



COMMISSION INTERNATIONALE
DE MICROFLORE DU PALEOZOIQUE

NEWSLETTER 25

January 1981

President

Prof. Maurice Streel
Laboratoire de Paleontologie Vegetale
Universite de Liege
7 Place du Vingt Aout
Liege B.4000
Belgium

Secretary General

Dr Bernard Owens
Institute of Geological Sciences
Ring Road Halton
Leeds LS15 8TQ
England

Contents

- I. Report on I.U.G.S. Working Group on Devonian-Carboniferous Boundary meeting PARIS 1980.
- II. Abstracts of Palaeozoic papers presented at 13th Annual Meeting of the A.A.S.P. KEYSTONE, COLORADO, 1980.
- III. Palynological Activities in South America.
- IV. Publication announcements.
- V. Forthcoming meetings.

Appendix 4. CIMP Directory of Members.

- I. REPORT ON I.U.G.S. WORKING GROUP ON THE DEVONIAN-CARBONIFEROUS BOUNDARY MEETING
July 16th, 1980, held at Universite de Paris Pierre et Marie Curie,
4 place Jussieu, Paris (5e).

Attending: Voting members: I. CHLUPAC, B. GLENISTER, M. HOUSE, M. LYS,
B. MAMET, E. PAPROTH, Chairwoman, C.A. SANDBERG, K. SIMAKOV, W. ZIEGLER and
M. STREEL, Secretary.

Apologies for non attendances were received from L.I. KONONOVA, E.A. REITTLINGER and
G. PLAYFORD.

The meeting originally scheduled at the International Geological Congress was held
at the Laboratoire de Geologie dynamique of the Paris University by courtesy of
Professor LETOLLE. The items below formed part of an agenda for joint workshop
and business meeting of the Subcommission on Devonian Stratigraphy and our
working-group.

E. PAPROTH firstly recalled the RECOMMENDATION voted upon by a large majority of
the W.G. and which text was later sent to many researchers around the world. She
emphasized that it is now important to begin the search for a boundary stratotype
best displaying the S. praesulcata to S. sulcata evolutionary lineage, as well as
exhibiting adequate representation among other zonally significant groups.

Regional report were then submitted:

CZECHOSL. I. CHLUPAC commented on the newly voted definition, which maintains
within the Devonian groups like the Clymenids and also typical faunas of Ostra-
codes and Trilobites found in the short interval of the Hangenberg Shales. He
pointed out that Czechoslovakia has no suitable rock sequence available for a
boundary-stratotype.

O.H. WALLISER explained how the Hangenberg beds (Shale, Sandstone and Limestone) are sometimes extremely reduced (or missing) between the Wocklum Limestone and the Black Alum Shale the base of which might be considered as isochronous.

U.S.S.R. K. SIMAKOV presented sections near the Devon./Carbon. boundary selected by a Soviet working group in 4 areas:

The sections are in the Donetz basin, Northern Ural, Southern Ural and the Omolon region. A discussion arises particularly on the reported joint occurrence of Clymenids, S. sulcata, and Quasiendothyra in a single bed in the Northern Urals.

B. MAMET asserted that confirmation of this occurrence would change the picture, no longer allowing the top of kobeitusana zone to be used as a marker of the D/C boundary.

E. PAPROTH asked members to focus their attention to a particular section and urged Soviet colleagues to document the Ural sections by providing a bed by bed collection and possibly sharing material with other members of the W.G.

K. SIMAKOV mentioned that these sections could be visited during the next Geological Congress but that data (full record) could be published for next year. He later on pointed out that the Omolon sections also provide good displays of joint occurrence of Quasiendothyra and S. sulcata.

U.S.A. C.A. SANDBERG referred to his report on the 1979 field trip to the Upper Mississippi Valley.

CANADA. B. MAMET (see report here enclosed) demonstrated that only the western part of the Canadian Cordillera could possibly yield a suitable succession but that the region is poorly accessible because of the climatic conditions.

AUSTRALIA. A short report by G. PLAYFORD was distributed to the attendance. B. MAMET commented on the very thick sequence of the Canning basin which in his opinion is a potential stratotype that is not as inaccessible as Northeastern USSR (Omolon) or Northwestern America (Brooks). A letter was also received from J. ROBERTS saying that there is no section available displaying the transition S. praesulcata/sulcata in Australia.

BRITISH ISLES. M. HOUSE (see report here enclosed) recalled that no international stratotype can be proposed from the British Isles.

BELGIUM-FRANCE. M. LYS referred to a new definition of a Strunian stage published by the Paris Congress.

GERMANY. M. STREEL showed the relations between the spore content of the highest Hangenberg Shales in the Seiler trenches and Oberrödinghausen boreholes and the thick Irish succession (see figs. 1 and 2 of the report mentioned below).

PALYNOLOGICAL CORRELATIONS. M. STREEL presented (see report here enclosed) the common opinion of a group of palynologists regarding D/C boundary level and boundary stratotype. P. VAN VEEN demonstrated the quantitative significance of the disappearance of S. lepidophytus comparing data from Ireland, Germany (Stockum) and USSR (Timan-Petchora).

After some discussion, the attending members accepted to concentrate researches in the Renish Slate Mountain and some specific region of USSR like the Ural.

The Devonian - Carboniferous Boundary in the British Isles

Stratigraphy about the Devonian-Carboniferous boundary in the British Isles has been reviewed by George *et al.* (1976) and House *et al.* (1977) where the Wocklumeria/Gattendorfia Stufen boundary, approximating to the base of the sulcata Zone, was

taken as the standard. The Devonian-Carboniferous boundary as originally defined by Sedgwick and Murchison in 1842 at Fremington Pill, North Devon, lies higher than this and has long been abandoned. No international stratotype can be proposed from the British Isles.

England and Wales (V.R.H.)

In South Devon and North Cornwall full marine sequences at Chudleigh (House and Butcher 1973) and around South Petherwin (Selwood 1971) enabled the Wocklumeria/Gattandorfia Stufen boundary to be located but the sulcata Zone has not been identified. These sequences are not suitable for stratotype designation.

In North Devon the junction of divisions A and B of the Pilton Beds (Goldring 1971) approximate to the boundary and this is confirmed by conodont and spore correlation (Austin et al. 1970) but the correlation is not yet very refined. The sequence is tectonically disturbed but may come to serve as a regional stratotype especially since a wide range of marine invertebrates occurs within it.

The South Wales sequences which cross the boundary are non-marine and some refinement in spore correlation has been achieved (Clayton et al. 1978) but marine intercalations in the Skrinkle Sandstone now suggest Lower Carboniferous rather than late Devonian date (Bassett and Jenkins 1977).

Ramsbottom and Mitchell (1980) have argued that the Courceyan is the equivalent of the Tournaisian and should be abandoned but it seems preferable to await the international definition of these divisions, the base of which should be defined to correspond with the proposed Devonian/Carboniferous boundary.

The Devonian-Carboniferous Boundary in Ireland (G.D.S.)

George et al. (1976) proposed regional stages as a framework for study of Dinantian rocks in Britain and Ireland. The base of the earliest (Courceyan) stage was defined in a section on the west side of the Old Head of Kinsale, County Cork, Ireland, at the base of the Castle Slate Member of the Kinsale Formation, an horizon which coincides there with the boundary between the Spelaotriletes lepidophytus - Verrucosisporites nitidus (LN) Subzone and the Vallatisporites verrucosus - Retusotriletes incohatus (VI) Subzone of the Verrucosisporites nitidus - Vallatisporites verrucosus (NV) miospore Zone (Clayton et al. 1974). The base of the Courceyan, recognised by identification of the LN/VI subzonal boundary, has been located in numerous sections in County Cork (see for instance, Clayton and Higgs, 1979). Clayton et al. (1974) have argued that the LN/VI subzonal boundary is the best approximation in Britain and Ireland to the base of the Carboniferous (*sensu* Heerlen 1935), but it must be stressed that precise correlations will not be possible until the ranges of critical miospore taxa are established in Germany.

Apart from miospores, both micro- and macrofossils occur only sporadically in the enormously thick marine clastic successions of latest Devonian and earlier Carboniferous age in south-west Ireland. The pre-Courceyan Old Head Sandstone and equivalent formations have yielded rare brachiopod faunas (see George et al. p. 71). The earliest Courceyan Castle Slate Member of the Kinsale Formation contains conodonts discussed by Clayton et al. (1978), and as yet unidentified goniatites and ostracodes.

REFERENCES

- AUSTIN, R.L., DRUCE, E.C., RHODES, F.H.T., and WILLIAMS, J.A. 1970. The value of conodonts in the recognition of the Devonian-Carboniferous boundary, with particular reference to Great Britain. C.r. 6e Congres Int. Strat. Geol. Carbonif., Sheffield 1967, 2, 431-444.
- BASSETT, M.G. and JENKINS, T.B.H. 1977. Tournaisian conodont and spore data from the uppermost Skrinkle Sandstone of Pembrokeshire, South Wales, Geol. et. Palaeontol., 11, 121-134.

- CLAYTON, G. and HIGGS, K. 1979. The Tournaisian marine transgression in Ireland. J. Earth Sci. R. Dubl. Soc. 2, 1-10.
- CLAYTON, G., HIGGS, K., GUEINN, J.J. and VAN GELDER, A. 1974. Palynological correlations in the Cork Beds (Upper Devonian - ?Upper Carboniferous) of southern Ireland. Proc. R. Ir. Acad. 74 (B), 145-155.
- CLAYTON, G., HIGGS, K., KEEGAN, J.B. and SEVASTOPULO, G.D. 1978. Correlation of the palynological zonation of the Dinantian of the British Isles. Coloquio Internat. Palinologia Leon, 137-147.
- GEORGE, T.N., JOHNSON, G.A.L., MITCHELL, M., PRENTICE, J.E., RAMSBOTTOM, W.H.C., SEVASTOPULO, G.D. and WILSON, R.B. 1976. A correlation of Dinantian rocks in the British Isles. Geol. Soc. Lond., Spec. Rep. 7, 87 pp.
- GOLDRING, R. 1970. The stratigraphy about the Devonian-Carboniferous boundary in the Barnstaple area of North Devon, England. C. r. 6e Congres Int. Strat. Geol. Carbonif. Sheffield 1967, 2, 807-816.
- HOUSE, M.R., RICHARDSON, J.B., CHALONER, W.G., ALLEN, J.R.L., HOLLAND, C.H., and WESTOLL, T.S. 1977. A correlation of the Devonian rocks of the British Isles. Geol. Soc. Lond., Spec. Rep. 7, 110 pp.
- HOUSE, M.R. and BUTCHER, N.E. 1973. Excavations in the Devonian and Carboniferous rocks near Chadleigh, South Devon. Trans. R. Geol. Soc. Cornwall, 20, 199-220.
- RAMSBOTTOM, W.H.C. and MITCHELL, M. 1980. The recognition and division of the Tournaisian Series in Britain. Jl. Geol. Soc. London, 137, 61-63.
- SELWOOD, E.B. 1971. Successions at the Devonian-Carboniferous boundary between Boscastle and Dartmoor. Proc. Ussher Soc., 2, 275-285.

DEVONIAN-CARBONIFEROUS BOUNDARY SEQUENCES IN CANADA: A SUMMARY
B.L. Mamet, Universite de Montreal, P.Q., Canada

Three regions of Devonian-Carboniferous successions can be distinguished in Canada:

1. The Fundy epieugeosyncline. The northern part of the Appalachian Orogen was intensively folded during the Devonian Acadian Orogeny. Post-orogenic molasses developed in Late Devonian-Tournaisian time and are mostly represented by the non-marine Horton Group. A "Hymenozonotriletes lepidophytus-H. pussilites" flora (zone C of Barss) has been recorded from the Cape George-Antigonish region (McInnes Brook Formation) by Hacquebard (1972). The overlying, discordant Tournaisian Fisset Brook Formation yield the "Hymenozonotriletes explanatus zone D" of Barss and has been radiometrically dated on basaltic volcanic flows.

There is no known marine fauna present and the basin therefore does not seem a suitable prospect for the solution of the Devonian/Carboniferous problem.

2. The Sverdrup Basin. Sediments in the Axel Heiberg and Ellesmere Islands were also intensively folded in Late Devonian time (see Thorsteinsson, 1974 and Nassichuk, 1975 for recent summary of the historical geology of the region). Folding of the Franklinian Geosyncline was accompanied by metamorphism and injection of granodiorites and quartzic diorites.

The oldest known Carboniferous rocks form the Visean Emma Fiord Formation, a succession of non-marine deltaic arenites with associated coal beds. The formation has been dated by spores. There is no known marine Tournaisian sediments in the Arctic.

3. The Cordillerans and the Williston Basin. Progressive Tournaisian encroachment of a carbonate platform of the shelf is observed in the Williston Basin. Stratigraphic relations, correlations and paleogeography of the Bakken Formation in the

subsurface of Manitoba, Saskatchewan and Alberta are described in Macauley et al. (1964). The Bakken, very thin and condensed, has thin microconglomerates with reworked phosphatic pebbles, suggesting non-depositional sequences. As the succession is known only through scattered boreholes, with few preserved cores, the Williston offers little prospect for further research.

In the non-metamorphosed part of the Cordillerans, the Rocky Mountains, conodonts and spores have been recovered from the Bakken correlative unit, the Exshaw Formation (Macqueen and Sandberg, 1970). The unit straddles the Devonian-Carboniferous contact. Siphonodonta sulcata is recorded by Sandberg, but there is apparently no S. praesulcata. A controversial and rare Imitoceras? goniatite fauna, is to be referred to the Carboniferous. Hymenozonotrites lepidophytus is also known from the unit. Otherwise, the Exshaw megafauna is extremely poor, the foraminifers are absent and the succession does not seem a possible candidate for a continuous Devonian-Carboniferous sequence.

Further to the North, Middle Tournaisian assemblages are known in the Clausen and in the Besa River Formations of the Northwest Territories (Jackfish River Region) and of Northeastern British Columbia (Peace River-Muskwa River) (Mamet and Bamber, 1979). No strata straddling the Devonian-Carboniferous conodont boundary have been demonstrated but further work is in progress.

West of the "Trench", the internal domain of the Cordillerans has been metamorphosed by Mesozoic orogenies. However, scattered Tournaisian outcrops have been discovered along the Pacific coast; none straddle the presumed Devonian-Carboniferous boundary. These Tournaisian fauna are of particular paleogeographic importance, as they have obvious Tethyan affinities. No complete Quasiendothyrid succession has been encountered. Yet, Quasiendothyra are abundant in the central part of the Brooks Range in Alaska and are very similar to the foraminiferal assemblages described by Yuferev in Simakov (1979) from the Omolon Massif.

In conclusion, for paleogeographic and paleotectonic reasons, only the western part of the Canadian Cordillera could possibly yield the suitable bio- and litho-stratigraphic succession requested by the Commission of Stratigraphy. As the region is poorly accessible, the prospect of finding such a rock body, appears to be quite remote.

Hacquebard, P.A. 1972. The Carboniferous of Eastern Canada. Septieme Cong. Inter. Strat. Geol. Carb., Krefeld, band I, p. 69-90.

Macauley, G., Penner, D.G., Procter, R.M. and Tisdall, M. 1964. Chapter 7, Carboniferous in Geological History of Western Canada, Calgary, Alberta Soc. Petrol. Geol., p. 89-102.

Macqueen, R.W. and Sandberg, C.A. 1970. Stratigraphy, age and inter-regional correlations of the Exshaw Formation, Alberta, Rocky Mountains. Bull. Can. Petrol. Geol., vol. 18, no. 1, p. 32-66.

Mamet, B. and Bamber, E.N. 1979. Stratigraphic correlation chart of the lower part of the Carboniferous, Canadian Cordillera. Huitieme Cong. Inter. Strat. Geol. Carbonifere, Moscou, C.R., vol. 3, p. 37-49.

Nassichuk, W.W. 1975. Carboniferous ammonoids and stratigraphy in the Canadian Archipelago. Bull. Geol. Survey Canada, Bull. 237, 240 pp.

Thorsteinsson, E. 1974. Carboniferous and Permian stratigraphy of Axel Heiberg Island and Western Ellesmere Island, Canadian Arctic Archipelago. Bull. Geol. Survey Canada, Bull. 224, 115 pp.

Yuferev, O.V. 1979. Division of the Devonian/Carboniferous boundary by foraminifers in the Perevalny Creek area (Omolon Massif) in Biostratigraphy and fauna of the Devonian/Carboniferous boundary deposits ed. by K.V. Simakov. Magadan, XIV Pacific Science Congress, supp. 4, p. 5-25, 2 pls.

PALYNOLOGIST'S COMMENT REGARDING THE DEFINITION OF THE DEVONIAN/CARBONIFEROUS BOUNDARY

This report collates the views of ten palynologists who had a meeting on the subject on Friday 4th July 1980 during the 5th International Palynological conference at Cambridge (UK). All have published papers using spores to delineate the Devonian/Carboniferous boundary in many regions of the world. Their names are listed below: CLAYTON and HIGGS (Ireland), LOBOZIAK (France), MCGREGOR (Canada), PLAYFORD (Australia), RICHARDSON (UK), STREEL (Belgium), TURNAU (Poland), VAN DER ZWAN and VAN VEEN (The Netherlands).

1. We recommend that the level of the Wocklumeria/Gattendorfia transitional beds continue to be accepted as the Devonian/Carboniferous boundary.

We recall that a similar statement was published by all palynologists (most from USSR) during the 8th Carboniferous Congress held at Moscow in 1975.

2. We want to emphasize the real time significance of these transitional beds which are not just a few metres of shales between rich fossiliferous limestones in the historic type region but are developed as more than 800 metres thick nearshore and continental sediments in Ireland.

3. We do not wish to claim for a boundary-stratotype to be defined in a nearshore facies but we would reject as well a too marginal distal facies devoid of spores or a section where there is evidence of slumping or other disturbing sedimentological processes. We believe that one cannot ignore such a fossil group which has the potential to accommodate any limits proposed in this interval and also enables us to correlate between continental and marine sediments (see fig. 1 enclosed).

4. Indeed, just as well as the five conodont zones ranging from sulcata to crenulata do correspond to a single spore zone (VI) in the lower part of the Carboniferous, 3 spore (sub)zones ranging from LL to LN correspond to the upper part of the praesulcata zone in the uppermost Devonian (see fig. 2). (We do not want to emphasize here the first occurrence of the lepidophytus spore zone and its lowermost subdivisions which allow accurate correlations with Foram. stratigraphy in the costatus-middle praesulcata range.)

5. Our most secure and useful limit is certainly the base of Hymenozonotriletes explanatus (limit LL/LE subzones) which occurs both in continental (Hoek Head) and nearshore marine beds (Old Head of Kinsale) in southern Ireland but can also be traced in some slope sediments (with mass transport?) in Germany (Riescheid). The base of H. explanatus which is not a dramatic event is also known in Australia, North America and in USSR (most detailed information from the Timan-Petchora).

6. The LN/VI limit which corresponds to the extinction of S. lepidophytus seems to match more or less the base of the sulcata level as high LN spore assemblages are encountered immediately below the Stockum Limestone in Germany (Siler). However delay between first deposition and possible mass transport cannot be ruled out in such an environment which makes the accurate correlation hazardous owing to the fact that the LN/VI limit is primarily based on extinction criteria.

That this level represents a world wide change is obvious (see the quantitative work made by Van Veen in Ireland and comparison with Timan-Petchora in USSR), but we are not yet prepared to specify the accurate first incoming of zone VI. More work has to be done to support the disappearance of S. lepidophytus at this level.

7. As a final comment, we welcome that definitions are required in more precise terms. In the same way, we would not consider the change of definition to be more accurate if not typified in a boundary-stratotype carrying both the new zone characteristic and the ancestor in a continuous lithological sequence.

M. STREEL

CIMP W-G on the D./C. boundary, convenor.

Belgium

SPORES

CONODONTS

Germany

"Tn2a"

$\beta\alpha$

T E

V I

Low. crenulata

Sandbergi

Upp. duplicata

Low. duplicata

sulcata

Upp. Protognathodus
(with P. kuehni)

Low. Prot

"Seiler"

"Miescheid"

"Oberrodingh"

PLs2

PLs1

←

"Tn1a"

L L

L E

L N

LCr

Upp.

Mid. "Upp. costatus"

Low

Mid. costatus

Top of spore bearing
Hangenberg Shales
in 3 different localities

II Abstracts of Papers presented at the 13th Annual Meeting of the American Association of Stratigraphy Palynologists held in Keystone, Colorado, USA. October 1980

1. DINANTIAN ACRITARCHS FROM THE S.W. PROVINCE OF THE BRITISH ISLES

Ken Dorning Pallab Research, Sheffield S6 5DX, U.K.

Diverse, well-preserved acritarchs have been examined in palynological assemblages from the Lower Limestone Shale Formation of the Mendips, England and South Wales. The acritarchs are subordinate in numerical abundance to miospores. Dinantian acritarchs are particularly small; sieving at 20 μ m increased the abundance of acritarchs in the small size fraction for ease of examination. Some of the acritarchs, including several previously undescribed taxa, have tops of ranges within this time interval and, thus, appear to have biostratigraphic potential.

2. SILURIAN ACRITARCH AND CHITINOZOA BIOSTRATIGRAPHY OF WESTERN EUROPE AND EASTERN NORTH AMERICA

Ken Dorning Pallab Research, Sheffield S6 5DX, U.K.

Palynological assemblages have been examined for acritarchs and chitinozoa from the type Llandovery, Wenlock and Ludlow sections in South Wales and the Welsh Borderland of England, UK. Diverse acritarchs and chitinozoa of generally excellent preservation are present in most of the surface and core samples. Utilizing data from other UK localities, workable standard acritarch and chitinozoan zonations have been established. Records from areas in western Europe and eastern North America show these biozonations to be of practical value in the correlation of sections in various lithofacies over a wide geographic area.

3. CARBONIFEROUS MIOSPORES FROM THE TYLER FORMATION, FERGUS COUNTY, CENTRAL MONTANA

Carol A. Dawson Amoco Production Company, Denver, CO 80202

The Tyler Formation of central Montana is divided into the red beds of the Cameron Crook Member and the dark grey shales and sands of the Stonehouse Canyon Member. A 396-foot section locally known as Beacon Hill was selected for study as part of a regional project assessing the stratigraphic relationship of Late Mississippian-Early Pennsylvanian units from central Montana to the Williston Basin of North Dakota. The Beacon Hill locality also represents the type section for the Stonehouse Canyon Member of the Tyler Formation.

A total of 45 samples was collected for both palynomorph and conodont analysis. Diverse and well preserved spores were present in most samples collected in the Stonehouse Canyon Member. Results show that the Mississippian-Pennsylvanian boundary occurs in the upper part of the Stonehouse Canyon Member. Additional work is planned to correlate these spores to the Carboniferous spore zones of Europe.

4. CAPPASPORITES - A COMMON MIDDLE PENNSYLVANIAN PALYNOMORPH

Arthur V Chadwick Paleobiology and Geology Research Group, Loma Linda University, Loma Linda, CA 92350

Cappasporites L. Urban 1966, a Middle Pennsylvanian spore genus, has been commonly overlooked or misidentified during descriptions of Pennsylvanian palynofloras. Numerous spores of this genus were found in the Middle Desmoinesian Croweburg Coal of Oklahoma and, subsequently, in other Desmoinesian coals.

The genus includes spores varying from 35 μ m to 100 μ m in longest dimensions and ranging from ovoid (polar) to spindle shape (equatorial) in outline. The spore is further characterised by a thickened exine over the distal surface generally with scattered granules. Trilete laesurae are rarely evident.

The spores are produced in cones of an arborescent lycopod, are most commonly associated with Lycospora and Laevigatosporites, and appear to be limited to the Desmoinesian interval.

5. RECYCLED PERMIAN AND TRIASSIC PALYNOMORPHS FROM SEYMOUR ISLAND, ANTARCTICA, AND THEIR GEOLOGIC IMPLICATIONS

Rosemary A Askin and David H Elliott

Palynomorphs recovered from Upper Cretaceous and Lower Tertiary marine and nonmarine sedimentary rocks from Seymour Island, northeastern Antarctic Peninsula, can be grouped into several assemblages of different ages. These include spores, pollen and dinoflagellates of Late Cretaceous and Early Tertiary age; recycled older Cretaceous palynomorphs; and recycled palynomorphs well known from Gondwana sequences of Permian and Triassic age.

The Permian and Triassic recycled palynomorphs are rare or absent in the ?uppermost Cretaceous "Snow Hill Island Series", the ?Paleocene Cross Valley Formation, and the Eocene lower and middle members of the La Meseta Formation. They are common in the Oligocene upper member of the La Meseta Formation. These assemblages exhibit a range of preservation from well preserved specimens of amber to brown colour, to black, corroded skeletal grains. Taeniate bisaccate pollen is particularly common. Spore and pollen species referable to more than 25 taxa are mostly diagnostic of Permian age, with some of probably Triassic age. These include Granulatisporites micronodosus, G. trisinus, ?Dulhuntyispora dulhuntyi, Aratrisporites spp., Parasaccites spp., Protohaploxylinus spp., Striatopodocarpites spp., and Marsupipollenites triradiatus. No marine acritarchs or dinoflagellates restricted to the Permian and Triassic have been observed. It is likely that the original sedimentary beds containing the Permian and Triassic terrestrial palynomorphs were continental strata, or possibly marginal marine deposits.

The Permian and Triassic palynomorphs have subsequently been recycled into Upper Cretaceous and Lower Tertiary sediments, either by direct one-stage redeposition, or by more than one stage of recycling via, for example, Lower Cretaceous beds. Continental or marginal marine Permian sedimentary rocks do not crop out in the Antarctic Peninsula area and have probably been completely eroded away.

6. PALYNOMORPHS FROM THE SILURIAN MEDINA GROUP (LOWER LLANDOVERY) OF THE NIAGARA GORGE, LEWISTON, NEW YORK, USA

Merrell A Miller and Leonard E Eames Amoco Production Company Research Centre,
Tulsa, OK 74102

Acritarchs, chitinozoans, and spore-like microfossils have been recovered from the upper part of the Whirlpool Sandstone, the Power Glen Formation, and the marine lower Grimsby Sandstone. Samples from shales within the coarse clastic portion of the Grimsby contained rare, poorly preserved palynomorphs.

The Whirlpool Sandstone, basal Silurian in western New York, contains Nodospora burnhamensis, Tetrahedraletes medinensis, and other spore-like microfossils. The overlying Power Glen Formation is dominated by spore-like microfossils, but also contains Cyathochitina aff. campanulaeformis, Microhystridium spp., Veryhachium spp., Diexallophasis sp., Leiofusa striata and Multiplicisphaeridium sp. The upper part of the Power Glen is a predominately marine assemblage containing Diexallophasis denticulata, Leprotolypa evexa, Comasphaeridium williereae, Multiplicisphaeridium sp., a species provisionally assigned to Retisphaeridium and other acritarchs with Ancyrochitina sp. and rare specimens of Nodospora burnhamensis and Tetrahedraletes medinensis. The lower part of the Grimsby contains an assemblage similar to that of the upper part of the Power Glen.

This Lower Silurian (Medinan) palynomorph assemblage is the oldest known Llandovery palynomorph assemblage, dated by independent methods, from North America. The spore-like microfossils are comparable to species from the Tuscarora Sandstone in Pennsylvania. The underlying Upper Ordovician Queenston Formation and overlying Thorold Sandstone (basal Clinton Group) have not yielded palynomorphs from the western New York localities examined.

7. PALYNOLOGICAL CORRELATION OF THE KENTUCKY NO. 12 COAL (MIDDLE PENNSYLVANIAN)

Gerald E. Vyhmeister, Stephen F. Barnett, and Arthur V. Chadwick
Paleobiology and Geology Research Group, Loma Linda University, Loma Linda, CA 92350

The Kentucky No. 12 Coal is characterized by the presence of distinct, widespread partings. An analysis of the coal was made to determine the precision of palynological correlation within a lithologically correlated seam.

Three columns of coal have been analysed to date. Column 1 is located 1000 m to the west of column 2, which is 76 m west of column 3. A fourth column located approximately 6 km southwest of column 1 is presently under study. Multiple samples were taken from within each of five chronostratigraphic units (defined by the partings within the seam), and spore assemblages were counted.

Correlation between the genera of closely spaced columns is very high and diminishes with an increase in distance. Furthermore, the correlation between genera of individual, stratigraphy equivalent samples is also significant. Although there are trends in the abundance of spores vertically throughout the columns, the trends seem unaffected by the presence of the partings.

8. ORGANIC-WALLED MICROPHYTOPLANKTON ABUNDANCE AND STRATIGRAPHIC DISTRIBUTION FROM THE MIDDLE DEVONIAN COLUMBUS AND DELAWARE LIMESTONES OF OHIO, USA

Reed Wicander and Robert P Wright

Twenty-nine species of organic-walled microphytoplankton were recovered from the 92-foot thick Middle Devonian Columbus and Delaware Limestones of central Ohio, USA. All species have been previously described and are distributed among 19 genera.

This organic-walled microphytoplankton flora occurs in nonfossiliferous to fossiliferous, fine to coarse-grained carbonate rocks, representing open, well circulated marine conditions. No organic-walled microphytoplankton were found in the lower 25-foot dolomite unit, which apparently represents a shallow water depositional site with restricted circulation.

Comparison of the Columbus and Delaware Limestone organic-walled microphytoplankton flora to other Middle Devonian North American floras indicates close floral similarity, although with lower species diversity. This lower diversity may be the result of selective destruction of the flora due to lithologic diagenesis.

9. MULTIDISCIPLINE EVIDENCE FOR A NEW DESMOINESIAN-MISSOURIAN (PENNSYLVANIAN) BOUNDARY IN CENTRAL OKLAHOMA

L R Wilson and A P Bennison

Paleontological data from invertebrates, plant compressions, silicified wood, palynomorphs, electric-log correlations, and lithofacies field mapping indicate that the Desmoinesian-Missourian boundary (Middle Pennsylvanian; Westphalian-Stephanian) in central Oklahoma should be placed at the base of the sandstone underlying the coal seam below the Checkerboard Limestone. The published Seminole Formation of Tulsa County should be abandoned because the lower two of the three coals occurring in it, the Dawson and Tulsa, are Desmoinesian based upon invertebrate and plant fossils. The third, or Checkerboard coal, is Missourian based upon plant fossils and is related to the Checkerboard Limestone, a cyclothem unit. The Checkerboard Limestone has been traced southward on electric logs and found to lie beneath the Seminole Formation in that formation's type area and not above as is published for Tulsa County. In Hughes and Seminole Counties, the Checkerboard and Sasakawa limestones are correlative on field evidence. Palynological evidence in Oklahoma is in agreement with that of Illinois and Europe for the above equivalent boundary.

FULL KEYSTONE ABSTRACTS AVAILABLE

Copies of the program and abstracts of the 13th Annual Meeting of AASP (Keystone, Colorado, 14-18 October 1980) are available from AASP Foundation at \$ 2.00 each. Write to: R.T. Clarke, AASP Foundation, c/o Mobil R & D Corp., P.O. Box 900, Dallas, TX 75221. The volume includes abstracts of 33 papers.

KEYSTONE FIELD TRIP GUIDE AVAILABLE

Copies of the field trip guide produced for the Keystone Meeting of AASP are available at \$ 3.00 each from the AASP Foundation. The guide was compiled by H.L. Ott with assistance from C.K. Chamberlain, C.A. Dawson, P.H.K. Groth, and K.R. Newman. The road log highlights the geology, scenery, history, resources, and flora en route from Keystone to Denver, Colorado. Included are two maps in color and reproductions of four historic photographs. The text includes anecdotes from the early days of gold and silver mining in the area and accounts of ichnology and palynology of local rocks. Order from: R.T. Clarke, AASP Foundation, c/o Mobil R & D Corp., P.O. Box 900, Dallas, TX 75221.

MEMBERSHIP OF AMERICAN ASSOCIATION OF STRATIGRAPHIC PALYNOLOGISTS (A.A.S.P.)

Although originally established to provide a forum for palynological activities in North America, A.A.S.P. has now grown into a fully world-wide society. Those members of C.I.M.P. who are not already members of A.A.S.P. are invited to apply for membership. Annual dues are only 15 US dollars which entitles you to receive the Association's publication PALYNOLOGY, together with 4 Newsletters and Membership Directory each year. If you are interested in applying for membership you are advised to write to: Dr John Clendening, Secretary-Treasurer AASP, Amoco Production Co., P.O. Box 3092, Houston, Texas 77001, U.S.A.

III. Palynological Activities in South America

(based on notes supplied by S. Archangelsky, Buenos Aires)

Annual Meeting of the Working Group, Project 42 (Upper Palaeozoic of South America), IGCP, Sao Paulo, Brazil, November 1-4, 1979. The following papers were presented:

Archangelsky, S. Recientes avances en los estudios paleobotanicos y palinologicos del Carbonico y Permico de Argentina.

Azcuy, C.L. and J.R. Morelli. Correlation of stratigraphic units of the Paganzo Basin.

Sundaran, D. Palynological study of the Upper Paleozoic sediments in parts of the Parana basin, Brazil.

Annual Meeting of the Argentine Working Group of Project 42. San Juan, Argentina, June 13-15. The following papers were presented:

Gamero, J.C. Megaspores neopaleozoicas de las perforaciones YPF CO (Santiago Temple), Provincia Cordoba.

Azcuy, C.L. y Laffite, G. Caracteristicas palinologicas del Perfil Arroyo Tuyunti, Sierra de Aguarague, Provincia de Salta.

Azcuy, C.L. y Salas, A. Datos palinologicos de la Formacion Tupambi, Cuenca Noroeste Argentina.

Gamero, J.C. y Archangelsky, S. Hallazgo de palinomorfos en sedimentitas neopaleozoicas de la Formacion Piedra Shotle, Estancia La Casilda, Chubut.

II Meeting of Palaeobotanists and Palynologists in Brazil, Sao Paulo, 6-8 December 1979.
The following papers were presented:

- Andreis, R.R., Cazzulo-Klepzig, M., Guerra-Sommer, M., Marques Toigo, M.
Interpretacao paleoambiental e estudo paleobotanico e palinologico do Grupo
Itarare, na area de Faxinal, Municipio de Guaiba, RS.
- Sunderam, D. Observacoes palinologicas sobre alguns sedimentos do Gondwana Inferior
da bacia do Parana, Brasil.
- Arai, M. Contribuicao dos polens estriados na bioestratigrafia neopaleozoica da parte
ne da bacia do Parana (1).
- Arai M., Rosler, P. Polen e Esporos associados a megafossils vegetais em Sao Jao do
Triunfo, PR, Formacao Rio Bonito.
- Archangelsky, S. y J.C. Gamero. Primer hallazgo de palinomorfos permicos en el
subsuelo de la Cuenca del Colorado, Costa Afuera, Republica Argentina.

During the IV Argentinian Symposium on Palaeobotany and Palynology (Cordoba, November
6-8, 1980), Dr O. Rosler lectured on "Current works on Palaeobotany and Palynology in
Brazil". Also of interest to palaeozoic palynology was the paper by Leguizamon, R.
and your correspondent on Carboniferous spores in situ in two species of Paulophyton
from the Argentine Paganzo Basin.

South America Carboniferous-Permian Symposium
(Actas II Congreso Argentino de Paleontologia y Bioestratigrafia y I Congreso
Latinoamericano de Paleontologia)

The volume (270 pgs) devoted to palaeontology and stratigraphy of both periods and the
problem on the limit in South America. The first, part, devoted to original contri-
butions, the second to invited papers and the third to discussions followed by a Report
on the proposal of Carb-Perm biozones in South America, their correlation and tentative
dating. The following contributions are of interest to Palynology:

- Archangelsky, S., Gamero, J.C. y Leguizamon, P. Estudios palinologicos de las
perforaciones YCF CO1, CO2 and CO3 (Paleozoico Superior), Santiago Temple,
Provincia de Cordoba.
- Azcuy, C.L. y Jelin, R. Las Palinozonas del limite Carbonico-Permico en la Cuenca
Paganzo.
- Doubinger, J. y Alvarez Ramis, C. Notas sobre la flora de la Formacion Ambo,
Carbonifero inferior del Peru.
- Russo, A., Archangelsky, S. y Gamero, J.C. Los depositos suprapaleozoicos en el
subsuelo de la Llanura Chaco-Pampeana, Argentina.
- Wagner, R.H. Consideraciones sobre el limite Carbonico-Permico.
- Archangelsky, S. y Marques Toigo, M. La Palinologia y el problema del limite
Carbonico-Permico en el Gondwana Sudamericano.
- Archangelsky, S., Azcuy, C.L., Pinto, I.D. Gonzalez, C.R., Marques Toigo, M.,
Rosler, O. y Wagner, R.H. The Carboniferous and early Permian of the South
American Gondwana Area: a summary of Biostratigraphic information.

ALPP)- Bulletin of the Latinamerican Association of Palaeobotany and Palynology No 7
(1980). Includes the following papers:

- Villar, H.J. y S. Archangelsky. Recientes enfoques de la geoquimica organica y la
palinologia aplicados a estudios sobre genesis y exploracion de petroleo y carbon.

Salas, A. y J. Seiler. Termopalinologia: confiabilidad del metodo "Luz transmitida.

Gamerro, J.C. y O. Cardenas. Como hacer permanente las preparaciones en glicerina-gelatina.

IV. PUBLICATION ANNOUNCEMENTS

ENGLISH LANGUAGE ARTICLES FROM CHINA

English language texts were specially written for 14 papers presented at the Cambridge or Reading meetings in July, 1980. Each is available as a separately bound reprint and can be obtained from the publisher at the price of \$ 2.00 each. Write to: Prof. Li Xing-xue, Institute of Geology & Paleontology, Academia Sinica, Nanking, China. The papers are:

- "An outline of recent researches on the Cathaysia flora" (Li Xingxue & Yeo Zhaoqui)
- "Notes on the ecological significance of some Cathaysia floral elements" (Zhang Shanzen)
- "Early Liassic plants from southwest Hunan, China". (Zhao Zhiyan)
- "Succession of Jurassic plant assemblages and stratigraphic correlation of China" (Ye Meina & Li Baoxian)
- "Microfloral areas of Early Cretaceous in China" (Li Wen-ben)
- "Middle-Late Early Cretaceous flora from Jilin, N.E. China" (Li Xingxue & Ye Meina)
- "Cretaceous-Tertiary spore pollen assemblages of Northern Jiangsu" (Song Zhi-chen et al.)
- "General aspects of the floristic regions of Late Cretaceous and Early Tertiary of China" (Song Zhi-chen)
- "Late Cretaceous and Eocene floral provinces" (Guo Shuang-xing)
- "Spores and pollen grains from the Fushun Group" (Song Zhi-chen & Cao Liu)
- "Eocene spores and pollen assemblage from northeastern Zhejiang" (Li Manying)
- "Tertiary spore-pollen assemblages in Northern Shandong" (Zhou Heyi)
- "Some fossil catkins and a male cone with their pollen in situ from Shanwang flora" (Li Haomin & Zheng Yahui)
- "Pollen analysis of the Nihewan Formation" (Liu Jingling & Tang Lingyu)

PALYNOSTRATIGRAPHIE ET PALEOCLIMATOLOGIE DE L'EOCENE SUPERIEUR ET DE L'OLIGOCENE DU BASSIN DE PARIS

Dr J-J Chateauneuf's January 1980 thesis is now published by Division Editions et Ventes, PRGM - SGN - BP 6009, 45060 Orleans Cedex, France. Send them FF 260 for a copy postage paid. The contents include Historique, Localisation et description du materiel etudie, Methodes d'extraction et d'analyse utiles, Description systematique, Palynostratigraphie de Bassin de Paris et Bassins de l'Europe occidentale, Evolution palynologique et milieu de depot, Essai de reconstitution paleoclimatique et Conclusions. There are 424 pages, 69 figures and 31 plates.

SPECIAL PAPERS IN PALAEOLOGY NO. 27

"Lower Devonian Acritarchs from the Carnarvon Basin, Western Australia" by G Playford & R G Dring. This volume will appear in 1981, further details will be circulated when available.

SOCIETE GEOLOGIQUE ET MINERALOGIQUE DE BRETAGNE

Several memoirs, dealing with sedimentology, palaeontology and stratigraphy, are available. These works are the result of joint research programmes. All the fossils including organic microfossils (spores, plant remains, Acritarchs, Chitinozoa, Scolecodonts ...), recorded in the sections, are studied (systematic, range biozone ...) and abundantly illustrated.

Mem. no. 19: "Les Schistes et calcaires eodevoniens de Saint-Cenere (Massif Armoricaire, France). Sedimentologie, Paleontologie, Stratigraphie". 328 p., 63 pl., 1 tabl. H.T. (1976). price: 200 F (=20 £).

Mem. no. 23: "Les Schistes et calcaires de l'Armorique (Devonien inferieur, Massif Armoricaire). Sedimentologie, Paleontologie, Stratigraphie". 313 p., 42 pl. (1980). price: 200 F (= 20 £).

Mem. no. 25: "La tranchee de la Lezais, Emsien superieur du Massif armoricaire. Sedimentologie, Paleontologie, Stratigraphie. 311 p., 39 pl. (1980). Subscription price until January 15 (1981): 150 F (= 15 £).

C.I.M.P. members may be interested too by other volumes or issues:

Mem. no. 26: "Les Chitinozoaires dans le Paleozoique du Sud-Ouest de l'Europe Cadre geologique, etude systematique, biostratigraphie". (by F. PARIS). 410 p., 135 fig., 44 tabl., 41 pl. (1981, in press). Subscription price (until 1st March 1981): 180 F.

Bull. 1978: "Acritarches de l'Ordovicien superieur du synclinal de Bucaco (Portugal). Systematique, biostratigraphie, interet paleogeographique". (by Z. ELAOUAD-DEBJAJ). 100 p., 18 pl. price: 90 F.

Please sent your order form to: Societe geologique et mineralogique de Bretagne. Institut de Geologie. Universite de Rennes. 35042 RENNES Cedex, France.

PALYNODATA (October 1980 list)

Publications of PALYNODATA obtainable from 101 N. Avenida Carolina, Tucson, Arizona 85711

Nos. 1 (Professional newsletters reporting on the progress of the research program; thru 6 out of print).

No. 7 1977, Part I. The Positions and Climatic Changes of Pangaea and Five South-east Asian Plates during Permian and Triassic Times. 21 pp., 8 figs.

Part II. Twelve hundred Annotated Reference Concerning the Upper Pennsylvanian to Triassic Literature in Palynology. 108 pp. 13.00 dollars

No. 8 1977, Lower Cretaceous Palynological Literature: Six Hundred Implemented References. 61 pp. 11.00 dollars

No. 9 1978. Pliocene Palynological Literature: Five Hundred Implemented References. 50 pp. 11.00 dollars

No.10 1978, Devonian Palynological Literature: Seven Hundred Implemented References. 66 pp. 11.00 dollars

No.11 1978, Upper Cretaceous Palynological Literature: A Thousand Implemented References. 127 pp. 14.00 dollars

No.12 1979, Oligocene to Pliocene Palynological Literature: Fifteen Hundred Implemented References. 183 pp. 20.00 dollars

No.13 1980, Jurassic Palynological Literature: Nine Hundred Implemented References. 118 pp. 16.00 dollars

No.14 Paleocene and Eocene Palynological Literature: Fifteen Hundred
Implemented References 21.00 dollars

In Press

Early Precambrian to Silurian Palynological Literature: Eight Hundred Forty
Implemented References.

In Preparation

Carboniferous Palynological Literature: Twelve Hundred Implemented References.

Precambrian to Tertiary Palynological Literature: Six Hundred Implemented References.

Further supplements are planned to Reference Lists already published.

Review articles may be added to Future issues.

10% off total if volumes 7 through 14 are ordered.

20% discount off total when order includes future volumes.

Prices include shipping and handling. Please pay by cheque in U.S. dollars or, if in
foreign currency, according to the dollar value on that particular day.

Make cheque to: PALYNODATA, 101 N. Avenida Carolina, Tucson, Arizona 85711.

Proceedings of the Meeting of the Subcommittee on Carboniferous Stratigraphy,
Sheffield 1965

Contents

Frontispiece (Photograph of Participants to the Sheffield Meeting)

Preface

List of Participants at the Sheffield Meeting

Introduction circulated before the Meeting

Programme of the Sheffield Meeting

Opening Speech by the Chairman of the Subcommittee on Carboniferous Stratigraphy

T.N. GEORGE "Relationship of Lower Carboniferous Fossils to Stratigraphy"

W.H.C. RAMSBOTTOM "The use of goniatites in zonation of the Namurian"

M.A. CALVER "Faunal succession in the Coal Measures of Britain"

R.H. WAGNER "The significance of floras for Upper Carboniferous stratigraphy"

H. BODE "On Carboniferous Floras"

M. LYS "Rapport sur les foraminifères du Carbonifère moyen et supérieur"

A.C. HIGGINS "The significance of conodonts in the Carboniferous of Europe"

R. NEVES "Stratigraphic distribution of Carboniferous miospores - a progress report on
the results of C.I.M.P. Stratigraphy Working Group (1965)"

A. BOUROZ "Caractères pétrographiques et genèse des niveaux à kaolinite dans les séries
houillères"

J. SCHEERE "Les roches stériles et leurs possibilités de corrélation (Carbonifère de
la Belgique)"

W.F.M. KIMPE "Occurrence, development and distribution of Upper Carboniferous
Tonsteins in the paralic West German and Dutch coalfields and their use as
stratigraphic marker horizons"

The proceedings of this meeting have been recently reprinted. (The original version
was only available to participants of the meeting). Copies can be obtained from
Dr A.C. HIGGINS, Dept of Geology, University of Sheffield, St Georges Square,
Sheffield 1, England. Cheques which should be in £ Sterling should be made payable
to Dr A.C. HIGGINS.

V. FORTHCOMING MEETINGS

XIII INTERNATIONAL BOTANICAL CONGRESS

The Executive Secretary of this Congress, W.J. Cram, has asked potential participants to send their names and addresses together with the sections and field trips of interest to: 13th IBC, Australian Academy of Sciences, PO Box 783, Canberra A.C.T. 2601, Australia. If this information is sent, it will not be necessary to return a preliminary reply form, and the names will be added to the list of those who will receive the second circular.

The following symposia are planned for Section II on historical botany: names of convenors of the symposia are included.

Advances in Paleobotany and Palynology (D. CHRISTOPHEL)
Applications of tree ring studies to Ecology and Climatology (J. OGDEN)
Development of regional vegetation types in Pre-Quaternary time (E. TRUSWELL)
Development of the plant geographical pattern of Australasia (J.M.B. SMITH)
Gymnosperms: Paleozoic and Mesozoic (TAYLOR & DELEVORIAS)
History and Ecology of crops and cropping systems in the Americas (I. FARRINGTON)
Man's influences on the ranges of plants (N.M. WACE)
Origins and evolution of angiosperms (DILCHER & CREPET)
Persistence and change in vegetation (WALKER & ANDERSON)
Physiological problems in evolution (J.A. RAVEN)
Plant geographical results of changing Cenozoic barriers (P. RAVEN)

A.A.S.P. FIRST ANNOUNCEMENT - 1981 ANNUAL MEETING

The 1981 Annual Meeting of AASP will be held in New Orleans, Louisiana, at the Monteleone Hotel. 7-10 October. The hotel is located 1½ blocks inside the French Quarter, within easy walking distance of a variety of excellent restaurants. Members are encouraged to bring their spouses. Varied tour arrangements are available without extensive pre-planning. The weather is likely to be warm (mid to high 80's) during the day and 70's in the evening.

The meeting will begin with a series of invited papers dealing with "Morphologic Lineages". The technical sessions will be organized in the following categories: biostratigraphy, morphology, paleoecology/biogeography, and organic geochemistry. Each session will be highlighted by an invited address. A poster session will be held in conjunction with the icebreaker.

In addition to the normal social and business gatherings attendant to any AASP meeting, an evening riverboat cruise with seafood and beer is planned.

AASP members are urged to come to New Orleans and participate in the technical sessions. The formal call for papers will appear in the next AASP Newsletter, as will information on reservations, registration, etc.

Please note that the FINAL DEADLINE FOR ABSTRACT RECEIPT is 15 AUGUST 1981.

THIRD N. AMERICAN PALAEONTOLOGICAL CONFERENCE August 5-7 1982

This is sponsored by the Paleobotanical Section of the Botanical Society of America and is titled: "Geological Factors and the Evolution of Plants". Contributors will be asked to address the effects of geological factors upon the evolutionary history of plants or the reciprocal influence of plants upon geological processes. Both botanical and geological perspectives are desired, and an interdisciplinary approach is essential.

Interested contributors are invited to submit a title and abstract (on a form available from the secretary) of the material they intend to cover to the steering committee on or before August 1 1981. The steering committee will choose from among the submissions so as to render the final presentation of uniform content and quality (sic). Acceptance/rejection notification will be made before the contributed paper deadline of September 15 1981. Participants to the symposium will be invited to submit a manuscript at the time of the symposium for inclusion in a symposium volume. Write to Bruce H. Tiffney, Secretary of the Symposium Steering Committee, Department of Biology, Yale University, 260 Whitney Avenue, P.O. Box 6666, New Haven, Conn. 06511, USA.

PALYNOLOGY OF THE NORTH ATLANTIC MARGINS

The Second Joint Meeting of the Commission Internationale de Microflore du Paleozoique and AASP is to be held in Dublin from 13 to 15 September 1982, hosted jointly by Trinity College and the Geological Survey of Ireland. All sessions will be held in Trinity College, Dublin.

Papers and demonstrations on the theme "The Palynology of the North Atlantic Margins" will be given preference for inclusion in the program, but contributions on other topics will also be welcomed. Several working groups will hold meetings during the conference, and some of these will present progress reports. It is anticipated that papers dealing with palynomorphs of all ages from Precambrian to Quaternary will be included in the program.

Registration will begin on Sunday, 12 September. Lectures, demonstrations, and working group meetings will take place on 13 to 15 September, inclusive. Two field excursions will be held immediately after the meeting, one lower paleozoic and the other upper Paleozoic. These will each be for either one or three days, depending on the preference of participants. The conference languages will be English and French. Abstracts of papers presented will be printed and distributed before the meeting. Papers read at the meeting will be considered for publication in PALYNOLOGY subject to the normal AASP publication procedures.

It is estimated that the registration fee will not exceed 20 pounds for professional members. A substantially reduced rate is planned for students. Limited accommodation will be available in Trinity College. Accommodation will also be available in numerous hotels of varying standards close to the College.

The First Circular was circulated in mid-1980. Additional enquiries and requests for further information should be addressed to either of the two local secretaries: GEOFF CLAYTON, Dept Geology, Trinity College, Dublin 2 or KEN HIGGS, Geological Survey of Ireland, 14 Hume Street, Dublin 2, Ireland. Second Circular will be issued in Spring 1982.

Meeting of A.P.L.F. 28 September 1981 - 1st October 1981, Geneva, Switzerland

Theme Palynology and Botany

Further details may be obtained from Dr M. CHRISTIAN REYNAUD, Laboratoire de Geologie, 13 Rue de Maraichers, 1211 Geneva 4, Switzerland.

HEXROSE CONFERENCE ON MODERN AND FOSSIL DINOFLAGELLATES, Tübingen, Germany, September 1981. (Dr HANS GOCHT, Inst. U. Museum für Geol., u. Palaont., Sigwartstrasse 10, D-7400 Tübingen 1, West Germany).

A two-day meeting has been organized for the Thursday 9th and Friday 10th of April 1981, in PAU (Universite de Pau et des Pays de l'Adour) by the AGSO (Association des Geologues du Sud-Ouest) and ICCP (International Committee for Coal Petrology) to discuss the theme:

GEOLOGY OF COALS, OIL SHALES, and KEROGENS

This meeting will enable us to exchange all new information in this field.

PROVISIONAL PROGRAM OF PAPERS

1. General

- J. VETTER (ex Charbonnages de France) ; paralic and limnic basins
- D. WELTE (Kernforschungsanlage, JHlich, R.F.A): Organic Matter in Sedimentary rocks
- D. NOEL and G. BUSSON (Museum National d'Histoire Naturella, Paris: the biological origin of fossil organic matter
- B. ALPERN (Univ Orleans): - Oil shales (reserves, petrology, valorization)
- Classification of fossil organic combustibles
- J. CLARET, P. ROBERT (SNEA-P, Boussens): The source rocks of some oil producing basins.

2. Coals and Oil Shales in the World

- R. FEYS, (BRGM, Orleans): Distribution of soild combustibles in the world
- D.G. MURCHISON et al. (Univ Newcastle, UK): Coal basins in the United Kingdom
- W. SPACKMAN (Univ Pennsylvania USA): Coals in North America
- H.J. GLUSKOTER (Exxon, Houston, USA): Oil shales in North America
- A.I. GINSBURG, A.V. LAPO (VSEGEI, Leningrad, USSR): Coals and oil shales in USSR.

3. Transformation and Sedimentation of Coals

- M.R. TEICHMULLER (Landesamt Krefeld, RFA): Coalification in geological studies
- M. BLESS (Geological Bureau Heerlen, Pays-Bas) - E. PAPROTH and M. WOLF (Landesamt, Krefeld, RFA): Coal basins in European variscides
- L. COUREL (Univ Dijon): Coal in its sedimentological environment
- R. PELET (IFP Rueil-Malmaison): Orgon Project: organic matter distribution in oceanic sediments

4. Methods and New Techniques

- J. GROLIER (Univ Orleans): structural and tectonic analysis as an aid to reconstruction of coal basins genesis
- J. SUAUA (Schlumberger, Londres): diagraphic tools for coal recognition
- Study Group for Deep Gazification in North France (GESG): In situ gaxification in North coal basin, France.

EXCURSIONS

After the meeting, two field trips are planned (optional), with a limited number of places available.

- on 11 April (Saturday): Pliocene lignites mining plant in ARJUZXANX (Landes)
- on 11 and 12 April (Saturday and Sunday): visit to the Stephanian coal basin in DECAZEVILLE, SW Massif Central.

PUBLICATIONS

- on arrival, attending members will receive the abstracts and final program.
- a special book containing all papers will be sent to participants at the end of 1981

PRACTICAL INFORMATION

- an hotels list (with prices) will be sent to people who answer the 1st circular.
- buses will be available between University and PAU City centre for lunch and evening meals.
- An amical evening party is organised on 9th April (Thursday) for participants and accompanying people.
- a simultaneous interpretation English-French and French-English will be available during the two-day meeting.

APPLICATION Forms to be returned by the 1st March 1981 to:

R. DELOFFRE, Societe Nationale ELF-AQUITAINE-PRODUCTION, 64018 - PAU CEDEX France
Te.: (59) 68.97.22, poste 4245

APPLICATION FORM for AGSO-ICCP

Meeting, PAU, April 1981

(to be returned to R. DELOFFRE - SNEA-P, 64018 PAU CEDEX, France, before 1 March 1981)

GEOLOGY OF COALS, OIL SHALES and KEROGENS

Name Christian Name Title

Address

- wish to attend the two-day meeting on 9th and 10th April 1981 (participants fee: 120 F.F.)

YES	NO
-----	----

- wish to attend the evening party on 9th April (price: 80 F.F.)

YES	NO
-----	----

Payment enclosed F.F. by bankers order ☐ postal order ☐

- wish to participate in a field trip: either: ARJUZANX

YES	NO
-----	----

or: DECAZEVILLE

YES	NO
-----	----

(provisional price: ARJUZANX : 80 F.F.
DECAZEVILLE: 400 F.F.)

net price will be indicated to first applicants (number limited).

IUGS SUBCOMMISSION ON CARBONIFEROUS STRATIGRAPHY
MEETING, AUGUST - SEPTEMBER, 1981

SECOND CIRCULAR

PROGRAMME

The meeting is being arranged in three parts; each can be attended independently of the others.

LOCATION OF STRATOTYPES

Westphalian	(C	Barnsley, Yorkshire
	(B	Duckmanton, Derbyshire
	(A	Langsett, Yorkshire
Namurian	(Yeadonian	Buxton, Derbyshire
	(Marsdenian	Marsden, Yorkshire
	(Kinderscoutian	Blackburn, Lancashire
	(Alportian	Buxton, Derbyshire
	(Chokierian	Keighley, Yorkshire
	(Arnsbergian	Slieve Anieran, Ireland
	(Pendleian	Chatburn, Lancashire
Dinantian	(Brigantian	Kirby Stephen, Cumbria
	(Asbian	Asby, Cumbria
	(Holkerian	Holker, Grange over Sands, Cumbria
	(Arundian	Pembroke, S Wales
	(Chadian	Chatburn, Lancashire
	(Courseyan	Kinsale, Cork, Ireland

- A. Field excursion to examine fourteen boundary stratotypes in northern England (from low Visean to Westphalian C) of Regional Stages used in north-west Europe. Travel is by bus
- Aug 25 Assemble at the Cumbria Grand Hotel, Grange-over-Sands, Cumbria for dinner. Grange-over-Sands can be reached by train from London or Manchester, changing trains at Lancaster. The excursion bus will be going that afternoon from the Institute of Geological Sciences, Leeds, via Manchester Airport to Grange-over-Sands and participants will be able to travel on it.
- Aug 26 Visits to the Asbian, Brigantian and Holkerian stratotypes and return to Grange-over-Sands. If time allows a visit will also be made to a basal Arnsbergian section.
- Aug 27 Visits to the Kinderscoutian, Chadian, Pendleian and Chokierian stratotypes en route to Leeds (Parkway Hotel).
- Aug 28 Visits to the Alportian, Yeadonian and Marsdenian stratotypes and return to Leeds.
- Aug 29 Visits to the Westphalian A, B and C stratotypes and return to Leeds.
- B. Two-day indoor meeting at the Parkway Hotel, Leeds.
- Aug 29 Assemble for dinner at the hotel.
- Aug 30) Consideration of West European stratotypes. Reports on Carboniferous) classification other regions. Symposium on a 'mid-Carboniferous'
- Aug 31) ('Mississippian-Pennsylvanian') boundary. The meeting will end at about 5 p.m.
- C. Field excursion to visit the three Carboniferous stratotype in the British Isles not seen on excursion A. Travel by bus or mini-bus on land and by ship from Pembroke to Cork.

- Aug 31 Dinner at the Parkway Hotel, Leeds
- Sept 1 Depart from Leeds at 8 a.m. for South Wales and the Arundian stratotype. Continue to Pembroke for overnight ferry to Cork.
- Sept 2 Visit Courceyan stratotype and travel to night accommodation at location yet to be decided.
- Sept 3 Visit Arnsbergian stratotype and travel to Dublin for dispersal at about 3 p.m.

COSTS

- A. Pre-meeting excursion: £107 per person to include bus travel, accommodation and all meals from dinner on 25 Aug to lunch on 29 Aug inclusive.
- B. Meeting: £40 per person to include accommodation and all meals from dinner on 29 Aug to lunch on 31 Aug inclusive.

If you do not wish to go on the post-meeting excursion C, but would like to stay in Leeds on the night of 31 Aug, accommodation is available at the Parkway Hotel for £20 (dinner, bed and breakfast).

- C. Post-meeting excursion: £107 per person, to include bus travel; accommodation and all meals from dinner on 31 Aug to lunch on 3 Sept inclusive; travel cost including a berth on the ferry.

Registration Fee: £15 payable by all participants.

Note that the prices include accommodation in a single room or sharing a twin-bedded room; tax and service; also morning coffee and afternoon tea at the indoor meeting. They do not include insurance and drinks (wine, beer and spirits). Accommodation for all three parts of the programme is limited and will be allocated on a first come, first served basis,

PAYMENT

1. By non-United Kingdom participants:
should be made through your own bank in the form of a bank to bank transfer, in British currency, to 'SCCS 1981 Meeting', Account number 73031462 at the Midland Bank Ltd (Code 40-27-33), 62 Arndale Centre, Cross Gates, LEEDS LS15 8EU, England. (All charges to be paid by the payer.)
2. By UK participants:
should be made by cheque payable to 'SCCS 1981 Meeting' and enclosed with the completed booking form.

THIRD CIRCULAR with full details of the itinerary and programme will be sent only to those people who have completed and returned the attached booking form and paid the appropriate remittance.

Note It is each participant's own responsibility to ensure they have any visa(s) necessary for their visit to the United Kingdom and (for those going on post-meeting excursion C) the Republic of Ireland.

NEW MEMBERS

SHAABAN, A.A., Dr.
Amoco Production Co
P.O Box 591
Research Center, 2 G06
Tulsa
Oklahoma 74102
U.S.A.

Carboniferous palynology

CAMERON, Donald K., Dr
Chevron Oil Company
1111 Tulane Avenue
New Orleans
Louisiana 70112
U.S.A.

McFARLANE, Rena
Geology Dept.
University of Alaska
Fairbanks
Alaska 99701
U.S.A.

WOOLLAM, Ron
Institute of Geological Sciences
Ring Road Halton
Leeds LS15 8TQ
England

Jurassic palynology

RIDING, James
Institute of Geological Sciences
Ring Road Halton
Leeds LS15 8TQ
England

Jurassic palynology

MACRAE C.S.
Geological Survey
Private Bag X112
Pretoria 0001
South Africa

CHANGE OF ADDRESS

WRIGHT, Robert P., Dr
Cities Service Company
Box 3908
Tulsa
Oklahoma 74102

FILATOFF, Joh, Dr.
A.A.R. Ltd
P.O. Box 880 G.P.O.
Brisbane
Queensland 4001
Australia

EGNER, Barbara E
Amoco Production Company
P.O. Box 3092
Houston
Texas 77001
U.S.A.

PEPPERS, Russel A.
Illinois State Geological Survey
Champaign
Illinois 61801
U.S.A.