



Commission Internationale de Microflore du Paléozoïque

NEWSLETTER 45 November 1993

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- 9-11 First circular Symposium on **Stratotypes and Stages, Palynology, Palaeoenvironments and Stratigraphy**, 6th-10th September 1994, Sheffield, U.K.
- 12-14 First circular **I International Symposium 'Biostratigraphy of Oil and Gas Basins'**, 3th-10th December 1994, St-Petersburg, Russia.
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Note of the Secretary-general

Together with this newsletter the Acritarch Newsletter N° 4 and the Chitinozoa Newsletter N° 12 are distributed. Persons who did not receive them with this issue are probably not on the mailing list of those subcommissions. Those interested in receiving a copy can obtain them from the secretariat and can ask the contact persons of the subcommissions to be added to their mailing list.

We have included in this newsletter more news than before of the subcommissions and the working groups, with a report of the final meeting of the *Grandispora* working group, plus an agenda of international conferences, symposia, meetings where palynomorphs are discussed from the Late Precambrian, Palaeozoic and Triassic.

At the next C.I.M.P. Symposium in september 94 in Sheffield we will have a C.I.M.P. general assembly where the accounts will be presented, and the financial situation and future plans of the C.I.M.P. will be discussed. An agenda for the meeting will be put in the Newsletter N°46 (april 94).

The C.I.M.P. Newsletter is open for all members for announcements for symposia or conferences, abstracts of previous ones, news from the working groups and subcommissions, changes of address of members or other messages. These should reach the secretary by the end of march and the end of october each year.

IUGS Subcommittee on the Carboniferous Stratigraphy (SCCS)

Early Carboniferous Stratigraphy - LIÈGE 1993 (8-10 june).

Five articles relating (partly) to palynology, appeared in the proceedings volume of the Meeting, called **Devonian-Carboniferous Boundary**, in the *Annales Société Géologique Belgique*, vol. 115, fasc. 2 (1992), published in june 1993.

Avchimovitch, V.I. Zonation and spore complexes of Devonian and Carboniferous boundary deposits of Pripyat depression (Byelorussia). pp. 425-452.

Avchimovitch, V.I., Turnau, E., & Clayton, G. Correlation of uppermost Devonian and Lower Carboniferous miospore zonations in Byellorussia, Poland and Western Europe. pp. 453-458.

Higgs, K., Streef, M., Korn, D. & Paproth, E. Palynological data from the Devonian-Carboniferous boundary beds in the new Stockum trench II and the Hasselbachtal borehole, northern Rhenish Massif, Germany. pp. 551-558.

Mamet, B. The Nanbiancun algal microflora: a study of the Devonian-Carboniferous boundary in China. pp. 623-628.

Bless, M.J.M., Becker, R.T., Higgs, K., Paproth, E. & Streef, M. Eustatic cycles around the Devonian-Carboniferous boundary and the sedimentary and fossil record in Sauerland (Federal Republic of Germany). pp. 689-702.

Abstracts of the talks or posters on palynology presented at the conference. are given below.

Carboniferous Time

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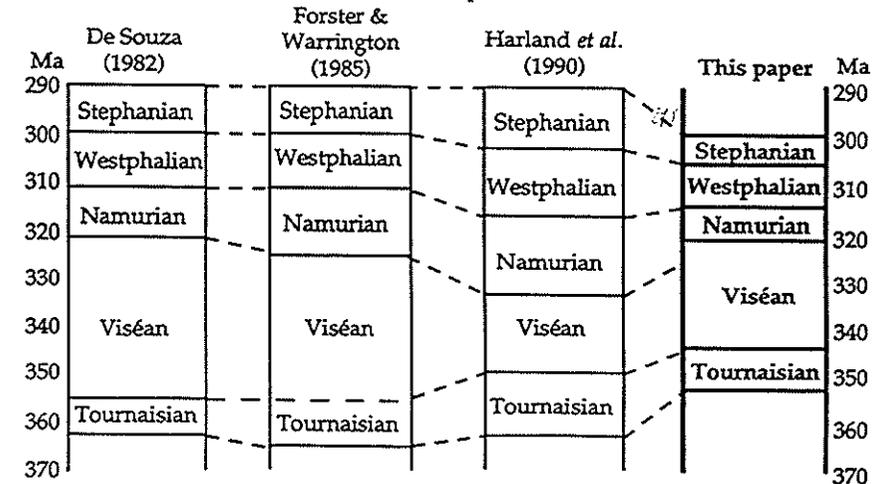
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A major development in the study of Carboniferous processes was the publication by Hess & Lippolt (1986) of accurate ⁴⁰Ar/³⁹Ar ages for Late Carboniferous stages. As a resource with which to calculate rates of Upper Carboniferous processes the importance of this age control cannot be exaggerated. Below the Namurian, Carboniferous time has been less well constrained; Forster & Warrington (1985) emphasised the dependence of Dinantian time on ages for continental volcanics having uncertain correlation with marine fauna.

Using the SHRIMP ion microprobe method of zircon U-Pb dating, we are measuring the ages of Carboniferous volcanic horizons in Australia and Europe. In the Late Carboniferous, the Australian record comprises glaciene continental sediments and low diversity cold water faunas that correlate mainly within Gondwana. Zircon dating is placing these environments in international context by correlation to the ⁴⁰Ar/³⁹Ar ages in Europe. Both the onset of glaciation, and the Australian marker for the base of the Permian-Carboniferous Reversed magnetic interval, are now dated as Viséan instead of Westphalian as previously supposed.

In the Early Carboniferous, Australian volcanics interfinger with cosmopolitan warm climate marine faunas; their ages directly constrain the Devonian-Carboniferous boundary (c.354Ma), the Tournaisian-Viséan boundary (c.343Ma), and the equivalent of the British Holverian (c.332Ma), all of which are much younger than interpreted in previous time scales. Zircon dating of European Brigantian (c.325Ma) and Arnsbergian (c.315Ma) horizons requires a Viséan-Namurian boundary near 320Ma, and constrains the numerical age of the proposed mid-Carboniferous boundary. When these zircon age constraints are combined with the earlier ⁴⁰Ar/³⁹Ar dating, a radically shorter and reconstructed division of Carboniferous time is produced.



Forster, S.C. & Warrington, G., 1985. Geochronology of the Carboniferous, Permian and Triassic, in Snelling (ed.) Geol. Soc. London Mem. 10, 99-103.

Harland, W.B. and others, 1990. A Geologic time scale 1989, C.U.P. 263pp.

Hess, J. C. & Lippolt, H.J., 1986) ⁴⁰Ar/³⁹Ar ages of tonstein and tuff sandines: new calibration points for the improvement of the Upper Carboniferous timescale. Chem. Geol. 59, 143-154

De Souza, H., 1982. Age data from Scotland for the Carboniferous time scale, in Odin (ed) NDS Part 1, 455-460

**MIOSPORES FROM THE DEVONIAN-CARBONIFEROUS TRANSITION
IN HUNAN, SW-CHINA.**

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The relationship between two species of *Retispora* Staplin (*lepidophyta* and *macroreticulata*) and one species belonging to a comparable, but monolete, genus (*Retizonomoletes hunanensis* n.g., n. sp.) is discussed and incorporated in a "morphon" concept.

The lack of characteristic species occurring both in China and in Western Europe, doesn't allow to propose accurate interregional biostratigraphic correlation near the Devonian-Carboniferous boundary. Only one of several outcrops studied, the Malanbian section, shows some possibilities of correlation as *R. lepidophyta* is found in two samples from clastic beds of only fifty centimeters thick, at the transition between the Menggong'ao and Malanbian Formations. The incoming of *R. lepidophyta* is shown above the last occurrence of *R. hunanensis*. Only one sample yields spores above the youngest samples containing *R. lepidophyta* (1.5m above, in the same clastic beds). This last sample, although very rich in spores, doesn't contain this species.

As we know that the disappearing of *R. lepidophyta* marks the Devonian-Carboniferous boundary, perhaps we have to consider that the limit is situated in the clastic beds. In that case the *R. lepidophyta* Biozone might be very condensed or reduced due to a sedimentary gap. Perhaps, the highest incoming of *R. hunanensis*, in this last sample, has to be regard as reworked in relation with the condensation or gap.

**NEW PALYNOLOGICAL DATE FROM THE LOWER PART OF THE
HANGENBERG SHALES IN SAUERLAND, GERMANY**

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New palynological data has been obtained from several levels in the lower part of the Hangenberg Shales at Stockum, Oberrodinghausen and Hasselbachtal. In addition, two old assemblages from the Hangenberg Shales equivalent at Riescheid have been restudied and reappraised. In all cases the miospore data show that the lower part of the Hangenberg Shales can now be assigned to the late Devonian LN miospore Biozone. The LE/LN miospore Biozone boundary occurs at or very close to the base of the shales and this can be correlated with the lower/middle praesulcata conodont Biozone boundary. Previous assignments of older LL miospore Biozone assemblages from the Hangenberg Shales are now considered to be incorrect. The reasons for this are discussed but it is best explained by strong overprinting of reworked LL Biozone species into early LN Biozone assemblages. In the light of this new evidence, the suggestion that the boundary between the Wocklum Limestone and the Hangenberg Shales is diachronous is no longer tenable.

This paper		Gao Lian-da, 1990	
Carbon.	Malanbian Fm		
	Clastic bed		
Devonian	Minggong'ao Fm	<i>R. lepidophyta</i>	FM (Zone)
	Shedong Fm	<i>Retizonomoletes hunanensis</i> sp. nov.	VI (Zone)
	Ouyichang Fm		LN (Zone)
			LE (Zone)
			LL (Zone)
	Myunso Fm		
			Carboniferous
			Devonian

Correlation of *Retispora lepidophyta* and *Retizonomoletes hunanensis* n. sp. around the D/C boundary.

LATEST DEVONIAN MIOspore ASSEMBLAGES FROM THE BERGISCH GLADBACH
PAFFRATH SYNCLINE (BERGISCHES LAND REGION, GERMANY)

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Strunian miospore assemblages have been extensively studied in the Ardenne-Rhenish area. S zonation schemes (Ospel Zones GF - LV) have been developed in the Dinant Synclinorium (summarized in STREEL et al. 1987). The type sections of the middle Famennian to early Strunian in the Ardenne developed in a shallow platform facies are well dated by index fauna. The late Strunian to Tournaisian spore zonation (Interval Zones LL - HD) as established in Ireland has been applied to Devonian/Carboniferous quiet water ("basinal") settings in the Sauerland where faunal studies offer independent biostratigraphic control (HIGGS & STREEL 1984). Due to palynologically unfavourable lithologies successions with the LV - LL miospore zones have not been identified in any section in western Europe.

During routine palynological analysis of Devonian sediments of the Bergisch Gladbach - Paff Syncline (about 20 km northeast of Cologne) latest Famennian basinal strata hitherto unknown in this region have been recognized. Geologically, the syncline is located between the southwest extension of the Ebbe Anticlinorium in the north and the Bensberg Anticline in the south. The latest Famennian sediments consist predominantly of mudstones very rich in brachiopods, bivalves, cephalopods, ostracodes, miospores, acritarchs and prasinophytes. Some levels have yielded a conodont fauna indicating a position in the Middle to Late *expansa* Zone (M. PIEC pers. comm.). The miospore assemblages are rich and diverse in composition. The thermal alteration is extremely low (TAI approximately 2+) compared to Upper Devonian sediments in the Ardenne-Rhenish area. Consequently, the spore preservation is very good to excellent. Species of the *Diducites* complex are particularly abundant. Other stratigraphically significant species are *Cyrtospora cristifera*, *Grandispora cornuta*, *G. famenensis*, *Raistrickia corynoides variabilis* and *Retispora lepidophyta*. The occurrence of *Knoxisporites literatus* is still doubtful. Hence, the assemblage has been assigned to the Ospel Zone LV.

JUX (1975) previously reported the presence of *Retispora lepidophyta* in the Knoppenbießen Formation (Nehdenian) which until recently was believed to be the youngest strata occurring in the Bergisch Gladbach - Paffrath Syncline. These finds could not be verified and are obvious based on a misidentification of strongly corroded camerate spores.

References

- HIGGS, K. & STREEL, M. (1984): Cour. Forsch.-Inst. Senckenberg, 67: 157-179.
JUX, U. (1975): Palaeontographica, B149: 113-138.
STREEL, M. et al. (1987): Rev. Palaeobot. Palynol., 50: 211-229.

MIOspores FROM THE TYPE LOCALITY OF THE ESNEUX Fm.,
MIDDLE FAMENNIAN OF THE OURTHE VALLEY,
EASTERN BELGIUM

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The Ourthe valley in eastern Belgium is the type area where MOURLON (1875) has subdivided, for the first time, the Famennian Stage. The latter has been intensively investigated since 25 years by THOREZ and collaborators. The Esneux Fm. the mostly silty and sandy lithologic group named "Psammites du Condroz" which succeeds to the shaly "Schistes de la Famenne". The Esneux Fm. is overwhelmed by the nodular limestones of the Souverain-Pré Fm. At the type locality of Esneux, a eight meters thick shaly bed occurs in the uppermost part of the Esneux Fm., seven meters below nodular limestones containing an early *marginifera* conodont fauna.

Six samples taken in the shales contain an assemblage of miospores which can be referred to the GF (*gracilis-famenensis*) Zone which in the area underlines the late Famennian VCo (*versabilis-cornuta*) Zone.

This is an early occurrence for this zone which is known also in the area from younger formations. The early character for the Zone is reinforced by the occurrence in all the samples, aside of typical specimens of specimens of *Grandispora famenensis* with reduced ornamentation (known as *G. famenensis minutus* in Bielorussia), unknown in younger formations. Typical specimens are lacking from the lowermost shaly sample; a few specimens with reduced ornamentation (but without typical forms) are also found in a more silty bed, some 10 meters below the base of the shales. It is concluded that the base of the GF Zone is probably reached in the section.

The first occurrence of *G. famenensis* and of the variety *minutus* is found in the *Cornispora varicornata* assemblage-acme Zone of Bielorussia, (base at the Eletz/Petrikov limit) where the lower part of which is correlated with the *rhomboidea* conodont Zone. The first occurrence of *G. famenensis* appears thus as a good marker for rather long distance correlations.

LATE DEVONIAN - EARLY CARBONIFEROUS MIOSPORES FROM
THE MENEN BOREHOLE, NAMUR SYNCLINORIUM, BELGIUM

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Samples from the Menen Borehole (West Flanders, Belgium) provide new datation based on miospores of the late Devonian and early Carboniferous of the western part of the Namur Synclinorium. Despite the discontinuity and the heterogeneity (cores and cuttings) of sampling, sediments of middle Famennian, uppermost Famennian (Strunian) and late middle to late Tournaisian are recognized.

Assemblages contain abundant and well diversified miospores. The state of preservation of the miospores is fairly good with material yellow to brown allowing easy identification. It indicates that the coalification level is much lower here than in nearby Dinant Synclinorium.

The oldest assemblage corresponds to the *gracilis-famenensis* (GF) Zone of middle Famennian age, with well documented *Grandispora famenensis*.

In the next assemblage, the joint occurrence of *Retispora lepidophyta*, *Verrucosisporites nitidus* and *Spelaeotriletes obtusus* indicates the highest level in the *R. lepidophyta* range Zone. It corresponds to the highest part of the Famennian, very near, but below the Devonian/Carboniferous limit. This is the first record of such a level in the Namur Synclinorium where the "Strunian" beds are often lacking.

The highest assemblages correspond to the *pretiosus-clavata* (PC) Zone of late-middle to late Tournaisian age. This last result is rather intriguing because the lithology is similar with the Hastarian Lmst. of middle Tournaisian age. The implication of these data on the regional geology is emphasized.

UPPER FAMENNIAN AND LOWER CARBONIFEROUS PLANTS
FROM THE RHEINISCHES SCHIEFERGEBIRGE

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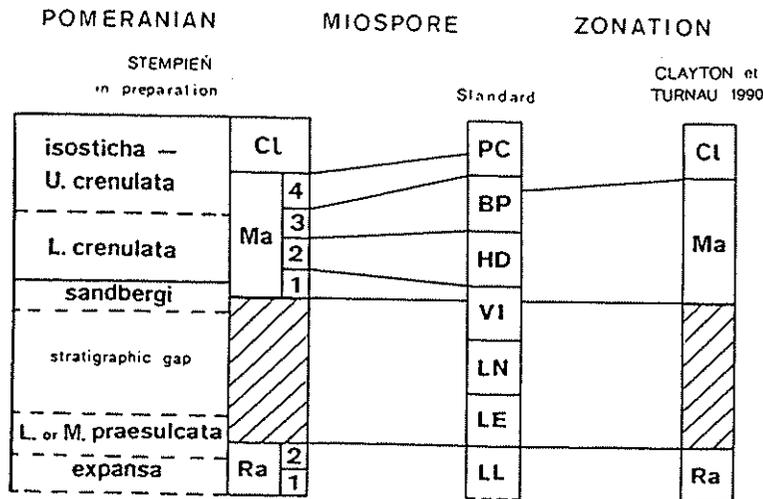
The evolution of the seed habit was one of the most important innovations in the evolution of land plants. The appearance of the first seed plants in the late Famennian and their subsequent diversification during the rest of the Devonian and Lower Carboniferous is being increasingly elucidated by recent macrofossil evidence, particularly from Europe and the US. In spite of recent advances, the largescale morphological and ecological diversification of the group observed by the end of the Tournaisian, is poorly understood. Such information relies on macrofossil evidence from sediments just above and below the D/C boundary. New findings from localities in the Rheinisches Schiefergebirge include seed plant assemblages from the Hangenberg Sandstein at Oese and exceptionally preserved stems and leaves of seed plants from the marine black shales (liegende alaunschiefer) at Oberrödinghausen. At least two types of seed from Oese including one form with 'winged' integument lobes demonstrate a wide divergence in seed structure and presumed ecological functioning of the seed integument by the end of the Devonian. Biomechanical analyses of exceptionally preserved stems from Oberrödinghausen (up to 1 metre length) have recently shown that some early gymnosperms such as *Calamopitys* were not self-supporting and were not 'trees' but rather leaning shrubs, probably growing in dense stands. Ongoing analysis of the Oberrödinghausen stems suggests that large leaves may have evolved for mechanical support of the stem in addition to light interception.

ASSEMBLAGES DES SPORES ET ZONATION PRES DE LA
LIMITE D/C, EN POMERANIE, NW POLOGNE.

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Les séries proches de la limite D/C, au Nord de la Pologne, en Poméranie, sont accessibles uniquement par les forages profonds. Elles sont formées généralement par des couches alternantes de dépôts carbonatés et argileux, où les microfaunes et les microflores (les conodontes, les ostracodermes, les miospores et les acritarches) sont tantôt nombreuses, tantôt absentes. Les matériaux pour les études palynologiques viennent des argiles noires, de quelques forages de profondeur d'environ 3.000 m. Après les recherches sur 40 échantillons, on a distingué deux zones Ra (*Tumulispora rarituberculata*) et Ma (*Convolutispota major*) et 6 sous-zones décrites et corrélées avec la zonation européenne standard (Turnau 1978, Turnau et Clayton 1990).



MIOspores FROM LATE FAmENNIAN VARVES AND TILLITES OF BRAZIL

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In large intracratonic basins of northern Brazil, diamictite: with striated, faceted and polished pebbles, rythmites with dropstones, erratic boulders and striated pavements indicate the existence of an ice age in the Famennian time. The sediments laid down under glacial and periglacial conditions make up the upper Cururi Formation in the Amazonas Basin and the uppermost Cabeças Formation in the Parnaíba Basin. Formerly dated by the presence of the fucal alga *Protosalvinia* (*Foerstia*), known in the middle Famennian (*marginifera* conodont Zone equivalent) of eastern USA, these sediments are now dated by miospores (LE = *lepidophytus-explanatus* and LN = *lepidophytus-nitidus*) as equivalent to the *praesulcata* conodont Zone which underlines the D/C limit. These sediments containing also a few reworked miospores from older deposits contrast with the palynological content of a rythmite with dropstones which was sampled in the Cabeças Formation of a borehole (1-TM-1-MA) in the Parnaíba Basin.

In this rythmite, 95 % of the specimens (not of the species!) of miospores are reworked from almost all Eifelian to Famennian miospore zones, except from those of the conodont *crepida* to *marginifera* equivalent time interval. The preservation state of the material is excellent. There are between one and eight thousands palynomorphs (miospores, spiny acritarchs and chitinozoans) per gram of sediments in this sediment.

The rythmite is composed of an alternance of sandy-silty (A) and silty-clayed (B) layers, about 0.5 mm thick, each. Both types of layers contain evidences of lateral influx rather than purely vertical sedimentation. Palynomorphs are almost as abundant in A than in B. It seems therefore that the dark part of the rythmite (B) is not sedimented vertically during winter when the surface of the lake is covered by ice (like in near-glacier varves of the Pleistocene) but is a result of periodic change in the transport capacity of the melted waters entering the lake (like in periglacial varves known in the Holocene).

Amongst the fifteen species of uppermost Famennian (equivalent to the middle and late *praesulcata*) only three are regularly in A and B, the other twelve being only found in B (the dark layer!). Plants (unknown) corresponding to the 12 species must produce their spores during the season of influx of silty-clayed. A consequence is that this rythmite is probably a true varve and that these 12 species represent the contemporaneous flora of the varves rather than being also reworked from older sediments.

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A quantitative (and qualitative) analysis of palynomorphs has been made in middle (Hony) and outer (Sinsin) shelf paleoenvironments at the F/Fa boundary and in argillaceous/silty/sandy material intercalated in between nodular limestone layers which represent "biologically bathyal" paleoenvironments (Hasselbachtal and Oberrödinghausen) at the D/C boundary.

Between the uppermost limestone bed containing the Frasnian linguiformis conodont Zone and the lowermost limestone bed containing the Famennian early triangularis conodont Zone many samples were taken in the 150 cm (Hony) and the 30 cm (Sinsin) of, sometimes black, siliciclastics. The relative proportions of miospores versus spiny acritarchs (a function of the distance between the deposits and the shore-line) evolve in a similar pattern in both sections. It demonstrates that the "increasing shallowing" detected in the last Frasnian limestone by the conodonts continue throughout the mudstone until and, at Hony only, within a level of fissile shale (immediately below the Famennian limestone) where the sedimentation rate is dramatically increasing. A sharp change in the quantitative composition of acritarchs occur in the lower part of the black mudstone but no major break in miospore development is noticed throughout the sections.

Between the uppermost layers of the Famennian Wocklumer Kalk containing the middle praesulcata conodont Zone and the lowermost layers of the Carboniferous Hangenberg Kalk containing the sulcata conodont Zone, several metres of siliciclastics (sometimes black) were sampled in Hasselbachtal and Oberrödinghausen sections and boreholes. Acritarchs are poorly present in these samples where miospores are very abundant (at least ten times more than in the shelf environment of Hony and Sinsin!) indicating a sudden replacement of the "biologically bathyal" conditions by very near shore conditions of environment. This interpretation is supported by the occurrence of reworked miospores in these samples (mainly at Oberrödinghausen). The sedimentation rate is not as important as found in the shales below the first Famennian limestone at Hony. The timespan of deposition corresponds here to one complete miospore zone (LN Zone) known to characterize some 250 m of sediment in the South Munster Basin in Ireland. It seems that the sedimentation rate was even lower in the upper part of the sections where a major (climatic?, not marked in lithology) change took place, representing the extinction event (LN/VI B.) for plants/miospores.

It is concluded from the comparison of both areas that, despite an evident similarity in the lithological succession, anoxic and regressional events "danced to a different beat" at the F/Fa and D/C boundaries. The eustatic fall was quicker and bigger with also a sharper (climatic?) change at the D/C than at the F/Fa B.

Elżbieta Turnau and Violetta I. Avkhimovitch

SUCCESSION OF SOME STRATIGRAPHICALLY IMPORTANT
MIOSPORE SPECIES IN LATE HASTARIAN AND IVORIAN
(POLAND AND BELORUSSIA)

The miospore assemblages of late Hastarian and Ivorian from Belorussia described by Kedo in the 60-ties have been recently reexamined and compared with those from NW Poland. It appears that the Belorussian assemblages contain more species in common with the Polish and NW European ones than was thought before. These are the species which have either been known from the three regions under different names or have been only recently recorded from Belorussia for the first time.

The following species are thought to be synonymous.

<i>Prolycospora claytonii</i> Turnau	<i>Lophotriletes minutissimus</i> Naumova sensu Kedo
<i>Colatisporites denticulatus</i> Neville	<i>Acanthotriletes multisetus</i> (Luber) Kedo
<i>Schopfites claviger</i> Sullivan	<i>Acanthotriletes dominans</i> Kedo (pars)
<i>Schopfites cf. delicatus</i> Higgs	<i>Acanthotriletes dominans</i> Kedo (pars)

The species recorded from Belorussia for the first time are *Anaplanisporites baccatus* (Hoffmeister, Staplin and Malloy) Smith and Butterworth, *Crassispora trychera* Neves and Ioannides, *Raistrickia clavata* (Haguebard) Playford, *Schopfites delicatus* Higgs and *Spelaotriletes pretiosus* (Playford) Neves and Belt.

In Belorussia, in a single subsurface section, *Prolycospora claytonii*, *Colatisporites denticulatus* and *Spelaotriletes pretiosus* appear at the same level. This level can be correlated with the base of the *Prolycospora claytonii* Biozone of NW Poland, defined on the first appearance of *P. claytonii*. The two other species just mentioned appear in Poland very close to this boundary.

In the studied section in Belorussia, *Schopfites claviger* and *Lycospora pusilla* appear successively 19 m and c. 60 m above the level of the first appearance of *P. claytonii*. These two levels can be correlated with the base of the (new) upper *P. claytonii* subzone (the new upper subzone = the former middle + upper subzones) and the base of the *L. pusilla* Biozone in Poland.

The above data suggest that the base of the *P. claytonii* Biozone of NW Poland and its equivalent in Belorussia corresponds to the base of the *pretiosus-clavata* (PC) Biozone of NW Europe, and the base of the upper *P. claytonii* subzone and its Belorussian equivalent corresponds to the base of the *claviger-macra* (CM) Biozone of NW Europe.

STUDIES ON THE BASE OF THE *PROTRITICITES* ZONE. A REPORT ON SCCS PROJECT GROUP 5.

E. Villa⁽¹⁾, V. I. Davydov⁽²⁾, M. V. Konovalova⁽³⁾ & S. Remizova⁽⁴⁾.

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- 2) VSEGEI, Sredny pr. 74, 199026 St. Petersburg (Russia)
- 3) TPO VNIGRI, Pushkina, 2, 169400 Ukhta (Russia)
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The Subcommittee on Carboniferous Stratigraphy, at its meeting of 1989 in Provo (USA), selected several stratigraphic intervals which should be worthy of further paleontological investigation worldwide, the aim being to detect evolutionary changes in various fossil groups which could be of potential use in establishing global correlation. One of the selected intervals was that roughly equivalent to the Moscovian/Kasimovian transition, for the study of which the SCCS promoted the creation of the Working Group on the base of the *Protriticites* Zone.

After three years of activity, members of the Working Group have generated some reports which summarise the first results. In some cases, the sections analysed do not comply with the recommendations of the SCCS, since they correspond to strata encountered in boreholes (e. g., Timan-Pechora), or to outcrops not accessible by normal transport (e. g., Chaika Cape). However, the aim of the Working Group in this first step is rather the palaeontological characterisation of an stratigraphic interval, not the proposal of an stratotype. Therefore, any significant palaeontological information affecting this interval has been welcome for our objectives.

We have now information available from Chaika Cape (Phai-Khoi), northern Timan, Timan-Pechora, Spitsbergen, the Donetz Basin and the Cantabrian Mountains.

The main efforts of the Cantabrian group have been directed to the analysis of the fusulinid, conodont, brachiopod, coral and spore contents of a section (Las Lacerias section) showing a continuous development of limestones beds throughout the Moscovian/Kasimovian transition. So far, the most promising data come from fusulinids, since the section, composed of a relative thick and undisturbed carbonate succession, provides the opportunity to study the *Fusulinella-Protriticites* lineage in a some detail. Further studies on the fusulinids, conodonts, spores and algae, are in progress.

The Chaika Cape section is situated on the shore of the Barents Sea, where a carbonate succession containing the Moscovian/Kasimovian boundary outcrops along the western side of the Yugorsky Peninsula. The succession is mainly composed of reefal limestones, which have yielded ammonoids, fusulinids, brachiopods, bivalves, ostracods, bryozoans and rugose corals. Data from earlier authors are compiled and reviewed, with emphasis on the stratigraphic significance of fusulinids, and establishing a fusulinid zonation throughout the uppermost Moscovian/lower Kasimovian interval. The presence of two levels with ammonoids allows the recognition of two ammonoid zones and to effect their correlation with those based on the fusulinids.

Two Carboniferous sections from Spitsbergen, i. e. the Kolosseum and the Trollfugifella sections, have been studied most recently. Detailed information on the distribution of fusulinids from Moscovian upwards into the Permian, has been first obtained, and this includes the stratigraphic levels of interest to the Working Group.

Exposures of the Malaja-Pokajama section along the lower reaches of the Volonga River, in northern Timan, show a continuous succession of marine strata. A stratigraphic interval, including the Upper Moscovian and Kasimovian, has been sampled in detail. These rocks have yielded abundant fusulinid faunas, showing a gradual replacement of assemblages. It has been possible to establish the main changes in evolutionary lineages and to erect a new biozonation.

The fusulinid contents of strata in four boreholes in the Timan-Pechora region have also been analysed. These show associations with somewhat peculiar characteristics. They allowed establishing five different fusulinid zones in rocks of Late Moscovian (Myachkovsky) and Kasimovian ages.

The report from the Kalinovo section summarises the fusulinid, conodont and plant megafossil occurrences throughout the well-known paralic succession of the Donetz Basin. The studies focused on an interval from limestone N₂¹ to limestone O₄¹. A new fusulinid zonation of potential importance for the correlation of the Donetz Basin with other areas, has been established.

Other reports, summarising studies in different parts of the world, are expected to be finalised in the near future. Members of the Working Group are asked to extend their investigations to levels higher than the base of the *Protriticites* Zone, since there is evidence to show the existence of more significant palaeontological events approximately at the base of the *Montiparus* (or *Triticites*) Zone.

Commission International de Microflore du Paleozoique
STAGES AND STRATOTYPES, PALYNOLOGY, PALAEOENVIRONMENTS AND STRATIGRAPHY.

Provisional Registration and Request for Second Circular

NAME: _____ TITLE: _____
 Forenames Family Name

ADDRESS:

TELEPHONE NO.:

FAX NO.:

I wish to attend the symposium YES/NO

It is likely that I shall be accompanied by _____ person(s)

I/we require accommodation in Tapton Hall of Residence YES/NO

I am interested in attending the field excursion YES/NO

I wish to offer a paper(s) YES/NO

Provisional title of paper:

I wish to offer a poster(s) YES/NO

Provisional title:

Please return this form to the Local Secretary:

Dr. D.W. Jolley
Centre for Palynological Studies
Department of Earth Sciences
University of Sheffield
Mappin Street
Sheffield S1 3JD
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Fax: (0742) 739826

CIMP

Commission Internationale de Microflore du Paleozoique

Symposium on

STRATOTYPES AND STAGES, PALYNOLOGY, PALAEOENVIRONMENTS AND STRATIGRAPHY

6th-10th September, 1994

Centre for Palynological Studies, Department of Earth Sciences, University of Sheffield, England.

Organising Committee: Geoff Clayton, Ken J. Dorning, David W. Jolley, Bernard Owens, Edwin Spinner

Local Secretary Dr. D.W. Jolley
Centre for Palynological Studies
Department of Earth Sciences
University of Sheffield
Mappin Street
Sheffield S1 3JD
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Fax: (0742) 739826

FIRST CIRCULAR AND PRELIMINARY REGISTRATION

CIMP and the Centre for Palynological Studies are organising this joint symposium with particular emphasis on Phanerozoic stages and stratotypes, to reflect the need for discussion on modern palynological work. This should permit a more detailed interpretation and understanding of some European type sections and possible correlation on a world wide basis. During the Symposium meetings of the Acritarch and Chitinozoan subcommissions are planned, reflecting both academic and industrial interests in the Palaeozoic.

Scientists wishing to attend the Symposium may present papers or posters relating to the broad theme of the meeting. During the Symposium short optional field visits will be made which will include some of the Carboniferous stratotypes of northwest Europe (eg. Langsettian, Duckmantian).

Technical sessions will be held at Tapton Hall of Residence. Facilities will be available for attending members to take part in workshop discussions on various aspects of palynomorph groups which will be held in the laboratories of the Centre for Palynological Studies. Those wishing to attend and present papers are asked to complete the attached preliminary registration form and return to the local secretary by 1st March 1994.

Accommodation:

Accommodation will be based at Tapton Hall of Residence (forum for the 1987 "Boundaries in Palynology" CIMP - University of Sheffield meeting) where the technical sessions and poster demonstrations will be held. The likely cost will be around £40 per day, updated costs will be given with the second circular.

Papers already offered to the organisers include:

- Late Permian Microflora from Turkey
- Further Application of Microwave Technology in Palynological Preparation
- Acritarch Biostratigraphy of Silurian Depositional Sequences
- Early Namurian Microfloras from Northeast England
- Palynological Evidence for Early Tertiary Climate Change

Second Circular:

A second circular will be mailed to all those responding during March 1994, and will include details of the programme, costs and a final registration.

The Organizing Committee of the First International Symposium 'Biostratigraphy of oil and gas basins' is honoured to invite You to attend and contribute to

FIRST INTERNATIONAL SYMPOSIUM
'BIOSTRATIGRAPHY OF OIL AND GAS BASINS'

ORGANIZERS:

- All Russia Petroleum Scientific-Research Geological-Exploration Institute (VNIGRI)
- Ruscomnedra
- With assistance:
- VSEGEI, VNIGNI, VNIIOKEANGEOLGIA, SNIIGGIMS
- Russian Academy of Sciences
- Russian Academy of Natural Sciences
- Committee of higher education (St.-Petersburg University, Moscow University).

At the forthcoming event You have a possibility to get acquainted with results of biostratigraphical research of petroliferous sequences of the World and with the collections of flora and fauna from key sections of Russia and former USSR. There are large oil and gas basins in Russia: Timan-Pechora, Pre-Caspian, Volga-Ural, Western- and Eastern-Siberian, Sakhalinian oil and gas region, shelves of Barents and Kara seas. Hydrocarbon producing sequences are related in these basins with sections of different age. Main Russian reports will present the results of detailed litho- and biostratigraphic subdivision of producing formations, substantiation of detailed correlation of their age and forecast of distribution within the basins. The following reports plan to be presented for:

- The Ediacaran-Cambrian of Eastern Siberia (Rozanov A.Yu., Melnikova L.M., Rudavskaya V.A., Vasilieva N.I. and others);
- The Paleozoic and Mesozoic of Russian platform (Menner V.V., Fedorov D.L., Ovnatanova N.S., Repin Yu.S., Beznosov N.V. and others);
- The Paleozoic and Mesozoic of Timan-Pechora province (Jakovleva S.P., Bogatskiy V.I., Barskov I.S., Melnikov S.A., Chirva S.A., Fedorova V.A. and others);
- The Paleozoic and Mesozoic of Siberia (Kiritchkova A.I., Krasnov V.I., Vavilov M.N., Zakharov V.A., Kozlova G.E., Iliyeva V.I. and others);
- The Cenozoic of Far East and Sakhalin (Salnikov V.A., Gladenkov Yu.B., Zhidkova L.S., Brutman N.J. and others).

The participants of the Symposium will exchange an experience of biostratigraphical research of leading fossils' groups and their significance to compile the unified scales and to draw the interregional key levels.

ORGANIZING COMMITTEE

- Chairman: Dr. M.D. Belonin, corresponding member of Russian Academy of Natural Sciences.
- Co-Chairmans: Dr. A.I. Kiritchkova, head of division.
Dr. A.I. Zhamoide, corresponding member of Russian Academy of Sciences, chairman of Russian Stratigraphic Committee.
Dr. Yu. Remone, chairman of International Stratigraphic Committee.
Dr. G. Hedberg, vice-president of ESSO, USA.

Secretariat:

General secretary: Dr. O.A. Sochevanova

- Secretaries: Dr. I.R. Makarova
Dr. A.A. Matveenko
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TENTATIVE SCHEDULE

- 3 December - Opening ceremony. Plenary meeting.
4-6 December - Scientific meetings.
7 December - Plenary meeting. Closing ceremony.
8-10 December - Seminar on the Phanerozoic fossils.

SCIENTIFIC PROGRAM

- Section 1. Biostratigraphy of the Ediacaran and Paleozoic basins.
Section 2. Biostratigraphy of the Mesozoic basins.
Section 3. Biostratigraphy of the Cenozoic basins.
Section 4. Key fossil groups.
Section 5. General subdivision of petroleum formations of buirred territories (litho-, seismo- and magnito-stratigraphy and control by biostratigraphic data).

SYMPOSIUM ORGANIZATION

Symposium will include plenary sections, sections, poster presentations and discussions on main problems of biostratigraphy.

Official languages of Symposium - Russian and English.
Simultaneous translation will be available.

Two forms of membership are suggested: participating member and accompanying member:

- Participating member makes a presentation, takes part in all events provided by the Program with right to vote, has a privilege to receive one copy of information materials and publications of Symposium and to participate in the final party.
- Accompanying members may take part in Symposium meetings without right to vote and attend the final party.

For the first registration participants must fill in the enclosing Questionnaire and send it to Organizing Committee till 1th October 1993. Any participant may cancel his participation in all or some measures of Symposium. Time and financial terms of such refusal will be expound in the second circular.

REGISTRATION FEES

Preliminary registration fees are listed below (as an 1st January of 1993)

Form of membership	participants (USD)	accompanying members (USD)
Symposium		
before 01.09.94	600	350
after 01.09.94	725	415
Seminar		
before 01.09.94	300	-
after 01.09.94	375	-

The registration fees are subject to revision in case of possible price changes.

The payments and terms of cultural program will be in the Second Circular.

The fact of fee's payment must be confirmed by sending (mail or fax) of payment order's copy to the Organizing Committee. If such copy will be absent the participants must pay the registration fees in cash during registration according with established rates.

On getting the confirmation of money income to VNIGRI account all cash payments will be reimbursed to participant to his account within 2 weeks.

PUBLICATIONS

Organizing Committee plan to edit the Symposium abstracts and proceedings.

Abstracts of all presentations must be mailed to Organizing Committee till 31 December 1993. The date of mailing will be considered the date of sender's postmark.

Since the Organizing Committee plan to get camera-ready copies of abstracts the following requirements must be completed:

- abstracts should contain not more than two pages,
 - abstracts should be typewritten in English and Russian, two copies in every language, double-spaced, paper format A4 (210-297 mm),
 - 30 lines a page,
 - 60 signs a line,
 - margins: left-30 mm, upper- 25 mm, right-20 mm,
 - pages do not number,
 - text should be thoroughly edited and corrected,
 - latin text should be printed or written distinctly in black.
- Abstracts disigned not accordance with the rules or sent later than 31 December 1993 will not be accepted by the Organizing Committee and will not be included in the Symposium program. The Scientific Committee of Symposium keeps right to select the presentations for Abstract volume and final proceedings.

TENTATIVE SCHEDULE

Return of questionnaire October 1, 1993
Deadline of Abstract receiving December 31, 1993
Second Circular's mailing March 1, 1994

The Second Circular will be sent only to those who return the questionnaire in time.

MEMBERSHIP QUESTIONNAIRE

INTERNATIONAL SYMPOSIUM "BIOSTRATIGRAPHY OF OIL AND GAS BASINS" AND SEMINAR ON THE FANEROZOIC FOSSILS

Family name _____
 Given name _____
 Profession, appointment _____

 Organization (In full) _____
 Address _____
 Telephone _____ Telex _____ Telefax _____
 No. of section you are going to participate _____
 Membership: participating member _____ accompanying member _____
 Presentation form: oral _____ poster _____
 Title _____

 Names of co-authors _____

 Accompanying members: _____
 Names: 1. _____
 2. _____
 Participating in seminar: _____ yes _____ no _____

Send questionnaire to secretariat of Organizing Committee:
 VNIGRI, Litelny 39, St-Petersburg 191104, Russia
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 Ipatov Yuri I.
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News from the Acritarch Subcommittee

1. At the time of writing, publication of the proceedings of the 1991 Nottingham meeting of the acritarch and chitinozoa subcommissions is imminent. The bibliographic reference is: Molyneux, S.G. & Doming, K.J. (eds.) 1993. Contributions to acritarch and chitinozoan research. *Special Papers in Palaeontology*, no. 48.

The following papers are included:

- Achab, A. & Asselin, E. Upper Silurian and Lower Devonian chitinozoan microfaunas in the Chaleurs Group, eastern Canada.
- Dufka, P. & Fatka, O. Chitinozoans and acritarchs from the Ordovician-Silurian boundary of the Prague Basin, Czechoslovakia.
- Fatka, O. Chitinozoans and acritarchs in latest Tremadoc-early Arenig sediments of the Prague Basin, Czechoslovakia.
- Lakova, I.C. Biostratigraphy of Lochkovian chitinozoans from north Bulgaria.
- Ribecai, C. & Vanguetaine, M. Latest Middle-Late Cambrian acritarchs from Belgium and northern France.
- Riding, J.B. & Duxbury, S. A new non-marine acritarch from the Middle Jurassic of Britain.
- Rubinstein, C.V. Acritarchs from the Upper Silurian of San Juan, Argentina: biostratigraphy and palaeobiogeography.
- Servais, Th. The Ordovician acritarch *Frankea*.
- Swire, P.H. The palynology of the Lower Wenlock of the Wenlock type area, Shropshire, England.
- Van Waveren, I.M. & Marcus, N.H. Morphology of recent copepod egg-envelopes from Turkey Point, Gulf of Mexico, and their implications for acritarch affinity.
- Vavrdova, M. Acritarch assemblages in the Arenig Series of the Prague Basin, Czechoslovakia.

2. A one-day workshop on acritarch taxonomy will be held at the University of Sheffield in conjunction with the CIMP symposium on 'Stratotypes and Stages, Palynology, Palaeoenvironments and Stratigraphy' in September 1994. The workshop will be held on Tuesday 6 Sept. 1994; the dates of the symposium are 6th-10th September 1994. The intention of the workshop is to investigate, and hopefully resolve through discussion, some of the problems associated with acritarch taxonomy. Further details from Dr. S. G. Molyneux, British Geological Survey, Keyworth, Nottingham NG12 5GG, U.K.

3. The new Acritarch Newsletter N° 4 is out, contains 19 pages and distributed amongst Acritarchs workers together with this CIMP Newsletter N° 45. Persons who did not find a copy attached are not on the list of acritarch workers and can obtain a copy from the CIMP Secretary-General. If they want to become a member of the Acritarch subcommission please notify the convener.

Stuart Molyneux (convener)

News from the Chitinozoa Subcommittee

1 The new Chitinozoa newsletter N° 12 is out! It was prepared by Stuart Sutherland and is distributed together with this issue of the C.I.M.P. Newsletter to all persons active in Chitinozoa. If you would not have received the Chitinozoa Newsletter N° 12, please ask the secretary-general for a copy and give your name to Stuart Sutherland as a new Chitinozoa friend.

The Chitinozoa newsletter contains 14 pages of news from recent studies in different countries (Belgium, France, British Isles), titles of abstracts of conferences in the last 2 years, a questionnaire on Chitinozoa and computers, a call for papers for the next C.I.M.P. symposium in Sheffield (september 1994), a call for a database for Chitinozoa topotype material, new Chitinozoa friends and changes of addresses.

2. There will be also a special workshop for Chitinozoa workers at the C.I.M.P. meeting in Sheffield where a new president has to be elected, and where different project on Chitinozoa nomenclature, revision of genera & stratigraphic important species, standard biozonations, topotype material, and databases will be discussed.

News from the *Grandispora* Working Group

Report of the C.I.M.P. Working Group on the Famennian *Grandispora* complex.

The final meeting of this C.I.M.P. working group was held in Liège in June 1993. Members of the working group include: Violetta Avkhimovitch (Minsk, Belarus), Ken Higgs (Cork, Ireland), Stanislas Loboziak (Lille, France), Marzena Stempien (Warsaw, Poland) and Maurice Streef (Liège, Belgium). The group had met on four previous occasions in Krakow (1990), Liège (1991), Aix (1992) and Lille (1992). The objective of the working group has been to make a taxonomic revision and stratigraphic correlation of the *Grandispora* taxa occurring in the Famennian rocks of eastern and western Europe. This complex is biostratigraphically important as many of these taxa have been used as zonal index species in the respective regions. At each of the working group meetings representative material has been exchanged and studied, this has allowed a consensus of agreement to be reached on the morphological delineation and nomenclature for all the *Grandispora* taxa studied. The outcome of this is that more confident and meaningful correlations can now be made between the Famennian successions and spore zonations.

In the report to the meeting Ken Higgs outlined the results of the working group. The generic concept of *Grandispora* was described, and comparisons with other genera such as *Geminispora* and *Cristatisporites* were made. The morphological criteria used to differentiate between the various species, such as exoexine/intexine ratio, exine wall thickness and ornament shape, size and distribution was described. Using such criteria, fifteen species of *Grandispora* have been recognized in both regions. A summary of the diagnostic features of each species was presented.

Maurice Streef then gave a report which described the stratigraphic ranges of the fifteen *Grandispora* species in the Famennian of both regions. New correlations of the Famennian spore zonation schemes were proposed and described. It is planned to publish the results of the Famennian *Grandispora* project in 1994.

Ken Higgs (Convener)

News from the Vallatisporites Working Group

Objective:

To re-examine the status of all species currently assigned to the genus with a view to restating the generic diagnosis and clarifying the relationship between *Vallatisporites*, *Kraeuselisporites*, *Cirratriradites* and other related cingulizonate genera.

Methods:

Compilation of data records and descriptions of all published taxa world-wide.

Examination of paratype material from many type material samples of published species.

Circulation of populations and single grain mounts for examination by group members in order to facilitate a consensus opinion. These slide collections will be supplemented with other photographic materials.

Progress to date:

Collections of slides, single mounts and photographs are compiled as available for *Vallatisporites vallatus*, *V. verrucosus*, *V. ciliaris*, *V. banffensis*, *V. splendidus*, *V. galearis*, *V. agadensis*, *V. (Cirratriradites) rarus*. In addition, parallel collections have been made for *Kraeuselisporites echinatus* and *K. ornatus*, *Cirratriradites saturni* and various apparently relevant members of *Radiizonates*.

Future needs:

We appear to have access to most published Carboniferous species of *Vallatisporites* from Western Europe, North Africa and North America. We are anxious to receive material from South America and Australia where *Vallatisporites/Kraeuselisporites* are common.

We know that Gondwanan Province material from the late Carboniferous-Early Permian interval contains numerous representatives of this complex. We would welcome donations of material for study.

The Group needs to assess how many species previously assigned to *Archaeozonotriletes* and *Hymenozonotriletes* could be transferred to *Vallatisporites*. Access to rock samples or slides and photographs would be important.

The question of when did the earliest *Vallatisporites* appear and what are its precise morphological relationships to other taxa will need to be studied.

Members of Group:

Drs Turnau (Krakow), Clayton (Dublin), Higgs (Cork), Streel (Liège), Hills & Braman (Calgary), Byvsheva (Moscow), Utting (Calgary), Loboziak (Lille).

We would be pleased to hear from the CIMP members who would like to join us and can contribute material, slides, photographs and ideas.

Next meeting planned for Sheffield, September 1994.

Bernard Owens (convenor)

News from the Reworked Palynomorphs Working Group

Since two years, I'm collecting the references of researchers, interested in reworking of palynomorphs. After the publication of a questionnaire about the reworking in the "AASP newsletter" and in "Palynos" (dec 1990) I have received twenty two answers. Among them, twelve expressed their interest to be involved in the new working group. After the Devonian/Carboniferous Meeting in Liège, June 1993, and the publication of the CIMP Newsletter n° 44, two other colleagues have expressed by letter their interest for the creation of a CIMP Reworked Palynomorph Working Group.

A letter is now prepared to be sent to each of those researchers interested to be involved in our new working group. The letter will contain firstly, a list of all interested colleagues of our little group (names, addresses, main subject of interest, ...), and secondly, a proposition for a strategy of research.

In a first step, I think it is necessary to take a full scope of the situation about the subject in the similar way as done in Streel & Bless (1980). It is necessary to collect as much publications as possible where reworking of palynomorphs is either mentioned or the main subject of the publication. On the basis of all these publications reworking can be grouped in function of the age of the host rocks and of the primary source rocks. These data can be correlated with others parameters as palaeogeography, palaeoclimates, etc. It will be necessary to divide the work following our own stratigraphic interests. The framework of a working group is the only manner to treat such a large subject.

I hope that the first signs of interest shown by the members of our new working group will be the beginning of a growing research project on reworking of palynomorphs, where different research methodologies will meet.

Streel, M. & Bless, M.I.M. 1980. Occurrence and significance of reworked palynomorphs. Meded. Rijks Geol. Dienst 32 (1/14): 69-80.

Philippe Steemans (convenor)

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Agenda of palynological conferences, symposia, workshops 1994-1996:

1994 July 11-18, Bujumbura, Burundi, **II Symposium of African Palynology** (see newsletter 44)

1994 Sept. 6-10, Sheffield, U.K., CIMP Symposium on **Stratotypes and Stages, Palynology, Palaeoenvironments and Stratigraphy**. First circular in this newsletter.

1994 Sept. 19-23, Kerkrade, Heerlen, The Netherlands, **IV Palaeobotanical-Palynological Conference**, with field trips a.o. Devonian-Carboniferous of Belgium and Germany. Details: G.F.W. Hemgreen, Geological Survey of the Netherlands, P.O.Box 157, 2000 AD Haarlem, The Netherlands; Fax.: 31- 23- 401754.

1994 Dec. 3-10, Sanct-Petersburg, Russia, **I International Symposium on Biostratigraphy of Oil and Gas Basins**. Deadline for abstracts Dec. 31 1993. Details and first circular: Dr. Olga. A. Sochevanova, VNIGRI, Liteiny 39, St-Petersburg 191104, Russia (see also first circular in this issue).

1995 Aug. 28- Sept. 2, Krakow, Poland, **XIII International Congress on the Carboniferous-Permian**, Details: Sonia Dybowa-Jachowicz, Panstwowy Instytut Geologiczny, Oddział Górnośląski, 1 Królowej Jadwigi, 41-200 Sosnowiez, Poland. Phone: 48 32 66 20 36; Fax.: 48 32 66 55 22.

1995 Oct. 10-14, Ottawa, Ontario, Canada, **28th Annual Meeting of the American Association of Stratigraphic Palynologists**. Symposia, Technical Sessions, Posters, Field Trip. Details: Ms. Susan A. Jarzen, Canadian Museum of Nature, P.O. Box 3443, Station "D", Ottawa, Canada K1P 6P4, Fax: 1- 613- 954 4724.

1996 June 22-29, Houston, Texas, **9th International Palynological Congress** of the I.F.P.S., Symposia, Technical Sessions, Posters, Field trips. Details: Vaughn M. Bryant, Jr., Dep. Anthropology, Texas A. & M. University, College Station, Texas 77843-4352, Phone: 1- 409- 845 5242; Fax.: 1- 409- 845 4070. or John H. Wrenn, Center for Excellence in Palynology, Dep. Geology & Geophysics, Louisiana State University, Baton Rouge, LA 70803, U.S.A. Phone: 1- 504- 388 4683; Fax.: 1- 504- 388 2302.