Commission Internationale de Microflore du Paleozoique

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1. Introduction

This last Newsletter for 1987 is the first under the new regime of Secretary Brugman. In wishing him a successful and productive term of office, I would also like to express the thanks of CIMP to Geoff Clayton who has guided us through the last four years. We are grateful for all the work he has done for us and hope we will be able to count on his continued support in the future.

It is some years now since CIMP mounted a serious recruitment campaign. The resurgance of interest in Palaeozoic palynology in the last few years has certainly seen an influx of new workers. Show them your newsletter and encourage them to join. They will benefit by being kept in touch with current palynological activities and we gain by being made aware of their research work and interests. One of our 1988 objectives will be to expand our membership to make CIMP fully representative of Palaeozoic palynology world-wide.

2. 1988 Subscriptions

We are pleased to announce that CIMP subscriptions will again stay at the rate set in 1976 - we must be unique in maintaining our annual subscription over 12 years. Subscriptions become due on January 1st and your payment should be made in the manner set out below. We are always glad to receive unpaid subscriptions from previous years.

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20th ANNUAL MEETING

THE AMERICAN ASSOCIATION OF STRATIGRAPHIC PALYNOLOGISTS INC.

OCTOBER 7-10, 1987

HALIFAX, NOVA SCOTIA, CANADA

SPORES FROM THE LOWER DEVONIAN HOLLAND QUARRY SHALE, NORTHWESTERN OHIO, U.S.A.

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The Holland Quarry Shale is a brown to black shale formerly exposed in a quarry located near Toledo, Lucas County, Ohio. The shale, completely removed by mining, occupied an approximately twenty-foot deep by fifty-foot wide channel eroded into the underlying Upper Silurian Raisin River Dolomite of the Bass Islands Group. The highly organic rich character of the shale; presence of eurypterid, fish, and terrestrial plant fossils; and local and regional stratigraphic relationships suggest deposition in a small stagnant-brackish channel or estuary. Eurypterid and fish fossils indicate a Late Gedinnian-Early Siegenian age for this unit.

Samples collected from slabs containing eurypterid and fish specimen types, housed in the Field Museum of Natural History (Chicago, Illinois) and the Orton Geological Museum of The Ohio State University (Columbus, Ohio), have yielded a well-preserved and taxonomically diverse spore assemblage. These spores are assigned to *Ambitisporites, Apiculiretusispora, Apiculatisporis, Convolutispora, Cymbosporites, Dibolisporites, Dictyotrileles, Emphanisporites*, cf. *Rhabdosporites, Stenozonotrileles, Tholisporites, Verrucosisporites*, and several new taxa. No marine palynomorphs were recovered. The spore assemblage contains species which range from the Late Gedinnian through Early Emsian.

A POTENTIAL MORPHOLOGIC LINEAGE FOR BILAYERED DESMOCHITINID CHITINOZOANS

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The informal category, bilayered desmochitinids, is characterized by a thin outer membrane that may separate from the vesicle to form a cavity or flange. Desmochitinids with this bilayered character appear during the Middle Ordovician, and range into the Middle Devonian. The oldest Ordovician forms have either discoidal or ovoidal vesicles, distinct collars, and the tendency for the outer membrane to form a cavity at the base or flanks. Two genera can be distinguished in these bilayered forms: (1) *Halochitina* Eisenack 1968 which has a discoidal vesicle, collar, cavity developed at the flanks but not base, and forms chains without attached subjacent opercula, and (2) an undescribed genus which is characterized by an ovoidal vesicle, collar, pronounced cavity developed between the base and aborally distended outer membrane, and forms chains with attached subjacent opercula. From the Middle to Late Ordovician, the outer membranes of both genera become closely apressed to the vesicle walls. The bilayered ovoidal forms become extinct in the Late Ordovician, and bilayered chitinozoans with vesicle shapes similar to that of *Halochitina* range into the Silurian. However, the Silurian species, which are included in *Pterochitina* Eisenack 1955, lack collars, have distinct flanges, and occur in chains without attached subjacent opercula. From the Early to Late Silurian, the flange position changes from equatorial to apertural, and may form a pseudocollar in the latest Silurian and earliest Devonian.

The proposed morphologic lineage is based on the contraction of the outer membrane against the vesicle wall during the Ordovician, and formation of flanges which migrate toward the aperture during the Silurian. Bilayered desmochitinids and other *Desmochitina* species in the Ordovician can have discoidal to ovoidal vesicles, many with pronounced collars; whereas, in the Silurian bilayered species and most other *Desmochitina* species are discoidal and lack distinct collars. This parallelism of vesicle shape and collar presence between bilayered and nonbilayered desmochitinids indicates the possibility that the bilayered character arose independently more than once in the desmochitinids.

THE EFFECTS OF PALEOENVIRONMENTAL CONDITIONS ON THE OCCURRENCE OF PALYNOMORPHS IN THE LOWER GULL RIVER FORMATION (MIDDLE ORDOVICIAN) OF SOUTHWESTERN ONTARIO

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The Gull River Formation in southwestern Ontario is a sequence of limestones and dolomitic limestones which were deposited in a transgressing, tropical, empiric sea during the Middle Ordovician. Through investigation of a continuous core from Kent County, covering roughly the lower forty percent of the formation, fifteen different lithofacies were delimited representing deposition under various conditions between the shallow subtidal zone and the supratidal zone. Palynomorphs which were recovered from these sediments include twenty-seven species of acritarchs from thirteen genera, fifteen species of Chitinozoa belonging to four genera, and a variety of scolecodonts. For each lithofacies, paleoenvironmental conditions such as water energy, substrate type and length of subaerial exposure were reflected in the state of preservation, species distribution, diversity and relative abundances of acritarchs and Chitinozoa.

CHITINOZOA AND ACRITARCHS FROM THE LAS CRUCES LIMESTONE (OSAGEAN/MERAMECIAN)

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The Las Cruces Limestone crops out in the northern Franklin Mountains, El Paso County, Texas. It is of Osagean-Meramecian (Visean) age based upon the presence of a conodont fauna assigned to the *Gnathodus texanus - Taphrognathus* and the *Taphrognathus varians - Apatagnathus* zones. It consists of thin-bedded, black, sublithographic, fetid limestone. Carbonate microfacies analysis suggests that the unit was deposited as a proximal to distal carbonate turbidite in a starved basin.

Palynomorphs occur throughout the unit and include numerous but poorly-preserved sphaeromorph acritarchs, possible terrigenous spores, and chitinozoans. Chitinozoans assignable to the following genera are present: *Ancyrochitina, Angochitina, Conochitina, Cyathochitina, Eisenackitina, Rhabdochitina*, and *Siphonochitina*. It is possible that these fossils are autochthonous components of the sedimentary rock. However, their disparate stratigraphic range and the absence of ornamentation on most specimens indicates that the assemblage is an allochthonous one, reworked from older strata.

SPORES OF A LYCOPOD CONE FROM THE UPPER DEVONIAN BLACK SHALE OF CLEVELAND, OHIO, U.S.A.

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Many outcrops of the Upper Devonian Black Shale of Cleveland, Ohio, have exposed various kinds of plants preserved as compressions and permineralizations. Most of them are lycopod axes and a few are fertile strobili. Small and large pieces of *Callixylon* woods are also collected.

The Lepidodendroid cone was collected in 1968 from the intersection of Interstate-71 and West 130th Street passing through Cleveland. It is a compression longitudinally split in part and counterpart, tolerably preserved. It shows a central axis with strap-shaped sporophyll/sporangium complexes arranged in a close helix. The elongate sporangia are compressed on the sporophylls on their adaxial surfaces all along their lengths.

The dimensions of the cone, 11.7 cm long and 4.5 cm broad, suggest that it belonged to a large size lycopod of arborescent habit. A few sporophyll/sporangia units have been macerated with routine techniques to separate the spores. A few pieces of shale from around the cone are also macerated for their spore content. Attempts are made to identify the spores from the cone and those from the surrounding shale.

MEGASPORES AND SMALL SPORES, PROBABLY ALLIED TO *LEPIDODENDROPSIS*, FROM THE LOWER CARBONIFEROUS OF VIRGINIA, U.S.A.

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Macerations of macroplant-bearing sediments and coals of the Lower Carboniferous (Visean) Price Formation in southwestern Virginia have not yielded palynomorphs except for one locality near Pulaski, Virginia. A gray to white shale adjacent to a coal seam and containing lycophytic stems, leaves and isolated sporophylls has produced megaspores and small spores. The stems are identified as *Lepidodendropsis* Lutz and the leaves and sporophylls probably belong to the same plants. Abundant, very coalified megaspores and one type of small spore were obtained and studied under the light microscope, the Scanning Electron Microscope and the Transmission Electron Microscope. It is hypothesized that they were produced by the *Lepidodendropsis* plants. The megaspores are 600-800 μm in diameter (exclusively of ornament), trilete, lageniculate, circular to subcircular in outline, with a hemispherical distal surface and pryamidal proximal surface. Gula and contact areas are ornamented with small coni or spines and the distal hemisphere is covered with spines up to 60 μm long which fork 1-3 times. To date, the wall appears homogeneous to laminated, but preservation is not good. The microspores, often found caught among the megaspore spines, are trilete, 35-45 μm in diameter, smooth proximally and echinate to connate distally.

The megaspores differ from most previously described taxa, being most comparable to *Lagenicula multiapicalis*, described by Hills, *et al.*, 1984, from Tournaisian (Tn1a) sediments of the Yukon Territory, Canada. Neither spore type alters current ideas of the dating of the Price Formation, but both are of considerable interest in suggesting that *Lepidodendropsis* is heterosporous, producing lageniculate megaspores and trilete microspores.

PALYNOMORPHS FROM THE UPPER DEVONIAN CLEVELAND FORMATION OF OHIO

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Spore and acritarch assemblages were recovered from the upper Devonian Formation in the vicinity of Cleveland, Ohio. Shale samples were taken in vertical profiles to determine the correlation between the paleoenvironment and changes in spore and phytoplankton assemblages.

Although the preservation of the spore flora is not especially good in every sampled shale layer, 80 spore taxa were recorded. The most common were Laevigati (e.g., *Punctatisporites debilis, P. labiagrandus*), with *Verrucosisporites* and *Retusotrileles* species also frequent. Certain of the recorded spore flora may be endemic.

Of the 22 acritarch taxa recorded, the most abundant forms are: *Micrhystridium, Gorgonisphaeridium* and *Veryhachium* species. A high proportion of *Tasmanites* appeared in the marine black bituminous shale deposits.

The abundant occurrence of *Retispora lepidophyta* (20-30%) in the samples from the upper portion of the Cleveland Shale correlates it with the European upper Famennian. A comparison of the Famennian taxa from North America, Europe and other parts of the world is in progress.

CAMBRIAN ACRITARCHS FROM THE GRAND BANKS, OFFSHORE EASTERN CANADA

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Late Cambrian acritarchs were recovered from sidewall cores in the Amoco-Imperial-Skelly Phalarope P-62 well, Grand Banks, offshore Newfoundland, Canada. The interval, now interpreted to be Late Cambrian, was previously considered to be Early Ordovician to early Middle Ordovician in age. These Lower Paleozoic sediments are unconformably overlain by Devonian strata.

The Late Cambrian acritarchs from the Phalarope well are the first evidence for the presence of rocks of that age in the Grand Banks area. They are correlative with acritarchs from the upper part of the Elliot Cove Formation on Random Island, eastern Newfoundland. This correlation is based on *Acanthodiacrodium* spp., *Arbusculidium rommelaerei* Martin 1981, *Cristallinium randomense* Martin 1981, *Cymatiogalea bouvardi* Martin 1973, *Impluviculus* spp., *Timofeevia phosphoritica* Vanguestaine 1978, *Trunculumarium* sp., *Veryhachium dumontii* Vanguestaine 1973 and *Vulcanisphaera* spp. The acritarch correlation suggests the Upper Cambrian interval in the Phalarope well can be assigned to the *Parabolina spinulosa* through *Acerocare* trilobite zones.

The acritarchs in the Upper Cambrian succession are uniformly light yellow in color except for a short interval containing anomalously dark specimens. The anomalous dark brown to black acritarchs are interpreted to reflect the presence of localized igneous intrusives.

THE ESSENTIAL ROLE OF PALYNOLOGY FOR BEDROCK MAPPING IN HUDSON STRAIT, N.W.T.

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Hudson Strait, which connects Hudson Bay to the Labrador Sea, is underlain by argillaceous carbonate rocks similar to Lower Paleozoic strata exposed on nearby Southampton Island. Mapping the distribution of bedrock in the strait initially was based on geophysical methods. The first *in situ* rock samples were recovered by two coring devices, the BIO and NORDCO underwater drills, during CSS Hudson Cruise during the fall of 1985.

Small samples from the 2.5 cm cores were insufficient for detailed conodont biostratigraphy. An undifferentiated Middle to Late Ordovician age was interpreted for 2 of the 6 stations examined for conodonts. Uncompressed and thermally unaltered acritarchs and chitinozoans were recovered from cores at 7 of the 12 stations examined. Fragments of graptolite periderm, melanosclerites and scolecodonts also occur. Diagnostic palynomorphs include: the acritarchs *Baltisphaeridium, Excultibrachium, Peteinosphaeridium, Polyancistrodorus*, and *Rhopaliophora;* and the chitinozoans *Desmochitina* sp. cf. *D. lata, D. minor, D. rugosa, Conochitina micracantha*, and *Tanuchitina* sp. These microfossils indicate an Ordovician age for all the samples. Specifically, the presence of *Hercochitina* suggests a Late Ordovician (Caradoc to Ashgill) age.

Palynomorph assemblages from the tan limestones differ slightly from those of the grey limestones. This observed relationship of the assemblages to the lithology may reflect environmental or age control. The presence of *Hercochitina* in the Hudson Strait samples indicates affinities with Late Ordovician assemblages from the U.S. Midcontinent and eastern North America.

11TH INTERNATIONAL CONGRESS OF CARBONIFEROUS STRATIGRAPHY AND GEOLOGY

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MIOSPORE CORRELATION OF THE CARBONIFEROUS OF EUROPE AND CHINA

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Carboniferous miospore zonations have been independently established in several regions of the world. Despite differences in the number of zones recognized and the index species designated, correlation is possible at numerous stratigraphic levels between the British Isles, Poland, the Donetz Basin (USSR) and the Gansu Province of China.

The top of the range of *Retispora lepidophyta* conveniently marks the base of the Carboniferous in the above regions. Reasonably precise correlation is possible through the Tournaisian and Visean, though independent substantiation of the miospore correlations is limited. Little information is available for the Namurian, but Westphalian miospore successions have been described in detail from all areas discussed, permitting adequate correlation. Insufficient data are available for any comparison of Stephanian palynofloras to be attempted.

The similarity of the palynofloras from the British Isles, Poland, the Donetz Basin and Gansu supports the current palaeomagnetic evidence which locates these regions at comparable Carboniferous palaeolatitudes. In the case of Central China, the miospore evidence indicates links with Europe rather than Australia.

PALYNOLOGY AND BIOSTRATIGRAPHY OF NAMURIAN A IN JINGYUAN OF GANSU

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The spores and pollen grains described in this paper are discovered from the Tsingyuan and Hongtuwa Formations in Jingyuan of Gansu. Four spore-pollen assemblages may be recognized in this area. The *Triparlites trilinguis-Simozontriletes arcuatus* Assemblage occurs in the lower part of the Tsingyuan Formation. The *Simozonotriletes verrucus-Stenozonotriletes rotundus* (or *Simozonotriletes sinensis-Stenozonotriletes rotundus*) Assemblage occurs in the upper part of the Tsingyuan Formation associated with ammonoid *Eumorphoceras bisulcatum* aff. *varicatum*, conodonts *Gnathodus bilineatus*, *Paragnathodus commutatus*, *R. nodosus*, and fossil plants *Linopteris*, *Neuropteris*, *Eleutherophyllum*. The *Densosporites sphaerotriangularis-Dictyotriletes bireticulatus* Assemblage occurs in the lower part of the Hongtuwa Formation associated with conodonts *Declinognathodus noduliferus*, *D. lateralis*, *Neognathodus bassleris*. The above assemblages can be roughly correlated with those of Namurian A in western Europe and North America. The author thinks that the middle assemblage may be compared with the *Stenozonotriletes triangulus-Rotaspora knoxi* Assemblage which occurs in association with the goniatite E_2 in western Europe. Based on the spore-pollen assemblages, ammonoids and conodonts, this paper also discussed the goniatite zone E_2-H boundary which roughly coincides with the base of the *Densosporites sphaerotriangularis-Dictyotriletes bireticulatus* Assemblage, the age of the strata bearing fossil plants *Linopteris*, *Neuropteris* and *Eleutherophyllum* and the subdivision of Namurian A in this area.

PALYNOMORPH ASSEMBLAGE ASSOCIATED WITH THE WELLINGTON (PERMIAN-ARTINSKIAN) INSECT BEDS OF OKLAHOMA AND KANSAS, USA

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The Wellington (Permian-Artinskian) insect fauna of Kansas and Oklahoma is one of the richest known and occurs in close association with an abundant and well preserved palynological flora. The deposits are of Lower Permian (Artinskian) age and more than 500 feet thick. They consist of lithologies ranging from marine or brackish basal shales containing *Lingula* brachiopods upward to freshwater shales that are dark grey to black, a forest layer of upright stumps with an overlying calcareous deposit presumably of freshwater origin. It is in the last where most of the insect fossils have been collected. Pollen and spores occur abundantly in the dark grey shales immediately below and consist mainly of monosaccate bisaccate and non-saccate gymnosperm pollen. The common genera are *Alisporites*, *Hamiapollenites*, *Leuckisporites*, *Platysaccus* and *Vittatina*. The fern spore *Schizaeoisporites* and others occur less abundantly. There are several new taxa to be described in the assemblage. *Hamiapollenites* and *Vittatina* here reach their maximum abundance in the observed Permian beds of North America. The Wellington deposits record an interim of warm humid climate between the more common arid Permian conditions. In this respect they present a different ecological association.

LATE CARBONIFEROUS AND EARLY PERMIAN SPORE POLLEN ASSEMBLAGE FROM THE CENTRAL JUNGAR COALFIELD, NEI MONGOL

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The materials dealt with in the present paper are obtained from the borehole of the Taiyuan and Shanxi Formations in the middle part of Jungar Coalfield, Nei Mongol. Abundant spores and pollen have been found, amounting to 47 genera in all. According to their characters, they may be divided into two spore-pollen assemblages as follows:

1. *Densosporites-Crassispora-Laevigatosporites* Assemblage (corresponding to the assemblage of the Taiyuan Formation): In the assemblage, pteridophytic spores amount to 87.75—89.3% of the total number, gymnospermous pollen to 10.68—12.24%, and Zonales to 4.4%. *Densosporites*, *Crassispora* and *Lycospora* are common, *Hymenozotriletes* and *Reinschospora* are rare. Azonotriletes mainly consist of *Leiotriletes*, *Punctatisporites* and *Cyclogranisporites*. The genus *Laevigatosporites* dominates the whole Monoletes, occupying 80—89%, with a handful of *Punctatosporites*, *Striatosporites* and *Perocanoidospora*. There is relatively abundant *Florinites*, occupying 6.7—11% of the total number, with some *Limitisporites* and *Vesicaspora*. *Tetraporina* is common. The assemblage may be correlated with those in the Late Carboniferous of Western Europe and, particularly, with those of the equivalent beds in the Zhuozishan area of Ordos Basin, Nei Mongol and northern Shandong.

In addition, the coal seam No.6 intercalated in the Taiyuan Formation is 28.89 m thickness, which has been regarded as the base of Shanxi Formation based on coal measures analysis (Chen Zhonghua, 1984) and fossil plants, but through the palynological analysis, it is suitable to be referred to the Taiyuan Formation.

2. *Laevigatosporites-Gulisporites* Assemblage (corresponding to the assemblage of the Shanxi Formation): In the assemblage, pteridophytic spores amount averagely to 54.32% of the total number, gymnospermous pollen to 5.67%. *Crassispora*, *Reinschospora* and *Hymenozonotriletes* are unseen. The genus *Florinites* still plays an important role, occupying 4.6% of the total number. The assemblage is similar in composition to that of the Taiyuan Formation, but it differs from the latter in the increase of *Gulisporites* and *Laevigatosporites*, which may be compared with the contemporaneous floras of some regions of China, such as Ninwu Basin in Shanxi Province, belonging to Early Permian in age.

SPORE-POLLEN ASSEMBLAGES FROM THE UPPER PALEOZOIC OF NORTHERN SHANDONG

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The Upper Paleozoic deposits in northern Shandong may be divided in ascending order into four formations; the Penchi, the Taiyuan, the Shanxi and the Shihhotse Formations. The palynological characteristics of these formations can be briefly summarized as follows. The Penchi Formation is disconformably underlain by the Middle Ordovician deposits. It is characterized by the presence of *Densosporites mirus* with a few *Tetraporina* and *Endosporites zonalis*. The Taiyuan Formation is disconformably underlain by the Penchi Formation. It contains abundant spores and varied Zonales, namely, *Densosporites mirus*, *D. amulatus*, *D.* cf. *triangularis*, *Lycospora pusila*, *Hymenozonotrilets*, *Reinschospora* with *Kaipingispora ornatus*, *Crassispora*, *C. orientalis* and *Peroconoidospora clatratus*. Based on the presence of a number of Zonales and fusulinids, the Penchi and Taiyuan Formations belong to Late Carboniferous.

The Shanxi Formation is predominated by having *Lacrigatosporites* together with some *Florinites*, *Peroconoidospora* and Zonales. Its age is probably early Early Permian.

The lower member of the Shihhotse Formation is characterized by the presence of quite a number of *Gulisporites* and *Florinites*, and the occurrence of important elements of *Striolatospora rarifasciatus*, *S. multifasciatus*, *Gulisporites cochlearius*, *G. crassus* and *Corisaccites quadratiodes*. *Corisaccites* was found in the late Early Permian of Hequ district, NW Shanxi. Its age belongs to late Early Permian.

On the basis of the characteristic of the microflora, the upper member of the Shihhotse Formation, which is unconformably overlain by the Mesozoic strata, may be subdivided into two parts. The lower part is marked by the predominance of *Torispora*, the presence of considerable number of *Triquitrites* and *Punctatisporites*, and the occurrence of important elements of *Torispora gigantea*, *Anticapipollis*. The upper part is characterized by the abundance of disaccate pollen, such as *Vesicaspora*, *Limitisporites*, *Vitreisporites*, *Pityosporites*, *Pinuspollenites* and Striatiti, and the occurrence of important elements of *Nuskoisporites dulhuntyi*, *Patellisporites meishanensis*, *Tuberculatosporites medius* and *Vesicaspora fusiformis*. The palynological assemblage of the upper member of the Shihhotse Formation as a whole is similar to that of the Upper Permian *Gigantopteris*-bearing Lungtan Formation of Changxing, Zhejiang and the Upper Permian Shihhotse Formation of Baode, Shanxi, but contains much more disaccate pollen. However, the content of the disaccate pollen is not so high as that of the late Upper Permian Sunjiagou Formation of Lishi, Shanxi. Therefore, its geological age belongs to early or early to middle Late Permian.

MEGASPORES FROM THE YANGHUKOU FORMATION IN THE WESTERN ORDOS BASIN AND ITS STRATIGRAPHICAL SIGNIFICANCE

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The megaspores have been found from the Yanhukou Formation in a bore-hole situated on the southeast of Shizuishan, Ningxia.

Fifteen species referred to eight genera are described, including six new species, *Pseudovalvisisporites suorensis*, *Zonalesporites* cf. *brasserti*, *Zonalesporites radiatus*, *Verrutriletes* sp., *Bothriotriletes magnus* (sp. nov.), *B. irregatus* (sp. nov.), *Sublagenicula* cf. *nuda*, *Sublagenicula* sp., *Cystosporites varius*, *Schopfipollenites ellipoides*, *Aneuletes indistictus* (sp. nov.), *A stenozonatus* (sp. nov.), *A. oviformis* (sp. nov.), *A cavatus* (sp. nov.) and *Aneuletes* sp.

Comparison is made with megaspore assemblages from northern France, Turkey and elsewhere in the world. The megaspore assemblage of Yanghukou Formation may be assigned to the Upper Carboniferous, possibly the Westphalia in age.

CARBONIFEROUS AND PERMIAN PALYNOLOGICAL ASSEMBLAGES IN JUNGGAR BASIN, XINJIANG

Wang Zhi and Zhan Jiazheng
(Institute of Exploration and Development, Xinjiang Petroleum Administration, China)

Based on the palynological data obtained from several decades of outcrops and boreholes of Carboniferous and Permian in Junggar Basin, the present paper is to report the assemblage succession. Nine assemblages have recognized, in ascending order they are, Assemblage I (C_1) overwhelmingly dominated by pteridophytic spores, *e.g.* "*Endosporites*", *Lophozonotriletes* and *Retusotriletes*, etc.; Assemblage II (C_2^1) characterized by the continual or abundant presence of "*Endosporites*" and the appearance of some elements of disaccate Striatiti, including *Striatolebachiites* and *Protohaploxypinus*, etc.; Assemblages III (C_2^2), IV (C_3), V (P_1), VI (P_2^{1-1}) and VII (P_2^{1-2}) all characterized by abundant gymnospermous (including pteridospermous) pollen and rare pteridophytic spores, the former including *Striatoabieites*, *Protohaploxypinus*, *Hamiapollenites*, *Vittatina and Corduitina*, etc.; but the delineation of these assemblages at specific level awaits for further research. Assemblage VIII(P_2^{2-1}) and IX (P_2^{1-3}) are characterized by the rather high content of *Lueckisporites*, *Alisporites* and *Klausipollenites* as well as some spores (*Kraeuselisporites* and *Nevesisporites*, etc.). Judging from the palynological data, the Junggar Basin might belong to the Subangara Floral Province in Meyen's sense during the late Middle Carboniferous to early Late Permian time.

PALYNOLOGY OF THE LOWER CARBONIFEROUS(VISEAN) OF THE SVERDRUP BASIN, CANADIAN ARCTIC ARCHIPELAGO, AND COMPARISON WITH ASSEMBLAGES IN NORTHWESTERN AND EASTERN CANADA

Utting, J.
(Geological Survey of Canada, Calgary, Alberta, Canada)
Jachowicz, M. and Jachowicz, A.
(Department of Geology, University of Silesia, Sosnowiec, Poland)

Well preserved miospores occur in the Emma Fiord Formation in the southeastern margin of the Sverdrup Basin on Grinnell Peninsula, Devon Island. Stratigraphically significant species include *Colatisporites decorus*, *C. denticulatus*, *Crassispora aculeata*, *Diatomozonotriletesus*, *Knoxisporites stephanephorus*, *K. triradiatus*, *Lycospora pusilla*, *Murospora aurita*, *Perotrilites tessellatus*, *Schizospora campyloptera*, *S. rara*, *Tripartites variabilis* and *Waltzispora planiangulata*. Abundant genera are *Calamospora*, *Lycospora*, *Punctatisporites*, and in some samples, *Colatisporites* and the alga *Botryococcus*. The assemblages may be tentatively correlated with the *Perotrilites tessellatus-Schulzospora campyloptera* (TC) Zone of Western Europe which is of early Late Visean (early V3) age. The upper part of the formation, which contains *Triquitrites marginatus* and *Spelaeotriletes arenaceus*, may be slightly younger, possibly coeval with the *Raistrickia nigra-Triquitrites marginatus* (NM) Zone of middle Late Visean (V3) age. Comparison with the Soviet Union suggests a correlation of the Emma Fiord material with the middle to upper part of the Bobrikov beds (br3) of Bielorussia.

On Grinnell Peninsula, the Thermal Alteration Index of spores is low (T.A.I. 2-, on a 5 point scale), indicating a potential for liquid hydrocarbons. However, in the northeastern margin of the Sverdrup Basin, on Axel Heiberg Island and northern Ellesmere Island, where the type section is located, the thermal alteration is high (T.A.I. 4 to 5), and thus in some cases is beyond the preservation limit for dry gas. In this northeastern area the assemblages have many species in common with the Grinnell material, but precise comparisons are difficult because many specimens are too poorly preserved to be identified.

In northwestern Canada, assemblages similar to those in the Grinnell material occur in Upper Visean rocks of the Hart River Formation (Yukon Territory) and Mattson Formation (Southwest district of Mackenzie, Northwest Territories).

In eastern (Atlantic) Canada, Upper Visean assemblage from the Upper Windsor Group contain many species in common with the Emma Fiord material, but there are significant differences. The Windsor material is much less varied, and lacks some of the biostratigraphically significant species of the Sverdrup Basin, such as *Crassispora aculeata*, *Diatomozonotriletes suetosus*, *Murospora aurita* and *Waltzispora planiangulata*; in addition it is characterized by an abundance of specimens of *Crassispora trychera* and *Rugospora minuta*.

GONDWANA CORRELATIONS AND PHYTOGEOGRAPHIC IMPLICATIONS

Foster, C.B.
(Western Mining Corporation. Petroleum Division. 168 Greenhill Road. Parkside. 5063. Australia)

Palynofloras of the *Granulatisporites confluens* Oppel-Zone have been recognised in glacigene sediments in western and southern Australia. In the Canning Basin, Western Australia, the associated marine fauna of brachiopods, molluscs, gastropods, bryozoans and foraminiferids, is of Early Permian (Asselian?) age. Elsewhere in Gondwana, palynofloras from the Talchir and Bap Formations of India, Dwyka Formation of Tanzania, and the Ordonez Formation of South America are positively correlated with those of *G. confluens* Zone. Antarctic assemblages are as yet too poorly known, but some may also belong to this zone. In keeping with the Australian occurrences, the correlative Gondwanan palynofloras are also recovered from glacigene sequences. In broad terms, the correlation is not new, but hitherto, has relied on gross quantitative compositions of assemblages and not, as here, on an association of selected species, most of which seem derived from lycopods, cymnosperms and ferns.

Known assemblages of the *G. confluens* Zone are recovered from sequences which show some evidence of deposition in a saline environment; either spinose acritarchs or marine faunas occur at the above localities. It is therefore evident that rifting in Gondwana had commenced, consequently the land distribution of the presumed fern parent of *G. confluens* must have preceded initial rifting and marine transgression. *G. confluens*, therefore, might also be expected in Laurasian continents. It also suggests that migration took place during a period of climatic amelioration, and both faunal and palynofloral evidence support this.

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LATE DEVONIAN AND EARLY CARBONIFEROUS MIOSPORE ZONES OF CHINA AND THE BOUNDARY OF THE DEVONIAN-CARBONIFEROUS

Gao Lianda
(Institute of Geology. Chinese Academy of Geological Sciences)

Miospores are particularly abundant in the Late Devonian and Early Carboniferous deposits in South and Southwest China.

Substantial advances have been made in the study of palynological subdivision of the Late Devonian and Early Carboniferous in South and Southwest China.

The Late Devonian and Early Carboniferous of China may be correlated basically with those of West Europe, USSR and North America.

Based on palynological data, the Devonian-Carboniferous boundary, the palaeogeography and the distribution of microfloras are discussed.

COALFIELD, NOVA SCOTIA, CANADA

Kumaran, K.P.N.
(Department of Biological Sciences. University of Calabar. Nigeria)
Zodrow, Erwin L.
(Department of Geology. University College of Cape Breton. Sydney. Nova Scotia. Canada B1P 6L2)

The non-coal samples mainly the overshales obtained from various stratigraphic levels of Sydney Coalfield yielded a rich and well diversified microflora. A detailed taxonomic analysis including the botanical affinity of the dispersed small spore genera is given. The relationship of the spores if any with the known contemporaneous macrofossils has been discussed. The qualitative and quantitative compositional development of the palynological assemblages of the samples of *Lonchopteris* Zone and *Linopteris obliqua* Zone is treated. A palynological zonation based on the successive assemblage zones is proposed. The distribution and stratigraphical importance of some selected genera, *viz.*, *Lycospora*, *Densosporites*, *Schopfites*, *Schopfipollenites*, *Ahrensisporites*, *Crassispora*, *Cirratriradites*, *Savitrisporites*, *Vallatisporites*, *Auroraspora*, *Florinites*, *Murospora*, etc., have been discussed.

A systematic attempt has been made to compare the spore assemblages known from the coals with those of the shales. The complete microflora and the absolute time ranges of the component forms obtained from all the sedimentary types are used to discuss the Upper Carboniferous microfloral succession in Sydney Coalfield.

COMPARISON OF PALYNOLOGICAL SUBDIVISIONS OF THE POLISH COAL BASINS CARBONIFEROUS DEPOSITS WITH THOSE IN WESTERN AND EASTERN EUROPE

Kmiecik, Halina
(Instytut Geologiczny Oddział Gornoslaski ul. Bialego 1.41-200 Sosnowice. Poland)

Local palynostratigraphic schemes based on range and abundance of characteristic spores and spore assemblages have been established for the Upper Silesian, Lower Silesian and Lublin coal basin Carboniferous sequences. The schemes reveal distinct features due to diversity in microflora evolution caused by different paleoecological condition.

The miospore zonation of coal basin sequences has been also compared with stratigraphic data based on floristic and faunistic evidence.

Detailed comparison of stratigraphic distribution of miospores in the sequences permits the compilation of a common polynological zonation scheme. The zonation is based on range and abundance of diagnostic spores that form 14 miospore assemblage zones ranging in age from the Upper Visean to Stephanian.

The correlation of miospore assemblage zones and diagnostic spore ranges in the Carboniferous sequence in Poland with the palynostratigraphic zonation of the Carboniferous strata in western and eastern Europe permits detailed comparisons and inclusion of the polish palynostratigraphic zonation into the common palynostratigraphic scheme of the Carboniferous typical of the Euramerican paleofloristic province.

PERMO-CARBONIFEROUS SPORE-POLLEN ASSEMBLAGE IN XISHAN COALFIELD, TAIYUAN, SHANXI

Liao Keguang
(Institute of Geological Exploration. CCMRI. Ministry of Coal Industry. Xi'an. China)

Abundant and well-preserved spore-pollen fossils were obtained from cores and outcrop samples in Gu-Jiao, a mine area of Xishan Coalfield in Taiyuan of Shanxi. There are altogether 48 genera and 82 species, of which 2 species are newly found. They are divided into 4 spore-pollen assemblage zones.

Zone 1 (*Laevigatosporites* Assemblage): The lower assemblage zone of Taiyuan Formation

Zone 2 (*Gulisporites* Assemblage): The upper assemblage zone of Taiyuan Formation

Zone 3 (*Rediizonates soluris* Assemblage): The assemblage zone of Shansi Formation

Zone 4 (*Vesiculatisporites-Punctatisporites* Assemblage): The assemblage zone of Lower Shihhotse Formation

In the lower assemblage zone of Taiyuan Formation, species and genera are monotonous, *Laevigatosporites* is predominant, *Lycospora* ranks next. *Anapiculatisporites hispidus*, *Dictyotriletes bireticulatus*, *Florinites*, etc. are occasionally observed.

In the upper assemblage zone of Taiyuan Formation, the Permian Cathaysian microflora (*Gulisporites cochleatus*, *Perotrilites striatus*, etc.) predominates in the assemblage. Therefore, this assemblage is not similar to the preceding assemblage. On the contrary, it closely resembles the assemblage found in the overlying Permian formation.

Judging from the features of spore-pollen assemblages, it would be reasonable to draw the boundary between the Upper Carboniferous and the Lower Permian at the level between the lower and upper assemblage zones of the Taiyuan Formation.

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CARBONIFEROUS MICROFLORA, LISBURNE GROUP, SADLEROCHIT MOUNTAINS, ALASKA

Mamet, Bernard and de Batz, Renaud
(Departement de Geologie, Universite de Montreal, Montreal, P.Q. Canada H3C 3J7)

In the Sadlerochit Mountains, the Lisburne Group is composed of a 450 m succession of shallow-water carbonates. The base of the Alapah trangression is Late Visean (Chesterian Zone $16_{\alpha\beta}$) and the youngest age of the Wahoo Limestone is Bashkirian (Zone 21, Atokan). The Carboniferous Lisburne platform is without much relief. Subsidence is fairly rapid and is the controlling factor of the sedimentation. Shallow-water facies range from bryozoan-echinoderm meadows immediatly below wave action to birdseye-calcisphere lagoons. Semievaporitic spiculitic sebkah microdolomites contain evaporite levels. Tempestites are major disrupting factors as the sediments were continuously ripped during storms.

Although the carbonate sequence is deceptively "continuous", major paraconformities are present at the foraminiferal zonal breaks. In particular, the Mississippian Pennsylvanian boundary coincides with a sharp regressive erosional event.

The Late Visean microflora is reduced to scattered Stacheinae (mainly *Stachecoides*). The Early Namurian microflora is somewhat richer, with *Archaeolithophyllum*, *Cuneiphycus* and *Asphaltina*. Periods of regression are underlined by floods of *Palaeamicrocodium* wich perforate the skeletal grains. The basal Pennsylvanian is characterized by *Maslovi poridium*: scarce dasycladaceans occur for the first time. During Zone 21, *Donezelle* suddenly becomes extremely abundant and forms seven consistent levels of reworked algal bafflestones. There are overlain by levels of high energy *Osagia* oncolites.

The algal flora is typical of the Taimy-Alaska Realm. There is a progressive temperature increase starting from temperate cold at the base to warm at the top of the sequence.

CONODONTS AND SPORES FROM DEVONIAN-CARBONIFEROUS BOUNDARY BEDS IN POLAND

Matyja, Hanna and Turnau, Elzbieta
(Institute of Geological Sciences, Polish Academy of Sciences, Krakow, Poland 31-002)

Latest Devonian and Earliest Carboniferous conodonts and spores were found in the same section in the Gory Swietokrzyskie Mts. (Central Poland) and in western Pomerania (NW Poland). In the former area, in one borehole, spore assemblages of the *lepidophytanitidus* Zone (LN) were found just above beds which yielded conodonts of the upper *expansa* or lower to middle *praesulcata* Zones. 2.5 m above the LN Zone, an assemblage typical of the *vallatusincohatus* Zone (VI) was found.

The Latest Devonian and Earliest Carboniferous spore assemblages from western Pomerania differ in composition from those from the Gory Swietokrzyskie Mts. and western Europe but interregional correlations are possible. The assemblage of the LN Zone (upper part of the local *T. rarituberculata* Zone) is associated with conodonts of the *praesulcata* Zone, and in some boreholes with those of the middle subzone of this zone. The spore assemblages of the succeeding *C. major* Zone, lacking *R. lepidophyta* and *D. versabilis*, are associated at the base of the zone with conodonts of the *sulcata* Zone.

THE CARBONIFEROUS MEGASPORES IN CENTRAL AFRICA

Pierart, Pierre
(Mons University, Belgium)

The stratigraphical and geographical distribution of Palaeozoic megaspores has already been studied in African areas such as Egypt, Lybia, Tchad, Zaire and South Africa. The study of the megaspores from Central Africa of Lower Carboniferous sediments showed a great similarity with the Tchad. The common species are *Legenicula horridissimo*, *L. cuneigulata*, *L. armata* (= *Triletes rarispinosus* Dijkstra) (= *Triletes nikitini* Dijkstra), *L. urna*, *L. bulbata*, *L. bulbata* forma *spinulata*, *L. brasiliensis*, *Duosporites tchadiense*, *Sublagenicula brasiliensis* (= ? *Triletes perversus* Dijkstra) (= ? *Triletes dulcis* Dijkstra), *Singhisporites incertus*, *Setosisporites? pilosus*, *Lagenicula brachyspinosa*, *Heliotriletes insectiodes* (non *Trichodosporites*).

This assemblage from Central Africa confirms that it is very similar to that described by Dijkstra in Tchad.

EARLY CARBONIFEROUS SPORE-POLLEN ASSEMBLAGE FROM DISHUIQUAN PROFILE OF EASTERN JUNGGAR BASIN, XINJIANG

Wang Hui
(Lanzhou Institute of Geology, Academia Sinica)

In Eastern Junggar Basin of Xinjiang, the Dishuiquan Formation in the Shuangjingzi profile contains megafossil plants, such as *Lepidodendropsis* sp. (cf. *L. porvipulvinata*), *Sublepidodendron* sp., *Demetria asiatica*, *Rhoden* sp., *Lepidodendropsis concinna*. The miospore assemblage dealt with in this paper was obtained from three samples of the Dishuiquan Formation of the Dishuiquan profile in this area. Altogether 13 genera and 18 species (types) are described.

The characteristics of the spore assemblage are given as follows: 1. Pteridophytic spores have an absolute superiority in number (99.48%) and only two pollen grains (*Florinites*?) are found; 2. Among the pteridophytic spores, Zonales holds 95.49%, while Azonotriletes 3.99%; 3. The forms with higher frequence are, *Densosporites*, *Lycospora* and *Ceistatisporites*; 4. *Cymbosporites*, a typical Devonian relict genus has been found.

The present assemblage is quite different from the Middle and Upper Carboniferous spore-pollen assemblage of Ningxia (Wang Hui, 1984) and the Late Tournaisian spore assemblage of the Qianheishan Formation of Kansu (Gao Lianda, 1980), but somewhat similar to that of the Kaolishan Formation (Late Tournaisian—Early Visean) of Jurong in Jiangsu (Ouyang and Chen 1987). Spores of Lycopsida are the commonest both in the present assemblage and that of the Kaolishan Formation. Owing to the appearance of *Cymbosporites* and megafossil plants in the adjacent profile, the present assemblage may be referred to Early Carboniferous (Tournaisian).

In the present assemblage Lycopsida obviously plays an important role and a small number of Filices and Cordaitopsida appear as well. So the climate in Early Carboniferous was probably humid.

PALYNOLOGY OF UPPERMOST(?) CARBONIFEROUS, PERMIAN, AND LOWEST TRIASSIC ROCKS OF THE CANADIAN ARCTIC ARCHIPELAGO

Utting, John
(Institute of Sedimentary and Petroleum Geological Survey of Canada, Calgary, Alberta, Canada, T2L 2A7)

Sediments from the marginal shelf facies of the Sverdrup Basin of the Canadian Arctic Archipelago, yield well preserved palynomorphs of Latest(?) Carboniferous (Kasimovian? and Gzhelian?), Early Permian (Asselian, Sakmarian, Artinskian and Roadian), Late Permian (Wordian and Capitanian), and Earliest Triassic (Griesbachian) age. No Permian assemblages of Dzhulfian or Changhsingian age have yet been found, suggesting a significant hiatus between Permian and Triassic rocks.

Assemblage from the Uppermost(?) Carboniferous rocks contain abundant monosaccate pollen (*Potoniesporites*) along with striate disaccate pollen *Protohaploxypinus* and the occasional polyplicate pollen *Vittatina*. Permian assemblages contain a variety of palynomorphs, including pollen, spores, occasional scolecodonts, and acritarchs (*Micherystridium* and *Veryhachium*). Asselian and Sakmarian assemblages are dominated by the striate disaccate pollen *Protohaploxypinus* and by the polyplicate pollen *Vittatina* and *Weylandites*. Monosaccate pollen (*Cordaitina*) is rare. Occasional specimens of trilete spores include *Apiculatisporis*, *Calamospora*, *Cyclogranisporites*, *Leiotriletes*, *Lophotriletes*, *Punctatisporites* and *Raistrickia*. The Late Artinskian—Roadian assemblages are more varied and include the disaccate *Alisporites*, *Hamiapollenites*, *Pityosporites*, *Protohaploxypinus*, *Striatopodocarpites*, *Triadispora*, *Vitreisporites*, and the polyplicate *Vittatina* and *Weylandites*. Present also is the monosulcate genus *Marsupipollenites*. Occasional specimens of monosaccate pollen include *Cordaitina* spp. and *Florinites luberae*. The trilete spores occurring in the Asselian and Sakmarian persist into the Artinskian, but the Late Artinskian—Roadian assemblages also contain *Convolutispora*, *Densosporites*, *Diatomozonotriletes*, *Foveosporites*, *Kraeuselisporites*, *Neoraistrickia*, *Nevesisporite* and *Verrucosisporites*. The monolete genus *Specioso porites* occurs rarely. Many of the above mentioned genera continue into the Upper Permian, but quantitatively, disaccate pollen becomes less significant and there is a greater variety of trilete spore species.

In the deeper basinal facies most Upper Carboniferous and Permian assemblages are too highly carbonised (Thermal Alteration Index 4- to 4, on a five point scale) to permit reliable specific identification and age determination.

The Triassic (Griesbachian) assemblages from the non-marine Bjorne Formation contain striate disaccate pollen *Taeniaesporites noviundi*, *Protohaploxypinus* spp. and *Striatoabieites richteri*; non-striate disaccate pollen *Falcisporites zapfei* and *Klausipollenites staplinii*; colpate pollen *Gnetaceaepollenites steevesi*; trilete spores *Kraeuselisporites* sp., *Lundbladispora obsoleta*, and *Propri sporites poconkii*; and the cyst-like microfossil *Tympanicysta stosehiana*.

The Sverdrup Basin assemblages have many taxa in common with those of east Greenland, Svalbard, and the northeast European part of the Soviet Union, suggesting that these areas were part of the same floral province in Late Paleozoic and Early Triassic time.

CIMP at the XI International Congress of Carboniferous Stratigraphy and Geology : Beijing, China

Seven members of CIMP attended the Carboniferous Congress in Beijing in September 1987. Abstracts of the relevant papers presented at the full day symposium on Palaeozoic Palynology are included elsewhere in this Newsletter. It is ten years since contact was first established between Chinese palynologists and CIMP and since that time our newsletters have been sent to an ever-increasing number of Chinese members of CIMP.

During the Congress a special business meeting for all palynologists present was convened to review our existing cooperation and to assess the potential for more productive collaboration in the future. In our first ten years our contacts have been limited to exchanges of the outline details of activities and providing a method for individual palynologists to exchange publications. From the evidence presented to us at the Congress it is obvious that not only have our Chinese colleagues made considerable palynological advances in the last ten years but also that there is a positive role that cooperation with the palynologists of CIMP could play in integrating these developments into the broader framework of Palaeozoic stratigraphy.

The special meeting concluded that despite the still considerable difficulties which exist world-wide in obtaining sufficient financial resources to enable us to make exchange visits, the potential for developing joint projects involving smalal groups of palynologists investigating clearly defined palynological problems is something which could be not only initiated but at least in its initial phases successfully operated by correspondence. CIMP members who work in the Carboniferous know that this is realistic since we have already had such a scheme working in Europe and the USSR since 1975. The secret in the past has been to identify a small problem which offers the possibility of a successful result and then to build on that success.

It was suggested that an announcement should be made in the Newsletter to canvas support for a new joint Chinese-CIMP programme of cooperation. Initially we suggest limiting these proposals to the Devonian Carboniferous and Permian since these are the only intervals covered by the infrastructure of the present proposals. However, the CIMP organisation would be glad to act as a coordinator for the generation of similar working groups in other systems once we receive your initiatives.

The Beijing meeting concluded that a number of broad stratigraphical units should be identified and a CIMP coordinator with a Chinese counterpart nominated for each. Anyone interested in becoming involved in any of these working grups should contact the convenors and present the details of any proposals for joint study they would wish to initiate. As an example, the Namurian Working Group could make detailed comparisons of European/N. American/Soviet spore assemblages from sediments associated with particular marine horizons with similar deposits in China. Such a study would not only highlight different taxonomic concepts but in the end would generate results of considerable significance for palaeogeographical reconstructions.

It was envisaged that such groups would be successful with even a small number of collaborators. To be viable, however, they need your cooperation. If you are interested write to one of the convenors now. If a large number of people wish to be involved it would allow us to subdivide into smaller stratigraphic units. We would like to commence these studies as soon as possible.

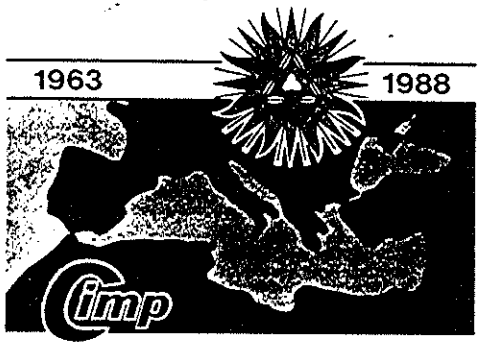
Suggested Working Groups and Convenors

Devonian	Dr W Riegel, Institut und Museum fur Geologie und Palaontologie, Goldschmidtstr. 3, 3400 Gottingen, W. Germany. Dr. Lu Lichang, Nanjing Institute of Geology & Palaeontology, Academia Sinica, Nanjing, China.
Dinantian	Dr G Clayton, Dept. of Geology, Trinity College, Dublin, Ireland. Dr. Gao Lianda, Institute of Geology, Chinese Academy of Geological Sciences, Beijing, China.
Namurian	Dr. Gao Lianda, Institute of Geology, Chinese Academy of Geological Sciences, Beijing, China. Dr. A. Jachowicz, Universytet Slaski, Wydzial Nauk O Ziemi, Ul Mielczarskiego 61, 41-200 Sosnowiec, Poland. Dr. B. Owens, British Geological Survey, Keyworth, Nottingham, NG12 5GG, England.
Westphalian-Permian	Dr. J. Utting, Institute of Sedimentary & Petroleum Geology, Geological Survey of Canada, Calgary, Alberta, Canada, T2L 2A7. Dr. A C Scott, Dept. of Geology, Royal Holloway & Bedford College, University of London, Egham, Surrey, TW20 OEX, England. Dr. S. Dybova-Jachowicz, Geological Instytut, Bialego 5, Sosnowiec, Poland.
Megaspores	Prof. P. Pierart, 22 Place du Parc, 7000 Mons, Belgium.

Bernard Owens

INTERNATIONAL SYMPOSIUM ON CIRCUM-MEDITERRANEAN PALYNOLOGY

ZEIST, THE NETHERLANDS, APRIL 19-23, 1988



COMMISSION INTERNATIONALE DE MICROFLORE DU PALÉOZOÏQUE

LABORATORY OF PALAEOBOTANY AND PALYNOLOGY UNIVERSITY OF UTRECHT

FIRST ANNOUNCEMENT AND CALL FOR PAPERS

INTERNATIONAL SYMPOSIUM ON CIRCUM-MEDITERRANEAN PALYNOLOGY

In 1988 the Commission Internationale de Microflore du Paleozoique (CIMP) will hold its biannual meeting at the University of Utrecht. Under the auspices of CIMP an international symposium on 'Circum-Mediterranean Palynology' is organised by the Laboratory of Palaeobotany and Palynology to commemorate its 25th anniversary.

Aims of the symposium

Founded as the world's oldest palynological organisation with its roots firmly established in Palaeozoic research, CIMP has gradually included the study of younger sediments within the range of its activities. The main thrust of these activities has always been aimed at constantly upgrading the knowledge of applied palynology on which earth sciences depend.

Throughout the circum-Mediterranean region, the important role of palynology in Palaeozoic, Mesozoic and Cainozoic research has now become fully appreciated. But also in other areas the Mediterranean palynological record is frequently of fundamental importance. The Mesozoic and Tertiary time-scales, for example, are largely defined on the basis of rock sequences in southern Europe so that accurate interpretation of palynological data from areas such as NW-Europe, the Middle East and North America highly depends on reliable Mediterranean information.

The symposium is aimed at the critical presentation and discussion of current advantages in Mediterranean palynology as well as the impact of its results on research elsewhere. Topics to be presented for a mixed audience of palynologists from universities, governmental institutions and industry cover the application of palynology in stratigraphy, palaeo-biogeography, palaeo-ecology, Palaeoclimatology, palaeogeography, palaeo-tectonics and hydrocarbon exploration.

Venue, Accommodation, Fees

The Symposium will be held in the Sports Centre of the Royal Dutch Football Association (KNVB), a modern complex located in the woods of Zeist at the edge of the nature reserve 'De Utrechtse Heuvelrug', approx. 10 km east of Utrecht.

Rooms are available for microscopy and demonstrations. If required, there will be facilities for round-table discussions or workshop meetings of specialist groups. Please contact the Symposium Secretariat.

Facilities of the KNVB sports Centre include accommodation in four separate buildings; there are rooms (with bathroom) for one to four persons. Restaurants provide a high-class cuisine (all Symposium dinners will be in the Centre). There is ample opportunity for a variety of field or indoor sporting activities.

Symposium fees are expected to be around Dfl. 135 per day, covering registration, accommodation in a double room, breakfast, lunch, dinner, coffee, tea and reception or party. There will be a surcharge for (limited) single room accommodation and a reduced rate for three/four bedrooms.

Pre-registration

Members and non-members of CIMP interested in attending the Symposium should contact the Symposium Secretariat immediately.

Call for papers and posters

Participants interested in presenting papers and/or posters should submit their title with the pre-registration form. Abstracts (300-400 words) must be received no later than December 31, 1987.

Further information from :

Secretariat,
Symposium on Circum-Mediterranean Palynology,
Laboratory of Palaeobotany and Palynology,
Heidelberglaan 2,
3584 CS Utrecht,
The Netherlands.

11. New Members

Dr Klaus H. Eiserhardt
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