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I. EDITORIAL

With this the second Newsletter of 1982 we include some of the abstracts of papers from the recent successful joint meeting held in Dublin with the AASP. More than 120 people attended this meeting and the thanks of all present were extended to Geoff Clayton and Ken Higgs. Not only did they ensure the smooth running of the scientific sessions, they also arranged two excellent post meeting excursions and a full social programme.

This year has seen further increases in the operating costs of CIMP mainly in the form of increased postal rates. In order to maintain our current subscription rates we had had to rationalise our Newsletters to two instead of three per year. Hopefully we are still managing to gather all relevant information together and you will probably notice that each issue is more substantial. Please remember this is your Newsletter: if you have any item of interest why not send it in and let others have the benefit of your experience.

In the last issue we asked for nominations for the post of CIMP Secretary General when this becomes vacant in 1983. I am pleased to report that several nominations were received and all were for the same person. Therefore I can announce that Geoff Clayton of Trinity College, Dublin will be taking over from me in 1983.

Finally can I remind you if you haven't already paid your 1982 subscription for CIMP we would be delighted to receive it as soon as possible.

II. Abstracts of Palaeozoic papers presented at the recent joint meeting of CIMP and AASP in Dublin entitled "Palynology at the North Atlantic Margins"

DEVONIAN ACRRITARCHS FROM BOLIVIA, SOUTH AMERICA
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Thirty-three cutting samples from a well in South America yielded a diverse and well-preserved organic-walled microphytoplankton assemblage. Thirty-eight species of acritarchs were encountered. Lithologically, the studied samples are siltstones, silty-shales, black-shales and limy-shales with brachiopods and trilobites. The age is considered to be late Silurian to Middle Devonian. The most abundant forms are Veryhachium, Exochoderma, Multiplicisphaeridium, Diexallophasis, Tasmanites, Muraticavia, and Onondagella. Several new species were also recovered.

The distribution of the organic-walled microphytoplankton suggests the presence of four biostratigraphic zones:

Zone One (Ludlovian) is distinguished by the presence of Veryhachium spp., Leiofusa estrecha, Ozotobrachion dactylos, Onondagella asymmetrica, Diexallophasis denticulata, Multiplicisphaeridium ramusculosu, Exochoderma sp.B, Hapsidopalla sannemannii, Tasmanites sommeri, Tasmanites spp., Pterospermella pernambucensis, and Quadrulobus? sp.

Zone Two (Gedinnian-Siegenian) contains the following species, in addition to the forms mentioned in Zone 1: Multiplicisphaeridium microcladum, Multiplicisphaeridium corallinum, Lusatia dendroidea, Pterospermella circumstriata, Gorgonisphaeridium sp. A, and Leiofusa cf. L. banderillae.

Zone Three (Emsian) is distinguished by the first appearance of Neoveveryhachium carminae, Eupoikilofusa striatifera, Lophosphaeridium deminutum, and Villasacapsula rosendae.

Zone Four (Couvinian-Givetian) is characterized by the disappearance of the following species: Multiplicisphaeridium corallinum, Pterospermella circumstriata, Villosacapsula rosendae, Quadrulobus? sp., and Lophosphaeridium deminutum.

LAGENICULATE MEGASPORES FROM THE LOWER CARBONIFEROUS OF NIGER AND THE SHABA
LOWER GONDWANA

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Lageniculate forms constitute an important part of the megaspore assemblages found in the Carboniferous basins of North and Central Africa (Egypt, Niger, Chad and Shaba). Comparative study of these sporomorphs has established the synonymy of Sublagenicula brasiliensis (Dijkstra) Dybova-Jachowicz et al., S. mutabilis (Dijkstra) Dybova-Jachowicz and S. dulcis (Dijkstra) Dybova-Jachowicz et al.

S. mutabilis was described by Dijkstra from Egypt, and subsequently from Chad by the same author, and also from Niger by Lachkar. S. dulcis was described by Dijkstra from Chad and by Lachkar from Niger.

The population of Sublagenicula brasiliensis described from Brazil and Shaba by Dijkstra and Pierart are variable in terms of their overall size, the size of their gula, and their ornament. Comparison with forms from Niger establishes their synonymy.

MIOSPORES AND ACRITARCHA FROM THE FORMATION D'HYDREQUENT (UPPER FRASNIAN TO
LOWER FAMENNIAN, BOULONNAIS, FRANCE)

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The "Formation d'Hydrequent" in the Boulonnais area of Northern France is shaly with intercalation of a few thin sandstone beds. The shales contain rich spore assemblages and also acritarcha. The latter allow a rather accurate correlation with the basal Famennian in the type region of Senzeilles in Belgium, where spores are scarce but conodonts and rhynchonellids are well known. A succession of several Upper Frasnian assemblages of spores is demonstrated.

BIOGEOGRAPHY OF UPPER DEVONIAN SPORES

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The distribution and composition of Devonian spore assemblages are consistent with other biogeographical and physical evidence indicating an extensive "North Atlantic" or "Old Red Sandstone" (ORS) continent in the Devonian Period. This landmass extended over a latitudinal spread of 40° astride the paleoequator and included Scandinavia, most of the British Isles, Greenland, and northeastern and arctic North America. It was the source of terrigenous sediments carrying the remains of land plants, including spores, into interior basins and into extensive marine coastal areas surrounding the landmass.

In the Late Devonian many (but not all) components of the floras of the ORS region were restricted to certain broad geographical regions on and around the landmass, probably by predominantly physiographic rather than latitudinal controls. Endemic species were most prominent in mid Frasnian through mid Famennian time. Concurrently however, other species attained nearly ubiquitous distribution throughout the ORS region, and thus provide evidence against the existence of Morel and Irving's Late Devonian "Atlantic two".

Some species, most notably in the early Frasnian and late Famennian-early Tournaisian, even reached Siberia, south China, medial South America, and Australia. Their world-wide distribution cannot reasonably be attributed to homeomorphy, but rather indicates connection or close proximity to the ORS landmass to Siberia and Gondwana in the Late Devonian.

INITIAL RESULTS OF PALYNOLOGICAL STUDIES ON THE LOWER PALAEOZOIC ROCKS OF THE SOUTHERN UPLANDS OF SCOTLAND

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The Southern Uplands, some 10,000 km² in area, is the southernmost region of Scotland. Over most of this area, rocks of late Ordovician to mid-Silurian age crop out, forming one of the largest outcrops of Lower Palaeozoic strata in the British Isles. Much of the Lower Palaeozoic sequence consists of turbiditic sandstones or siltstones and black graptolitic shales, with subordinate radiolarian cherts and basaltic pillow lavas. Graptolites are the only macrofossils to be recorded in any abundance from the region.

No systematic attempt to recover palynological assemblages from the Southern Uplands has been made until recently, but this work is now being undertaken. The aims are twofold, and are (i) to establish the biostratigraphy of acritarchs and chitinozoa in the area, particularly with reference to the graptolite zones, and (ii) to provide age determinations where other evidence is lacking.

At present, little data is available - a large number of samples have proved to be barren, and the preservation of those palynomorphs which have been recovered is generally poor. Nevertheless, acritarch assemblages have now been noted at several localities in the Southern Uplands including Dobb's Linn, Grieston Quarry, Pirn Quarry and Stobs Castle, at each of which there is some graptolite control. Chitinozoa are rarer than acritarchs in the Southern Uplands but have been noted at Dobb's Linn.

One encouraging aspect of the work carried out so far is that there do appear to be stratigraphically significant differences between acritarch assemblages recovered from different graptolite zones. However, there is as yet insufficient information to provide a definitive account of acritarch and chitinozoa biostratigraphy in the Southern Uplands.

COMPUTER RETRIEVAL OF PUBLISHED BIOSTRATIGRAPHIC DATA

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The Kremp Palynological Computer Research Project, a cooperative project supported by nine oil companies and the Geological Survey of Canada, has compiled information for computer retrieval from nearly 10,000 publications. Information compiled includes stratigraphic and geographic occurrences, and the taxonomic and nomenclatural treatment of palynomorph taxa. Approximately 60,000 taxa of spores, pollen, dinoflagellates, acritarchs, chitinozoans and fungal spores are included, representing most of the world's literature on these fossil groups. A series of bibliographies have been published listing the references by geologic age.

CAMBRIAN AND LOWER ORDOVICIAN ACRITARCHS FROM SARDINIA (ITALY)

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Acritarch associations are described from the (?) Lower, Middle and Upper Cambrian and Lower Ordovician of Sardinia. The Cambrian associations are of low diversity and are generally dominated by acritarchs which are small in size. These are succeeded by rich but peculiar associations of probable Tremadocian-Arenigian transition age.

THE DEFINITION AND DESCRIPTION OF TWO LATE CARBONIFEROUS SPORE-POLLEN ASSEMBLAGE-ZONES FROM AUSTRALIA

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During the Namurian, the Australian Continent moved rapidly southward into high latitudes. By the end of the Carboniferous this produced a significant cooling of climate resulting in a glacial period which affected most of the continent. Two broadly similar, diverse, palynomorph assemblage-zones are found in strata laid down immediately prior to the culmination of the typical Gondwanan glacial and fluvioglacial floristic realm. These assemblages contain the oldest spermatophyte pollen in the Australian record. The remainder of the assemblages consist of a variety of trilete spores, many of which are characteristic of the European Late Carboniferous, e.g. Auroraspora, Convolutispora, Cristatisporites, Reticulatisporites and Verrucosisporites. The assemblages lack the distinctive forms so ubiquitous throughout the latest Carboniferous and Permian of Gondwana, e.g. taeniatae disaccates and cheilocardioid spores.

The older of the two pre-glacial zones has so far been recognised only in the sedimentary basin of northwestern Australia. Its base is defined by the first appearance of the monosaccate pollen. The zone also contains as a consistent and usually common component, the nominate species Spelaetriletes ybertii and is believed to be Namurian in age. The younger zone is recognised in both eastern Australia and in northwestern Australia where it occurs in strata conformably overlying strata containing the S. ybertii Assemblage-zone. The younger zone is characterised by common monosaccates but a lack or extreme rarity of S. ybertii plus the rare although consistent occurrence of the nominate species Diatomozonotriletes birkheadensis sp. nov. It also differs from the older zone by a change in the type of mesosporoids as well as containing several new species of trilete spores. The zone is believed to be Westphalian to Stephanian in age.

Outside of Australia, the Paganzo Basin of Argentina is the only area in Gondwana where similar assemblages have been recognised.

THE AGE AND CORRELATION OF THE SENNI BEDS (LOWER BRECONIAN) BRECON BEACONS AND BLACK MOUNTAINS (SOUTH WALES)

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Miospores assemblages from Gwent, Powys and Shropshire are correlated and four miospore assemblage zones (palynozones) two of which are new, and three new sub-zones are recognized which can be partly correlated with the fish finds of White (1938, 1950, 1956). The MN Palynozone is divided into three subzones, lower, middle and upper MN respectively, which are confined to the Ditton and Red Marl Groups. The BZ Palynozone (Richardson, Streel, Hassan and Steemans, 1982), along

with two higher zones, are used to zone the Senni Beds in the Brecon Beacons and in the Black Mountains to the east. Both MN and BZ Zones are recognizable outside the Anglo-Welsh area, the former over a wide area: the bases of these two zones correspond almost exactly with the lower boundaries of the Dittonian (sensu White, 1950) and Breconian Stages respectively, where considerable changes in the spore flora take place. The beginning of each of these stages, therefore, is marked by a significant biological event. Recent fish evidence and comparisons with miospore sequences in Belgium necessitates some adjustments to the age of the Dittonian and Breconian in terms of the Ardenno-Rhenish Stages.

AN EARLY NORIAN PALYNOLOGICAL ASSEMBLAGE FROM AMMONOID-BEARING STRATA IN SVALBARD

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The traditional European concept of a Rhaetian, Rhaetic or Rhaeto-liassic palynological assemblage has suffered in the past from lack of precise correlation with the standard chronostratigraphic scale because of the complete lack of any records of palynomorphs from strata conclusively dated as Norian in age. Recent results from Arctic Canada (Fisher 1979) have shown that 'Rhaetic' taxa such as Chasmato-sporites, Kyrtomisporis, Limbosporites, Rhaetipollis, Ricciisporites, and Triancuraesporites occur in Middle Norian strata in Arctic Canada. This paper will show that an assemblage of similarly 'Rhaetic' aspect from Svalbard (at the north-western extremity of the European continent) is of the earliest Norian (Kerri Zone) age on the basis of associated ammonites and bivalves, and some implications of this will be discussed.

GEDINNIAN AND SIEGENIAN SPORE STRATIGRAPHY IN BELGIUM

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Four spore assemblage zones are defined in the Gedinnian and Siegenian of Belgium, two of which are new. A lineage zone is demonstrated in the Upper Gedinnian. These zones allow correlation between areas south and north of the Ardennes. They show some lithological correlations to be diachronous. They also allow correlation with British Isles and Brittany, which in turn permits correlation with Bohemia.

THE GOLDEN ANNIVERSARY OF CARBONIFEROUS PALYNOLOGY

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The impetus to the development of Carboniferous Palynology was the realization that the spore distribution in vertical seam profiles provided an accurate means for correlation of coals. Early workers distinguished spore types based on the shape and ornamentation of outlines observed in thin sections of coal, but in 1932 the first important paper appeared which described spore assemblages isolated from coals by chemical reagents. The author has selected for review these papers which have contributed most to the development of the science in the ensuing fifty years and concludes with an evaluation of our present state of knowledge and a discussion of those areas which require further research.

A REVIEW OF THE LOWER CARBONIFEROUS MIOSPORE SUCCESSION IN CANADA AND A COMPARISON WITH WESTERN EUROPE

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In Eastern Canada the Lower Carboniferous contains spore assemblages which are similar to those from Western Europe. Tournaisian assemblages from the upper part of the Horton Group of Nova Scotia contain species which are common to both localities. These include Auroraspora macra, Grandispora echinata, Raistrickia clavata, Retusotriletes incohatus, Schopfites claviger, Spelaotriletes pretiosus, Vallatisporites vallatus, Vallatisporites varrucosus, and Verrucosisporites nitidus. Spelaotriletes pretiosus is very abundant. Visean assemblages from the overlying Windsor Group are dominated by Convolutispora spp., Crassispora trychera, Punctatisporites spp., Retusotriletes incohatus, and Rugospora minuta. The lower part of group contains Knoxisporites stechoufferhorus and Lycospora noctuina var. noctuina, and the upper part Knoxisporites trinadiatus and Schopfipollenites cf. S. ellipsoides. At the boundary with the overlying Canso Group Grandispora spinosa, Lophimisporites magnificus and Schulzospora cf. S. elongata appear. The appearance of Potonisporites elegans in the lower part of the Canso Group suggests a Namurian age.

In Western Canada less is known about the Lower Carboniferous assemblages; they differ in certain respects from Western Europe, although some species are common to both localities. For example the Tournaisian Banff Formation contains Auroraspora macra, Cyrtospora cristifera, Densosporites spitsbergensis, Dibolisporites distinctus, Grandispora echinata, Knoxisporites literatus, Lophozotriletes parituberculatus, Retusotriletes incohatus, and Vallatisporites vallatus. In the younger Clausen Formation similar species occur and the stratigraphically important Tripartites incisotrilobus appears. Little is known about the lower and middle parts of the Visean. Reinschospora spp., Rotaspora fracta and Triquitrites spp. occur in the upper Visean Golata Formation and lower Mattson Formation, and species of Densosporites, Lycospora, Murospora and Punctatisporites are common, although significant quantitative variations take place with the formations. In the upper part of the Mattson Formation Grandispora spinosa and Schulzospora spp. appear. Costatascyluscrenatus and Florinites spp. appear in the uppermost part of the formation which is probably of Namurian age.

In the Arctic Islands palynological data concerning the Lower Carboniferous is sparse. The Emma Fiord Formation of Axel Heiberg Island, Ellesmere Island and Grinnell Peninsula, contains a Visean assemblage that is similar to those from Western Canada and is not unlike the Aurita Assemblage of Spitzbergen described by Playford, 1963.

AN ATTEMPT AT PALEOMAGNETIC VALIDATION OF PALYNOPHYTOGEOGRAPHIC RECONSTRUCTIONS OF EURAMERICA IN THE DEVONIAN AND CARBONIFEROUS

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Tournaisian to Namurian palynological assemblages from Euramerica show distinct compositional differences. An early paper dealt mainly with qualitative variation, whereas here the quantitative differences will be examined in more detail.

In the present study all the available quantitative data is evaluated statistically. The palynomorph distribution pattern, when integrated with the qualitative data, indicates the presence of several palynophytogeographical areas. This quantitatively based reconstruction of the Tournaisian-Namurian palynophytogeography forms the basis for further qualitatively based reconstructions of the Devonian palynophytogeography.

All the data available have been plotted on palaeomagnetic reconstructions of Euramerica, and for the Tournaisian-Visean suggest a climatic equator 10 degrees North of the palaeomagnetic equator. This discrepancy can be traced throughout the Devonian to Middle Carboniferous and might be explained by differences in origin of the

data. The world climate is influenced by variation in land-sea distribution in each hemisphere, whereas the palaeomagnetic data are related to physical properties of the Earth.

PALEO-ENVIRONMENTAL DIFFERENTIATION OF (SPORE) FLORAS DURING THE LATE DEVONIAN AND EARLY CARBONIFEROUS: SOUTHERN IRELAND - A CASE HISTORY

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During the late Devonian and Early Carboniferous the Munster Basin in southwestern Ireland was filled with fan, alluvial plain and marginal marine sediments under semi-arid conditions. Marked qualitative as well as quantitative differences exist between palynological assemblages of various (paleo) geographical units during the LM to LN Phases (Latest Devonian, Strunian). These differences are resumed in a set of Local Phases, the palynological expression of vegetational differentiation:

- (a) Diducites-Auroraspora torquata (DT) Local Phase, related to fan and proximal alluvial plain facies.
- (b) A derived Diducites (D) Local Phase, related to medial alluvial plain facies.
- (c) Diducites-Lophozotriletes curvatus (DC) Local Phase, which characterises distal alluvial plain facies.
- (d) Lophozotriletes curvatus-Raistrickia (CR) Local Phase, related to coastal plain facies.
- (e) Retispora lepidophyta-Vallatisporites (LV) Local Phase, characteristic for marginal marine facies.

The palynological evidence thus suggests the existence of a well diversified flora, which was however radically disrupted at the LN/LCr Phase transition (concurrent with entry of Protognathodus kuehni).

Subsequent assemblages (LCr-NH Phases) show a less well defined differentiation into 2, probably 3 local Phases. The most important of these, the Tumulispora-Cyrtospora cristifer (TCr) Local Phase, now characterises coastal plain and marginal marine facies. The relatively sudden appearance of Cyrtospora cristifer and Tumulispora spp. is thought to indicate a climatic warming, which is taken as the cause for the fall of the Late Devonian flora.

There appear to be marked differences in evolution before and after the LN/LCr transition. The re-establishment of the flora during the earliest Carboniferous was apparently accompanied by evolution of various plant groups.

It is not until the Spelaotriletes pretiosus-Vallatisporites vallatus (PV) Phase that a flora is founded with a structure similar to what existed in the Late Devonian.

A NEWLY DISCOVERED ACRITARCH SEQUENCE FROM THE MIDDLE CAMBRIAN TO TREMADOC CONTINENTAL MARGIN DEPOSITS OF THE DIGERMUL PENINSULA, FINNMARK, NORTHERN NORWAY

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The Digermul Peninsula is located on the northern coast of Finnmark, northernmost Norway (ca. 28° east and 70°30' north). Parautochthonous clastic sediments of Eocambrian to Tremadoc age are exposed between the overthrust metamorphic Caledonian nappes to the north-west and the Precambrian crystalline complex of the Fennoscandian basement to the south.

The Kistedal (Middle to Upper (?) Cambrian) and Berlogaissa (Tremadoc) Formations of the Digermul Group consist of approximately 1300 m of alternating grey-green t

black coloured shales, quartzites and sandstones, indicative of platform and shelf-margin depositional cycles. The geological structure is a south-eastward facing overturned syncline, whose axis is generally aligned parallel to the thrust direction of the Caldeonian Laksefjord Nappe to the north-west of the Digermul Peninsula. The incompetent members of the succession, especially the alternating shale-quartzite layers within the core of the syncline show a strong disharmonic almost isoclinal folding, whereas the scale of folding becomes more subdued within the thicker bedded quartzites and sandstones of the "K5" and uppermost Berlogaissa Formation.

Fifty percent of the hitherto investigated samples along this section yielded a moderately to well preserved acritarch association. The diversity of the material is restricted to several abundant species of Micrhystridium in the lowest Middle Cambrian (K1) and further up-section to an excellently preserved occurrence of hercomorphitic acritarchs probably of the genus Cymatiosphaera appearing some 20 m above the base of the "K2" (Middle Cambrian). Throughout the higher parts of the succession the flora increases in diversity, containing several larger acanthomorphic forms of predominantly multiplicisphaerid character. The genera Timofeevia, Cristallinium and Multiplicisphaeridium form the main part of the acritarch association during the Upper Cambrian (K4) up to the 150 m massive grey quartzite (K5), which is the topmost member of the Kistedal Formation.

After this major regressive phase the black shale-quartzite sedimentation of the lower Berlogaissa Formation starts with a dm-thick intraformational quartz-conglomerate. The sudden abundance of several well-developed species of the genus Acanthodiacrodium and Lophodiacrodium a few metres above this basic conglomerate indicates a Tremadoc age also for the lowest parts of the Berlogaissa Formation, already 70-130 m below the first appearance of Radiograptus and Rhabdinopora ("Dictyonema" flabelliforme).

According to the results of this preliminary investigation, which are based upon the apparent change of acritarch associations, the Cambrian-Ordovician boundary either is situated within the highest grey quartzite member of the Kistedal Formation (K5) or at the base of the Berlogaissa Formation.

III. ABSTRACTS OF PALYNOLOGICAL PAPERS PRESENTED AT THE SYMPOSIUM OF BRITISH MICROPALAEONTOLOGICAL SOCIETY HELD IN GLASGOW, SEPTEMBER 1982

CURRENT WORK ON LOWER PALAEOZOIC ACRITARCHS AND CHITINOZOA FROM THE SOUTH OF SCOTLAND

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The Institute of Geological Sciences is currently engaged in a number of projects which involve work in several areas of Lower Palaeozoic outcrop in Britain. One of these projects deals specifically with the Southern Uplands of Scotland and, as part of this work, a systematic and detailed investigation of acritarchs and chitinozoa in the late Ordovician and Silurian rocks of the south of Scotland is being undertaken. The aims of the palynological work are twofold, and are (i) to establish the biostratigraphy of acritarchs and chitinozoa in the area, particularly with reference to the graptolite zones, and (ii) to provide age determinations where other evidence is lacking.

At present, little data is available - a large number of samples have proved to be barren, and the preservation of those palynomorphs which have been recovered is generally poor. Nevertheless, acritarch assemblages have now been noted at several localities in the Southern Uplands including Dobb's Linn, Grieston Quarry, Pirn Quarry and Stobs Castle, at each of which there is some graptolite control, and also in the Linkin Beds of Linkin Kip for which the acritarchs indicate a probable Wenlock age. Chitinozoa are rarer than acritarchs in the Southern Uplands but have been noted at Dobb's Linn.

One encouraging aspect of the work carried out so far is that there do appear to be stratigraphically significant differences between acritarch assemblages recovered from different graptolite zones. However, there is at yet insufficient information to provide a definitive account of acritarch and chitinozoa biostratigraphy in the Southern Uplands.

In contrast to the low yields and poor preservation of palynomorphs in samples from the Southern Uplands, several samples from the Llandoverly sediments of the Pentland Hills have yielded diverse assemblages of abundant and well-preserved acritarchs and chitinozoa.

PROBLEMS CONNECTED WITH ACCURATE COMPARISON OF NORTHERN AMERICAN AND EUROPEAN NORMAPOLLES POLLEN ASSEMBLAGES

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Pollen grains referable to the Normapolles group are numerically important in Late Cretaceous and early Tertiary palynomorph assemblages from Western Europe and eastern North America. Morphologically comparable forms first appear almost simultaneously in Cenomanian strata on both sides of the Atlantic. There are specific differences, however, and these become rapidly magnified to generic level through the remainder of the Cretaceous and into the Palaeogene. Interporopollenites, Kruttschippollis, Oculopollis, Papillopollis and Vancampollenites are, for example, common in some assemblages within the Coniacian-Maastrichtian of Europe, but have yet to be recorded from the Cretaceous of North America. Separate development of the Normapolles palynofloras is clearly indicated from the Coniacian onwards.

While generic differences are recognisable, it is difficult to make detailed morphological comparisons between American and European Normapolles assemblages because there are numerous taxonomic and biostratigraphic problems which first needs to be resolved. In particular, many of the characters which have been used to define Normapolles taxa are of such minor significance that the identification of genus, let alone species, often poses a problem. In an attempt to eliminate some of these morphological difficulties, several genera, including Atlantopollis, Complexiopollis, Papillopollis and Vancampollenites, have been examined in detail by light, scanning and transmission electron microscopy. This has led to a refinement of morphological descriptions, the relegation of some species to synonyms, and the description of a few new forms. It is hoped that this approach to the taxonomy of the Normapolles will both facilitate the use of the group for biostratigraphic correlation within Europe and provide a more reliable basis for comparison of American and European Late Cretaceous and Palaeogene palynomorph assemblages.

IV. FUTURE MEETINGS

A) PALAEONTOLOGICAL ASSOCIATION 1982 ANNUAL CONFERENCE

University of Sheffield 12-15 December 1982

Amongst the 30 papers scheduled to be delivered which cover a wide range of palaeontological research, the following are directly concerned with Palaeozoic palynology.

1. Palaeozoic palynology in exploration geology

K. Dorning, Pallab Research, Sheffield

Analysis of the palynomorphs in rock samples from resource exploration areas provides results to a wide variety of geological problems. In addition to

biostratigraphy, where organic microfossils are of prime importance in palaeontological data input in exploration stratigraphy, palaeozoic palynomorphs are of value in many other aspects of geological interpretation.

2) Devonian miospores of the western Shetland volcanic groups

J.E. Marshall, Gearhart Geodata Services, Aberdeen

Middle Devonian miospores have been recovered from the previously undated volcanic groups found on the island of Papa Stour and in the Sandness Formation, Western Shetland. The significance of these ages is discussed in relation to plate tectonic models based on the geochemistry of these lavas with respect to those of the Midland Valley of Scotland.

The presence of Lower Old Red Sandstone deposits not found at outcrop is inferred by a reworked miospore assemblage from Papa Stour occurring with the in situ Mid-Devonian miospores.

3) Plant/animal inter-relationships in the Upper Carboniferous

A.C. Scott, Chelsea College, University of London and
T.N. Taylor, Ohio State University

The paper reviews and documents new evidence for plant/animal relationships in the Upper Carboniferous. Close interactions are seen from the study of fossil plants and animals preserved in a wide range of environments. The evidence is in the form of: (1) animal morphology (both of vertebrates and invertebrates) - The vertebrates are dominated by amphibians but a few reptiles are known and are mostly carnivores or insectivores. The invertebrate communities are dominated by arthropods, many of which are herbivores: Millipedes, Collembola and mites on the forest floor and in peats with insects dominating above ground environments. The diets of the animals have been studied using evidence from gut contents, coprolites, anatomy and comparisons to modern day representatives. (2) plant morphology - both in terms of positive stimulation, i.e. dispersal vectors or in terms of negative stimulation, i.e. protection against herbivory. The data includes; plant anatomy and morphology, evidence of herbivory in the form of eaten leaves, bored seeds and megaspores etc. Evidence is provided that the pteridosperm pollen Monoletes may have been animal dispersed. Data on animal/plant relationships in a single environment is provided from a study of coprolites from a permineralised peat (coal balls from the Pennsylvanian of Lewis Creek, Kentucky). Assemblages of coprolites, their shape and content suggest they are mainly from mites, Collembola and millipedes and that this association of soil arthropods important in modern day soils ecosystems were already dominating similar environments in the late Carboniferous. It is our thesis that there is abundant fossil evidence for plant/animal inter-relationships in the Upper Carboniferous and this should be taken into account when considering co-evolution.

Further details concerning registration, accommodation and the scientific programme can be obtained from Dr. M. Romano, Dept. of Geology, Beaumont Building, University of Sheffield, Brookhill, Sheffield S3 7HF (Telephone (0742) 7855 ext. 4477).

B) 2ND INTERNATIONAL PALEOBOTANICAL CONFERENCE, EDMONTON, ALBERTA, CANADA
August 18-24, 1984

The University of Alberta, Edmonton, Alberta, Canada will be the site of the 2nd International Paleobotanical Conference that is tentatively scheduled for August 18-24 1984. These meetings, which were so successful in Reading, England in 1978 will be conducted under the auspices of the International Organization of

Paleobotany, and will take place immediately before the sixth International Palynological Conference that is being planned for August 24-30, 1984 in Calgary, Canada. It is hoped that the scheduling of both meetings together will provide the opportunity for paleobotanists and palynologists to attend both conferences.

Plans at this stage call for approximately four days of field excursions that will depart from Calgary and then return to Edmonton for two days of contributed papers and poster sessions. An evening workshop on cladistics in paleobotany is tentatively being planned. The field excursion will include collecting at an Upper Cretaceous site, a visit to the Dinosaur National Park, collecting at a Paleocene locality famous for not only plant remains, but insects, fish and tetrapods as well, visit to the Columbia Ice Fields and the Jasper National Park and an additional Paleocene locality before returning to Edmonton.

The scientific program will include contributed papers and concurrent poster session. It is anticipated that travel will be provided for the participants to Calgary for the Palynological Conference. Accommodations will include both hotel and University of Alberta dormitory facilities.

Further information may be obtained from Dr Ruth A. Stockey, Department of Botany, The University of Alberta, Edmonton, Alberta, Canada, T6G 2E9. A second circular will be mailed early in 1983.

C) 27TH INTERNATIONAL GEOLOGICAL CONGRESS, MOSCOW, AUGUST 1984.

The first circular of this conference has recently been published and is available from the Organising Committee of the 27 IGC, Institute of the Lithosphere, 22 Staromonetny, Moscow 109180, USSR. Two of the Sections are of particular interest to IOP members:

C.01. Stratigraphy includes topics on the correlation of sediments belonging to different facies zones and biogeographical provinces, the Precambrian/Phanerozoic boundary, the Permian system and palynostratigraphy.

C.02. Palaeontology includes topics on early stages of organic life, palaeoecology and the evolution of ecological systems, florogenesis and continental history.

D) LATE CAINOZOIC PALAEOCLIMATES IN THE SOUTHERN HEMISPHERE

An International Symposium and workshop on Late Cainozoic Palaeoclimates in the Southern Hemisphere will be held in SWAZILAND (Southern Africa) from 28 August to 2 September 1983, including pre- and post symposium excursions. This Symposium will be held under the auspices of SASQUA, the affiliated Society of INQUA. Eminent International Scientists are giving keynote addresses. Enquiries:

Dr David Price-Williams
S.A.R.A.
Swaziland National Trust Commission
PO Box 100
Lobamba
SWAZILAND
Southern Africa.

E) TENTH INTERNATIONAL CONGRESS OF CARBONIFEROUS STRATIGRAPHY AND GEOLOGY, MADRID, SEPTEMBER 1983

If you have not already received a copy of the Second Circular for this meeting and wish to register, please write as soon as possible to: The Secretary General, X.I.C.C. Instituto Geologico y Minero de Espana, c/Rios Rosas 23, Madrid 3, Spain.

F) SIXTH INTERNATIONAL PALYNOLOGICAL CONFERENCE, CALGARY 1984

For the First Circular, please write to: Conference Co-ordinator, 6th International Palynological Conference, c/o Lois Kokoski, Conference Officer, Faculty of Continuing Education, Education Tower, Room 102, University of Calgary, Calgary, Alberta, Canada.

V. PALAEOZOIC PALYNOLOGY IN CHINA

Dr Gao Lianda of the Institute of Geology, Chinese Academy of Sciences, Beijing, China has recently supplied the following information for inclusion in the Newsletter.

1. THE SYMPOSIUM ON THE PALAEOZOIC AND MESOZOIC PALYNOLOGY IN CHINA

The Symposium on the Palaeozoic (from Devonian to Permian) and Mesozoic Palynology in China, sponsored by the Palynological Society of China, will be held in Xian, Shaanxi Province at the end of November or the beginning of December 1982 lasting for five full days. To be present at the Symposium are more than 100 Chinese palynologists from different institutions and organisations in many places of China, including the units for petroleum or coal exploration and for geological surveys, departments of geology and botany of universities, and research institutes.

At the Symposium, recent progress obtained in palynological studies are to be reviewed and the problems concerning the sequence and correlation of palynological assemblages, the evolution of spores and pollen, the stratigraphical boundaries, and the microfloral provinces are to be discussed. In addition, acritarchs, chitinozoans, and dinoflagellates will also be dealt with.

Dr Gao has also supplied an updated list of Chinese palynologists with research interests in Acritarchs. This list which will be included in a more comprehensive list being compiled for the first edition of the Newsletter of the Acritarcha Subcommittee is included here to bring your contacts with Chinese palynologists completely up to date.

Members of the Acritarch Commission

A.1. Chung Guofang
Yichang Research Institute of Geology and Mineral Resources,
Yichang City, Hubei Province, China.

2. Precambrian, Cambrian, Ordovician and Silurian

B.1. Gao Liana (Kao Lianda, Kao Lian-ta)
Institute of Geology, Chinese Academy of Geological Sciences
Beijing, China

2. Ordovician, Silurian and Devonian

C.1. Hu Yuanxu
Xian Research Institute of Geology and Mineral Resources
Xian City, Shaanxi Province, China.

2. Precambrian

D.1. Luo Qiling
Tianjin Research Institute of Geology and Mineral Resources
Tianjin City, China.

2. Precambrian.

3. Luo Qiling et al., 1981: New Data on the Microfossils in Xiamaling Formation of Qingbakou System of Jixian County. Bull. Tianjin Institute of Geology and Mineral Resources, Chinese Academy of Geological Sciences, No.3, pp. 123-136.
- E.1. Pun Changwen
Institute of Geology,
Geological Bureau of Xinjiang, Urumqi City, Xinjiang, China.
2. Precambrian
- F.1. Ouyang shu
Nanjing Institute of Geology and Palaeontology
Academia Sinica
2. Precambrian
- G.1. Wang fuxing
Chengdu Research Institute of Geology and Mineral Resources
Chendu City, Szechuan Province, China.
2. Precambrian
- H.3. Wang Fuxing and Luo Qiling, 1981: Filamentous Fossil Taeniatum and its Pseudo-analog es. Bull. Chengdu Institute of Geology and Mineral Resources, Chinese Academy of Geological Sciences. Series IX, Vol. 2, No. 1. pp.
- H.1. Wang Zhiqiang
Beijing Graduate School, Wuhan College of Geology, Beijing, China.
2. Precambrian
- I.1. Xing Yusheng (Xsing Yu-seng, Sing Wu-Shen)
Institute of Geology
Chinese Academy of Geological Sciences, Beijing, China
2. Precambrian, Cambrian, Ordovician and Silurian
3. Xing Yu-sheng and Liu Gui-zhi, 1980: Micropalaeoflora from the Sinian Suberathem of W. Hubei and its stratigraphic significance. Professional Papers of Stratigraphy and Palaeontology, No. 8, pp. 1-14.
- J.1. Yan Yongkui
Nanjing Research Institute of Geology and Mineral Resources,
Nanjing City, Jiangsu Province, China.
- K.1. Yang Sen
Shenyang Research Institute of Geology and Mineral Resources,
Shenyang City, Lioling Province, China.
2. Precambrian
- L.1. Yin Leiming
Nanjing Institute of Geology and Palaeontology
Academia Sinica, Nanjing City, Jiangsu Province, China.
2. Precambrian

VI. REPORTS OF OTHER MEETINGS

a) Brazilian Palaeobotanists and Palynologists

The 3rd (Brazilian) Meeting of Palaeobotanists and Palynologists was held December 10-12, 1981, at the Institute of Geosciences, University of Sao Paulo, in Sao Paulo, Brazil, sponsored by the IG-USP and the Associacao Latino-Americana de Paleobotanica e Palinologia (ALPP), and was attended by more than 60 professionals and students, including several foreign participants. Topics presented ranged from the stratigraphic use of Brazilian Precambrian stromatolites to an ecological study of territorial dominance in modern bees based on pollen evidence. Five papers on

paleobotany were delivered, of which four dealt with the Carboniferous-Permian of the eastern Parana basin; seven papers dealt with paleopalynology (2 on the Neo-Paleozoic, 2 on the Mesozoic, and 3 on the Cenozoic), and six papers treated modern pollen and its use. A round-table discussion was held on the origin and evolution of the angiosperms, concluding with the prospects for eventual Brazilian breakthroughs in this field. Finally, researchers interested in the Neo-Paleozoic phytostatigraphy of the Parana basin met to discuss the formation of a working group. Ten of the papers will be published in the IG-USP's Boletim, hopefully before October.

Of greatest interest to members of the AASP will be the palynological articles by Arguijo et al. and Gonzalez-Amicon & Volkhemier on the Argentinian Jurassic, Lima on the Brazilian mid-Cretaceous, Lima & Sundaram's review of Neo-Paleozoic palynology of Brazil, and Barth on modern Brazilian Rutaceae. These papers are in Portuguese or Spanish. For information on our next meeting (December, 1983) or to order this publication, contact Thomas R. Fairchild, IGUSP, C.P. 20899, Sao Paulo, SP, Brazil 01000.

b) REPORT ON BRITISH PALAEOBOTANY & PALYNOLOGY 1980-1981

The latest edition of this work is compiled by W.G. Chaloner & G.T. Creber, and was printed in May 1982. The 41 pages have the references arranged in the usual stratigraphic order. Send £2, negotiable at a London Bank, and payable to "Bedford College", to Botany Department, Bedford College, Regent's Park, London NW1.

VII. INTERNATIONAL BIBLIOGRAPHY OF PALAEOBOTANY AND PALYNOLOGY FOR 1982

The second edition of this bibliography will be compiled early in 1983 by Drs Pfefferkorn and Gillespie. If you have had any papers published during 1982 and wish to have them included in the 1982 list you are requested if you live outside North America to send the details directly to Dr B Owens, Institute of Geological Sciences, Ring Road Halton, Leeds LS15 8TQ, England.

Your references should be compiled using the following formats:

GLENDINING, John A. & WOOD, Gordon D. 1981. Thymadora, a new acritarch genus from the Middle Cambrian Rogersville Shale of Tennessee, U.S.A. Palynology, v. 5, p. 153-158; 3 figs., 1 pl.

LOBOZIAK, Stanislas & STREEL, Maurice. 1981. Miospores in middle-upper Frasnian to Famennian sediments partly dated by conodonts (Boulonnais, France). Review of Paleobotany and Palynology, v. 34, p. 49-56, 2 fig., 4 pl.

Your entries for inclusion in the next edition should be received by January 31st 1983.

If you live in North America and wish to submit details of 1982 papers you are requested to write directly to Dr Pfefferkorn.

VIII. PALAEODATA BANKS

Publications of PALYNOLOGICAL DATA available from Palynodata, 101 N. Avenida Carolina, Tucson, Arizona 85711, U.S.A. [Make cheques payable to PALYNOLOGICAL DATA and payable in U.S. Dollars.]

VOLUMEPRICE

Nos. 1 thru 6 - out of print

Implemented References, Palynological Literature:

No. 7 - 1977 - Part I, The positions and climatic changes of Pangaea and five Southeast Asian Plates during Permian and Triassic times; Part II, Pennsylvanian to Triassic, 129 pp, 8 figs.	\$13
No. 8 - 1977 - Lower Cretaceous, 66 pp	12
No. 9 - 1978 - Pliocene, 50 pp	11
No. 10 - 1978 - Devonian, 66 pp.	12
No. 11 - 1978 - Upper Cretaceous, 127pp	16
No. 12 - 1979 - Oligocene to Pliocene, 183 pp	21
No. 13 - 1980 - Jurassic, 118 pp	17
No. 14 - 1980 - Paleocene and Eocene, 190 pp	21
No. 15 - 1980 - Precambrian to Silurian, 101 pp.	16
No. 16 - 1981 - Carboniferous, 149 pp	20

Supplements, Precambrian to Tertiary Palynological Literature:

No. 17 - 1982 - First Supplement; On the continental drift of China, India, and Southeast Asian Plates, 113 pp, 24 figs, 10 tabs.	17
No. 18 - 1982 - Second Supplement; The Oldest traces of life and the advancing organization of the Earth (Part I: Archean and Cryptophytic), 128 pp, 22 figs, 4 tabs.	18

IX. LES CHAMPIGNONS FOSSILES

par Marcel V. Locquin

Vol. I. Recherches sur quelques organismes fongiques et d'affinités fongiques probables présents au Paléozoïque.

Vol. II. Nouvelles recherches sur les champignons fossiles; Macromycètes Mésozoïques; Paléosporologie.

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

Il contribue à la mise en évidence de la genèse coloniale des mégasphéroïdes précurseurs des cellules eucaryotes. Il explique le passage de ceux-ci aux cellules eucaryotes en trois étapes et par trois mécanismes: la métamérisation, l'aggrégation oncogène d'exosymbiotes, l'aggrégation oncogène d'endosymbiotes. Il prouve que les framboïdes pyriteux ont une origine organique cellulaire et que les microfossiles sont libres dans la roche qui les contient.

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

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

L'auteur fait une revision des thriotheces d'Ascomycetes fossiles dont il donne la classification des 38 genres fossiles commus depuis le Silurien, avec leur stratigraphie. Il etudie un synascomycete particulierement bien conserve de la tourbiere Devonienne de Rhynie.

Il etudie plusieurs Polypores silicifies de Lybie ainsei que le bol alimentaire fossile d'un grand Sauropode qui contient une douzaine de genres de Macromycetes encore actuels, dont le genre: Amanita.

Enconclusion il donne une synthese taxinomique des connaissances neomycologiques et paleomycologiques comparees, avec une classification des Sporaedispersae de champignons, permettant un traitement sur ordinateur pour l'aide a la determination par les formes.

BON DE COMMANDE:

Pour les Mycologues, Paleomycologues, Palynologues, Paleontologues, Paleobotanistes, Geologues

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II Les Champignons fossiles, Vol.11. tirage papier 21x29 du precedent, broche	Fr.205

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Remplir et reexpedier a:

ex: Marcel V. LOCQUIN, 54 Bd de la Liberation 94300 Vincennes, France.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in financial matters. The text suggests that organizations should implement robust systems to track and report on their operations, ensuring that all data is up-to-date and easily accessible.

2. The second part of the document addresses the need for regular communication and reporting. It highlights that stakeholders, including investors, regulators, and the public, have a right to know about the organization's performance and financial health. Regular updates and reports help build trust and confidence, while also allowing for timely identification and resolution of any issues or concerns.

3. The third part of the document focuses on the importance of ethical conduct and integrity. It stresses that organizations should adhere to high standards of ethics and integrity in all their dealings. This includes being honest, transparent, and fair in all transactions, and ensuring that all actions are in compliance with applicable laws and regulations. Ethical conduct is not only a moral imperative but also a key factor in long-term success and sustainability.

4. The fourth part of the document discusses the role of leadership in promoting a culture of transparency and accountability. It notes that leaders should set the example by being open and honest in their communication, and by encouraging others to do the same. Strong leadership is essential for creating an environment where employees feel comfortable reporting issues and where the organization's values are consistently upheld.

5. The fifth part of the document concludes by reiterating the importance of these principles and the need for ongoing commitment. It states that transparency and accountability are not one-time events but ongoing processes that require continuous effort and attention. Organizations should regularly review their practices and make improvements as needed to ensure they remain aligned with these core values.

6. The sixth part of the document provides a summary of the key points discussed. It emphasizes that transparency and accountability are fundamental to the success of any organization. By following the principles outlined in this document, organizations can build a strong reputation, foster trust, and ensure long-term sustainability. The text encourages all stakeholders to work together to promote these values and create a more transparent and accountable environment.

7. The seventh part of the document offers some practical advice and suggestions for implementing these principles. It suggests that organizations should start by identifying key areas where transparency and accountability are most needed, and then develop specific plans and procedures to address these areas. Regular training and education for employees can also help reinforce these values and ensure they are understood and practiced consistently.

8. The eighth part of the document discusses the benefits of transparency and accountability. It notes that organizations that practice these values are more likely to attract and retain top talent, build strong relationships with stakeholders, and achieve long-term success. Transparency and accountability also help reduce the risk of fraud, corruption, and other unethical behaviors, which can be costly and damaging to an organization's reputation.

9. The ninth part of the document provides a final call to action, urging all organizations to commit to transparency and accountability. It states that these values are not just nice-to-haves but essential for the success and sustainability of any organization. The text encourages organizations to take the steps necessary to implement these principles and to hold themselves and others accountable for their actions.

10. The tenth part of the document concludes with a statement of hope and optimism. It expresses confidence that if all organizations and individuals work together to promote transparency and accountability, we can create a more just, fair, and sustainable world. The text encourages everyone to do their part and to hold others accountable for their actions, ensuring that these values become a cornerstone of our society.

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