English spelling) can hardly be used to denote this science, for the name would be, I suppose, 'pollinilogy '(cf. polliniferous, pollinization), which is bad.

"To me 'pollen science' (Swedish, 'pollenvetenskap'; German 'Pollenwissenschaft') and 'pollen scientific' sound better. Would 'pollen science' be preferable to 'pollen analysis'?"

Among several replies was the following, on July 15th, 1944, from H. A. Hyde and D. A. Williams:

"The question raised by Dr. Antevs: 'Is pollen analysis the proper name for the study of pollen and its applications?' and his suggestion to replace it by 'pollen science' interests us very much. We entirely agree that a new term is needed but in view of the fact that pollen analysts normally include in their counts the spores of such plants as ferns and mosses we think that some word carrying a wider connotation than pollen seems to be called for. We should therefore suggest palynology from Greek paluno (paluno), to strew or sprinkle; cf. pale (pale), fine meal; cognate with Latin pollen, flour, dust: the study of pollen and other spores and their dispersal, and applications thereof. We venture to hope that the sequence of consonants p-l-n (suggesting pollen, but with a difference) and the general euphony of the new word may commend it to our fellow workers in this field. We have been assisted in the coining of this new word by Mr. L. J. D. Richardson, M.A., University College, Cardiff."

In this regard, it is interesting to note that in the apparently earliest description of pollen grains in 1682, Nehemiah Grew described pollen as being "... powders ... like those of Meal or Dust ..." (Wodehouse, 1935).

Responses to these suggestions were enthusiastic. Sears, for example, commented:

"Both on the grounds of euphony and sense, this suggestion from Dr. Antevs appeals to me. I am inclined to suggest, if it meets with no objection, and if interest warrants continuing this circular after the present year, that issues beginning in 1945 be entitled 'Pollen Science Circular'."

This was, in fact, done and the journal retained that name to the end of its life. The term "palynology", of course has retained a wider and longer-lived use. Without doubt, these events earmark 1944 as one of the most important landmarks on the frontiers of palynology. In closing, I must acknowledge the contribution of Owen Davis, University of Arizona, who alerted me to the 1944 discussion, and supplied many of the above details.

References

Boyd, W.E. & Hall. V.A. in press. Landmarks on the Frontiers of Palynology: An Introduction to the IX International Palynological Congress Special Issue on New Frontiers and Applications in Palynology. Review of Palaeobotany and Palynology.

Muir, M.D. & Sarjaent, W.AS. (eds) 1977. Palynology, Part I: Spores and pollen. Dowden, Hutchinson & Ross, Stroudsburg.

Wodehouse, R.P. 1935. Pollen Grains: Their structure, identification and significance in science and medicine. Hafner, New York.

SPEAKING OF PALYNOMORPHS.....

The following article is offered by Mary Dettmann. Mary writes "Also enclosed are a couple of photos just to indicate that we weren't dreaming. I know there is only one specimen illustrated, but I assure you we saw hundreds of the beasts, all with pollen inside them - they must have been hungry!!" I'm sure she'd be glad to hear from those of you who have made similar observations.

DINOFLAGELLATE GRAZE POLLEN!

Cynthia A. Heil, Mary E. Dettmann, and William C. Dennison
Department of Botany, University of Queensland, Queensland, Australia 4072
e-mail:C. Heil@botany.uq.edu.au;
M.Dettmenn@botany.uq.edu.au;
W.Dennison@botany.uq.edu.au

Noctiluca scintillans, a common cosmopolitan dinoflagellate in coastal and estuarine waters, exhibits a variety of unique morphological, behavioral and genetic

characteristics. Single cells are visible to the naked eye and can be both bioluminescent and non-bioluminescent. *N. scintillans* exhibits the typical dinoflagellate gymnodinoid shape only during gametogenesis. Otherwise cells are generally balloon shaped with a large, single striped tentacle used in feeding.

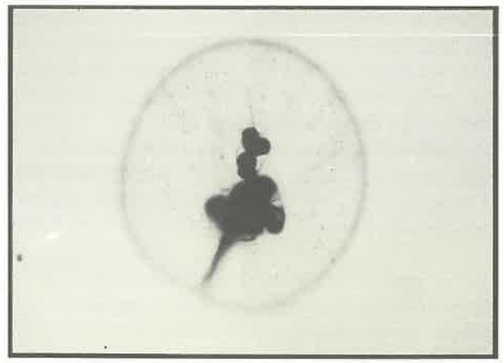
Numerous accounts exist of *N. scintillans* red tides in which massive accumulations of cells at the water surface result in streaks and patches of either dull red or greenish discolored waters. The ecological consequences of these blooms are highly variable. *N. scintillans* is often reported to be toxic to fish and invertebrates *in situ* due to the release of high concentrations of vacuolar ammonia from cells (Okaichi and Nishio, 1976) and can be a significant cause of mortality in prawn ponds (Yuzao *et al.*, 1993). Fish kills also result when blooms decay due to localized oxygen depletion.

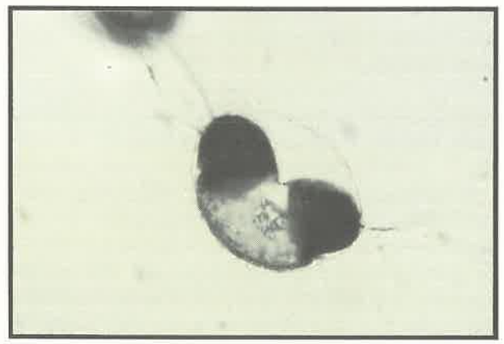
Little is known about the ecological function of *N. scintillans* in marine ecosystems, however. An exclusive heterotroph, this species is a voracious and non-selective predator of phytoplankton, larval fish and zooplankton and fish eggs, suggesting that one of its principle functions in coastal waters may be as a regulator, via grazing, of phytoplankton, zooplankton and fish populations. During a recent (May, 1996) phytoplankton bloom in Moreton Bay, Australia, we observed *N. scintillans* ingesting diatoms, dinoflagellates, and silicoflagellates as well as fish eggs. Analysis of a surface slick in the eastern bay during the decline of the bloom revealed a large population of *N. scintillans* feeding exclusively on pollen of *Pinus radiata* dispersed from plantations which surround Moreton Bay. Examination of ingested pollen grains revealed that the dinoflagellates were ingesting cytoplasm of the pollen. Please see figures printed below.

References

Okaichi, T. and Nishio, S. 1976. Identification of ammonia as the toxic principle of red tide of *Noctiluca miliaris*. Bulletin of the Plankton Society of Japan, v. 23, 75-80.

Yuzao, Q., Ziaping, Z., Ying, H. Songhui, L., Congju, Z., and Yaquing, L. 1993. Occurrence of red tides on the coasts of China. In T. J. Smayda and Y. Shimizu (eds.), Toxic Phytoplankton Blooms in the Sea. p. 43-46. Elsevier, New York.





Noctiluca scintillans with ingested pollen of *Pinus radiata*, Top photo 75x, bottom photo 400x

MEET THE NEW COUNCILLORS

Owen Davis, the new President of IFPS wasted no time in securing additional help to administer to the organization's needs. Following are biographical sketches of the two new councillors.

Scott Anderson is presently the Director of the Center for Environmental Sciences & Education at Northern Arizona University. He received his BA in ecology (1974), his MS in Quaternary paleoecology (1979) and his PhD in Paleoecology and Environmental Science (1987). He has directed the Laboratory of Paleoecology at NAU since its inception in 1987. Dr. Anderson is interested in Quaternary pollen analysis, with special interests in disturbance paleoecology (fire and insect infestation), in paleoecology and climate, the history of plant communities, and in global change issues, especially as they relate to human activities in forested ecosystems.
Recent research activities include the biogeography and disturbance history of the mixed conifer forests of California; vegetation, climate and disturbance histories of the Colorado Plateau, southeast Alaska, the Sonoran Desert of the U.S. and Mexico, and New England; and interannual variation in climate and vegetation as recorded in annually laminated lake sediments. You can visit his Web site at www.nau.edu:80/~envsci/people/scott.anderson.html

Fred Rich is Professor of Geology and Chair of the Department of Geology and Geography at Georgia Southern University. He received a BS in geology at the University of Wisconsin (1973), attended Southern Illinois University for a year of graduate work, then transferred to The Pennsylvania State University where he earned his Ph.D. in 1979. From 1979 until 1988 he was with the faculty of the South Dakota School of Mines and Technology where he was responsible for a coal research program. Having done his Ph.D. work in the Okefenokee Swamp (southeastern Georgia, in the US), and having grown lonesome for its vast, swampy wilderness, he moved to Georgia in 1988 to assume his current position. His interests lie generally in the area of the terrestrial paleoecology of the southeastern US, and, though his dissertation research dealt entirely with Quaternary deposits, he is currently working on Pliocene and Miocene strata as well as Quaternary sediments. The purpose is to attempt an understanding of the changes which have taken place in an area of remarkable climatic and floristic stability. Fred can be reached at frich@gsaix2.cc.gasou.edu

NOMENCLATURAL NOTE NO. 5

IS IT GOOD FORM TO HAVE FORM-GENERA??

Rob Fensome and Judy Skog

The history of naming fossil plants has been long and varied, but one of the first concepts that emerged was the need to indicate the place of fragmentary specimens in a taxonomic system. The assignment of distinct names to different plant organs began in the 1820's and has been used with more or less formality ever since. From the formal incorporation of paleobotanical rules into the ICBN in 1959, until 1975, there were two categories of genera that were available for fragmentary remains of fossil plants: organ-genera and form-genera. These were recognized under Article 3, which describes the hierarchical system of ranks of taxa. Article 3, Note 1 read as follows:

"Since the names of species, and consequently of many higher taxa, of fossil plants are usually based on fragmentary specimens, and since the connection between these specimens can only rarely be proved, organ-genera (organo-genera) and form-genera (forma-genera) are distinguished as taxa within which species may be recognized and given names according to this Code.

"An organ-genus is assignable to a family. A form-genus is a genus unassignable to a family, but it may be referable to a taxon of higher rank (see Art. 59). Form-genera are artificial in varying degree."

In 1975 the Committee for Fossil Plants proposed the elimination of the category organ-genus from the ICBN, mainly because this category involved taxonomic and not nomenclatural decisions (Meyen and Traverse, 1979). The form-genus was retained; however, also retained was the stipulation that a form-genus was not assignable to a family (also a taxonomic decision). The wording of the proposal approved by the Fossil Plant Committee in 1975 (Traverse, 1975) stated that a form-genus "**may be assignable to a family, but may be referable to a taxon of higher rank".** However, when the actual ICBN was published the wording had been changed to: "Because of the fragmentary nature of the specimens on which the species of some fossil plants are based, the genera to which they are assigned **are not assignable to a family, although they may be referable to a taxon of higher rank.** Such genera are known as form-genera." At the same time, the Note was raised to the status of an Article (3.3), which, according to the Code must be followed. While the article that was actually approved allowed potential assignment of a form-genus to a family, the outcome of the published ICBN was quite different and does not allow it at all. This has resulted in numerous difficulties for paleobotanical nomenclature.

Several suggestions have been proposed, including 1) elimination of form-genus also and treatment of all genera as equal, 2) use of a term such as "fossil genus" to identify the fragmentary remains of plants regardless of their affinities, and 3) reinstatement of organ-genus. None of these solutions successfully clarifies the situation which needs to be resolved with nomenclatural and taxonomic issues kept separate.

The interpretation of Article 3.3 has been varied. Arguably the most literal interpretation is that, if one names a fragmentary fossil, then it must be called a form-genus and therefore cannot be assigned to a family. Other workers have used form-genera to include species

that can be assigned not to a single family, but to more than one. In other cases the form-genus has been used only for plant fragments that cannot be assigned to a family, with other designations for plant fragments that can be assigned to families.

Fossils representing part of a plant constitute only one of several situations for which the designation of form-genera is appropriate. In some cases, fossils may represent a particular stage of a life cycle. For example, dinoflagellates are represented in the fossil record almost exclusively by a cyst stage. For nomenclatural purposes dinoflagellates are ambiregnal organisms and include both phyto- and zooplankton. Up until the early 1960's some dinoflagellate paleontologists applied the ICZN to their taxa and some used the ICBN. Recognizing this to be an undesirable state of affairs, agreement was reached at that time to treat fossil dinoflagellates under the ICBN. That organ-genera were permitted under the ICBN at the time, but no equivalent device was incorporated within ICZN, was the decisive factor in the choice of Code for fossil dinoflagellates.

It is entirely feasible to assign many fossil dinoflagellate genera to extant families; moreover, it is clear from the morphology of other fossils that they represent extinct groups of dinoflagellates that are assignable to fossil families. Such families were permissible for organ-genera, but not for form-genera. Hence, dinoflagellates are currently classified into "regular" genera, not as form-genera. This makes sense in that fossil dinoflagellates must be included with living forms in a comprehensive suprageneric scheme, but it produces a confusing situation for dinoflagellate taxa in which both the fossil cyst and motile equivalent are known.

Because they are based on different stages in the life-cycle, fossil dinoflagellates and living dinoflagellates have largely received two sets of names, the equivalencies of which are becoming increasingly well known. For example, *Gonyaulax spinifera* (the "type species" of *Gonyaulax*) and related species are known to produce cysts assignable to the genus *Spiniferites*. Indeed, it is generally informally acknowledged that *Spiniferites* and *Gonyaulax* are taxonomic synonyms. For several reasons this synonymy has not been formally proposed: 1) the fossil generic name *Spiniferites* is senior to the extant name *Gonyaulax* and acceptance of the synonymy would bring considerable changes to the nomenclature of this major extant genus (and conservation of *Gonyaulax* would cause a reciprocal chaos among fossil names); 2) the exact correspondence of *Spiniferites* species with *Gonyaulax* species is not clear; and 3) it is impossible to establish whether earlier representatives of the genus *Spiniferites* were cysts with a thecate stage identical to living *Gonyaulax*. In other words, to many researchers, it is useful and desirable to retain both *Gonyaulax* and *Spiniferites* while acknowledging that they may represent the same biological taxon. Even if some authors disagree that there is merit in retaining quasi-equivalent names for fossil and living dinoflagellates, the ICBN is a nomenclatural tool and should have no part in or influence over this taxonomic debate.

According to Meyen and Traverse (1979) the problems of naming fossils are as follows. 1. Living plants are assignable to a single taxon at any rank whereas fossil plants with dispersed parts and no observable original connections may be referred to several taxa of the same rank and have different names (*Stigmaria, Lepidodendron, Lepidostrobus*) 2. In living plants, all individuals belonging to a species belong to the same genus, etc., whereas in fossil plants various specimens of a species may or may not belong to the same genus and the genus may belong to different families when the complete plant is considered (*Stigmaria* may belong to genera assigned to the Lepidodendraceae, Sigillariaceae, or Lepidocarpaceae). 3. Living plants are assigned to a complete hierarchy of taxa whereas fossil plants may be assigned only to genera with higher rankings unknown (some leaf genera might belong to pteridosperms, ferns, or cycads). 4. Living plants cannot be assigned to different genera based upon different types of preservation whereas fossil plants may be. 5. Different ontogenetic phases of the living plants do not normally serve as a distinction for a taxon whereas in fossil plants this is possible (seeds, microspores, megaspores, cysts). They concluded that fossil plant nomenclature requires only two special circumstances be reflected in the ICBN: 1) the possibility to keep genera of fossil plants outside the hierarchy of formally named higher taxa; and 2) the possibility to retain names of taxa established for various parts. Each of these issues is addressed below.

Article 3 sets forth a sequence of names, i.e. orders are subdivided into families and not vice versa. Also, species are assignable to genera and genera to families, when placed in a hierarchy. It does not say that this sequence must occur as a requirement for valid publication, and, in fact, placement of genera within a family is not a requirement for a generic name to be valid, whether or not it is a fossil. Many genera of extant plants have been validly published and accepted with no familial assignment (e.g., *Panda*) , since there is no requirement for any plant to be placed in a family, we do not need to separate out fossil plants in this regard and Article 3.3 is unnecessary. It is a taxonomic decision whether to place any genus into a family. Article 3.4 adequately allows for the use of form-genera. The second point raised by Meyen and Traverse is critical for generic names of dispersed fossil parts. Allowing more than one generic name for the same biological taxon is most appropriately placed under Article 11, which deals with priority names.

In light of the above discussion, we are making proposals to change the Code. These proposals are currently in the form of a manuscript to be submitted to Taxon. They include the deletion of Article 3.3, thus removing the confusion as to whether or not fragmentary fossils should be assigned to families; regardless of one's philosophical stance on this matter and the definitions of form- and organ-genera, these are taxonomic issues and should not be addressed in a nomenclatural code. Article 3 is about the ranks of taxa and insofar as form-genera need to be mentioned in this context, they are alluded to in Article 3.4.

We are proposing a new article under Article 11 prescribing the circumstances under which form-genera should be applied and how they relate to the principle of priority. In the sense of our proposal, "form-genera" equate with both form-genera and organ-genera of previous usage in that they may or may not be assignable to families. In a proposed new recommendation, we discourage the use of form-genera in typifying families if names based on whole organisms are available. However, this is a taxonomic issue and under no circumstances should this recommendation be incorporated into an existing or new article.

We believe that these proposals formally allow taxonomists the freedom of deciding whether or not to assign a form-genus (incorporating the former concepts of organ-genus and form-genus) to a family and to permit the use of alternative names for fossil genera (the old organ-genus concept of naming dispersed parts of the taxon separately). The proposals do not change existing **practice** in the nomenclature of fossil plants, but serve to clarify the situation and to place the rules more appropriately within the ICBN.

As always, we welcome your input, especially on the form-genus topic and also the new BioCode draft (Greuter et al., 1996). We feel that the draft is unacceptable in its present state in respect to form- and organ-genera. (The Committee for Fossil Plant's suggestions on the first draft of the BioCode have not yet been incorporated into the draft BioCode.)

References

Greuter, W. et al. 1996. Taxon 45: 349-372.

Meyen, S. and A. Traverse. 1979. Taxon 28: 595-598.

Traverse, A. 1975. Taxon 24: 690.

The North American Pollen Database is Accepting Data Contributions!

The North American Pollen Database (NAPD) is accepting contributions of Quaternary pollen data from North America. The data will be safely archived and preserved for future generations. The database archives original pollen counts, not percentages, and relevant metadata.

NAPD is a public database available by internet (WWW and FTP) from the World Data Center-A for Paleoclimatology, located at the National Geophysical Data Center in Boulder, Colorado. The database coordinator is Eric C. Grimm at the Illinois State Museum.

Data will be accepted in any form, electronic or hardcopy. Electronic submission is preferred (any ASCII or spreadsheet format), but paper count sheets will also be accepted, although they will take longer to process.

Data contributions should be sent to Dr. Eric C. Grimm, Illinois State Museum, Research and Collections Center, 1011 East Ash Street, Springfield, IL 62703. Email: grimm@museum.state.il.us. Data may be sent via Internet or snail mail. For electronic submission, send as an email attachment or contact Dr. Grimm for a suitable anonymous FTP address. Diskettes or paper copy may be sent by post.

Check out the North American pollen database on the Web! Relevant URL's are:

http://www.ngdc.noaa.gov/ [NGDC home page]
http://www.ngdc.noaa.gov/paleo/paleoveg.html [NGDC paleovegetation page]
http://www.ngdc.noaa.gov/paleo/pollen.html [NGDC pollen page]
http://www.ngdc.noaa.gov/paleo/napd.html [NGDC NAPD page]
http://www.museum.state.il.us/research/napd/mainmenu.html [ISM NAPD page]

The anonymous FTP address for NAPD data is

ftp.ngdc.noaa.gov:/paleo/pollen.

NEW DISSERTATION ON CRETACEOUS PALYNOLOGY

Dr. Nina Baghai would like to announce the completion of a Ph.D. The title of the dissertation is "An analysis of palynomorphs from Upper Cretaceous sedimentary rocks with emphasis on the Aguja Formation, Big Bend National Park, Brewster County, Texas" . Individuals that would like a copy may contact Dr. Baghai at the listed address. Individuals possibly will need to pay for Xeroxing and binding.

Nina Baghai
117170 Briar Forest Dr. #1012
Houston, TX 77077

BOOK REVIEWS

Spore Morphology of Chinese Pteridophytes. Zhang Yulong, Xi Yizhen, Zhang Jintan, Gao Guizhen, Du Naiqiu, Sun Xiangjun, and Kong Zhaochen. 1990. Science Press, Beijing. 592 pages, 101 plates. $100.00. (Copies can be ordered by mail or by email from: Dr. Qinhua Jiang, Department of Geology, Peking University, Beijing 100871, People's Republic of China; Email: qjiang@geoms.geo.pku.edu.cn)

Last year I reviewed the recently released second edition of the Pollen Flora of China. At the time I mentioned that I considered almost any published pollen or spore atlas as an essential for the bookshelf of all serious palynologists. Spore Morphology of Chinese Pteridophytes is another one to add to your list of "must have" books. It is expensive, though not as expensive as some of the more recent European pollen atlases, and the advantage of this Chinese edition is that it is written entirely in English.
Most book reviews occur soon after a book has been printed. As the reader will note, this review comes six years after the book was first printed in 1990. However, I feel the review is timely because I doubt that many palynologists outside China have copies of this edition, or even know that it exists. Like many others, I first learned of this book only a few months ago.
This guide to Chinese pteridophyte spore morphology represents an extensive look at fern types found in all regions of China. In the first chapter the authors note that more than 12,000 fern species exist in the world and of those, at least 2,600 species grow in China. The present Chinese flora includes pteridophyte species in 54 different families and there are about 200 separate genera. When discussing fern distributions, the authors divide China into six separate geographical regions and provide a brief overview of the major fern taxa found in each region.
Chapter two is a short, but informative chapter devoted to a summary of the various types of fern spores recovered from the geologic record of China.
The authors begin their discussion with spores found in Chinese Silurian deposits, and conclude with a section devoted to the fossil spores of the Chinese Cenozoic Period. Chapter three is brief, and discusses how each specimen was collected and processed, how each of the traced line drawings was made, and finally a statement about the micrographs for each spore type. Chapter four consists of a general discussion about the terminology and definition of terms the authors used to describe the morphology of each specimen.
More than 500 pages of the book are devoted to a detailed study of each spore type. Beginning with spores in the family Psilotaceae, and ending 52 families later with the spores of the Azollaceae, the authors offer a precise discussion for each spore taxon. The discussions for each species include: 1) the source and voucher number, 2) a description of the spore's shape and morphology, 3) size range in microns, and 4) the known geographical distribution of the taxon in China. Many of the taxa also include beautifully hand-drawn line drawings (i.e., most are drawn at magnifications of 500x to 1,000x), which the authors say came from careful tracing. Each taxon is also illustrated by one or more micrographs located in a single section devoted to photographic plates.
There are a number of nice features about this book. First, all of the micrographs are shown at a magnification of 500x; any exceptions are noted. Second, the micrographs are of good quality. The authors were careful not to include light and dark pictures together on the same plate, and the vast majority of prints are in sharp focus. Third, there two alphabetical indexes based on the Latin names of all taxa mentioned in the book. One lists all extant taxa and the other lists all fossil taxa. Both indexes list both the text and plate page numbers for each taxon.
Overall, this is an excellent, and useful spore atlas. The line drawings are of high caliber and remind me very much of the beautiful illustrations drawn by Anna-Lisa Nilsson in Erdtman's 1957, two-volume book, Pollen and Spore Morphology/Plant Taxonomy--Gymnospermae, Pteridophyta, Bryophyta. The text is readable and written in clear English. The micrographs are of high quality and most clearly illustrate significant ornamentation and other morphological features. Paper quality of the book is good, but I would have liked to see the plates printed on paper with a higher clay content so the photographs would have been even sharper.
I am not an expert on the pteridophytes of the world, therefore, I cannot vouch for the accuracy of the text portion of the book. Nevertheless, I have every reason to believe that it is of the same high quality as the rest of the book. There is one item, however, which. I think deserves brief mention. Readers will note that the authors of the Chinese spore atlas have included five families of fern allies (Psilotaceae,Lycopodiaceae, Selaginellaceae, Isoetaceae, and Equisetaceae) under the broad heading of Pteridophytes. That classification system was popular decades ago, but in recent years most cryptogamic classification systems split these five families into separate groups instead of lumping them in with the Pteridophytes.
Perhaps some may feel that $100 U.S. is a steep price to pay for this book. However, my experience has shown that when I delay the purchase of a palynomorph atlas, I find that by the time I need the atlas, it is out of print or no longer available for sale. This is why I would urge each of you to consider your purchase now rather than waiting. Some day in the future all of these types of atlases may be available on CD disks or can be accessed on the world wide web. However, until that day arrives, we are still bound by the need for books made of paper!

Reviewed by:
Vaughn M. Bryant, Jr.

Dr. Vaughn M. Bryant, Jr.
Professor and Head
Department of Anthropology
Director of Texas A&M Palynology Laboratory
Texas A&M University
College Station, Texas 77843-4352
Telephone (409) 845-5242
FAX (409) 845-4070
email (vbryant@tamu.edu

RECOVERIES '97

First announcement and call for participation and papers.

The final meeting of the UNESCO IGCP Project 335, "Biotic Recoveries from Mass Exctinctions" is to be held September 12-14, 1997 in Prague, Czech Republic
PLEASE, POINT YOUR WWW BROWSER TO:
http://www.gli.cas.cz/conf/recovery/recovery.ht m

About the project: In the history of the Earth (including the recent), numerous events of ecosystem collapse have occurred that were followed by recoveries and origination of new ecosystems. This significant transformation could be realized in numerous ways. The project aims to be a platform for the study of survival and recovery of the biosphere, and restructuring of global environments, following mass extinctions.
The project outlines are: (1) to study patterns of extinction/survivorship of organisms during the mass extinction events; (2) to analyze the evolutionary and ecological strategies that allowed clades and communities to survive and initiate subsequent biotic recoveries; (3) to study the structure of the deep-crisis ecosystem; (4) to elucidate the recovery initiation mechanisms; (5) to find the time, space and functional patterns of the recovery; (6) to refine the data and tools for this discipline; (7) to develop general models by means of comparison of individual global crises in Earth's history; (8) to apply these (predictive) models to better understanding the modern environmental and biodiversity crises.

This international project is headed by Douglas H. Erwin, Smithsonian Institution, Washington, D.C., and Erle G. Kauffman, University of Colorado, Boulder. Over sixty countries are involved in the project.

Audience:
The meeting should bring together palaeobiologists, palaeontologists, biologists, ecologists, systems theorists, and other persons that are interested in the topic.

Organizers:
The conference is held under the auspices of the Geological Institute, Academy of Sciences, and is organized by Petr Cejchan and Jindrich Hladil, Geological Institute, Academy of Sciences, Rozvojova 135, CZ 165 02 Praha 6 Lysolaje
Czech Republic

Venue:
The conference will be held at the new IKEM Conference Building, Videnska 800, Prague 4, Czech Republic, two bus-stops away from the Metro line C station "Kacerov", ca. 20 minutes off the city centre.

Abstracts:
Abstracts should be submitted before May 31,1997, preferably as plain text on a DOS- formatted diskette. The abstract book will be included with the conference materials. Persons interested in obtaining the abstracts in advance can order the DOS-formatted diskette with abstracts for US$ 25 (after July 1, 1997).

Second announcement:
The responders to the first announcement will obtain the second announcement (registration form, hotel reservation form & call for papers) during February, 1997.

Please, direct all your correspondence related to the conference to the Conference Manager: Petra Hovorkova, Recoveries '97, Eurocongress Centre, Budejovicka 15, CZ 140 00 Praha 4, FAX +42-2-61211247
For conference update and details on the programme please consult:
http://www.gli.cas.cz/conf/recovery/recovery.htm
e-mail: recovery@gli.cas.cz

AVAILABILITY OF PHOTOPAL

PHOTOPAL, the interactive bank of digital images of modern pollen grains and their morphological descriptions is now available. It is based upon information derived from several modern pollen collections, including those of Montpellier, Paris, Lyon, and Stockholm. PHOTOPAL runs independently both in English and in French. Species of all botanical families, various regions and distinct ecologies are concerned (for example: Acanthaceae, Bombacaceae, Caryophyllaceae, Celastraceae, Cucurbitaceae, Euphorbiaceae, Gnetaceae, Hamamelidaceae, Icacinaceae, Lythraceae, Nyctaginaceae, Oleaceae, Pinaceae, Rhamnaceae, Rosaceae, Verbenaceae, Zygophyllaceae, etc.).

Today, PHOTOPAL includes more than 200 species and is regularly enlarged (planned expansion: 200 taxa per year). PHOTOPAL provides up to 20 high-resolution (Super VGA: 756 x 581 pixels - 256 grey levels) black and white images. Most of the images have been obtained in photonic microscopy and show all the views and details useful in pollen morphology; some species are also represented by additional scanning microscope photographs. Photographs are grouped on half-screen, one of them being selected to be exhibited at a higher magnification on the second half-screen. Information on the plant origin, on its geographical repartition, ecology, synonymies and biology are provided separately as well as a listing of the pollen morphological characters.

Palynologists possessing diverse levels of morphological knowledge can use PHOTOPAL very easily, searching via Systematics or via pollen Morphology.

The PHOTOPAL subscription price is decreasing greatly and will continue to do so if enough subscriptions are received.

PHOTOPAL users need a CDRom reader and a PC computer with a Super VGA screen. PHOTOPAL is now distributed on annual CDRom disk. The availability of PHOTOPAL through INTERNET is in progress, and PHOTOPAL demodisks are available. A demonstration runs on INTERNET at the following address: ftp://ftp.univ-lyon1.fr/pub/systems/dos/photopal. Requests for information should be sent to: Jean-Pierre SUC, Centre de Paleontologie Stratigraphique et Paleoecologie, Universite Lyon 1, 27-43, Boulevard du 11 Novembre, 69622 Villeurbanne Cedex (France), e-mail: jean-pierre.suc@univ-lyon1.fr. Indicate whether you are interested in receiving the demodisks in English or French.

IFPS NECROLOGY

Dr. James Canwright, Past President of IFPS has provided the attached list of members of IFPS-affiliated societies who have passed away since the previous Congress meeting in 1992.

Name	Life-Span
Dinesh C. Bharadwaj	(1923 - 1995)
Mavis Ann Butterworth	(1929 - 1996)
Donald K. Cameron, Jr.	(1931 - 1994)
Jeanne M. Doubinger	(1921 - 1994)
Warren S. Drugg	(1929 - 1994)
Ichitaro Harada	(1916 - 1994)
Wolfgang Hartung	(1907 - 1995)
Norman F. Hughes	(1918 - 1994)
Marie-Roger Ickovic	(? - 1995)
Fredrik P. Jonker	(1912 - 1995)
Hideo Kitami	(? - 1993)
Robert M. Kosanke	(1917 - 1996)
Gerhard O.W. Kremp	(1913 - 1994)
Alfred R. Loeblich, Jr.	(1914 - 1994)
Francine L. Martin	(1937 - 1994)
Winfried Remy	(1924 - 1995)
Terah L. Smiley	(1914 - 1996)
Lewis F. Stover	(1925 - 1993)
Takeo Takada	(1904 - 1994)
Seiya Tanaka	(1921 - 1993)
Shinobu Tomita	(1921 - 1996)
Joseph M. Wood	(1921 - 1994)
Xu Ren (Hsu Jen)	(1910 - 1992)

A NOTE FROM THE NEW EDITOR

This is the first in a series of newsletters which I will be editor of. I had some experience years ago as editor of the AASP Newsletter, and feel fairly comfortable with the task, particularly since electronic publishing has advanced some since then. I want to thank all the contributors to this issue; virtually all the items were submitted voluntarily and I spent very little time "shaking the tree" as John Wrenn, former edtor, put it. Any stylistic mistakes you may have seen are mine; the editor is supposed to make sure those don't appear. Should you have differences of opinion concerning the content of the articles, I urge you to contact the authors directly. I have endeavored to print email addresses when they are available to me. I look forward to hearing from our many councillors around the world, and solicite your contributions to this newsletter so that, next June, I don't have to "shake the tree" for information suitable for publication! I would be very happy to hear from all of you. My address is printed below.

PALYNOS (ISSN 0256-1670) is published semiannually (June and December) and is distributed to all individual members of the scientific organizations affiliated with the **International Federation of Palynological Societies (IFPS).** News items, photos, member and society activities are welcome. (Scientific papers will not be published in *PALYNOS*.) Please forward materials for *PALYNOS* to the Editor:
Dr. Fredrick J. Rich
Department of Geology and Geography
P.O. Box 8149
Georgia Southern University
Statesboro, Georgia 30460 U.S.A.

Phone: (912) 681-5361
FAX: (912) 681-0668
E-Mail: frich@gsaix2.cc.gasou.edu

NEW AASP FOUNDATION PUBLICATION

The long-awaited 3-volume book entitled:

Palynology: principles and applications

Edited by: Jan Jansonius and Colin McGregor

HAS BEEN PUBLISHED
and is AVAILABLE NOW

32 major chapters; 1330 page, 125 photographic plates, 14 in color.

ORDER FORM ORDER FORM ORDER FORM

(AVAILABLE NOW)

Ship _____copies of Palynology: principles and applications @ $100.00 $_____

Postage: add $15 for **EACH** 3-volume set ordered – **Postage Total** $_____

TOTAL $_____

Name: Date:

Shipping Address:

Make check (in U.S. funds) payable on a U.S. bank to: AASP Foundation. Mail to: Robert T. Clarke, Mobil E&P Technical Center, P.O. Box 650232, Dallas, Texas 75265-0232

(November, 1996)