IOP NEWSLETTER 19

INTERNATIONAL ORGANIZATION OF PALAEOBOTANY

INTERNATIONAL UNION OF BIOLOGICAL SCIENCES
-SECTION FOR PALAEOBOTANY
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PLEASE MAIL NEWS AND CORRESPONDENCE TO YOUR REGIONAL REPRESENTATIVE OR TO THE SECRETARY FOR THE NEXT NEWSLETTER 20, BEFORE THE END OF FEBRUARY 1983. The views expressed in the newsletter are those of its correspondents and do not necessarily reflect the policy of IOP.

IOP NEWS

NEWSLETTER PRODUCTION

This edition of IOP newsletter has been typed on a different machine to the normal one, so that each character is closer together by 20%. The reason for this is to save money on paper and postage. It may mean that some readers will find it difficult to see the text. Please send criticisms to the secretary; otherwise, future newsletters may follow this style.

IUBS GENERAL ASSEMBLY, AUGUST 1982

This 21st assembly, held in Ottawa, made a number of decisions which have importance to IOP. A summary of the assembly and a report of the executive committee meeting are available from the IUBS secretariat, 51 Boulevard de Montmorency, 75016 Paris.

1. IOP is now a Section of IUBS, and not of the "Division of Botany" (see page 2 of IOP Newsletter 5, 1978) which has been abandoned. There is resolve to bring together, as a group, Sections with special interests in Systematic and Evolutionary Biology.
2. The IUBS Executive Committee emphasised an IUBS rule: "IUBS Grants cannot be allocated to the scientific activities of the Scientific Members". For this reason the IOP application for a subvention of $1,000 for 1983 was unsuccessful.
3. The National Annual Dues through the years 1983 - 1985 give an annual income to IUBS of $193,000.

IOP FINANCIAL CRISIS

As a result of our failure to gain a $1,000 subvention from IUBS for 1983 the financial affairs of IOP are very serious. We received such subventions regularly and reliably in earlier years and had come to rely on the grant to pay for our activities. We received no warning that the subventions were to be stopped, or even that the IUBS "rule" (see 2, in the paragraph above) exists.

One possible course of action is for members of the Executive Committee of IOP to approach their National grant-awarding authorities for help. Other ideas and initiatives from IOP members will be gratefully received.

OBITUARY - HANNA CZECZOTT

On March 17th 1982, Professor Hanna Czeczott, one of the most outstanding Polish palaeobotanists, died in Warsaw.
Hanna Czeczott, whose maiden name was Peretiatkowicz, was born in Petersburg where she received her college education. After a short stay in Poland she returned to Russia in 1910 as wife of Henryk Czeczott, Professor of the Petersburg Institute of Mining. In 1922 she graduated from the Biogeographical Department of the Geographical Institute in Petersburg. Her diploma work was a study of forests in the vicinity of Murmansk, carried out under the supervision of a well-known botanist Professor V.N. Sukaczow. In the same year Hanna Czeczott went to live in Poland.
Between the two World Wars she carried out research work on taxonomy and the geography of plants. She collected her material during numerous expeditions to the USA, Canada, Central Asia, the Canary Islands and Turkey, where she accompanied her husband. Among her most significant works of that period are: The Atlantic Element in the Flora of Poland, 1926; The Distribution of some Species in northern Asia Minor and the problem of Pontide, 1937; A Contribution to the Knowledge of the Flora of Turkey, 1938 &1939; as well as works on the variability of beech, oak and hornbeam in which she employed a biometric method.
In 1934 Hanna Czeczott published her first palaeobotanical study on fossil beech, and in 1937 she collected Miocene fossil plants from Zaleśce near Wisniowiec.
After the second World War, in 1946, she started her work in the Museum of the Earth of the Polish Academy of Sciences in Warsaw. Here she began a palaeobotany laboratory, furnishing it with constantly growing collections of fossil floras, comparative collections of contemporary plants, and a collection of books. In 1947 she discovered the Miocene flora in the Turow brown coal mine which gave rise to the biggest palaeobotanical collection in the Museum of the Earth. The research of this flora was carried out also by some other prominant Polish palaeobotanists and the results were published in Prace Muzeum Ziemi under the common title "The Fossil Flora of Torów near Bogatynia", 1959, 1961, 1967, 1975 and 1980. They constitute a complex and versatile study of this rich fossil flora. Hanna Czeczott also carried out research on Baltic amber and the flora preserved in it. This is published in Prace Muzeum Ziemi 1961: "The Flora of the Baltic Amber and its Age".
Professor Hanna Czeczott was a strong personality, a woman of immense passion for research. She was an untiring field worker of great intuition. Her numerous expeditions resulted in rich and valuable herbaria which have been transmitted to the Botanical Institute of Warsaw University, and in extensive collections of fossil plants which are housed in the Museum of the Earth. Another passion of Professor Czeczott was collecting books. Her collection, which contains a lot of valuable palaeobotanical studies as well as studies on contemporary subtropical and tropical floras of the world, has been given to the library of the Museum of the Earth.
For her research work on fossil floras, Hanna Czeczott received a number of State Awards: the Order of the Banner of Labour of the Second Class, the title of Turów Honorary Miner, and the Gold Award of the Turów Worker of Merit.

A. HUMMEL, Warsaw, Poland.

REPORT OF RECENT MEETING

3 NORTH AMERICAN PALAEONTOLOGICAL CONVENTION, Montreal, August 5-7, 1982.
This meeting was sponsored not only by such bodies as the Society of Economic Palaeontologists and Mineralogists, but by the American Association of Stratigraphic Palynologists and the Paleobotany Section of the Botanical Society of America. So, properly, paleobotany and palynology were much in evidence.
In the current atmosphere inevitably the "mechanics of evolution" controvery had a good share of the programme - or, more accurately, pride of place. The opening session of that title was of seven lectures, starting with Stanley and ending with Gould; unfortunately the latter was unwell, but his paper was delivered by Eldredge, so that the tone of the session was well maintained. The ground seemed vaguely familiar but I have to admit reluctantly that some of the more rarified high spots eluded me.
The McGill campus is still surprisingly green and treed, the more remarkably so since it stands in the shadow of a "Manhattan style" facade of rather elegant glass-fronted office blocks. A pleasant open-air cafe with sun-shades (which were even needed, on occasion) added to the attractions of the setting.
Palaeobotany and palynology items constituted almost exactly a quarter of the 184 papers delivered. I find this a most encouraging sign of the health of North American palaeobotany - as was the presence of a strong contingent of younger contributors in this field. One all-day session was devoted to "Geological factors and the evolution of plants", convened by Bruce Tiffney and presided over by Andy Knoll and Pat Gensel (Bruce was away on a palaeobotanical trip to China, which he judged, rightly, I believe, to take priority).
A volume, based on this session, is planned for early publication by Yale University Press. The contents range from a pre-Cambrian tour de force by Knoll, to the latest installment of the Gray/Boucot even-earlier-records-of-?land-plants saga (cuticles and spores now back to the Caradoc with Llandovery "lycophytes and rhyniophytes").
There was a strong palynology session. This came in two halves entitled, with obtuse American humour, "Palynology - the latest environmental impact statement" and "Palynology - the state of the art". The most encouraging feature here, to me, was not the sight of palynologists reviewing their work to the converted, (which they did well enough) but rather, the range of other palaeontologists who had wandered in from parallel sessions on the fossil insects, forams and the Siluro-Devonian.
The Redpath Museum, a focal point in the history and geography of McGill was having its Centennial year in 1982. Appropriately, a session of the convention was devoted to reviewing Dawson's contributions to palaeontology. These ranged from the pre-Cambrian "non-fossil" Eozoon to early tetrapods, with a lot of palaeobotany along the way. Dawson is apt to be remembered by palaeobotanists only as the discoverer of Psilophyton; but the session was a sobering reminder of his amazing range of achievements as field worker and palaeontologist, teacher and university administrator and a man of deep religious conviction. Among these activities he found time to write some 300 scientific papers and 25 books. All this, without a word-processor....!
We were treated to a bibulous and elegant reception in the Redpath Museum, and to a dinner in the University Center. The latter was rounded off by Digby McClaren's talk on: "Evolution - ancient and modern", which combined the best of an after-dinner speech with a first-rate lecture.
"General palaeobotany" got crammed into an afternoon session. I use the phrase advisedly, as fourteen papers were more or less fitted into a 3½ hour session, with the aid of coloured lights and an egg-timer. It was a somewhat breathtaking experience, for speakers and audience.
Our Canadian hosts did a first rate job of organisation, in every detail, not least in the 600 page, 2 volumes, of proceedings produced before the congress by Bernard Mamet and Murray Copeland.
A strong signal emanating from the meeting was that American palaeobotany and palynology are not only alive and well, but their vigour and diversity of approach are being noticed in the other branches of palaeobiology.
W.G. CHALONER, London.

FORTHCOMING MEETING

THE SCANNING ELECTRON MICROSCOPE & PALAEOBOTANY, April 1983, Michigan, USA
Scanning Electron Microscopy Inc. is arranging this annual meeting in the Hyatt Hotel, Dearborn, Michigan from April 18-22 1983. The hotel is linked to Fairlane Town Centre by monorail train. A programme is scheduled with the theme "Plants and their Environment", in which emphasis will be given to: plant mineralisation, root systems, palaeobotany and palynology, and plants in general. T.N. Taylor is a member of the organising committee.
A special programme follows the meeting, from April 23 - 28 on The Science of Biological Specimen Preparation for Microscopy and Microanalysis. This will be at the Sugar Loaf mountain resort located near Traverse City (he must be important!) of northwest Michigan.

RECENT AWARDS

David Batten of the Department of Geology and Mineralogy, Marischal College, Aberdeen AB9 1AS, Scotland, has written to the IOP secretary asking to be quoted verbatim: "In connection with the section "Recent Awards" which you introduced in the last IOP Newsletter, I think it should be made clear to readers that the studentship projects you list and the two related topics not mentioned (proposed by Charles Downie and myself!) were approved by the Natural Environment Research Council (NERC) but are not necessarily "awards". This is because the NERC is in the habit of agreeing to support more projects per university department than it provides money for. The members of staff concerned have to decide which projects will have priority and this may depend on a number of factors including the need to maintain a balance of research activities in the department and the qualifications of the applicants. Thus, while it is to be hoped that all of the "approvals" for this year have by now gained financial support either via departmental agreement or by appeal to the NERC or other grant-giving bodies, this is not guaranteed."

IS IT TRUE WHAT THEY SAY ABOUT CORDAITES?

Is it true what they say about Cordaites?
Is it true that they really were trees?
Francois Cyrille* said yes, since there was no progress,
Forty meters is Tom's* guess, based on peels.

Is it true what they say about Cordaites?
Were they pines? Were they walnuts, or palms?
Did they use them for the ark*? - hollow stems, resistent bark -
It's not in the Book, or the psalms.

Is it true what they say about Cordaites?
Did they die; do they live still today?
Is there not a hidden place, on this earth or out in space
Where mangroves in breezes still sway?

Oh, give me a home where the Cordaite-birds roam
Where those strap-like leaves cover the ground;
Where the Antholithes sway at the end of the day
And the seeds drop with sarcotest sound.

References: Grand'Eury, F.C. 1877. Flore Carbonifere du Departement de la Loire et du Centre de la France.
Taylor, T.N. 1981. Paleobotany, an Introduction to Fossil Plant Biology.
Brainstorm, W.C. 1982. How did the Ark float? Very special publication.

M. BOERSMA, UTRECHT, THE NETHERLANDS.

FRENCH-SOVIET PALAEOBOTANICAL COOPERATION

A joint French-Soviet palaeobotanical programme on the study of floral provinces in the geological past started in 1979 under the co-chairmanship of Y.Lemoigne and S.V. Meyen. Since then, several French palaeobotanists (G. Barale, J. Broutin, Y. Lemoigne, C. Roy and E. Samuel) have visited palaeobotanical laboratories in Moscow, Kiev, Leningrad and Tashkent, and a number of joint projects have been initiated. In May 1982 four Soviet palaeobotanists (V.A. Vakhrameev, I.A. Dobruskina, M.P. Doludenko and S.V. Meyen) visited palaeobotanical laboratories and museums in Lyon, Paris, Lille and Strasbourg. The visit was aimed at studying collections and localities, discussion of topics of mutual interest and the planning of further joint work.

At the beginning of the visit all the Soviet palaeobotanists worked in Lyon, where, among others, huge collections transferred from the Ecole des Mines in Paris are presently kept. Some of the older collections belonging to Zeiller, Grand'Eury, Renault, etc are very well known. Interesting newer collections are also available in Lyon, eg Lemoigne's Permian plants from Saudi Arabia, Barale's Jurassic plants from France and Samuel's Upper Cretaceous plants from France. Dobruskina and Meyen were allowed to borrow some specimens for further study in Moscow. Dobruskina took some Triassic plants from the Keuper of Lunz (Austria) for closer comparison with coeval plants from the USSR. Meyen loaned Gran'Eury's specimens of seed-bearing fronds of Dicksonites pluckenetii (Schl.) Sterz. to prepare his part of the joint paper on this plant with Lemoigne. In Lyon the Soviets met John Holmes who had travelled north from Montpellier specially. Meyen discussed with him the problems of fern and pteridosperm morphology and systematics.

Vakhrameev, Dobruskina and Doludenko together with Lemoigne visited Strasbourg, where they met J. Doubinger and L. Grauvogel-Stamm. They were very impressed by Grauvogel-Stamm's huge collections of Triassic plants. Meanwhile, Meyen and Samuel visited Lille University to meet J. -P. Laveine, C. Brousmiche and other members of staff at the palaeobotany laboratory. Meyen was particularly interested in the collections of Palaeozoic plants, particularly the pteridosperms.

In Paris, the Soviet group visited Paris University and the National Museum of Natural History. In the latter there are many famous collections, including those of Brongniart, Renault, Grand'Eury, Saporta etc. C. Blanc of the Museum demonstrated her collection of the supposed angiosperms from the Lower Cretaceous of France.

At the university J. Broutin showed the visitors his collection of the Permian plants from Spain, and D. Pons demonstrated the Cretaceous plants from South America.

In Paris, Meyen spent a day with J. Galtier and J. Broutin, discussing problems of the systematics of gymnosperms.

The preliminary results of Meyen's work in Lyon and Paris were briefly summarised in IOP Newsletter 18, 1982: 4-6.

At the end of the visit a round table discussion was organised in Paris where the continuation of the joint research programme for 1983-1986 was discussed. It was decided to extend the membership of the programme and to devote future efforts to major changes in the floral development in different floristic provinces.

The group then visited some fossil plant localities: in Jura (Creys, Cerin and Orbagnoux) to see Upper Jurassic floras, and in south east France (Sabran) to see Cretaceous floras.

Both the French and Soviet participants regard their joint work as very productive. The French are becoming acquainted with the quite different floras from the huge territory of the USSR and the Soviets are interested in the detail of French work, particularly the anatomy, the collections and the localities. The participants of the programme hope that this cooperation provides a good example to be followed by palaeobotanists in other countries. Soviet palaeobotanists are very grateful to their French colleagues for their hospitality and the very good organisation of the visit.

Y. LEMOIGNE & S.V. MEYEN.

IMPERFECTIONS OF THE FOSSIL RECORD

The first man who scrutinised the imperfections of the fossil record was Darwin. The chapter X of his book was specially devoted to the issue. The last paragraph of this chapter claims: "....I look at the geological record as a history of the world imperfectly kept, and written in a changing dialect; of this history we possess the last volume alone, relating only to two or three countries. Of this volume, only here and there a short chapter has been preserved; and of each page, only here and there a few lines." Darwin needed explanations of phenomena like the sudden appearance of some groups in the succession of strata. Such phenomena were widely used by his opponents. He succeeded in his efforts, but unfortunately he damaged the tree where palaeontology built a nest. His conviction was echoed by K. Goebel, to mention only one well known example, who claimed that the palaeobotany is nearly worthless for the general plant morphology and phylogeny. All the totally extinct groups discovered by palaeobotanists can always be treated as "only here and there a few lines".

I was confronted with these problems when I recently compiled a general phylogeny of higher plants. I was surprised to see that at the ordinal level the tree looks pretty well without many gaps. During the work I noticed an interesting situation which can be exemplified with the callistophytans. The family Callistophytaceae appeared in 1970 (Stidd & Hall) and the order Callistophytales in 1981 (Taylor and Rothwell working independently). But the plants presently placed in the taxa were known to Schlotheim (his Filicites Pluckeneti), Sterzel and Grand'Eury (fertile fronds), Renault (Poroxylon) etc. More than a century ago palaeobotanists repeatedly met the plants recently recognised as a separate order. Is the latter really new, then? Just the same story happens with plenty of taxa established during the last few decades. Progymnospermopsida, Peltaspermaceae, Cheirolepidiaceae, Zosterophyllophyta etc - all of them were well represented in collections of the last century, albeit that they have not been interpreted in the same way as now.

Statistically this looks as follows: the system of gymnosperms adopted by me comprises 29 totally extinct families. Most of these were established during the last decades, members of 26 families were actually discovered in the 19th century, members of another 2 before 1934, and only one family (Buteoxylaceae) remains uncertain in these respects, probably because we do not know its foliage from impression and compression material. Anyhow, in spite of the highly extensive collecting during the last 50 years, palaeobotanists have been able to recognise only new families, and have been almost unable to find the first specimen of a new family. Members of all the orders adopted by me were actually found more than a century ago.

I presume that in the case of gymnosperms the imperfection of the fossil record involves an overwhelming majority of individuals, the majority of species, many genera and only a few taxa of higher rank. It means that at certain levels of the taxonomic hierarchy the fossil record is practically perfect, and the characteristics "imperfect" should be attributed to the palaeobotanical studies. For gymnosperms, the fossil record is perfect at the family level and above. The situation will be quite different in groups like lichens or unicellular algae without resitant membranes.

I would not like to be undertood as a person throwing stones at his fellow men. On the contrary, I am convinced that the very possibility that the fossil record is perfect at certain taxonomic levels providesadditional nutrition to further palaeobotanical studies.

S.V. MEYEN, Moscow.

NEWS OF INDIVIDUALS

ANTONIN HLUŠTÍK from the Geoindustria Praha, Branching Office Slany, Bienerova 1536, 274 01 Slany, Czechoslovakia, collected Late Palaeozoic and Mesozoic plants in the Wadi Ash Shatti region (formerly the Fezzan Province) of the Libyan Sahara during the spring of 1982. Working on samples of pteridophytes from the Devonian, Carboniferous and "Nubian Sandstone" rocks he has an excellent opportunity to compare his central European experience with the impression fossils of North Africa. His next trip to the Sahara will be to Marada, south

of the Great Syrta to collect Tertiary plants. This work is being done in conjunction with Zlatko Kvacek from the Czechoslovak Academy of Sciences. The studies are a service operation for a Czechoslovak mapping team which is being financed and supervised by the Industrial Research Centre specialists in Tripoli, the S.P.L.A.J. All the palaeobotanical results from the work are planned to be published in the form of special papers.

SVEIN MANUM is staying at the Birbal Sahni Institute, Lucknow, India, during the months of November and December 1982. He has been invited to give the 30th Sir Albert Seward Memorial lecture on November 15th.

TOM HARRIS is also visiting the Birbal Sahni Institute during late 1982 and early 1983. Something will be arranged there to celebrate his 80th birthday on January 8th.

PETER CRANE has moved to the Department of Geology, Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, IL 60605, USA. His telephone number is (312) 922-9410 extension 334.

LES CHAMPIGNONS FOSSILES

This is the main title of two volumes by Marcel V. Locquin recently published privately by him and available from 54 Bd de la Libération, 94300 Vincennes, France. Volume 1 costs Fr 55 microfiches or Fr 185 paperback; volume 2 costs Fr 70 microfiches or Fr 205 paperback.

Volume 1: Recherches sur quelques organismes fongiques probables presents au Paleozoique.

Volume 2: Nouvelles recherches sur les champignons fossiles; Macromycetes Mezozoiques; Paleosporologie.

L'auteur devéloppe un certain nombre de techniques originales pour des microfossiles conservés à l'état de matière organique depuis environ un demi milliard d'années: fractographies, broyage et flottation différentielle, dépolarisation de la lumière, inclusion puis amincissement par usure et microréflectographie en fluorescence et en polarisation, regonflement chimique des cellules déformées par la fossilisation. Il effectue des réactions cytochemique sur lames minces de roches contenant les microfossiles.

Il contribue à la mise en evidence de la genese coloniale des megaspheroides precurseurs des cellules eucaryotes. Il explique le passage de ceux-ci aux cellules eucaryotes en trois étapes et par trois mécanismes: la métamérisation, l'agrégation oncogène d'exosymbiotes, l'agregation oncogene d'endosymbiotes. Il prouve que les framboides pyriteux ont une origine organique cellulaire et que les microfossiles sont libres dans la roche qui les contient.

L'auteur étudie en détails les Chitinozoaires jusqu'ici insertae sedis. Il recherche les mécanismes de leur sexualité qu'il reconstruit à partir de l'étude de structures internesjusqu'ici incomplètement connues. Il met ainsi en évidence: spores, coiffe, canal copulateur, gamètes, gymnoplastes, nannandres, zygospores etc. Excluant deux genres fossiles à verser dans les Chytridiomycetes encore actuels, l'auteur établit la très grande probabilité que les Chitinozoaires devenant Chitinomycetes soient une classe éteinte des Mycota depuis le début du Carbonifère.

L'existence de champignions marins au Paléozoique est confirmée par la découverte de mycoses fossiles chez les Poissons et Agnathes de cette époque.

L'auteur fait une révision des thyriothèces d'Ascomycetes fossiles dont il donne la classification de 38 genres fossiles connus depuis le Silurien, avec leur stratigraphie. Il étudie un synascomycète particulièrement bien conservé de la tourbière Dévonienne de Rhynie

Il étude plusieurs Polypores silicifiés de Lybie ainsi que le bol alimentaire fossile d'un grand Sauropode qui contient une douzaine de genres de Macromycètes encore actuels, dont le genre Amanita.

En conclusion il donne une synthèse taxonomique des connaissances néomycologiques

et paléomycologiques comparées, avec une classification des Sporae dispersae de champignons, permettant un traitement sur ordinateur pour l'aide à la détermination par les formes.
M.V. LOCQUIN, Vincennes.

BOOK REVIEWS

FOSSILS, UNKNOWN COMPANIONS. E. Annoscia, 1981. 180pp. Soliart, Milano. Distributed by Silvana Editoriale, Milano. Italian, French and English language editions. (Production is financed by the AGIP oil company, who will do their best to meet offical requests for copies from relevant libraries, institutions and museums. Write to: E Aunoscia, AGIP/AMI-CEDI, 20079 San Donato Milanese, Italy.)

Recently, I was presented with this book, not to be reviewed but to be enjoyed, and I am writing this to share my joy with fellow palaeontologists and palaeobotanists. The book is about such commonplace matters as mass communication, tools and building materials, art, decoration, games, coins and stamps, and a great deal more. The extraordinary thing about it is that it deals with fossils in relation to the commonplace. The author is a palaeontologist serving as the director of the Italian oil company AGIP's documentation and information centre in Milano; he is also teaching economic palaeontology in the university in Milano. The book is published for the Italian state-owned industrial group ENI of which AGIP is a subsiduary. ENI annually sponsors the publication of a finely illustrated and original contribution on a historical, artistic or cultural theme. "Fossils, unknown companions" is published simultaneously in Italian, French and English, and I am informed that by the end of 1982 copies will be made available to the general book market through Silvana Editoriale, Milano.
Obviously, animal fossils take up the major part of the book. Amber, however, receives its fair share of attention, and one will find that for instance silicified wood has been used in some unexpected as well as expected ways.
To state it briefly, the book tells a fascinating story of how man has been using fossils in different ways in daily life (including as an energy source), starting way back in prehistoric times based on archeological finds.
The book is beautifully illustrated. The amazing information it contains comes from the most unlikely sources. It is quite evident that the author enjoyed his fascinating detective job and that he is happy for the opportunity to share what he found with others who love fossils. They will find in it a true gold mine of exciting information and beauty. The book also contains the necessary 'formal' palaeontological chapters, such as the history of the plant and animal kingdoms through geological time, and fossils in modern science.
S.B. MANUM, Oslo, Norway.

GEOLOGICAL ATLAS OF WESTERN AND CENTRAL EUROPE. P.A. Ziegler, 1982. 130pp & 40 maps. Elsevier Scientific Publishing Co., ISBN 0 444 42084 3. US$68/Dfl.160.
These two expensively produced volumes will be a useful aid to palaeobotanists working on fossils from the Devonian to the Pliocene in Europe. The second volume is the most relevant and useful and contains 21 palaeogeographic maps extending from the Early Devonian to the Miocene-Pliocene. The maps are not bound into the volume and are printed in colour on A3 size paper. Symbols represent lithology and colours represent depositional environments (non-depositon, continental, lacustrine, deltaic coastal and shallow-marine clastics, shallow-marine shale, deeper-marine shale, deeper-marine clastics, carbonates mainly shallow-marine and evaporites).
All the maps are drawn over present-day coastal outlines and there is a topographic overlay. The details are based on the published literature and on data gathered by the Shell group of companies and affiliates in the course of their exploration work.
M.C. BOULTER, London.

PALEOBOTANY, PALEOECOLOGY AND EVOLUTION volume 1. Ed. K.J. Niklas, 1981. 297pp., Praeger Publishers, New York, US$37.50.

In the past couple of years, several new books have been published under the general heading of paleobiology-paleobotany. Perhaps the most recent of this breed is the two volume set entitled Paleobotany, Paleoecology and Evolution edited by Karl Niklas. The thirteen papers which comprise this work were presented in a symposium dedicated to Harlan P. Banks, Professor Emeritus of Botany at Cornell University in appreciation of his many years of teaching, research and leadership in paleobotany. This review concerns Volume 1, which includes five papers dealing with paleobotanical and paleoecological aspects of the Paleozoic Era punctuated by two papers whose relevance to the overall theme of the work is questionable.
In the initial paper, Barghoorn provides a judicious appraisal of early Precambrian life as revealed in the fossil record - a timely summary of a significant topic by the foremost expert on the subject. This is followed by a palaeoecological analysis of microbial assemblages at the late Precambrian Bitter Springs locality, written by Knoll. Although clearly an interesting and important research contribution, a less specialised topic might have been more appropriate for the general scientific audience to whom this book is directed. The succeeding paper, by Retallack, provides a coherent review of the study of paleosols, "an emerging area of earth science". Although this subject is undoubtedly of value in broad scale paleoecologic analyses, relatively few of the 48 pages of Retallack's contribution are devoted to aspects of fossil plant biology. In what is perhaps the most interesting and speculative paper in Volume 1, Swain and Cooper-Driver provide a fascinating account of biochemical evolution in early land plants. Whereas previous attempts by other authors to deal with this subject were bogged down in a multitude of molecular diagrams and biochemical pathways, this paper is a refreshing change and represents a well-written and highly readable description of the authors' views on the topic. The contribution by Schopf entitled "Evidence from findings of molecular biology with regard to the rapidity of genomic change: implications for species durations" seems misplaced in this volume. It stretches the broad goals of the symposium designated by the editor, namely, to draw "...attention to an innovation in approach currently seen in fossil plant studies." The quality of Schopf's paper is first rate, but its decidedly genetic nature makes one wonder what criteria were used in selecting papers for this paleobotanical symposium. The final two contributions, one by Beck and the other by Phillips and Dimichele, represent significant additions to the paleobotanical literature. Beck's paper, a summary of our current understanding of Archeopteris and its significance in plant evolution, provides several important new ideas intended to clarify the relationship between the most thoroughly known progymnosperm and younger "coniferous" taxa. The Phillips and Dimichele paper represents a state-of-the-art paleofloristic study, in which the famous Herrin Coal member is analysed.
Six out of the seven contributions include a brief final statement summarising the important points of the paper. This is valuable in view of the fact that the title of the book will attract the attention of readers from a variety of disciplines, some of whom may lack the necessary breadth of experience to deal with the wide-ranging topics. Facilitating the use of this book as a reference source is a complete subject-taxonomic index that is independent of the second volume. All things considered, this book is a collection of interesting and significant papers honoring one of paleobotany's foremost authorities. A more critical eye toward organisation, however, might have made the tribute more appealing.
M.A. CICHAN, Ohio, USA.

SLEDY TRAV INDEJSKICH (TRACES OF INDIAN GRASSES). S.V. Meyen, 1981. Moscow, Publishing Office "Mysl". 159pp, 25 figs., 16pls. 65 kopeks.

Slavonic palaeobotany has not had such a gifted popularising author until now. Professor Meyen started well. His book "From the History of Plant Dynasties" (Moscow, Nauka, 1971) was successful without any doubt. The new book is that sort of attractive excursion into a modern understanding of the discipline, not only

for a wide public, but also for students and specialists. The series of ten concise, comprehensive and logically-built chapters leads readers into the problems of phylogeography, palaeoclimatology, palaeofloristics and palaeobotany as a whole. He has an historical approach, delicately done in small droplets, by which the well-experienced author introduces all that is new in modern palaeofloristics, mainly from the Angarida and Gondwana provinces. In the text there are many places where Sergej Meyen draws us into his own world of thinking, and expresses original ideas. As a whole the book is a good synthesis of Soviet palaeobotanical progress. From a typographical point of view it belongs to the better ones of USSR production. The photographic plates are especially good, the numerous maps are instructive. Perhaps there should have been more drawings. It should be translated into English.
A. HLUŠTÍK, Praha, Czechoslovakia.

A HISTORY OF AUSTRALASIAN VEGETATION Ed. J.M.B. Smith, 1982. 168pp. Santos Ltd., 13th floor, 307 Queen Street, Brisbane, Queensland 4000, Australia.

These five essays attempt to show the degree to which the former nature of the vegetation of Australia and the neighbouring landmasses can be determined, and how the present vegetation of the area is changing.
The book is introduced with an interesting chapter by J.M.B. Smith who reviews the various lines of evidence which may have a bearing on past vegetation types, and goes on to discuss patterns of plant migration and evolution. R.E. Gould presents a brief summary of the floristic history of the Australasian area during the late Palaeozoic and Mesozoic, based on megafossils. His presentation is very short and covers too long a time span to give the reader any clear impression as to what the vegetation of the region may have been like during any part of the period covered. R.T. Lange gives a highly enthusiastic and detailed discussion of vegetational reconstruction in the Tertiary. He emphasises the importance of plant geographic, plant phylogenetic, megafossil, microfossil and habitat considerations in constructing Tertiary vegetation and presents novel ideas as to how the microfossil remains of epiphyllous fungi may help in establishing the physiognomy of past vegetation types. He then reviews evidence for past vegetation through the area, epoch by epoch, against a synopsis of palaeoclimatic data established from oxygen isotope studies.
Gurdip Singh then takes over in the later Tertiary, covering the "environmental upheaval" triggered by the build-up of ice in Antarctica, and then placing emphasis on the Quaternary. His contribution consists mainly of a review of the detailed work being carried out in New Guinea and in a number of areas in Australia by the Research School of Pacific Studies in The Australian National University, Canberra. One of the most surprising outcomes of Quaternary vegetational history studies in the Australian region is the time during which prehistoric man has had a marked influence on vegetation. Singh argues that pollen assemblage changes and charcoal influx into Lake George in southeast Australia as early as 128,000 years BP can best be explained in terms of human activity!
In the reviewer's opinion the book succeeds to a large degree in assembling facts and indicating gaps in our knowledge with respect to the Tertiary and Quaternary periods. The main criticism of the book is its attempt to cover vegetational history since the Late Carboniferous, when south Gondwanaland began to develop its own characteristic flora. The book would have been much more balanced either had the discussion of pre-Tertiary vegetation been more comprehensive, also taking into account microfossil data, or preferably, had the book been restricted to Cenophytic vegetation. In the latter case, a chapter outlining the Cretaceous palaeogeography of the area and describing the immigration of angiosperms and their rise to dominance by the end of the Cretaceous would have set the scene for subsequent chapters and would have greatly improved the overall value of the book.
Nevertheless, the book can be highly recommended for its reviews of the impact of European man on the vegetation of Australia; it must be most valued, however, for Lange's approach to the reconstruction of Tertiary vegetation.

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