INTERNATIONAL UNION OF BIOLOGICAL SCIENCES SECTION FOR PALAEOBOTANY

IOP NEWSLETTER 41

APRIL 1990

CONTENTS

PLEASE MAIL NEWS AND CORRESPONDENCE TO YOUR REGIONAL REPRESENTATIVE OR TO THE SECRETARY FOR THE NEXT NEWSLETTER 42.

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

IOP NEWS

NEW IDENTITY FOR IOP

A friend of the IOP Secretary, Derek Hodgetts, is a professional graphics designer. He was severely critical of the old IOP Newsletter design because it did not reflect the organisation's activities and the logo looked too much like a 10p (ten pence in sterling currency) price tag. Free of charge, Derek has designed our new logo and newsletter style. His address is Overview, 82 South Hill Park, London NW3 2SN.

Already the new identity has been featured as an example of high quality graphic design by the journal Design Week. There are plans to incorporate the design on T-shirts which will be on sale shortly.

A prize of one such T-shirt will be given to the first correct identification of the fossil plant on which the logo is based.

THE COST AND VALUE OF MEMBERSHIP

An anonymous correspondent, identified only as "Moaning Mancunian" has responded to the item in Newsletter 39 about the poor value for money of IOP membership. "Surely you have got the wrong end of the stick? I feel sure they must be complaining that there is too much for the money. That was certainly the point I was making in my last little note. It does masquerade under the title Newsletter not a Newscyclopedia. But I take comfort from the fact that it underlines what I have known for 30 years - palaeobotanists are just plain boring."

There are no prizes for identifying the writer.

REGIONAL REPRESENTATIVES

Two new regional representatives have been appointed this year, Prof O. Rosler for South America and Dr B.S. Venkatachala for India. Both these regions continue to have currency exchange difficulties and so they arrange their own membership and newsletter distribution schemes. The full list of regional representatives is:

NORTH AMERICA - T.N. TAYLOR, Botany Department, Ohio State University, 1735 Neil Avenue Columbus, Ohio, 43210, USA.

SOUTH EUROPE - J. GALTIER, Laboratoire de Paleobotanique, Universite des Science, Place E. Bataillon, 34060 Montpellier, France.

USSR - M.A. AKHMETIEV, Geological Institute, Academy of Sciences of USSR, 109017, Moscow, Pyzhevsky per 7, USSR.

EAST EUROPE- Z. KVACEK, Geologicky Ustav, 182 09 Praha 8, V. Holesovickach 41, Czechoslovakia.

AUSTRALASIA - J.G. DOUGLAS, Geological Survey of Victoria ITR, GPO Box 173, East Melbourne 3002.

SOUTHERN AFRICA - H. ANDERSON, Botanical Research Institute, Private Bag X101, Pretoria 001. South Africa.

JAPAN - T. KIMURA, Department of Astronomy Earth Sciences, Tokyo Gakugei University Koganei, Tokyo 184, Japan.

CHINA - ZHOU ZHIYAN, Nanjing Institute of Geology & Palaeontology, Academia Sinica, Chi-Ming-Ssu, Nanjing, Peoples' Republic of China.

PAKISTAN - K.M. KHAN, University of Sind, Jamshoro, Pakistan.

NORTH EUROPE - M.C. BOULTER, Polytechnic of East London, Romford Road, London, E15 4LZ, UK.

INDIA - B.S. VENKATACHALA, Birbal Sahni Institute of Palaeobotany, 53 University Road, Box 106, Lucknow 226 001, India.

SOUTH AMERICA - O. ROSLER, Inst Geosciencias, Univ. San Paulo, 20899, 01498 Sau Paulo -S.P. Brazil.

REPORTS OF RECENT MEETINGS

2ND EUROPEAN PALAEOBOTANICAL CONFERENCE, MADRID, SEPTEMBER 1989

About 50 people met in the Palaeobotany Department of the University of Madrid to discuss problems of palaeobotany, give lectures and to get some experience with the Spanish Carboniferous in the field.

It was a pity that so many colleagues refused to come to the Symposium (despite the fact they had said they would) and so there was much time between the lectures.

Considering the offer of topics one noticed that there was a broad field of interests, from the palynological record of the Devonian up to the macrofloras of the Cretaceous - Tertiary, from the well known (for years now!) impression of the biotope of Messel up to a view about fossil fungi.

The excursion was a bit confusing because of the 7 hours trip to reach the locality leaving hardly half an hour for digging and collecting in the really wonderful Carboniferous outcrops at Villablino. The environmental studies along the way to the outcrop, an open cast, were very exciting from the geological point of view - an artificial lake with drowned buildings etc., an interesting vegetation on the old Palaeozoic rocks, burning woods and then the fossiliferous Westphalian coals and claystones with abundant ferns but also conifers and other fossils.

The lunchtime was long enough to get drunk after the excellent meal - but sometimes I regret not having had enough time for the excavations!Summarizing I have the impression that the European palaeobotanists should force their efforts to have one common language - the English one and get an international standard (compared for example with the IGCP-meeting in Prague some days before).

J. GREGOR, Grobenzell, Munich, Germany

FIRST INTERNATIONAL SYMPOSIUM ON EXTANT AND FOSSIL CHAROPHYTES,
MONTPELLIER, FRANCE, 4-8 JULY 1989

Sixty participants representing fifteen countries met in Montpellier under the auspices of the IPA, the Societe Botanique de France and the IGCP "Global biological events in Earth History". Fifty-four reports were presented, covering a wide scope of biological and palaeontological studies.

New data were presented on the relationships between living species of Chara and other plants or animals such as, for example the contribution of V.W. Proctor (Lubbock, USA), who suggested that morphological ecotypic variation might be caused by a response to animal grazing. Ecology was shown to be of growing interest: in connection with lake eutrophication (S. Blindow, Lund, Sweden), depth zonation (J.Blazencic et al., Beograd, Yugoslavia), colonization and specific associations (M. Guerlesquin, Angers, France) as well as with the study of thanatocoenosis (E. Fendler, Berlin, W-Germany and I. Soulie- Marsche, Montpellier).

Relationships between extant and fossil forms were expanded, with special interest in the gyrogonite wall and oospore membrane by L.A. Dyck and K.E. Manyak (Clemeson, USA), J. Pedrola (Blanes, Spain) and J.A. Moore (London, Great Britain). J.P. Berger (Fribourg, Switzerland) outlined the use of stable Oxygen isotopesof the gyrogonite in relation with climatic variations during the Tertiary.

Most of the communications dealt with the fossil floras. A.A. Istshenka (Kiev, USSR) attracted interest with an undoubtedly charophyte assemblage from the Upper Silurian of Podolia and with the problematical Chaetocladus from Ludlow deposits. Semi- protected open marine habitats with Karpinskya from the Devonian were presented by G. Racki (Sosnoviec, Poland). New zonations were proposed for the Triassic of Kazakhstan (F.J. Kisielevsky, Saratov, USSR) and for the Mesozoic of China (J. Liu, Beijing). Among lectures dealing with the Lower Cretaceous, S.J. Choi (Seoul, S-Korea). presented rich and diverse assemblages from the Nagdong and Banyaweol Formations, S-Korea; P.O. Mojon (Geneve, Switzerland) drew attention to the Globator lineage and pointed out relationships between polymorphism and palaeoecology in some Porocharaceae from the Swiss Berriasian. Several contributions, including the comparison of charophytes studies with data from ostracods, planktonic foraminifers, radiometric and palaeomagnetic data, focussed on the Cretaceous-Tertiary boundary event, especially for the dating of the Infra-trappean Beds of the Godavari area (South West India) which appear to be likely of Danian age (T.N. Mukherjee, Calcutta); data on the Inter-trappean Beds of Kutch and Godavari areas (East and South West India) presented by S.B. Bhatia (Chandigarh) and Chanda et al. (Calcutta) also support an age very close to the Cretaceous Tertiary boundary; stepwise evolution and

zonation of the Maastrichtian and Paleocene of Argentina (Musacchio, Comodoro Rivadavia) and South-West Europe (M.Feist, Montpellier) were demonstrated. The age (Eocene or Miocene?) of the Kurtulmus Formation (Turkey) was discussed by J. Riveline (Paris, France) and Tertiary floras from West Germany were described by J. Schwarz (Frankfurt, Germany).

Two different but reconcilable cladistic approaches to charophyte phylogeny were outlined by C. Martin-Closas (Barcelona, Spain) and M. Schudack (Berlin, Germany). R.J. Huang and Z.Wang (Nanjing, China) presented a new classification of the Characeae Family including the raskyellacean representatives; the Triassic Porocharaceae were reclassified by R. Breur (Montpellier), I.M. Shaikin (Kiev, USSR) emphasized rates of evolution in the Charophyta.

The first meeting of the International Research Group of Charophyte specialists (IRGC) was held during the Symposium. The question emerged of creating regional sub-groups such as the previously constituted European "Groupe d'Etude sur les Charophytes" (GEC). Three provisional correspondants (J.P.Berger, M. Feist, I. Soulie-Marsche), designated by a vote, were entrusted with sending the second issue of the IRGC News, including statutes of the new association.

The charophyte Symposium was followed by two excursions; one to the Camargue Natural Park,took participants along coastal saline lakes and freshwater paddy-fields containing living characean species;the other presented the opportunity of collecting abundant and well preserved fossil specimens in the Upper Cretaceous-Paleocene sequences of the Villeveyrac Basin, then in a succession of Lower Eocene age in the Aude Vallen and Minervois.

Proceedings ofthe Symposium will be published in a next issue of the "Bulletin de la Societe Botanique de France". Co-organizers of the charophyte Symposium were: M. Feist, N. Grambast-Fessard, I. Soulie-Marsche (Montpellier) and M. Guerlesquin (Angers).

M. FEIST, Montpellier, France

FOUNDER'S DAY FUNCTION: BIRBAL SAHNI INSTITUTE OF PALAEOBOTANY, LUCKNOW, INDIA, NOVEMBER 14TH 1989

The Birbal Sahni Institute of Palaeobotany celebrated its FOUNDERS DAY on 14th November 1989. In the morning floral tributes (PUSHPANJALI) were offered on the Samadhi of Professor Birbal Sahni. As the day coincided with the concluding day of Pandit Jawaharlal Nehru's birth centenary celebrations, a "SHILALEKH" (a stone memorial) with inscribed words of Nehru's speech delivered on the occasion of Foundation Day in 1949 was unveiled in the Institute's premises by Sri Y.N. Saxena, IPS, Inspector General of Police (CID) U.P., Lucknow. Rich tributes were paid to Pandit Jawaharlal Nehru and Prof. Sahni. An exhibition of photographs and sayings of Pandit Jawaharlal Nehru and Professor Sahni was also organised which was viewed by several visitors.In the evening two memorial lectures were organised. Welcoming the distinguished gathering, Dr B.S. Venkatachala, Director, Birbal Sahni Institute of Palaeobotany recalled the ideals of Professor Sahni and stressed his dedication and services to science. He further talked on the scientific information explosion and the need to channel the data banks for narrowing the gap between information gathering and wisdom.

Delivering the 19th Prof. Birbal Sahni Memorial Lecture on "RATES OF FLORAL TURNOVER AND DIVERSITY CHANGE IN THE FOSSIL RECORDS" Dr Norman Frederiksen, United States Geological Survey highlighted the significance of plant fossils to discern evolutionary patterns. Dr. Frederiksen also explained the interaction of climatic changes and floral components and the need to study the floral turnover rates and diversity changes.

While delivering the 35th Sir Albert Charles Seward Memorial Lecture on "FLORISTIC COMPOSITION AND DISTRIBUTION OF EVERGREEN FORESTS IN THE WESTERN GHATS, INDIA" Dr Jean Pierre Pascal, Director, Institut Francais de Pondicherry laid emphasis on preserving rich evergreen forests and emphasised the ecological factors influencing the composition of the flora; understanding of climax evergreen forests, variations in their structure and floristic composition and its interaction with gradual changes in the climate is essential. Dr Pascal informed the gathering that the distribution of natural evergreen forests in South India are dependent on various climatic parameters such as rainfall, periodicity of season, temperature and local edaphic factors.

The function was concluded with a vote of thanks by Dr H.P. Singh,Deputy Director, Birbal Sahni Institute of Palaeobotany, Lucknow.

B.S. VENKATACHALA, Lucknow, India.

NEWS OF FORTHCOMING MEETINGS

LATE PALAEOZOIC AND MESOZOIC FLORISTIC CHANGE, CORDOBA AND MADRID, 16-20 APRIL 1990

The third circular for this meeting is now available from C. Alvarez-Vazquez, Jardin Botanico de Cordoba, Apartado 3.048, 14080 Cordoba, Spain.

8TH MID-CONTINENT PALEOBOTANICAL COLLOQUIUM, CHICAGO, APRIL 20 - 21 1990

The second circular was available in February 1990 and can be obtained from Dr P.R. Crane, Department of Geology, Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago Ilinois 60605, USA.

ORGANISATION FRANCAISE DE PALEOBOTANIQUE: COLLOQUE DE PALEOBOTANIQUE, LIEGE, 25-6 MAI 1990

Le prochain colloque O.F.P. et l'Assemblee Generale de 1990 se tiendront a Liege. Les dates du 25 et 26 mai 1990 ont ete retenues pour cette reunion qui aura lieu au Service de Paleobotanique-Palcopalynologie et Micropaleonotologie de l'Universite de Liege, ceci afin de permettre auxcollegues qui le desirent de voyager vers Francfort durant la fournee du dimanche 28 mai et participer au Symposium dedie a R. KRAUSEL.

Le programme comprendra la journee de communications et 1 journee de travaux sur le terrain.

- La journee de travaux sur le terrain sera consacree aux visites des carrieres Langlier - Famennien Superieur de la Vallee du Bocq (Synclinorium de Dinant) et des sablieres de Bioul- Miocene de l'Entre-Sambre et Meuse.
- Les communications pourront traiter de tous lesaspects de la Paleobotanique. Des posters pourront etre presentes. Les resumes devront me parvenir avant le 30 janvier 1990. Des informations complementaires et la notice aux auteurs seront envoyees avec la prochaine circulaire.

Durant la journee de communications, les plus beaux specimens recoltes dans le Devonien de la Belgique seront exposes et pourront etre examines.

Un programme detaille de la reunion sera expedie fin novembre 1989 a ceux qui auront renvoye la fiche d'inscription ci-jointre ainsi que les droits d'inscription fixes a 150 F.F. (non remboursables

- Le logement peut, suivant votre meilleure convenance, se faire:

+ en hotel, centre ville, a reserver par vos soins (des renseignements complementaires seront fournis a la demande; environ 2000 frs belges par nuit (300-360 F.F.), petite-dejeuner compris; c'est un minimum).

+ a la Residence du Blanc Gravier, sur le site du nouveau campus du Sart-Tilman, en dehors de la ville (bus a partir de la gare et du centre ville; 950 frs belges (environ 130-160 F.F.) par nuit, petit dejeuner inclus.)

WORKSHOP ON DEVONIAN PALAEOBOTANY, MUNSTER, JUNE 1ST 1990

After the Krausel Memorial Symposium to be held in Frankfurt from May 26 - 31 Dr W. Remy is presenting this workshop. He writes:

"Over the last few years my working group and I have discovered a number of new and unexpected gametophytes and anatomical features in the plants from Rhynie and new gametophytes and sporophytes from the Devonian of northern Germany. Some of these results have been published in SCIENCE and ARGUMENTA PALAEOBOTANICA but a large part of the results are so new that they have not yet found their way into print. We would like to demonstrate these results with the

original microscope slides and photographs in a two- (three-)day symposium and workshop in June of 1990. We hope that you will be able to attend. This workshop will give you direct access to the material to evaluate the results and make them useful for your own research.

"This meeting on Devonian Palaeobotany will happen in the context of the annual meeting of the "Arbeitskreis fuer Palaeobotanik und Palynologie" (APP) on June 1 till 3, 1990, in Munster, West-Germany. This will be directly after the international symposium on Palaeobotany in Honor of Richard Krausel to be held in Frankfurt.

"The workshop on Devonian plants will present photographs and original thin sections of:

1. Rhynie chert. Two male and one female gametophyte taxa (Lyonophyton rhyniensis and two new genera). Morphology and histology of the gametophytes (for instance antheridia, spermatogeneous tissue, spermatozoids, xylem, epidermis with stomata and glands). All sporophyte taxa with new histological and morphological findings. Several unknown fungi with fructifications. Algae (Palaeonitella, in mats; (?)oogonia). Nematothallus. Animal remains (eggs, in part (?) with remnants of embryos).
2. Impression florasofSiegenian and Emsian Stages with two possible gametophyte taxa. Cooksonians, Rhyniaceae, Horneophytaceae, Zosterophyllaceae, etc.
3. Limonitized Emsian floras from Germany with anatomically preserved trimerophyte and cladoxylalean axes (published only Gothanophyton).
4. A Middle Devonian flora in impression preservation and pyritized.
5. In-situ-situations of Devonian plants (palaeoenvironment).

"You are most welcome to present a paper or a poster at this meeting and I would like to point out that there will be a one day field trip through the Devonian on May 31, guided by Dr Schweitzer to the Devonian of the Eifel and Wahnbachtal."

8TH SIMPOSIO DE PALINOLOGIA, APLE, Tenerife, 24-28 September 1990

The preliminary registration form is available from Secretaria del 8 Simposio de Palinologia, Departamento de Biologica Vegetal, Universidad de la Laguna, 38271 La Laguna, Tenerife, Islas Canarias, Spain.

GLOBAL EVENTS AND NEOGENE EVOLUTION OF THE MEDITERRANEAN, IX CONGRESS RCMNS, Barcelona, November 19-24 1990

This will include topics on stratigraphy, palaeoecology, palaeobiogeography and taphonomy. Write to Prof. J. Martinell, Laboratori de Paleontologia, Zona Univeritaria de Pedralbes, 08071 Barcelona, Spain.

VII REUNIAO DE PALEOBTOANICOS E PALINOLOGOS, Sao Paulo, Brazil. 10-16 December 1990.

This will cover all aspects of palaeobotany and palynology and a 2 day field trip to the Parana Basin is planned. Write to Comissao Organizadora VII RPP, Departamento de Palcontologia e Estraigrafia, Instituto de Geosciencias USP, Caixa Postal 20899, Sao Paulo, SP, Brazil, CEP 01498.

5TH SYMPOSIUM ON MESOZOIC TERRESTRIAL ECOSYSTEMS AND BIOTA, Oslo, August 12-15 1991.

The symposium will deal with Mesozoic terrestrial floras and faunas, their evolution, ecology, taphonomy and stratigraphy. Papers on problems of plant-animal interaction, insect faunas, vertebrate palaeoecology and the terminal Cretaceous event are especially welcome. Two field trips are being organised, one to the Mesozoic estuarine and marine sections at Andoya in northern Norway and another to such localities in Scania and East Denmark.

Write to Dr N. Heintz, Palaeontologisk Museum, Sars gate 1, N-0562 Oslo 5, Norway.

5TH NORTH AMERICAN PALEONTOLOGICAL CONVENTION, Chicago, June 28 - July 1 1992.

For the first circular write to Dr P.R. Crane, Department of Geology, Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, Illinois 60605, USA.

"SUPPORT FOR PALAEOBOTANY" - ARE WE EXPECTING TOO MUCH?

We warmly congratulate Charles Beck on his vigorous defence of the importance of palaeobotany, and the need for universities and other bodies to fund it (IOP Newsletter 39). However, palaeobotanists may be putting themselves in averyvulnerable position by claiming that they are misunderstood and undervalued. Any subject will receive the funding that it is perceived to deserve. The science of biology has grown - as we all know - in an astonishing way over the last half century. It is arguable that palaeobotany - as a body of scientific knowledge - no longer represents the fraction of the whole area of biology that it did, say fifty or even perhaps twenty, years ago. Whole new areas of biology have emerged and flowered to claim a major part of the basic core of the science that a biology graduate should at least be acquainted with. But palaeobotany still occupies high ground, although it may not be proportionately so much of the whole. Are we really so badly off? Look at the names in the IOP address list - when were there ever more palaeobotanists in positions of seniority in universities, in scientific institutions and in industry?

To claim that "some small fields may be threatened by the lack of understanding of their importance" is special pleading which palaeobotany does not need. It has been argued that every professorial Chair vacated by a palaeobotanist should be filled by another; this is a starry-eyed view of how the world works. As Harris's and Walton's positions came to be vacated, the universities of Reading and Glasgow saw fit to replace them with other kinds of botanists, and they were quite entitled (and perhaps even right!) to do this. Any other course of action would have frozen (one might almost say, have fossilized) botany in a fixed mould - a disasterous course for science in higher education. In the event, several new appointments were made to university Chairs, or other positions in universities,which had not previously had senior appointments in the field of palaeobotany. Lacey's Chair in Bangor, our own editor's in the Polytechnic of East London, Chaloner's at Egham, Alvin's position in Imperial College and Bob Spicer's in Oxford University, Dianne Edwards's in Cardiff and Keith Allen's in Bristol are all noteworthy as academic positions which had not previously been occupied by palaeobotanists. There are many similar examples on the Continent of Europe, in the USA and elsewhere.

We firmly believe that university palaeobotanists, at least, must earn their keep as teaching biologists or geologists, and not expect to be funded for the luxury of being 100% palaeobotanists. Of the generation that many now see as a heyday of post-war palaeobotany in the West - typified by Andrews, Banks, Barghoorn, J.M.Schopf and before them Arnold, Chaney, Walton, Harris and many others, all "earned their keep" teaching botany or geology to a wide diversity of students. The contribution of palaeobotany to our understanding of the evolution of living plants, and to the accumulation of fossil fuels, is absolutely fundamental. None the less, palaeobotany always was (and still is) a rather specialist subject, to be taught as a science in its own right to a few advanced students and of course pursued with research students at post-graduate level. The involvement of university-based palaeobotanists in general basic botanical and geological teaching also has the merit of keeping them in touch with the basics of their science!

What palaeobotany undoubtedly does need is enthusiastic exponents who will "sell" the subject to other earth- and life- scientists by taking our wares to the market-place of scientific meetings of other disciplines. Rather than telling them how important palaeobotany is, we should demonstrate its relevance in their fields by showing them how a study of plant fossils can contribute to our understanding of living ones, the course of their evolution and their biogeography. We need to prove to geologists the relevance of fossil plant studies to palaeoenvironmental interpretation, to plate movement, to fuel formation and to stratigraphy. Of course palaeobotanical congresses are useful to us too, but other scientists don't attend them! We are too enclined to talk only to fellow palaeobotanists, and to feel deprived if we are isolated as "the only palaeobotanist" in a department of molecular /biochemical/genetical/cellular biology, or of hard-rock geology, or

whatever. Rather than hiding in corners in such situations, palaeobotanists would do well to follow avenues of investigation in collaboration with other specialists, and not to feel, in doing so, that their subject is becoming diluted. We urge this not in any sense as a substitute to Charles Beck's line of action, which is very necessary, but as an addition to it. We need to embrace the challenge of being a "minority subject", not by berating those who don't appreciate us, but by actively demonstrating our contribution to science.

W.G. CHALONER and A. HEMSLEY, London, UK.

THE BIRBAL - SAVITRI SAHNI FOUNDATION

This foundation exists to promote a number of programmes connected with palaeobotany and allied fields, as summarised below. It was founded on her death by Mrs Savitri Sahni (1902- 1985), wife of the renowned Indian palaeobotanist Birbal Sahni, who, in her Will, bequeathed her entire estate to the nation of India and to the Foundation. As part of the Foundation's activities, it is planned to convert the former Sahni residence on the banks of the Gomti river into a museum and guest house, together with a palaeo-garden including several outdoor reconstructions of fossil plants, to be located fittingly at the site of Mrs Sahni's cremation.

The scientific programmes at present under way include the following.

1. The Birbal-Savitri Sahni Collaborative Research Programme. This facilitates exchange of scientists between the Birbal Sahni Institute of Palaeobotany and palaeobotanical centres, organisations, and individuals overseas.

2. Birbal-Savitri Sahni International Fellowships are awarded to young palaeobotanists and other Earth Scientists for resarch in any specialised branch of palaeobotany in India.

3. Birbal-Savitri Sahni International Awards are given biennially to a scientist excelling in palaeobotanical and allied fields. The award carries a cash prize of 25,000 Rupees and a gold/silver plaque. Nominations should be forwarded annually, to arrive at the Foundation's offices between 10 and 26 April of every year.

4. Savitri Sahni Samman, founded by friends and admirers of Mrs Sahni for her dedication to the cause of palaeobotany, will carry a cash prize of 10,000 Rupees and a medal, to be awarded annually on 22 January to an individual for outstanding research work in palaeobotany.

5. Savitri Sahni Smarak Lecture, instituted with donations from well wishers of Mrs Sahni, carries an honorarium of 5,000 Rupees. It is intended to facilitate an invited lecture annually on 19 September in any specialised field of palaeobotany. Lectures will be published as monographs under the auspices of the Foundation.

For additional information, including relevant extracts from Mrs Sahni's Will, please contact Dr Shyam C Srivastava, Secretary, Birbal-Savitri Sahni Foundation, 686, Birbal Sahni Marg, Post Bag No.1, New Hyderabad Post Office, Lucknow - 226007, India.

S.C. SRIVASTAVA, Lucknow, India.

THE PLANT FOSSIL RECORD PROJECT

The project outlined in IOP Newsletter 40 is progressing effectively. All 9,246 generic records from ING have been automatically reformatted to the PFR format. These are being edited to include more taxonomical, stratigraphical and geographical details. Also, additional genera from Andrews'(1970 et seq) catalogue are being added. At the end of February about one quarter of the genera had been revised in this way and we hope to be on target to complete all genera for the Frankfurt meeting in late May.

Dr Alexander Gamonkov, Moscow, is planning to visit London from March 15th - April 3rd to add details from S.V. Meyen's catalogue and to arrange for its separate publication.

Progress is also being made with hardware and software development. Text scanning facilities to automatically capture printed text of such indices as Jansonius and Hills catalogue are being investigated and WORM (write once read many) facilities may become available soon to store and distribute the very large amounts of data. At least two software packages are being programmed to best accomodate the database for the kind of search facilities you users might require.

The demonstration disc is now available and is expected to reveal details of what the users might eventually require of the system. So far about 30 palaeobotanists have asked for copies of the demonstrator.

As many as ten people are working on the project, on and off, in London. World-wide, more than 30 others are becoming involved. They have been asked to serve as "assessors" of the edited records for the "Names in Current Use" project, described in IOP Newsletters 40 and 37 and already six have responded with comments. Their judgements and comments on the controversial task will be debated at the Frankfurt workshop.

The two main protagonists of the work, Alan Hemsley and Phillip Holmes, have used their experience so far to write an account of some of the main principles being followed. The article also contains details of some of the problems being encountered and examples of the different kinds of generic records being made available or being contemplated. This is being printed as an IOP Circular (see the item below) and will be sent automatically to those 40 or so people currently involved. It will also be available at the Frankfurt workshop, where it will serve as a major discussion document, and is available free, on request, from your regional representative.

IOP CIRCULARS

These were first instituted in 1978 and the last was produced in 1982. They serve as informal, unrefereed, documents to announce rather than pronounce on matters of detail. They are contributions too long and too specialised to print in the newsletter. Those still available include

Circular 1 IOP address list (now, constitutionally, serving as the IOP electoral role)

Circular 7 Palaeobotanical extracts from Marie Stopes' The Sportophyte

The IOP office now has access to Desk Top Publishing facilities and so the concept of the IOP Circular is being resurrected. The latest edition is "The Format and Content of Plant Fossil Records" by P.L. Holmes & A.R. Hemsley. This will be available soon, free of charge, from your regional representative.

OBSERVATIONS

THE BBC WORLD SERVICE is well known as an international radio station of high quality: not surprising then that Jack Wolfe's voice was heard thoughout the world last month. He was speaking on a programme called Science in Action.

IOP'S PLANT FOSSIL RECORD project has been reported in two London newspapers, The Times Higher Education Supplement and The Independent on Sunday. The first article contained at least 30 factual errors and the second invented some wierd ideas on evolutionary theory. Never trust a journalist! ....or a newsletter editor?

REVOLUTIONS in Eastern Europe are beginning to have an impact on the institutions where palaeobotany is taught and researched. There are suggestions that some of their pure and applied research institutions are being reorganised. It may mean that the purer research will be transfered to the university sector.

THE NATURAL HISTORY MUSEUM is the new name for what was officially The British Museum (Natural History). The change has caused consternation in some of the more reactionary parts of the British scientific establishment. To add to their fury the museum has spent many thousands of pounds to produce this new identity. Like IOP, the museum has a new logo, designed after the "tree of life". But some staff there call it a "zebra's arsehole".

DIANNE EDWARDS, at the University in Cardiff, Wales, has been awarded a ScD, the higher doctorate degree of the University of Cambridge.

BOHEMIAN BIOGRAPHIES II

During the autumnal months of 1848 (in the time of Corda's final arrangementsfor a year-long Texas expedition), one of the most important historical chapters of Bohemian palaeobotany became concluded: the period of initial, no doubt successful attempts at microscopical studies on mineralized fossil stems, their external and anatomical features.

The following lines are dedicated to the memory of two less known men who tried to take up in the suddenly interrupted endeavour of Corda. Due to a fateful combination of life circumstances, neither were able to fullfil the intention. In the course of time, their names nearly fell into oblivion...

Maximilian Dormitzer (18?? - 1853)

To A. Corda personally, this gifted young man was known, at least, since 1847. Dormitzer assisted him for casual occassions in zoological collections of the Czech Patriotic Museum (now National Museum, Prague) and, evidently, came into contact with Joachim Barande and other outstanding naturalists of that time.

Dormitzer was nominated as a free-of-wage volunteer-assistant and Corda, leaving Bohemia, commited to his care all unfinished manuscripts, hand-made illustrations and other personal materials concerning plant fossils. He desired them to be "suitably used" (zweckmassig zu verwenden). This bequest reflected Corda's confidence in the dilligent, talented assistant, his possible successor in the Museum. On December 30, 1850, when Corda's tragic death had appeared to be an indubitable fact, Dormitzer was actually appointed a Custos (an official term of curators) of the zoological and botanical collections.

After archival documents and personal recollections, the appointment was not an accidental act. Dormitzer's contemporaries commemorated him as a sociable, educated man, an ardent naturalist, speaking several languages and interested in different topics of biosciences. The nomination was understood also as a recognition for his devoted administration of the entrusted collections.

It is also known that both the botany and palaeobotany belonged to his much-favoured disciplines. Moreover, he was evidently a skillful draughtsman, too. I am sure that Corda and Dormitzer had many common interests and understandings each for other. No wonder that Dormitzer progressively prepared own publications on plant fossils. They based on data undertaken from Corda's materials. It seems to be attested by the text of the first but last published part of Dormitzer's "Beitrage zur Kunde vorwetlicher Pflanzen - reste". It appeared in the German-printed periodical Lotos where Dormitzer took up a position of an editor (Prague, February 1853, p. 36-45).

In the article, Corda's observations on the Psaronius-like fossils are summarized as well as a description of the species Psaronius rubeschi CORDA in lit. is given. The reverence to the passed away Custos is expressed at many places of the Dormitzer's article. Corda's original drawing was also used for lithographed illustrations (Plate I).

Dormitzer's self-reliance as a student of fossil plants was published in Czech periodical Ziva (January, 1853). Famous Czech geologist Jan Krejci reported there on two petrified stems of ferns coming from Cenomanian sandstones in the vicinity of the Kounice village (Kaunitz, central Bohemia). The specimens were found by Krejci himself, in 1849 and 1852. Beside others, the author wrote his "... friend, Mr Max Dormitzer, the Custos of the National Museum ... established the two new species basing upon both the mentioned trunks: Alsophilina kauniciana DORM, and Oncopteris Nettwalli DORM. " (Ziva 1853, 1, p.28). Concluding the report, Krejci discussed a possible affinity of fossils to the living genus Cyathea SMITH. The test is accompanied by two half-sized lithographs (pls I, II).In the index of H.N. Andrews jr. (1970) both the quoted binomials have been accepted as generotype names for ordinary erected plant genera Alsophilina DORM , in KREJCI and Oncopteris DORM. in KREJCI. After some thirty years, J. Velenovsky re-determined the stem of A. kauniciana and assigned it to the genus Oncopteris, too.

Except the two above mentioned papers, we have no information on other palaeobotanical activity of Formitzer. Owing to an unknown but probably grave disease, he suddenly died in Prague, during the night of 23rd - 24th August, 1853.

Dormitzer's day of birth has not been ascertained up to the present time. He was probably two or three years older than Krejci, born in 1825. Dormitzer's only biographer, Czeck zoologist O. Stepanek assumed that Maximilian might have been born between the years 1819 and 1823. From this point of view, all the same, he died not later than in his very early thirties. As a dependent of Jewish trading family (domiciled in Prague since the end of 18th century), Dormitzer was probably not too good in Czech. In my opinion, this fact stimulated Krejci to publish his friends' determinations of fern stems from the Peruc-Korycany Formation. As a co-editor of the natural historical journal Ziva, he had a good opportunity to do it. On the other hand, Dormitzer himself published many other articles on non- palaeobotanical topics in German. I am sure that he was able to continue in Corda's work - if he was allowed to take his time.

Concerning his personal life we know nearly nothing. He had to go through some university education because it was asked for the Museum office he held as a Custos. He also had to be a financially independent man: the wages paid to the Museum clerks of his time were remarkably low. On the contrary to Corda, we do not have even so much as a lithographed caricature of his assistant.

Karel L. Renger (1842-1872)

The second figure of our rather sorrowful pair was born on June 4th 1842, in the Jensovice village near Trutnov (north Bohemia). As a son of a country teacher, Renger went to study at the Prague University. After finishing his studies and some peripeties, he obtained an Assistant position at the University Department of Botany (since May 4th, 1871). After testimonies of contemporaries, Renger was enormously good in the science of botany. As a member of Naturalists Club in Prague, he was probably engaged in the elaboration of the Museum Palaeobotanical collections, too. After some preparations, Renger published two articles dealing with Bohemian Cretaceous plants (Ziva 1866). The studies reveal his effort to "botanize" previous determinations and revive some of Corda's ideas. Nevertheless, as a Czech patriotic scientist, he was not able to suppress some criticism to certain taxonomical operations of Corda, namely those concerning a use of German words (names) for binomials. As far as I can judge after my own experience, this Renger's approach to Corda is a little exaggerated.

On the other hand, Renger was evidently wellacquainted with studies of both - Corda and Dormitzer. Moreover, I am afraid that we must consider him as one of the last serious students looking over Corda's palaeobotanical heritage as a complete set. Due to Renger's probity, for example, the name of Corda's family Kranneriaceae CORDA in RENGER, 1866, was validly published, although as usual, now the taxon is understood in rather a changed systematical position.

Karel Renger died in Prague, on November 11th 1872, at the age of thirty. Medicaldiagnosis was said to be an "inflammation of the brain".

A. HLUSTIK, Slany, Czechoslovakia

OBITUARY

JOHN HOLMES 1949 - 1989

In my early years at the laboratory of Paleobotany in Montpellier, about ten years ago, John Holmes and I shared an office. I was very demanding and he patiently answered my numerous questions. He was preparing his "Doctorat d'Etat" memoir on the Westphalian ferns from Europe, a remarkable piece of work for the accuracy of his observations. He spent a considerable amount of time preparing his fossils for he strongly believed that accurate techniques were an essential ingredient for good research. John also took great care in the way he communicated his results and his publications were generally recognised as outstanding.

John was very sensitive and concerned about others, especially those living far away from their country. He was a real friend to people in their situation. He liked to make them laugh when they were discouraged. John hated injustice. About four years ago, he personally

led a fight for the liberation of an african scientist who had been sent to jail for political reasons. He lost this battle and was deeply affected.

In a letter I received last December, he said he had recovered confidence in life and was working on three manuscripts. Even in his worst moments, John was always preoccupied with research. I used to tell him that I liked his spirit, his culture and his humor. I am very proud to have been his friend.

B. MEYER-BERTHAUD, Ohio, USA.

John had just obtained his B.Sc at University College London when he applied to a French Government Fellowship. His double interest in Palaeobotany and French was so obvious when he visited Montpellier in the summer 1972 that Louis Grambast and myself decided to encourage and support him in his enterprise to become a scientific Citizen of Europe. In 1973 he successfully passed his first degree in french, the 'Diploma d'Etudes Approfondies' and started research on anatomically preserved ferns from Carboniferous coal balls.

From 1973 I accompanied John several times in the Lancashire; John was convinced of the urgency for the intensive collecting of coal balls in view of the rapid closure of coal mining all through the basins. He was very indebted to Albert Long who generously provided him with very precise information on the location of several tips. On one occasion Cedric Shute and Mark Crawley joined us and collected coal balls for the British Museum collections. Every time the trip back to Montpellier was the matter of funny situations when we passed through the customs with our cars filled with coal balls instead of passengers.

In 1981 John completed his doctorate on the coenopterid ferns of the Upper Carboniferous of Europe. In the meantime he had got a research position at the CNRS. Of cheerful disposition he quickly became very well integrated in the research team in Montpellier. John was an enthusiastic student of fossil plant anatomy, a careful and even perfectionist worker. I was very proud of the results that he obtained rapidly on the plant morphology and ontogeny of several ferns, particularly Botryopteris and Psalixochlaena. His series of papers in Palaeonotographica provides some of the best documented examples of whole plant reconstructions for Palaeozoic plants. John was awarded a CNRS medal by the National Committee of Plant Biology and Physiology in recognition of the excellence of this work.

John was also very clever in all technical aspects of research, always trying to improve methodology. He was also of great help in the running of the laboratory. On the occasion of the European Palaeobotanical Conference in Montpellier, 1983, Nicole, his wife and himself nicely invited to a dinner in their house all the earliest participants to the Conference. I hope all the colleagues who attended this meeting will keep this souvenir of the young colleague who so enthusiastically organised two memorable field trips.

John was 40, his death is a tragedy for his young family and a terrible loss for all of us to whom he was a dear friend.

J. GALTIER, Montpellier, France

EDNA PAULINE PLUMSTEAD

"Members of the Palaeobotany and Palynology Colloquium of the Department of Botany, University of Calcutta, attended a condolence meeting to convey their deep sorrow and grief at the news of the sudden death of this renowned palaeobotanist.

"Dr Plumstead visited the laboratory in 1964 and inspired many of the researchers who were working on Glossopteris at that time. Her name will be remembered for as long as evolutionary biology will be taught in our university."

M. BANERJEE, Calcutta, India

RECENT PUBLICATIONS

ORIGINS AND EVOLUTION OF THE ANTARCTIC BIOTA Ed. J.A. Crame 1990. Geological Society Special Publication 47. ISBN 0 903317 44 3, UKL58.00 US$ 89.00 (Order from Unit 7, Brassmill Enterprise Centre, Brassmill Lane, Bath, BA1 3JN, UK)

Of the 22 papers one concerns temperate forests and another endemism in Seymour Island palynofloras. The authors include W.G. Chaloner and M.E. Dettman.

ANTARCTIC PALEOBIOLOGY T.N. Taylor and E.L. Taylor, 1989. Springer-Verlag ISBN 3 540 97006 1, DM198.

This discusses the current status of paleobiology, principally paleobotany and palynology in Antarctica and the inter- relationship of Antarctic floras to those of other Gondwana continents. A review is planned to appear in a forthcoming IOP Newsletter.

PLANTS AND THEIR PALAEOECOLOGY: examples from the last 80 My. Marjorie E.J. Chandler Memorial volume. Ed. M.E. Collinson, 1988. ISSN 0308 9649.

The A4 format volume is extensively illustrated and includes 17 papers whose authors originate from 10 countries. Material ranges from Upper Cretaceous to Pliocene, including palynological and megafossil studies, covering pteridophytes to angiosperms, from Europe and North America. An article reviewing Miss Chandler's life and work forms an essential part of the volume and a bibliography of her work is also included.

Write with UKL17.50 drawn on a London bank to D.J. Ward, 209 Crofton Lane, Orpington, Kent BR6 0BL, UK.

GUIDE PALEOBOTANIQUE DANS LE TERRAIN HOUILLER SARRO-LORRAIN. J.P. Loveine.

This new publication was introduced on page 11 of IOP Newsletter 39. Send 400FF to P. Schroeter, 2 rue de Metz, 57802 Freyming-Merlebach Cedex, France.

GUIA DE PALEOBOTANICA Jardin Botanico de Cordoba, R. Wagner and C. Alvarez-Vazquez 1989.

This is a guide to help visitors understand the palaeobotanical aspects of plants in the Cordoba botanical gardens. There are explanations, drawings and plates.

THE PALAEOBOTANICAL SOCIETY NEWSLETTER 1, July 1989, Lucknow.

This is a new publication of the Palaeobotanical Society of India and aims to bring together palaeobotanists in India in a collaborative effort. The first edition contains a message from the President, a list of Council members, conference items and a list of members.

ASOCIACION DE PALINOLOGOS DE LENGUA ESPANOLA

There are two new publications of this association obtainable from M. Josefa Diez, Departmento de Botanica, Universidad de Sevilla, Avda Reina Mercede s/n, 41012 Sevilla, Spain.

One is a list of addresses of members and a national bibliography of publications for 1988.

The other is the first financial report (1989) and a catalogue of publications.

BOOK REVIEWS

PALEOFLORA OF SOUTHERN AFRICA, MOLTENO FORMATION (TRIASSIC).VOLUME 2 GYMNOSPERMS (EXCLUDING DICROIDIUM) by John M. Anderson and Heidi M. Anderson. A.A. Balkema, Rotterdam, Brookfield and Pretoria, 1989, 567 pp. ISBN 90 6191 284 9.

The latest installment of South African palcobotanical studies by the Andersons is even more impressive than their last. In 567 pages are crowded 331 plates, 1107 text figures, 154 tables and 117 maps. Each taxon of Triassic gymnosperm (excluding Dicroidium treated in a previous volume) is illustrated with three or four plates of photographs, often with several tens of specimens each. For some taxa there are also one or two plates of SEM and light photomicrographs of cuticles. The quality of the pictures, specimens and data are a feast for the eyes and mind. I found it both overwhelming and captivating. Such a presentation is beyond the reach of most of us given the costs of printing. With the advent of electronic media such as hypercard and videodisc however, the Andersons may well have initiated the way of paleobotanical reporting

in the future.

Also offered with this volume is an explanation for the authors' idiosyncratic recognition of published type specimens: a problem with earlier volumes in this series, as noted in my reviews for this newsletter. The Andersons now argue that because their fossil species are based on large, fully illustrated collections of well preserved fossils from well characterised localities, then it is misleading to identify them with previously named species based on fragmentary and often poorly preserved fossils collected from casually documented localities. To be fair to them, there is a similarity in this argument to those proferred to justify separate form genera for remains preserved as petrifactions, as opposed to compressions or impressions. Clearly, better preservation and larger collections give greater confidence in taxonomic and other kinds of paleobotanical interpretation. Nevertheless, this is a poor excuse to ignore valid and identifiable types and their names. A call to add yet more names for the "best characterised species" in addition to an already combersome framework of form genera is to me the straw that breaks the camel's back. I personally yearn for a natural classification based on priority using fertile structures, and for gymnosperms specifically, ovulate structures. Vertebrate paleontologists have managed for years to name and classify their fossils with an explicit preference for teeth and skulls, without bothering with form generic names for post cranial remains. It is time for paleobotonists too to be putting whole plants together. There are probably as many views on this subject as there are paleobotanists. Perhaps others also will be challenged to dialog by the Anderson's work.

In the light of the above comments, there are many minor points of naming and citation with which one could take issue, for example, their rejection of type specimens that I find acceptable, their unexpected emendation of species not found in the Molteno Formation and their explicit exclusion of non- Gondwanan species for comparison. For New Zealand plants that I have referred to Pachydermophyllum praecordillerae and Sphenobaiera robusta, I am unswayed by the new names provided here. "Glossopteris" moribunda of Johnston 1887 appears to be a senior specific synonym for Gontriglossa "verticillata" of this volume. These are however, minor quibbles that are seldom resolved to the satisfaction of all.

A major contribution of the present work is documentation of a startling diversity of well preserved ginkgolike and cycadlike foliage. The ginkgolike leaves have cuticular structure and associated reproductive material (to be reported in more detail in later volumes) that support Sergei Meyen's idea of a peltasperm ancestry for Ginkgo. There is no evidence from the Molteno leaves of a relationship with Karkenia, Leptostrobus or other enigmatic gymnosperms: an explanation that seemed more promising in the past and may yet hold for ginkgolike leaves of Triassic age elsewhere. No fertile structures and few cuticles are reported for the cycadlike leaves, but those available suggest affinities with cycads rather than cycadeoids. This may disappoint those who were looking for a variety of cycadeoid ancestors to angiosperms in Triassic floras of Gondwanaland.

The abundance and diversity of cycads in these cool climate paleofloras may also be puzzling to northern hemisphere botanists accustomed to thinking they are tropical to subtropical plants. But then, Macrozamia is widespread in temperate southeastern Australia, even on frosty mountain ridges that occasionally receive winter snow. As has been known for some time, not all Mesozoic cycads and cycadeoids had large frost-sensitive terminal meristems like those found in modern palms.

Conifers documented in this new volume include foliage and cones allied to voltzias and podocarps. Among seed ferns are documented several incredibly polymorphic species of Lepidopteris, a new genus (Dejerseya) of peltasperm foliage, and a paleobotanical oxymoron,non-forking Dicroidium leaves.

The most exciting discovery to me is the cuticular unity of the leaves Yabeiella, Gontriglossa (formerly Glossopteris) and Jungites (formerly Taeniopteris). Furthermore, Gontriglossa has truly verticillate leaf insertion. quite unlike the compact short shoots of Glossopteris. Also illustrated are intriguing scales around the ovules of Fraxinopsis, the likely winged fruit of Yabeiella. These finds together with recent work by Bruce Cornet on Late Triassic fructifications from Texas, stimulated me to speculate that we might be seeing a great Late Triassic adaptive radiation of gnetaleans. The glory of a richly documentary and clearly laid out work such as this is that it encourages interaction. You too will probably find yourself dipping into this book at random, asking questions, comparing and calculating. As with all of these volumes of the Andersons, this is an opportunity in exploration which should not be missing from any paleobotanical library.

G. RETALLACK, Oregon, USA

John and Heidi Anderson offer us another large unit of their 'life1-work contribution. They seek to achieve natural taxonomy in palaeobotany, no less. To this end they have continued and elaborated their most detailed and precise presentation of both new and existing data.

After a brief revision statement of Dicroidium incorporating two species for which cuticle data has become available, this work is primarily concerned with Lepidopteris, Sphenobaiera, some species placed in Ginkgo, Dejerseya, Pseudoctenis and various other pinnate bennettitalean leaves including Moltenia, Taenioptens, Pinopsida such as Heidiphyllum and Rissikia, and a few unclassified genera such as Yabeiella. The material is principally from their own very extensive Molteno collection since 1967, but Gondwana Triassic revisions are also involved.

The Anderson' technique, as in 1983 and 1985, is to present a maximum proportion of raw data by means of a profusion of photographs, numerous complementary pen sketches, tabulations, maps, and histograms with a minimum of very carefully written concise text. It is, of course necessary to read their brief introductory chapter to understand and to obtain most benefit from their planning. In this volume, they have announced various modifications and innovations which are significant but not disturbing to their whole presentations.

The Linnean binomial system and the International Code of Botanical nomenclature (ICBN) are followed, but major inadequacies in their application to palaeobotany are highlighted. The most obvious divergence is the Anderson palaeodeme which is a single fossil assemblage from a discrete lithologic unit at one locality; this collection of specimens is presumed to represent a single breeding population, is represented by as many photographs of specimens as are useful, and in effect replaces the holotype.

When there are numerous palaeodemes (which are all equally treated), one is labelled 'reference palaeodeme' and stands for the species. The foreseen extension of this is the use of 'statistically identified nodes' for species; divergence begins to sound like a separate code for fossils. On the other side only species are handled in this volume, which cuts out subspecies and other formally recognised fragments copied from Holocene taxonomy.

The use of leaf cuticles, although confined to a small number of favourable localities, is enthusiastically pursued with SEM in addition to some LM; Chapter 3 discusses the employment of cuticle characters in a concise neat account which is a model and which dispels various earlier pessimistic or unenterprising accounts of this topic.

At a difference level the whole Gondwana Triassic for five continents is analysed through the literature for occurrence data. All species are discussed in terms of a 'prominence rating' derived from figures for diversity of species in each genus + Ubiquity of geographic occurrence + Frequency of records by degree squares + Abundance (DUFA); the last item although fully documented in the (Anderson) Molteno, is very rarely discernible from the literature because of unexplained reluctance of authors (not confined to palaeobotanists). This leads on to a very brief section on evolutionary models with some support for reticulate evolution, but little else.

From the first chapter, and indeed from the Prodromus published in 1985, a historial perspective is maintained. Using an earlier analysis first research produces alpha taxonomy (pioneer, exploratory, descriptive) followed by beta taxonomy (consolidation, revisionary), with the present work providing perhaps gamma taxonomy (biosystematic, explanatory). This leaves an ultimate, perhaps unattainable, target of omega taxonomy (encyclopaedic), certainly for one's successors. The Andersons, however, are undeterred and have a major programme of volumes ahead, covering fruits and seeds, pollen, wood, co-existing fauna and general synthesis.

The most interesting problem for them is mentioned with their customary honesty in Chapter 5, tucked away at the end of the book after 470 pages of systematic treatment of palaeodemes. They conclude that the use of ICBN holotypes does not produce stability and cannot

because they are concerned with nomenclature rather than with fossil specimens; the choice appears to be between scrapping ICBN for fossils, and erecting a far stricter legal system to maintain standards. This problem will not be settled quickly, although perhaps it should be, but its consideration should in no way decrease our encouragement for the Andersons or our admiration for their efforts. What they have done is so thoroughly carried out and so carefully planned, that it will provide uniquely valuable data for any foreseeable situation, and a great example.

N.F. HUGHES, Cambridge, UK.

FOSSILS AS INFORMATION N.F. Hughes, 1989. Cambridge University Press. 136pp. ISBN 0521366569.

"The fool will turn the whole science of astronomy upside down" Luther on Copernicus.

"There is only one Jesus Christ and all the rest is a dispute over trifles". Elizabeth I on Luther.

"...he seems to me.... The most glaring-flaring-staring harlotry imposter that ever passed a trick upon the sense of mankind.... I never saw such an assemblage of florid nightmares. Byron on Rubens.

"What an enchanter! ....how superior he is to all those little qualities which make up the whole baggage of others! ... he overpowers you by all his liberty and boldness"

Delacroix on Rubens.

Partisan views, polemic, conflict, argument - The very stuff of the evolution of our civilization. Science, no less than any other field of human endeavour, shifts, becomes moribund, advances in the broth of polemic. The very motto of the British Royal Society - "Nothing by mere authority" invites critical disagreement, debate. The search for truth. Some scientists are motivated by minutae, others by fundamental issues, all aim at adding their contribution to the previously held body of knowledge and ideas.

Hughes is concerned with fundamentals, the shift he is proposing is of major proportions and all embracing. He aims at no less than Reformation. The sophistication of our understanding of earth evolution - of the lithosphere & biosphere - is at stake.

I, for one, go along quite some way, with most of his ideas.

When Linnaeus developed his binomial system over 2 centuries back both King George III in London and Louis XV in Paris were enchanted by it and employed it in their gardens, Rousseau as well as his arch-rival Voltaire, were both besotted, Goethe took it no less than he did Shakespeare to heart. All biologists everywhere have employed it since. It has undoubtedly proved of extreme value. But it is an approximation and particularly so as applied to fossils. Has it the resolution we now require? What actually is a species, a genus, any of the higher taxa? Can it be employed to further benefit in stratigraphic correlation? These questions are addressed by Hughes and he decides to let go of Linnaeus.

Our man from amongst The Gothic spires of Cambridge lets go also of the elaborate codes of botanical and zoological nomenclature that have grown to preserve and bolster the Linnaeus system and of the International Stratigraphic Code. He implodes current attempts at one-present classification, most of post-Darwinian evolutionary theory and biostratigraphic zonation in correlations.

Hughes erects his own internally consistent, computer compatible, systems of biological and stratigraphic taxonomy and nomenclature and justifies it step by step. And there seems little doubt that if employed it would yield results of a refinement far exceeding anything currently imagined. He offers a new Paleontologic Data- Handling Code (PDHC). He does not pose, though, as the ultimate oracle: "It is quite possible" says he "That other plans will prove to be better than the suggestions made above. Most desirable first, however, is proper scientific debate"

The basic unit in the Hughesian taxonomic system is the paleotaxon (which supercedes his earlier biorecord). The paleotaxon is a suite of specimens showing a normal range of variation and derived from a rock sample of specified extent. This element of raw data is not subject to any of the slippery vicissitudes of the traditional fossil species. Neither its morphological limits or its name (a unique serial based on author and date) are subject to change. It is adopted or rejected according to its usefulness. It is the tool by which we can reveal the picture of evolution and by which we can effect high- resolution stratigraphic correlation.

I have spent a large part of my adult life getting familiar with both the fossil and extant worlds through the manipulation of generic and specific names. It has worked, mostly, and I have got to love not only the actual plants and animals but their names also. Just possibly at least on the fossil front I will have to give a deal of that up. Being human I will be reluctant.

In a world which is dying fast we must think big. we must get bold, we oughtn't muddle complacently along. In a world from which both biosphere and atmosphere are being savagely torn all current political systems are undergoing trial. There seems to be no reason why our scientific systems should enjoy special immunity.I have made no attempt to summarise or discuss each step in the Hughesian system. He does that perfectly succinctly and lucidly himself. His book, a re-evaluation and synthesis (with a few new heresies as he privately puts it) of his ideas published over the last 20 years, is short but explosive. My purpose is to encourage serious study of this perceptive manifesto. Any palaeontologist or stratigrapher simply ignoring it treads dangerously close to the scientific "trash can".

J.M. ANDERSON, Pretoria, South Africa.