COMMISSION INTERNATIONALE DE

MICROFLORE DU PALEOZOIQUE

NEWSLETTER No 17 JANUARY 1978

PRESIDENT
Serge Jardine
Laboratoire Exploration ELF - R.E.
31360 BOUSSENS
France

SECRETARY GENERAL
Bernard Owens
Institute of Geological Sciences
Ring Road Halton
LEEDS LS15 8TQ
England

Contents

1. EDITORIAL

The first Newsletter of 1978 gives me the opportunity of expressing on behalf of all the membership of C.I.M.P. our sincere thanks to Maurice Streel, our past Secretary General, for all of the excellent work which he did during his period of office between 1971 and 1977. Much of the high esteem with which C.I.M.P. is held in palynological circles is the direct result of the tireless efforts of Maurice Streel. His enthusiasm for the activities of C.I.M.P. resulted in the emergence of C.I.M.P. as a fully acknowledged group outside the confines of Western Europe. The contacts we now enjoy with our colleagues in the Soviet Union are the direct result of his efforts as are our strong connections with other regional societies i.e. A.P.L.F., A.A.S.P., KRING etc.

To take over the post of Secretary is never easy, particularly in a situation where such a high standard has been set. Inevitably such a change in organisation is bound to result in changes in format of our Newsletter to suit local production facilities but efforts will be made to maintain its main functions. I should like to take this opportunity to point out that the Newsletter is a media available to all of the C.I.M.P. membership. If you have some item which you think is worthy of inclusion, why not send it to me for inclusion in the next issue.

The current high level of activity of many of the regional palynological societies in Western Europe has in some cases recently lead to minor difficulties over clashes in dates and content of meetings.

At the recent meeting of A.P.L.F. and KRING in Liege in September an informal discussion was held between the Secretaries of the various regional palynological societies to discuss this problem. It was agreed that closer cooperation and liason was possible and could be achieved by a regular interchange of Newsletters and Circulars etc. We agreed to establish a secretariat responsible for coordinating this interchange of information and Dr W Herngreen (Holland) has agreed to fulfil the role for the first year.

Best wishes for 1978

BERNARD OWENS
Secretary General

2. NEXT MEETING

INTERNATIONAL SYMPOSIUM ON THE DEVONIAN SYSTEM 1978

UNIVERSITY OF BRISTOL
September, 1978

CIRCULAR No.2.
(June 1977)

Provisional Programme

1st September — Assembly of pre-sessional field excursion A2 in Edinburgh, Scotland.

2nd September — Assembly of pre-sessional field excursion A1, S. Devon and N. Devon, in Exeter.

8th September — A2 excursion arrives in Bristol.

Saturday, 9th September

Morning and afternoon: Registration
A1 excursion arrives in Bristol.
Evening: Reception and Special Address.

Sunday, 10th September

Morning: Programme of keynote papers. (0930-1245 hrs)
Afternoon: Programme of shorter papers*. (1400-1730 hrs)
Evening: Poster session in Hiatt Baker Hall. (see p.1)

Monday, 11th September

Morning: Programme of Keynote papers. (0930-1245 hrs)
Afternoon: Programme of shorter papers. (1400-1730 hrs)
Evening: Reception by City of Bristol in Council House. (2000-2200 hrs)

Tuesday, 12th September

Morning: Programme of keynote papers. (0930-1245 hrs)
Afternoon: Programme of shorter papers and summary session. (1400-1730 hrs)
Evening: Reception by University of Bristol in Great Hall. (2000-2200 hrs)

Wednesday, 13th September

Morning: Departure of excursions B1 and B2 (S.W. England and S. Wales)

Thursday, 21st September

Excursion B2 returns to Bristol.

(*It is expected that there will be four concurrent sessions of shorter papers.)

General Information

SUBSCRIPTION The conference fee of £40 will cover a copy of the Symposium Volume, field guides, set of Abstracts of all communications, transport to and from Halls of Residence, and tea and coffee. Students and subscribers to Special Papers in Palaeontology may write for details of a reduced rate.

ACCOMMODATION Single room or double room accommodation has been arranged at Hiatt Baker Hall of Residence, University of Bristol. The provisional cost for full board for a stay of three days or longer will be £7.50 per day. Persons requiring accommodation outside the conference dates should indicate in the box provided on P.A.D.S.2a.

EXHIBITIONS of material will be welcomed for display at the University. Intending exhibitors should indicate their needs in response to Circular 3.

POSTER SESSION By this means authors display, diagrams, maps, photographs in a small booth, and are in attendance to answer informal questions. Participants who wish to communicate their papers this way, rather than by formal reading, should indicate on Form P.A.D.S.2a. The number of such booths is limited; details of display areas will be issued in Circular 3.

ABSTRACTS Contributors and keynote speakers should supply abstracts on the attached form. The abstracts will be issued to participants at registration.

FIELD EXCURSIONS (for registered participants only)

Pre-Symposium

Excursion A1: South and North Devon. Estimated cost £80, assemble Exeter p.m. 2 September, arrive at Bristol 9 September. Leaders: Dr C T Scrutton, Dr E B Selwood, Dr R Goldring and others. Torquay, Saltern Cove and Newton Abbot, Baggy Point, Ilfracombe, Lynton and Lynmouth.

Excursion A2: Central and Northern Scotland. Estimated cost £190, assemble Edinburgh p.m. 1 September, cost includes flight to Bristol and overnight accommodation there 8/9 September. Leaders: Dr P F Friend, Dr R N Donovan, Dr W Mykura and others. Berwickshire, Edinburgh, Arbroath, Stonehaven, Elgin, Strathpeffer, Helmsdale, Thurso and Wick, charter flight to Bristol.

Post-Symposium

Excursion B1: South Devon and North Cornwall. Estimated cost £80. Leave Bristol a.m. 13 September, disperse Exeter 19 September.
Leaders: Dr C T Scrutton, Dr E B Selwood, Prof M R House and others. Torquay, Saltern Cove, Newton Abbot, Trevone, Trevose Head, Tintagel, Plymouth.

Excursion B2: South Wales and Welsh Borders. Estimated cost £110.
Leave Bristol a.m. 13 September, disperse from Bristol a.m. 20 September.
Leaders: Dr B P J Williams, Prof J R L Allen and others.
Ludlow, Clee Hills, Brecon Beacons, Milford Haven, Cosheston, Pembroke Peninsula.

Places on field excursions are limited: preference will be given to overseas participants and to those who are earliest to register. Final applications for places on excursions should be made on the enclosed Registration Form. A deposit of £30 is due for each place on each excursion. Costs given above are as realistic and accurate as possible at present. The organisers have been able to obtain only estimates of hotel costs.

PAYMENT of the conference fee and the deposits for accommodation and field excursions must reach the Symposium Treasurer as soon as possible, and the balance, which will be specified for each individual, must be paid by 1st July 1978. Payment should be made in pounds sterling by cheque (if from UK and Republic of Ireland) or by Banker's Draft from overseas participants, payable to Dr K C Allen, P.A.D.S. Account. The Symposium Bank is the National Westminster Bank, 40 Queen's Road, Clifton, Bristol. In the event of cancellation, return of deposits will be made in full up to 1st March 1978.

Confirmed costs, together with booking forms for detailed requirements, will be sent with Circular 3 in March 1978.

PRESENTATION OF PAPERS About 125 papers have been offered, including keynote papers invited by the Organising Committee. Keynote papers will occupy about 35 minutes each and will be as follows:-

Special Address: Prof M J S Rudwick (Amsterdam)
The Devonian: a System born from Conflict.

Biostratigraphy

Prof W Ziegler (Marburg), Chairman of the Devonian Subcommission.
Historical Subdivisions of the Devonian.
Prof W G Chaloner (London). The Devonian Megafloras.
Dr D C McGregor (Ottawa). Spores in Devonian stratigraphical correlation.
Prof T S Westoll (Newcastle upon Tyne). Devonian Fish Biostratigraphy.
Prof M R House (Hull). Devonian goniatite and clymenid zonation.
Dr W A Oliver, Jr. (Washington) and Dr A E H Pedder (Calgary).
Corals in Devonian stratigraphical correlation.
Prof G Klapper (Iowa) and Prof W Ziegler (Marburg).
Devonian conodont biostratigraphy.
Prof H Alberti (Göttingen). Devonian trilobite biostratigraphy.
[Prof J G Johnson (Iowa). Devonian brachiopod biostratigraphy.]

Biofacies

Prof D L Dineley (Bristol). Tectonic setting of Devonian sedimentation.
Dr N Donovan (Oklahoma). Old Red Sandstone internal basin facies.
Prof J R L Allen (Reading). Old Red Sandstone external basin facies.
Dr R Goldring (Reading) and Dr F Langenstrassen (Gottingen).
Near shore clastic facies.
Prof P H Heckel (Iowa). Carbonate facies.
Prof W Krebs (Braunschweig). Basinal facies.
Prof T S Westoll (Newcastle). Summary and concluding remarks.

It is hoped that everyone who has offered a paper will be able to present it at one of the four concurrent sessions when 15 minutes will be allotted to each presentation and 5 minutes for subsequent discussion.

PUBLICATION A Symposium Volume to be published by the Palaeontological Association in their Special Papers in Palaeontology Series as soon as possible after the symposium will contain the keynote papers presented at the meeting.

REGISTRATION FORM 2. The accompanying form should be completed and returned with payment of deposit to the Symposium Secretary, Department of Geology, University of Bristol, Queen's Building, University Walk, Bristol BS8 1TR, England, as soon as possible.

I.U.G.S. MEETINGS The Subcommission on the Devonian System will hold a business meeting at a time to be arranged during the Symposium.

Project Ecostratigraphy will hold a meeting immediately prior to the commencement of the Symposium.

A room will be available for C.I.M.P. meetings during the course of the Symposium. (Full details in next Newsletter).

Titles of papers submitted on Palynology & Palaeobotany

ALVAREZ-RAMIS Dr C, Spain
Note on a Devonian Flora from Badajoz, Spain.

BANKS Prof H P, U.S.A.
The role of Psilophyton in the evolution of vascular plants.

CRAMER-DIEZ Prof F, Spain
Palynology of tidal flat sediments (Wenlockian-Gedinnian) of the Cantabrian Mountains.

CHIBRIKOVA Dr E V, U.S.S.R.
Stratification of Eifelian deposits on plant miospores in the European part of the USSR.

DORNING Dr K, England
Downtonian microplankton, palynostratigraphy and palaeoecology.

EDWARDS Dr D, U.K.
Lower Devonian Floras of Britain.

EDWARDS D S, Ghana
Rhynie Chert Flora.

FORBES Prof W H, U.S.A.
Early Middle Devonian vascular plant paleogeography.

GENSEL Prof O, U.S.A.
(Details to come)

HUEBER Dr F M, U.S.A.
Devonian Megafloras of Australia; their place in world distribution.

HASSAN A M, England
Biostratigraphy, Palynologic Detail Studies of Spores and Pollen of South Wales and North Devon.

KREMP Prof G O W, U.S.A.
Palyno data information concerning the Devonian.

LEJAL-NICOL Dr A, France
Sur la flore devonnienne de Libye.

THE PALAEONTOLOGICAL ASSOCIATION FORM P.A.D.S. 2a

DEVONIAN SYSTEM SYMPOSIUM - UNIVERSITY OF BRISTOL, SEPTEMBER 1978

REGISTRATION FORM

(Please use BLOCK CAPITALS (or type) throughout and place tick ( ) in boxes as required.)

Family Name: .....

First Name (a): .....

Style (Title): .....

Address: .....

.....

.....

I wish to confirm my attendance at the Symposium, and enclose my Registration Fee of £40 .....

OR I wish to be registered as a non-attending member of the Symposium, and enclose my Registration Fee of £5. .....

I enclose deposit of £5 for the accommodation and meals in University Hall over the period 9-13 September 1978. (Estimated total cost £30.00). .....

OR I do not require accommodation .....

FIELD EXCURSION: A1 South and North Devon. I enclose deposit of £30. .....
(Estimated total cost for seven day excursion £80.00)

OR A2 Scotland. I enclose deposit of £30. .....
(Estimated total cost for seven day excursion £180.00)

B1 South Devon and Cornwall. I enclose deposit of £30. ....
(Estimated total cost for five/seven day excursion £80.00)

OR B2 Wales and Welsh Borderland. I enclose deposit of £30. ...
(Estimated total cost for five/seven day excursion £110.00).

ACCOMPANYING MEMBER:

I shall be accompanied by: (NAME): .....

I enclose deposit of £5 for additional accommodation in Hall for:

double accommodation .....

extra single accommodation .....

If possible, I should like the accompanying member to be included on:

Excursion A1. I enclose deposit of £30. .....

OR Excursion A2. I enclose deposit of £30. .....

Excursion B1. I enclose deposit of £30. .....

OR Excursion B2. I enclose deposit of £30. .....

TOTAL REMITTANCE ...

I should like to book accommodation outside the period 9-13 September .....

Dates as follows:-

I subscribe to the Special Papers in Palaeontology Series .....

I wish to participate in the Poster Session .....

Banker's Drafts in Sterling (outside British Isles) and cheques (U.K. and Ireland) should be made payable to P.A.D.S., and forwarded with this form to Dr.K.C.Allen, Symposium Treasurer, Department of Botany, University of Bristol, Woodland Road, BRISTOL BS8 1UG, England.

FORM TO BE RETURNED BY 1st OCTOBER 1977.

LEMOIGNE Prof Y, France
Presence des genres Callixylon, Cladoxylon et Xenocladia dans la flore devonienne du Kazakhstan (URSS). Remarques sur l'individualite de la province du Kazakhstan au Devonien.

NAYLOR Dr D, Ireland
Devonian stratigraphy and palynology in Ireland.

PETROSYAN Dr Nina, U.S.S.R.
Correlation of Lower Devonian deposits in USSR and England on plant assemblages.

RIEGEL Dr W, Germany
Microflora of the Emsian-Eifelian type region.

RICHARDSON Dr J B, U.K.
Miospore zonation of the Upper Silurian and Devonian.

STREEL Prof M, Belgium
Palynology of Gedinnian to Siegenian stages in Belgium.

SERGEEVA Dr L, U.S.S.R.
Palaeozoic microflora of Eastern Carpathian, Caucasus and Balkans.

SENKEVICH Myrra, U.S.S.R.
Stratigraphical significance of Devonian Lycopsida and some views on type terminology.

SCHWEITZER Prof Dr H J, Germany
The lower Devonian megaflora of the Rhineland.

TAYLOR Prof T N, U.S.A.
Devonian Spore ultrastructure.

TIMS Ms J D, Australia
Recent findings and re-assessment of the Lower Devonian flora of Victoria.

---

3. REPORTS OF WORKING GROUP ACTIVITIES AT "THE INTERNATIONAL PALYNOLOGICAL COLLOQUIUM", LEON, SPAIN; SEPTEMBER 1977

Address to the XII General Assembly of the Commission Internationale de Microflore du Paleozoique by the Chairman of Session IV: Sven Laufeld (Geological Survey, Stockholm, Sweden).

It is an understatement to say that the Session on Chitinozoa was successful. Never before have so many Chitinozoa papers been given at a single symposium and never before has the overall quality of the presentations been as high as yesterday's. This reflects the trust we all had in Fritz' and Carmina's ability to organize successfully this colloquium. We are most grateful to you and your co-workers for the tremendous job you have done. I'm also very pleased that both of you gave papers on the chitinozoans that, so to speak, surround us here in Leon, because I know from personal experience that organizing a symposium is a full-time job.

When trying to make a summary of the Session on Chitinozoa it is my first impression that the success of the Session can be explained by the meticulous approach to the basic data that were presented. It is no secret that some of us have been annoyed by the sloppy attitude in many publications as far as precise geographical and stratigraphical sampling is concerned. I hope that the presentations of yesterday will set a standard in this respect for the future. Another reason for the fruitfulness of our session is to be found in the wide range of topics dealt with there. Apart from studies on biochemistry and ultrastructures, all aspects of Chitinozoa were discussed at our session, viz., their total

stratigraphical range, their systematics and biostratigraphy, and their palaeobiology, palaeoecology and palaeogeography. I find it convenient to use these three headings when summarizing briefly the individual contributions, even though I'm aware of the overlap among the three topics.

Most of us believe that Chitinozoa show up in the Tremadocian, that is, in earliest Ordovician time, and that they disappear by the end of the Devonian. Wilson's (1956) report on supposed chitinozoans from the Middle Cambrian Nassau Shale of New York was based on doubtful fragments. The same is true of reports on supposed Chitinozoa in the "late Precambrian" of, for instance, Czechoslovakia. Yesterday, it became evident that very few, if any, of us would subscribe to Bloeser et al.'s interpretation in "Science" (1977) of the Chitinozoa-like microfossils in the late Precambrian Kwagunt Formation at Nankoweap Butte in Grand Canyon as true Chitinozoa. Nor has anyone of us accepted as a chitinozoan the specimen from the Mississippian Goddard Shale in Oklahoma, described in 1960 by Wilson and Clarke. Gafford and Kidson's discovery of "apparent chitinozoans" in the Permian of Kansas was not substantiated in the literature. Similarly, scepticism is the attitude towards Tasch's (1973) interpretation of some Permian microfossils in Kansas as chitinozoans. Some earlier reports on the occurrence of Chitinozoa in Mississippian rocks have not been disputed but these late occurrences have been explained as having been caused by redeposition.

Those were the feelings against which Paul Tasch had to fight when presenting Terry Hutter's and his paper "Pennsylvanian (Virgilian) chitinozoan fauna from eastern Kansas". A deliberate search for post-Devonian chitinozoans met with success in the Virgilian Leavenworth Limestone in Eastern Kansas. The chitinozoans were referred to nine species (four new) and five genera (one new; two new subgenera) and new angle measurements and ratios were introduced in the descriptions. It was demonstrated that contamination in the laboratory could be excluded and that the chitinozoans are indigenous to the Leavenworth Limestone. In the lively discussion that followed Tasch's presentation it became obvious that most specialists agreed on the chitinozoan nature of the fossils. However, redeposition was considered the most probable explanation, partly because of the Devonian aspect of morphology and partly because of differences in colour and state of preservation as compared with the other organic-walled microfossils encountered in the Leavenworth Limestone. Tasch pointed out that we should not consider as sacrosanct an Ordovician-Devonian range of Chitinozoa. It is always stimulating to hear divergent opinions and I think Hutter & Tasch's paper focussed our attention to redeposition as a possibly more important factor in the distribution of chitinozoans than was earlier conceived. We should continue to have an open mind for possible pre-Ordovician and post-Devonian Chitinozoa.

The next group of papers was concerned with systematics and biostratigraphy. In his paper "Problems of taxonomic applications of ornament in acritarchs and chitinozoans", Mike Chaiffetz used some late Ordovician and early Silurian chitinozoans as examples when arguing against the use of ornamentation or sculpture in the definitions of chitinozoan genera. His approach was that of a palynostratigrapher - "Poor preservation of sculpture often causes difficulty making accurate taxa assignments at the generic level, resulting in a potential loss of palynostratigraphic information" - and he hoped that some generally accepted taxonomic guidelines would soon be forthcoming. Chaiffetz also pointed out the importance of recognizing pseudo-ornamentation.

Florentin Paris presented his meticulous work on the "Distribution des chitinozoaires dans la Formation de Louredo; Ordovicien superieur du Synclinal de Bucaco, Portugal". He established the occurrence in this sandy-silty formation, of abundant Chitinozoa showing a low diversity, and proved that his range zones are most useful in correlation. His establishment of the Eremochitina dalbyensis Range-zone in Portugal also has far-reaching palaeo-geographical implications.

Two papers that were given yesterday are of importance in the discussions of the Ordovician-Silurian boundary, viz., Aicha Achab's "Les chitinozoaires de l'Ordovicien superieur de I'lle d'Anticosti, Quebec, Canada" and Yngve Grahn's "Chitinozoa and the Ordovician-Silurian boundary in southern Sweden".

Achab showed that Hercochitina species characterize the late Ordovician Vaureal Formation on the Anticosti Island. A different and less diversified chitinozoan fauna occurs in the overlying unit, the Ellis Bay Formation, which is either of Ordovician or Silurian age. In the Ellis Bay two Conochitina species disappear at the base of member 6, where some stratigraphers place the boundary between the two systems.

Grahn showed that the late Ashgillian Chitinozoa in South Sweden range through the Glyptograptus persculptus Zone and into the overlying Akidograptus acuminatus Zone. At present, the Ordovician-Silurian boundary is placed at the base of the G. persculptus Zone. Although the system boundary in Sweden cannot be defined by changes in the chitinozoan fauna, Grahn demonstrated that the Ancyrochitina:Conochitina ratio is a powerful tool in detailed correlation at this level. Achab's and Grahn's papers have interesting palaeoecological and palaeogeographical implications.

Fritz Cramer and Carmen Diez co-authored two papers, the first given by Fritz "Iberian chitinozoans" and the second by Carmina "Chitinozoan zonation of the La Vid Formation (Gedinnian to Eifelian) in the Provinces of Leon and Oviedo, Spain". Cramer and Diez introduced a composite chitinozoan zonation for the Iberian peninsula from the Ordovician Llanvirn through Devonian Givet stages and divided the Cantabrian late Llandoverian - early Eifelian into 20 "Cantabrian Chitinozoan Zones". They also stressed the similarities between Iberian, French and North African chitinozoan assemblages. In the discussion that followed, it was pointed out that there is an age discrepancy between the Devonian palynomorph datings and the brachiopod data.

Diez & Cramer described a number of new chitinozoan species from the Devonian La Vid Formation in Leon and its equivalent in Oviedo, the Nieva Formation. They recognize five chitinozoan zones, the same in both formations. The paper's presentation was very timely, because we shall have an opportunity to sample and get topotype material from the Leonese La Vid Formation during our field excursions of the next few days.

The last group of papers was concerned with the palaeoecology of Chitinozoa. Palaeobiology and palaeogeography were also touched upon.

Mike Chaiffetz presented "First report of Chitinozoa from the Upper Devonian Percha Shale, SW New Mexico" (not announced in the program) authored by himself, G Kocurek and W C Cornell. Chitinozoans were encountered only in the basal dark shale occurring in erosional depressions in the underlying late Ordovician dolomites of the Montoya Group. The

black shale was interpreted as being deposited in "shallow ponds, landward of the upper tidal flats" and the chitinozoans - Ancyrochitina, Angochitina, ?Sphaerochitina, and Hoegisphaera - were indigenous to that environment.

The best illustrated paper in our session, "Chitinozoans from the Middle Devonian of the Midwestern U.S.A." by R P Wright and E W Felt was presented by Bob Wright. Using examples from the Eifelian and Givetian carbonates in Ohio and Indiana it was demonstrated that chitinozoans show a maximum diversity in the open marine limestones. In the more restricted shallow-water, laminated and lithographic dolomites, chitinozoans either do not occur or occur with a very low diversity, Wright concluded that mapping of the regional distribution of Chitinozoa together with sedimentological studies can give a "representative picture of the temporal and spatial arrangements of depositional environments".

In "Palaeoecology of Silurian chitinozoans" I advocated that chitinozoans were restricted to holomarine environments and that their distribution was controlled chiefly by water depth (indirectly), temperature and salinity. I concluded that Ancyrochitina species were planktic and, for example, Desmochitina and Margachitina were benthic and coupled with specific benthic brachiopod assemblages.

We all regret that Marcel Locquin preferred to attend the mycology congress in Florida because we had been looking forward to hearing his arguments for placing Chitinozoa amongst Fungi.

In summing up, I think that in the future we'll see a lot more work particularly on the biochemistry and ultrastructures of Chitinozoa, but otherwise the topics in our session are representative for the paths research on chitinozoans will take in years to come. But I think that only those publications that contain detailed information on the geographical and stratigraphical provenance of samples will be of lasting value. An experiment that cannot be duplicated in a second laboratory hasn't proved anything scientifically.

Report on Acritarcha session

Nine contributors presented papers at the session; acritarchs were described from strata ranging in age from Cambrian to Devonian. The open nature of the session meant that papers varied considerably in content embracing studies on morphology, biostratigraphy, regional distributions and problems of reworking.

The following speakers participated:

C FOURNIER-VINAS Acritarches cambro-ordoviciens des Monts de Lacuna (Nord de la Montagne Noire, France).

S R JACOBSON Middle and Upper Ordovician acritarchs from the eastern Midcontinent, U.S.A.

K RAHMANI Ordovician and Silurian chitinozoans and acritarchs from the region around Rabat, Morocco.

R KALVACHEVA Acritarchs from three Lower Paleozoic formations in the West Balkan Mountains, Bulgaria.

D G SMITH Lower Paleozoic acritarchs in an Irish Lower Carboniferous siltstone.

K.J. DORNING Regional distribution of Silurian acritarchs in Britain

A B REAUGH Morphologic variation in the marine palynomorph Quisquilites in the Chattanooga Shales of Tennessee, U.S.A.

M VANGUESTAINE Acritarchs from Upper Famennian strata in the Tohogne borehole, Belgium.

M A FOMBELLA Sucesion palinologica del Cambrico Superior de Sebares, Provincia de Oviedo, Espana.

It is pleasing to note the sustained high level of interest in the Acritarcha which augurs well for future sessions. At a working group meeting during the conference, aims and objectives for future research were discussed. It is envisaged that a progress report will be presented in the next issue of the newsletter.

P J HILL

---

2 MEGASPORE WORKING GROUP

Dr G LASCHKAR presented a very interesting communication about Agades coalfield megaspores (NIGER). Some new species are described. The assemblages present some affinities with the Tchad ones described by DIJKSTRA. In addition, Dr Lachkar's paper makes it possible to extend the Gondwana area towards North Africa. Prof M Streel with the collaboration of Loboziak presented a paper about an Upper Westphalian C shale sample from East Netherlands. The assemblage of megaspores is characteristic of the Upper Westphalien C and proves more and more the importance of megaspore for the stratigraphy of the Westphalien C and D. P PIERART presented the state of advancement taxonomy of megaspore. Four types of Gula were defined i.e. the Hologula or fully developed Gula, the Subgula on non fully developed Gula, the Crassigula characterized by thick trilete laesurae, the Anguligula characterized by ears. On the basis of these structures it is possible to define the Genera Sublagenicula, Crassilagenicula and Auritolagenicula in addition to Lagenicula genus. Finally higher taxa have been created for a better structuration of the taxonomy of megaspores.

P PIERART presented at the symposium "Apport des techniques recentes en Palynologie" of Liege (19-23 September 1977) a paper about the diagenesis of megaspores.

P PIERART presented in Lille University at the Societe Geologique du Nord meeting a paper about the megaspores of the Gondwana area.

The next meeting of the C.I.M.P. megaspore group will be in Sosnowiec between 27 August and 7 September 1978. Anyone wishing to obtain further details of the megaspore group should contact the Secretary:-

Prof P Pierart
Universite de l'Etat
Service de Botanique generale et d'Ecologie
avenue du Champ de Mars, 24
B - 7000 MONS, BELGIUM

---

3 "HYSTRICHOSPHERE" WORKING GROUP

Discussions with various C.I.M.P. members at the International Palynological Colloquium, Leon, Spain, last September have revealed sufficient interest to warrant reactivation of the previously projected

"Hystricospore" Working Group dealing with a taxonomic revision of all general bearing anchor-hooked appendages. After more detailed discussions with D C McGregor during his visit at Göttingen it was agreed that the following steps in temporal order might be followed as an outline of procedure for the work to be accomplished:

1. Inventory of species: Preliminary lists of species will be prepared and exchanged with annotations by some palynologists having worked more extensively with "hystricospores".

2. Delimitation of revision: Which general should be included? (Hystricosporites, Ancyrospora, Archaeotriletes, Dicrospora, Nikitinsporites).

3. Exchange of material (slides of types or topotype material).

4. Proposal of guidelines for the circumscription and delimitation of species and genera.

5. Emendation of generic diagnoses.

6. Emendation of species diagnoses.

7. Taxonomic synthesis and photographic documentation.

8. Compilation of stratigraphic ranges and geographic distribution.

Meetings of the working group will be arranged at optional times and places. The chances of conducting a first full working session in connection with the Devonian System Symposium at Bristol next September will be negotiated. At that time the working group should attempt to cover steps 1 through 4 of the proposed procedure while the work concerning steps 5 and 6 may then be assigned to certain members of the working group. It would therefore be necessary that the exchange of type material among active participants is initiated as soon as possible. My suggestion is that slides with designated specimens from topotype material may be sent to D C McGregor, J B Richardson or myself for an initial review and circulated from there to anybody indicating interest.

The following is a provisional list of prospective contributors to the working group who are invited to provide material, information and comments. Any additional contributors are welcome.

United Kingdom and Ireland: K Allen, W G Chaloner, K Higgs, M Mortimer, B Owens, J B Richardson, A Scott.

France and Benelux: A Moreau-Benoit, M Streel, J Taugourdeau-Lantz, Van der Zwan

Norway: O Vigrann

Poland: E Turnau

U.S.A. and Canada: D Beju, W Brideaux, G K Guennel, L V Hills, D C McGregor, D Potter, R Sanders, J B Stough, J B Urban, H S Walton, M Wilson, G Wood.

Southern Hemisphere: B E Balme, R F Daemon, N J DeJersey, G Playford, F W Sommer

Soviet palynologists should be contacted by an intermediate from a western country (f.i. J B Richardson).

Convenor: W Riegel

Address: Geol.-Paläontol. Institut
Goldschmidtstr.3
3400 Göttingen /Germany

---

4. A PROPOSAL FOR A C.I.M.P. WORKING-GROUP ON SCOLECODONTS

The broad objective of the proposed working-group on scolecodonts is to increase the interest and communication, as well as the understanding between the scientists, whose contacts and exchanges have been severely limited by contrasting affiliations, techniques and goals.

The working-group on scolecodonts will seek to explore all those aspects of scolecodonts that are of interest, such as: morphology of scolecodonts and jaw apparatuses and the classifications based upon them (morphology - taxonomy - systematics); evolutionary hypotheses based on either comparative studies of modern species and/or the fossil record; factors controlling species distribution past and present (palaeoecology - palaeobiology); stratigraphical and geographical distribution; and techniques (preparation - observation - storage).

The ultimate goal of the proposed working-group on scolecodonts will be:

1) to establish harmony between the workers in this field, with regard to the way scolecodonts and jaw apparatuses are described and figured, resulting in a morphography (compare the publication Microfossils organiques du Paleozoique - Les Chitinozoaires 2 - Morphographie);
2) to establish a formal nomenclature to facilitate communication between workers; and
3) to publish an illustrated bibliographical analysis comprising the complete list of numbered and briefly analysed publications, in the annual chronological order of their issues - the main information of the literature is represented under three headings:
   a.- systematical data: generic diagnoses and corresponding species diagnoses (+corresponding photographical illustration),
   b.- stratigraphical data: in form of species repartition charts,
   c.- a multiple entrance index (compare the publication Microfossils organiques du Paleozoique - Les Chitinozoaires I - Analyse bibliographique illustree).

When you want to be an actively participating member of this new C.I.M.P. Working Group on Scolecodonts please inform:

Dr Anton W van Erve
Laboratory of Palaeobotany & Palynology
State University of Utrecht
Heidelberglaan 2
UTRECHT 2506
The Netherlands

---

5. ABSTRACTS OF PAPERS PRESENTED AT THE 10th ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF STRATIGRAPHICAL PALYNOLOGISTS, TULSA, OKLAHOMA: OCTOBER 1977

PLANT REMAINS IN SILURIAN ROCKS OF PENNSYLVANIA

Paul K Strother[1] and Alfred Traverse[2]

[1]Paleobotanical Laboratories, Harvard University, 22 Divinity Avenue, Cambridge, Massachusetts 02138, U.S.A.

[2]Department of Geosciences, Deike Building, Pennsylvania State University, University Park, Pennsylvania 16802, U.S.A.

Macerations of shales from Lower Silurian (Tuscarora Formation) beds in central Pennsylvania and Middle? Silurian (Clintonian age) beds in eastern Pennsylvania yield remarkable assemblages of non-marine palynomorphs. Samples from the upper portion of the Tuscarora Formation contain spore tetrads, dyads, and diacrodioid palynomorphs, inaperturate "spores", cuticular fragments, smooth cylinders and trilete spores. These trilete spores are not of the Ambitisporites type, but are characterized by thick laesurae and, in some cases, delicate reticulate ornamentation. In addition to the above remains, samples from Middle? Silurian beds in eastern Pennsylvania contain numerous cylinders with spiral and annular thickenings as well as trilete spores of the Ambitisporites type. No informative plant megafossil remains have been found in these deposits, although carbonized fragments are common in many beds. All of the studied material is found in association with the ichnofossil, Arthrophycus.

The relationships of Lower Silurian microscopic plant remains to known megafossil and extant taxa are largely enigmatic, but certain forms do show algal, nematophytalean and tracheophyte affinities. Although thickened tubes partially resemble tracheids in morphology, they are probably not homologous structures. The evolution of land plants with respect to the functional morphology of plant structures is discussed in the light of these and other Silurian microfossil occurrences. The presence of diverse non-marine Silurian floras does not change the concept of a primary radiation of the vascular plants in the Lower Devonian, but their existence should serve as a framework on which to build a more concise theory of land plant evolution.

FIRST REPORT OF CHITINOZOA FROM THE UPPER DEVONIAN PERCHA SHALE, SW NEW MEXICO

Michael S Chaiffetz,[1] G Kocurek,[2] and William Cornell[1]

[1]Department of Geological Sciences, University of Texas at El Paso, El Paso, Texas 79968, U.S.A.

[2]Department of Geology, University of Houston, Houston, Texas 77004, U.S.A.

Samples of five outcrop sections of the Upper Devonian Percha Shale (Grant, Hidalgo, Sierra, and Dona Ana Counties, southwestern New Mexico), examined after acid maceration-sieving techniques, contained a variety of palynomorphs, including tasmanitids, sparse acanthomorphitic acritarchs and spores, and some well-preserved chitinozoans.

Chitinozoans have so far been encountered exclusively but sporadically in the basal Percha of central Grant County, within a dark gray fissile shale facies, a few inches thick, deposited in shallow erosional depressions on the underlying Upper Ordovician Montoya Group dolomites. This facies is interpreted to have been an environment of shallow ponds, landward of the upper tidal flats. Sedimentological evidence indicates that the chitinozoans may have been an in situ part of the pond biota, not the result of reworking or transport from subtidal or more marine environments. The good to excellent preservation of the chitinozoans tends to support this conclusion.

VISUAL KEROGEN ANALYSIS: THE TIME FOR STANDARDISATION?

M Sedley Barss, Jonathan P Bujak and Graham L Williams

Atlantic Geoscience Centre, Geological Survey of Canada, Bedford Institute of Oceanography, Dartmouth, Nova Scotia B2Y 4A2, Canada.

Techniques presently used for determining maturation of organic matter (kerogen) in sediments include geochemical analysis, vitrinite reflectance, and visual analysis in transmitted light. Standardisation is now firmly established in the two former techniques, permitting ready communication of results. This is facilitated by a universally accepted terminology. To date, however, no such standardisation has been achieved in visual kerogen analysis. Thus there is no consensus of opinion concerning colour, its quantification and significance to maturation, the types of organic matter, or even the meaning of the term kerogen. Standardisation might be achieved by adopting an approach similar to that taken by coal petrologists for vitrinite reflectance.

PALYNOLOGY OF THE LOWER DEVONIAN ROSS FORMATION, DECATUR AND BENTON COUNTIES, WESTERN TENNESSEE

Ann Brooke Reaugh

GeoChem Laboratories, Inc., 1143-C Brittmore Road, Houston, Texas 77043, U.S.A., and Department of Geological Sciences, University of Tennessee, Knoxville, Tennessee 37916, U.S.A.

The Ross Formation, the basal Devonian strata in western Tennessee, contains abundant palynomorphs which have affinities with assemblages from North Africa and the North American craton.

The Birdsong Shale and Rockhouse Limestone members of the Ross Formation are found in discontinuous outcrops in the western valley of the Tennessee River. Excellent exposures are found in Vulcan Materials Quarries in Benton County and north of Parsons in Decatur County. In all outcrops, the Ross Formation is distinguished by its diverse, well-preserved invertebrate fauna. The microflora is comparably diverse and well-preserved.

Acritarchs are the dominant palynomorphs, and a minimum of 19 genera and 47 species are present. Many taxa have been identified from the Lower Devonian Haragan Shale of Oklahoma (Loeblich and Wicander 1976); some have been identified from the Devonian in northern Spain (Cramer 1964). There are few in common with those illustrated by Richardson and Ioannides (1973) from the Upper Silurian of the Algerian Sahara of North Africa. In contrast, the spores from the Ross Formation are similar to those illustrated for North Africa.

The large number of spores present suggests the presence of an adjacent, emergent land mass to the east which may have acted as a barrier to phytoplankton migration.

6. ABSTRACTS OF PAPERS PRESENTED AT SYMPOSIUM "APPORT DES TECHNIQUES RECENTES EN PALYNOLOGIC" ORGANISED BY A.P.L.F. & DUTCH PALY. KRING. LIEGE, BELGIUM; SEPTEMBER 1977

OBSERVATIONS NOUVELLES SUR LES SCHOPFIPOLLENITES (POT. ET KR.1954).

M Abadie*, G Lachkar**, E Masure**, J Taugourdeau-Lantz**.

* Directeur du Laboratoire de cryptogamie ultrastructurale de l'Ecole pratique des Hautes Etudes, Paris.
** Laboratoire de Micropaleontologie, Universite Pierre et Marie Curie, Paris.

L'observation au Microscope electronique a balayage de nombreux specimens du g. Schopfipollenites (Medullonacees, Pteridospermales) du bassin lorrain a permis de preciser l'ornementation externe et l'aspect vacuolaire de la paroi. L'etude ultrastructurale au Microscope electronique a transmission nous a aide a retrouver la structure feuilletess profonde de la paroi et l'aspect des vacuoles tels que Pettitt 1966 les avait observes. De plus elle nous a permis de mettre en evidence une couche feuilletee exterieure a la couche vacuolaire. Cette ultrastructure tripartite comparable a celle de l'exopore des spores de Pteridophytes actuelles nous montre comment les spores de Pteridosporinees ont tente de s'alleger.

RELATIONS ENTRE SPORES, ACRITARCHES ET PALYNOFACIES ET L'ANALYSE SEQUENTIELLE ET PETROGRAPHIQUE DE SEDIMENTS D'AGE FAMENNIEN (Fa 2c) DANS LA VALLEE DE L'OURTHE (BELGIQUE) J KIEVITS*

* Laboratoire de Paleontologie vegetale, Universite de Liege, Liege.

56 echantillons de schistes repartis sur 4 profils, de 5 a 15 metres chacun, contiennent, en quantite variable, des spores de la zone VU (Fa 2c), des acritarches et des palynofacies differents.

L'analyse petrographique de ces schistes rend compte de leur diversite. Les frequences absolues de spores et d'acritarches repondent a des processus sedimentaires partiellement distincts qui s'expriment mieux lorsqu'on analyse les sequences coupe par coupe. Chacune de celle-ci repete en effet avec des modalites diverses le passage d'un milieu "subtidal" a un milieu "supratidal". Ces milieux, et en particulier l'"intertidal" correspondent a des comportements differents des palynofacies et des quantites de spores et d'acritarches, et aussi probablement, par l'intermediaire de la selection qui s'opere sur la taille des formes, a des frequences relatives differentes.

APPORTS DU MICROSCOPE ELECTRONIQUE A BALAYAGE DANS L'ETUDE DES CHITINOZOAIRES CARBONIFIES. F PARIS

Centre Armoricain d'Etude Structurale des Socles (Laboratoire C.N.R.S.), Laboratoire de Paleontologie et de Stratigraphie, B.P. 25 A, 35031 Rennes Cedex.

Les difficultes d'observations des Chitinozoaires carbonifies ont longtemps constitue un obstacle a leur etude: le microscope optique

n'en donne qu'une simple silhouette et les techniques faisant appel a un eclairage incident restent peu probantes. Le microscope electronique a balayage (M.E.B.), utilise en routine, resout par contre la plupart des difficultes posees par la carbonification des Chitinozoaires.

Cet appareil apporte en effet, une amelioration a la connaissance de la morphologie et de la structure des Chitinozoaires (mode de liaison, opercule, structures internes, ornementation du test ...); ces deux points etant essentiels pour preciser la hierarchie des criteres de determination.

Dans le cas de sediments fortement compactes ou structures (schistosite, plissements ...), l'usage du microscope electronique a balayage permet egalement d'apprecier l'importance de la deformation des Chitinozoaires.

Enfin, dans le domaine de la stratigraphie fine, le microscope electronique a balayage confere un interet nouveau aux Chitinozoaires opaques en rendant leur determination possible et controlable sur les cliches publies.

EFFETS D'INTRUSIONS DE DIABAS SUR LES ASSEMBLAGES DE SPORES ET LE POUVOIR REFLECTEUR DE LA VITRINITE DANS UNE SEQUENCE SCHISTO-GRESEUSE AU SOMMET DU DEVONIEN A LANGENAUBACH (R.F.A.) V SOMERS* & M STREEL**

*Institut National des Industries Extractives (I.N.I.E.X.) rue du Chera 200, a 4000 Liege (Belgique)

**Laboratoire de Paleontologie vegetale, Universite de Liege. Place du XX Aout 7, a 4000 Liege (Belgique)

23 echantillons de schistes repartis sur un profil de 17 metres dans une sequence schisto-greseuse appartenant aux couches de Wocklum et de Hangenberg, contiennent des spores appartenant a la zone pusillites-lepidophytus (PL zone). La partie moyenne du profil comprend cinq "sills"intrusifs de diabas, de faible epaisseur (maximum 40 cm).

Le pouvoir reflecteur de la vitrinite mesure sur ces echantillons delimite relativement bien la partie du profil influencee par les intrusions, bien que la modification du pouvoir reflecteur soit faible.

L'etat de conservation des spores et, par consequent, les composantes de l'assemblage, sont en relation avec les memes phenomenes.

7. FUTURE INTERNATIONAL MEETINGS & OTHER SOCIETIES' ACTIVITIES

9th International Congress of Carboniferous Stratigraphy and Geology, U.S.A., May 1979

This will be held in Washington DC and Urbana, Illinois during May 1979. The first circular is now available and gives details of field trips and the broad themes of the congress; there is also a call for volunteers to lead group discussions. Details may be obtained from Dr E L Yochelson, IX-ICC, 1979, Museum of Natural History, Washington DC 20560, U.S.A.

The second circular will be circulated with the next Newsletter. Although there will be no formal C.I.M.P. meeting linked to the Congress it is anticipated that C.I.M.P. Carboniferous palynologists will cooperate with our North American colleagues in the organisation of various symposia within the framework of the Congress. Further details with Newsletter 18.

Subcommission on Carboniferous Stratigraphy

There will be a field and general meeting in Turkey from 15th - 24th May 1978. A provisional programme is now available and a second circular will be distributed to all who respond to it before November. The provisional details are available from Dr C F Winkler Prins, Bachlaan 16, Voorschoten NL 2260, The Netherlands. The Subcommission will also meet in Washington DC from May 17-18th 1979, in conjunction with the IX International Congress of Carboniferous Stratigraphy and Geology (see above).

Asociacion Paleontologica Argentina

The second circular for the second Argentine Congress of Palaeontology and Biostratigraphy and the first Latinamerican Congress of Palaeontology due to take place in Buenos Aires in April 1978 was published in June 1977. It can be obtained from Dr E J Romero, Maipu 645, 1 Piso, Buenos Aires 1006, Argentina.

International Organization of Palaeobotany

Following the death of Dr Hans Tralau on March 14th 1977, a new secretary has been appointed by the Executive Committee: Dr M C Boulter, N E London Polytechnic, Romford Road, London E15 4LZ. IOP Newsletter 4 was published on August 30th and is available from the secretary.

Membership is open to any palaeontologist who subscribes to the aim of international cooperation in the study of palaeobotany and palaeopalynology. At least twice a year IOP publishes an informative newsletter which announces palaeobotanical meetings, reports of their proceedings, describes regional bibliographies, gives news of institutions and individuals, reviews books and offers other pertinent information. It plays a substantial role at each International Botanical Congress and cooperates with other international organisations having interest allied to palaeobotany. Its constitution was adopted in August 1977 and sets out a framework for many possible initiatives. Bibliographies, address lists and other methods to help with the exchange of information within the subject are of central concern within its development. Membership is at a rate equivalent to U.S.$4.00 a year - new members are urgently required to help with the work of this new organisation.

International Commission for Palynology

Initial discussions have now taken place regarding the venue of the 5th I.C.P. Conference in England in 1980. Full details and dates will be supplied in the next Newsletter.

Le "RAPPORT SUR LA PALEOBOTANIQUE ET LA PALEOPALYNOLOGIE de FRANCE, BELGIQUE et SUISSE (1972-1976)" est maintenant paru. Nous le tenons a la disposition de tous les chercheurs qui en feront la demande. Il comporte 90 pages et 610 references bibliographiques.

Nous sommes obliges de demander une petite contribution financiere pour nous aider a assurer sa diffusion.

Vous trouverez ci-joint un bon de commande.

BON DE COMMANDE

Nom:.....Prenom:.....

Address ou doit etre expediee la correspondance:.....

.....

.....

.....

Je desire recevoir ... exemplaires du "RAPPORT SUR LA PALAEOBOTANIQUE ET PALAEOPALYNOLOGIE DE FRANCE, BELGIQUE ET SUISSE (1972-1976" au prix unitaire de 30 F.F. ou 6 U.S. Dollars.

Ci-joint la somme de ... viree au compte - cheque postal suivant:
Dr A Lejal-Nichol
Laboratoire de Paleobotanique de la Faculte
12 rue Cuvier, 75005 - Paris, France.
C.C.P. no. 15 378 75 J PARIS

---

8. TRANSLATIONS OF RUSSIAN PUBLICATIONS

The Geological Survey of Canada has in recent years initiated the translation of numerous palynological publications. It is not possible to borrow these translations from the Library of the G.S.C. but they are prepared to forward any requests for copies to a commercial agency who will undertake to make photocopies. Photo reproductions of the illustrations are sometimes included for information, the quality is not however guaranteed. In future newsletters we will regularly include details of translations which are available. If you are interested in obtaining a copy of any of these you should send your order to:- The Librarian, Geological Survey of Canada, 601 Booth Street, Ottawa, Canada KIA OE8. Your request will be forwarded to the agency who will send you an invoice for the work. The work will be carried out by the agency when you return your payment in advance.

Arkhangel'skaya A D 1971
A palynological characterisation of the premosolevian middle Devonian beds of Saratovoblast, their correlation and stratigraphic position (In Vsesoyznzyy Nauchno-Issledovatelskiy Geologoraz-vedochnyy Neftyanoy Institut. Trudy, No 106, pp 10-17)
G.S.C. Library Translation Series No 798.

Araslanova R M 1969
Tetraradiate Spores from Devonian and Lower Carboniferous Deposits of the Perm Oblast. (In Nauchnye doklady vysshey shkoly biologicheskie nauki No 12 pp. 53-60) G.S.C. Library Translation Series No 939.

Arkhangel'skaya A D

Palynological characteristics of the Middle Devonian lower horizons in the eastern part of the Russian Platform (In Vsesoyuznyy Nauchno-Issledovatel'skiy Geologorazvedochnyy Neftyanov Institut Trudy 83 pp 124-143) G.S.C. Library Translation Series No 885.

Ditsevichyus E K

New species of chitinozoans from the Ordovician and Silurian deposits of the southern Baltic and Belorussia. 2 Sphaerochitina (In Paleontologiya i stratigrafiya Pribaltiki i Belorussii Sbornik III, Vilnius, No 3, pp 77-95) G.S.C. Library Translation Series No 1067.

Kalvacheva R & Chobanova A 1973

Biometric investigations of certain species of the genus Veryhachium (Acritarcha) from the Ordovician of the Iskur Gorge in Bulgaria (In Bulgarska Akademiya na Naukite. Geologicheskie Institut. Izvestiya Seria Paleontologiya v.22 pp 5-18) G.S.C. Library Translation Series No 799.

Sergeeva L A 1971

Some new species of spores from the Upper Devonian deposits of the Dnioper-Donets Basin (In Problemy Palinologii Kiev, "Naukova Dumka" pp 42-62). G.S.C. Translation Series No 892.

Byvsheva T V 1972

Additional information on the spore-pollen picture of terrigenous lower Carboniferous deposits in the Volga-Ural district (In Vsesoyuznyi Nauchno-Issledovatel'skiy Geologorazvedochnyi Neftianoy Institut. Trudy 83 pp 143-150, 203, 241-242) G.S.C. Library Translation Series No 776.

Further titles will appear with the next Newsletter

9. NEW PUBLICATIONS

A.)MEDED.RIJKS GEOL. DIENST, VOL. 29, 1-71 (published 7.12.1977)
CARBONIFEROUS MIOSPORES OF WESTERN EUROPE: ILLUSTRATION AND ZONATION

Report of Commission Internationale de Microflore du Paleozoique working Group on Carboniferous Stratigraphical Palynology
G Clayton, R Coquel, J Doubinger, K J Gueinn, S Loboziak, B Owens & M Streel

This report which is the result of a collective study by members of the C.I.M.P. Working Group on Carboniferous Stratigraphical Palynology synthesises all the data that is available from the Carboniferous deposits of Western Europe in the formulation of a unified zonal scheme for these deposits. A scheme of 24 zones is proposed extending from the uppermost Devonian to the lowermost Permian, each illustrated with a selection of characteristic palynomorphs.

A limited number of copies are still available for purchase from Prof M Streel, Lab. de Paleontologie, Universite de Liege, 7 Place du Vingt Aout, B.4000 LIEGE, Belgium. Price 150 Belgian Francs or 4 U.S. Dollars.

B.) INSTYTUT GEOLOGICZNY PRACE. TOM LXXXI 1977
Revision des Megaspores a Corona du Carbonifere

Report of the C.I.M.P. Working Group on Megaspores by S Dybova-Jachowicz, J Karczewska, G Lachkar, S Loboziak, P Pierart & Z Zoldani.

C.) PROCEEDINGS IV COLLOQUIUM ON INDIAN MICROPALAEONTOLOGY & STRATIGRAPHY 1974-1975
Editors B S Venkatachala & V V Sastri

This recently published volume contains 43 papers including 14 on palaeobotanical and palynological subjects ranging from Gondwanan to Recent.

Copies of the Volume are obtainable from; The Librarian, Institute of Petroleum Exploration, O.N.G. Commission, Kaulagarh Road, Dehra Dun 248195 India. The cost is 18 U.S. Dollars and cheques should be drawn in favour of Finance & Accounts Officer, I.P.E., O.N.G.C., Dehra Dun.

D.) A Review of Gondwana Permian Palynology with particular reference to the North Karroo Basin, South Africa, by J M Anderson.
Memoir Botanical Survey of South Africa No 41, May 1977.

This new important work published in 1977 is profusely illustrated and represents a detailed compilation of Karroo palynological data which should prove of considerable interest to all Permo-Triassic palynologists. A further review will appear in the next newsletter.

Copies may be obtained from The Botanical Research Institute, Private Bag X101, Pretoria 0001, South Africa, for R 6.50 including postage.

E.) Distribution of Biostratigraphically Diagnostic Dinocysts and Miospores from the Northwestern European Continental Shelf and Adjacent Areas.
Compiled by B Thusu (Trondheim) with contributions by J Morbey (Watford), R J Davey (Leeds), L A Riley (Llandudno), G W Herngreen (Haarlem), S Duxbury (Sunbury on Thames), C Denison (Llandudno), M J Fisher (Glasgow), Y Caro (Talence) & R Harland (Leeds)

A limited number of copies of this interim report which documents the distribution of dinocysts and miospores from Triassic to Quaternary deposits on the Northwestern European Continental Shelf are still available. They may be obtained from Dr B Thusu, Institutt for Kontinentalsokk-elundersokelser, Hakon Magnussons gt 1B, Postboks 1883, 7001 TRONDHEIM, Norway. Cost of copies will be £5 or 10 U.S. Dollars (payable in advance). Cheques should be made payable to "Institutt for Kontinentalsokkelundersokelser"

A more complete and fully illustrated version of this work is currently being prepared for publication and should be available in 1979.