M. STREEL

INTERNATIONAL UNION OF GEOLOGICAL SCIENCES
(IUGS)

INTERNATIONAL COMMISSION ON STRATIGRAPHY

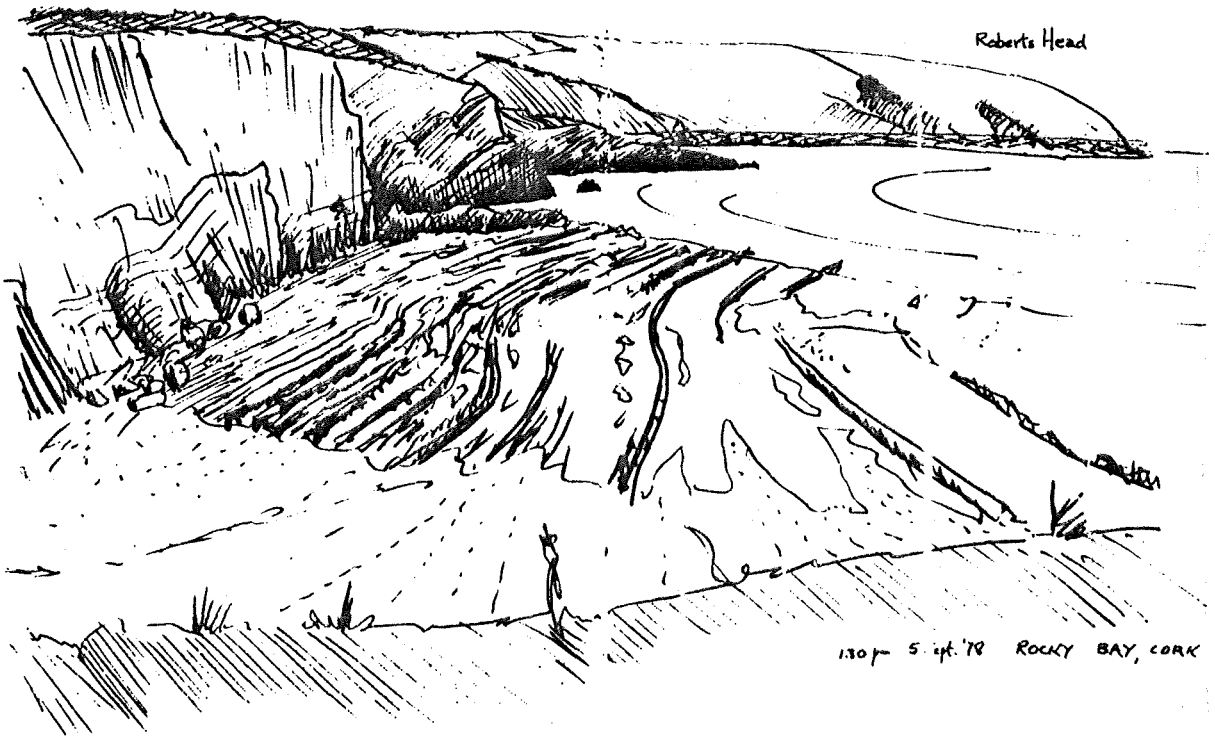
Working Group on the Devonian-Carboniferous Boundary

Chairman :
Dr. E. Paproth

Vice-Chairman :
Prof. Dr. E.A. Reitlinger

Secretary :
Prof. Dr. M. Streel

REPORT ON THE FIELD MEETING FROM GERMANY TO IRELAND
(27th August - 8th September 1978)



Part of the Old Head Sandstone Fm at Rocky Bay, Cork, Ireland (from M. HOUSE notebook, with his permission)

Immediately below the 1935 D-C limit and often more than 800 meters thick, this Fm. should be a lateral equivalent of the Hangenberg Schiefer in Germany. Their equivalent could be gapping near the base of the Calcaire d'Hastière and Calcaire noir d'Avesnelles in the Dinant basin in Belgium and Northern France.

IUGS WORKING GROUP ON THE DEVONIAN-CARBONIFEROUS BOUNDARY

REPORT ON THE FIELD MEETING FROM GERMANY TO IRELAND
(27th August -- 8th September 1978)

M. STREEL
Secretary

Sunday 27th August 1978.

Geological-Palaeontological Department and Museum of the Georg-August University, Goldschmidt Str. 3, D 34 GOTTINGEN.

Attending : B.F. GLENISTER, H. GROOS-UFFENORDE, H. HOLLARD, M. HOUSE, B. MAMET, C. MATTHEWS, E. PAPROTH, W. RIEGEL, P. SARTENAER, M. STREEL and H. UFFENORDE.

An exhibit had been prepared by the Göttingen Staff on the Stockum Limestone from the now filled trenches at the Stockum locality. The relation of this limestone at Stockum with the goniatite reference section at Oberröding-
(1) hausen was explained : O. WALLISER thinks that the first goniatites occur within bed 6 of VOHRINGER 1960 (from bed 3 of ZIEGLER 1971) rather than from the base of this bed.

From a discussion held in the Geological Department, several opinions arose which were rediscussed during the Courtmacsherry session and therefore are not reported here. H. GROOS-UFFENORDE remarked that sections containing several groups of fossils were rarely recorded on the D/C boundary as compared with other stratigraphical levels like the Lower/Middle Devonian boundary. M. HOUSE noted that a D/C boundary reference section in a facies which should not allow correlations with the Old Red facies, should be rejected.

H. HOLLARD and B. MAMET reported on possible sections respectively available in Morocco and Alaska.

Monday 28th August.

Drewer quarry.

Attending : C. CLAUSEN, B.F. GLENISTER, G. HAHN, R. HAHN, H. HOLLARD, M. HOUSE, H.R. LANE, B. MAMET, C. MATTHEWS, E. PAPROTH, C.A. SANDBERG, P. SARTENAER, M. STREEL and W. ZIEGLER.

This section originally studied by H. SCHMIDT, has recently been resampled for Conodonts by C. CLAUSEN and K. LEUTERITZ on both side of a grey-greenish shale unit (n° 12) on the NE wall of the quarry where it is thinning to nothing. The results are not yet available but could be
(2) important as the D/C limit has traditionally been drawn within this unit at Drewer. Note however that this shaley

unit is thicker on the NW-wall of the quarry and could there include nodular limestones missing on the NE wall.

G. HAHN showed typical trilobites from the shaley unit n° 7, also containing the Conodont Crenulata zone. He assumed a Phacops specimen found for the first time in this quarry to have fallen from layers corresponding to the top of the Devonian. He emphasized differences between Limestone facies and Culm facies trilobites.

Tuesday 29th August.

Borke-Wehr by Wocklum, Oberrödinghausen and Oese sections.

Attending : B.F. GLENISTER, G. HAHN, R. HAHN, H. HOLLARD, M. HOUSE, H.R. LANE, K. LEUTERITZ, B. MAMET, C. MATTHEWS, E. PAPROTH, C.A. SANDBERG, P. SARTENAER, W. SCHÄFER, M. STREEL and W. ZIEGLER.

The small old quarry at Borke-Wehr by Wocklum is the type locality of DENCKMANN'S "Wocklumer Kalk". The Hangenberg Schiefer is here 1 m.5 thick.

Oberrödinghausen is the reference section for the Goniatite zonation which serves to delineate the Heerlen 1935 base of the Carboniferous system.

W. ZIEGLER explained the new conodont evidences in this and other related sections. The boundary between the Lower and the Middle costatus is below the base of Wocklumeria. The Hangenberg Schiefer d'nt contain carbonates at Oberrödinghausen and therefore have no conodonts; Siphonodella sulcata is present there in bed n° 1; O. WALLISER assumes Goniatites to occur only in bed n° 3, S. duplicata occurs in bed n° 5, 15 centimeters higher. S. praesulcata (with a Lower Protognathodus Fauna) is present below S. sulcata at Oese at the top of a rather thick (27 meters) Hangenberg Schiefer-Sandstein sequence, but the Hangenberg Kalk has no Gattendorfia.

In conclusion, there is nowhere in that region any
(3) published available section where the first occurrence (in a succession) of S. sulcata can be compared with the Gattendorfia first occurrence. A borehole crossing an unweathered
(4) Hangenberg-Kalk at Oberrödinghausen is planned and hoped soon. Oberrödinghausen railway cutting was the reference section of the BALVIAN Stage (Lower limit at the base of the Hangenberg Kalk) defined by H. SCHMIDT in 1971. Published data on the Seiler and Stockum now filled trenches do not help in showing only a succession of Lower and Upper Protognathodus faunas. The known relations between Siphonodella and Protognathodus biofacies were longly explained by C.A. SANDBERG.

DEVONIAN - CARBONIFEROUS BOUNDARY

The first meeting of the I U G S working group on the Devonian-Carboniferous boundary was held from August 27 to September 8, 1978.

Attending Members were B.F. GLENISTER (Iowa City, USA), H. HOLLARD (Rabat, Marocco), M. HOUSE (Hull, UK), M. LYS (Paris, France), B. MAMET (Montreal, Canada), C.A. SANDBERG (Denver, USA), E. PAPROTH (Krefeld, FRG) Chairman of the working group, P. SARTENAER (Bruxelles, Belgium), W. ZIEGLER (Marburg, FRG) and M. STREEL (Liège, Belgium) secretary.

Apologies for non attendance were received from I.CHLUPAČ (Praha, CSSR), G. PLAYFORD (Brisbane, Australia) and E.A. REITLINGER (Moscow, USSR).

Many specialists contributed for parts or all of the excursion : M.J.M. BLESS (Heerlen, The Netherlands), J.BOUCKAERT (Leuven, Belgium); C. BRAUCKMANN (Wuppertal, FRG), C. CLAUSEN (Krefeld, FRG), E. GROESSENS (Bruxelles, Belgium), G. HAHN (Marburg, FRG), R. HAHN (Marburg, FRG), K. HIGGS (Dublin, Ireland), H.R. LANE (Tulsa, USA), K. LEUTERITZ (Krefeld, FRG), T. MARCHANT (Dublin, Ireland), C. MATTHEWS (Bristol, England), D. NAYLOR (Dublin, Ireland), W. SCHÄFER (Krefeld, FRG), G.D. SEVASTOPULO (Dublin, Ireland), A.G. SLEEMAN (Dublin, Ireland), J. THOREZ (Liège, Belgium) and M. VANSTEENWINKLE (Leuven, Belgium).

The field trip started in Göttingen (FRG) and ended in Courtmacsherry (Ireland). An exhibit on the Stockum trenches, now filled, was prepared by O.H. WALLISER, H. GROOS-UFFENORDE, H. UFFENORDE and W. RIEGEL at Göttingen.

Twenty-two localities were visited in the FRG (Drewer, Oberrödinghausen, Borkewehr-Wocklum, Oese and Riescheid), Belgium (Evieux-Esneux, Chanxhe, Rivage and Anseremme), France (Avesnelles and Etroeungt), England (Maesbury, Clevedon and the Avon Gorge) and Ireland (Old Head of Kinsale, Rocky Bay, Myrtleville, Marino Point, Nohoval Cove, Ringabella, Minane Bridge and Flathead).

Sections and other explanatory data prepared for the participants are available, upon request, from the secretary.

Sedimentologic and biostratigraphic features of sections visited were reviewed during a morning session at Courtmacsherry.

Two correlation charts based on existing information and new interpretations formulated during the excursion were prepared. The charts cover a timespan ranging from the Upper styriacus to the Lower crenulata Zone, zonal reference being related to conodonts.

One chart presents detailed interzonations of different groups of fossils. The other correlates the lithostratigraphic successions.

These correlation charts will be submitted to many specialists for comment and are available, upon request, from the secretary.

One of the major accomplishments of the excursion was the opportunity to compare within a span of ten days depositional environments ranging from bathyal to continental with some rates of sedimentation more than one hundred times greater in some areas than in others. One of the important conclusion is that discontinuities are obvious or inferrable in almost all of the sections visited.

The members of the working group concluded collectively that :

1) There exists already a general correlation of strata near the Devonian-Carboniferous boundary, although refinement is desirable.

2) The most useful boundary will be one that lies within the span of fully documented continuous evolution of one or, more desirably, several groups of fossils.

3) Because of their abundance and tendency toward ubiquitous occurrence, microfossils offer the best practical guidance in selection of a boundary although megafossils will continue to play an important role.

4) Priority in definition of a boundary is a significant consideration but not a dominant one. The least disruption of the literature is a desirable objective.

Therefore, the working group members resolved that :

1) All specialists who are able to present detailed descriptive, statistical, and distributional data on evolution of a group of organisms in a section on either side of a proposed boundary are invited to provide these summary data for review at the next meeting of the working group (Carboniferous Congress meeting at Washington and Urbana, in May 1979). Circulation of data through the secretary six weeks prior to the meeting will be advantageous.

2) In the expectation that the relevant data will be available in 1979, it is the hope of the working group that a recommendation to the International Commission on Stratigraphy can be formulated at an early date.

IUGS working group on the Devonian-Carboniferous boundary

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I.U.G.S. WORKING GROUP ON THE DEVONIAN-CARBONIFEROUS BOUNDARY

JULY 16th, 1980 meeting at Paris

Université 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. REITLINGER and G. PLAYFORD.

The meeting originally scheduled at the International Geological Congress was held at the Laboratoire de Géologie 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 recalls 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 emphasizes 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 reports were then submitted :

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

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

U.S.S.R. K. SIMAKOV presents 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 asserts 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 asks members to focus their attention to a particular sections and urges 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 mentions 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 that the Omolon sections also provide good display of joint occurrence of Quasiendothyra and S. sulcata.

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

CANADA. B. MAMET (See report here enclosed) demonstrates 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 comments 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) recalls that no international stratotype can be proposed from the British Isles.

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

GERMANY. M. STREEL shows 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 mentionned below).

PALYNOLOGICAL CORRELATIONS. M. STREEL presents (See report here enclosed) the common opinion of a group of palynologists regarding D/C boundary level and boundary Stratotype. P. VAN VEEN demonstrates 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.

M. STREEL emphasized the importance of one of the unpublished Seiler sections where the first spore Verrucosisporites nitidus is found with a Lower Protognathodus
(5) fauna, allowing comparison with the Irish spore zonation (LN zone). Contacts were taken by W. ZIEGLER with the Iserlohn Municipality in order to open a new trench at Seiler.

Wednesday 30th August.

Riescheid railway cutting.

Attending : C.B. BRAUCKMANN, B.F. GLENISTER, M. HOUSE, H.R. LANE, B. MAMET, C. MATTHEWS, E. PAPROTH, C.A. SANDBERG, P. SARTENAER, W.SCHÄFER, M. STREEL and W. ZIEGLER.

A section in an area near the shelf/basin border, with a rather thick sequence of Hangenberg Schicfer including a decimeter thick sandstone layer, one meter below the top. H.R. LANE & W. ZIEGLER demonstrated the unnamed overlaying limestone to belong to the Upper Crenulata-isosticha zone. M. STREEL found a PLs 2 spore subzone in 7 meters from the Hangenberg Schiefer and emphasized the first occurrence of
(6) H. explanatus from the highest sample below the sandstone layer allowing comparison with the Irish spore zonation (LE zone*).

A rich unpublished trilobite fauna was demonstrated from this section by C. BRAUCKMANN.

Thursday 31th August.

Evieux rail cut, Chanxhe and "Rivage gare" sections. Anseremme section.

Attending : M.J.M. BLESS, J. BOUCKAERT, B.F. GLENISTER, E. GROESSENS, H.R. LANE, M. LYS, B. MAMET, C. MATTHEWS, E. PAPROTH, C.A. SANDBERG, P. SARTENAER, M. STREEL, J. THOREZ and M. VAN STEENWINKLE.

Evieux railway cutting has pre-lepidophytus spore assemblages (VU zone) and ostracod assemblages. CHIJOVA
(7) claimed this level to belong to her "Carbonimitia turgenevi-Maternella hemisphaerica" zone, which occurs in the Turgenev beds in USSR. M.J.M. BLESS and J. THOREZ respectively demonstrated the Ostracod-facies relationship and the local sedimentology.

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* More samples have been examined since the excursion and confirm the presence of H. explanatus in four samples immediately and up to one meter below the sandstone layer.

Between beds n° 159 and 160 is the lower limit of the HASTARIAN stage as defined by CONIL et al. 1976.

Friday 1st September.

Avesnelles rail cut and Etroeungt quarry.

Attending: M.J.M. BLESS, B.F. GLENISTER, E. GROESSENS, H. HOLLARD, H.R. LANE, M. LYS, B. MAMET, C. MATTHEWS, E. PAPROTH, C.A. SANDBERG, P. SARTENAER, M. STREEL and J. THOREZ.

Most of the discussion at the Avesnelles rail cut turned around the first occurrence of Quasiendothyra kobeitusana subsp. kobeitusana which has been published to income in bed 146 (term q) by MAMET, MORTELMANS & SARTENAER 1965, in bed 136 (term o) by CONIL & LYS 1971.

(12) A short text (read by E. GROESSENS) accompanied by photographs, was sent by R. CONIL who claims that many specimens from bed 135 (term n) have almost all characters of this species but 12 instead of 14-17 loci - B. MAMET disregards these last specimens as true Q. kobeitusana kobeitusana but remarks that he never collected any material between 146 and 135. Attendants feel that a compromise could be reached and therefore M. LYS resampled levels 135, 136 and one level (135/136) in between in order to submit this material to russian specialists for comparison with their concept of typical Q. kobeitusana kobeitusana*

(13) The Calcaire d'Etroeungt type locality was visited in the afternoon. Most of the attendants regret the lack of up to date macrofaunal studies of this famous quarry.

Saturday 2nd September.

The party travelled from Maredsous in Belgium to Bristol (UK).

Sunday 3rd September.

Maesbury railway cutting, Clevedon beach and Avon Gorge.

Attending : B.F. GLENISTER, H.R. LANE, M. LYS, B. MAMET, C. MATTHEWS, E. PAPROTH, C.A. SANDBERG, P. SARTENAER, M. STREEL and W. ZIEGLER.

The Maesbury railway cutting, in the Mendip Hills, is the most southern section available on the shelf at

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* Twenty-two slides containing forams have been cut from this material since the excursion. Arbitrarily labelled, they are submitted for reporting to Drs. CONIL, MAMET and REITLINGER, with additionnal material of their own these specialists would like to demonstrate.

Chanxhe section has the spore VU and PL zones and within the lastone, the first occurrence of the foraminifera Quasiendothyra kobeitusana. The first occurrence of Q. kobeitusana is better argumented in the Tohogne borehole, southward near the Ourthe valley. The top of Chanxhe section is faulted but the sequence is complete at "Rivage gare" reaching the Schiste du Pont d'Arcole of Middle Tournaisian age and higher horizons.

Conodonts are rare in these sections. Bispathodus
(8) ultimus of Chanxhe, bed 111 has later revealed to be an Icriodus and therefore the relations of these lateral equivalents of the Etroeungt Limestone with the Wocklumeria Kalk (Middle and Upper costatus zone) become questionned.

Other exposures in the Ourthe valley show limestone beds with a Costatus zone in VU spore zone*. Therefore the PL zone is clearly incoming within the Costatus zone.

An introduction to the Anseremme railway cutting were given by J. BOUCKAERT and M. VANSTEENWINKLE when stopping for lunch in the small village called Ocquier.

The most important new information was the first
(9) occurrence of Siphonodella duplicata in bed n° 172, but J. BOUCKAERT emphasized also the occurrence of the ostracod Pseudoleperditia ("Bernix") venulosa in approximately the same horizon (bed n° 174), ~~which should allow comparison with the Malenka Horizon in USSR, according to CHIJOVA.~~ M. VANSTEENWINKLE splendidly demonstrated a very shallow water succession starting from bed n° 161 upwards. Conodonts in such an environment were supposed to be redistributed.

J. BOUCKAERT also reported the important discovery of a presumed ancestor of Patrognathus variabilis in the $C_1^t a_2$
(10) zone of the Donetz basin in USSR, called P. dombassicus 1978 ~~(nomen nudum)~~. This species is there believed to characterise a new conodont zone between the costatus zone and the sulcata zone. A major gap was therefore supposed near the base of the Calcaire d'Hastière, at Anseremme. Part of this demonstration was opposed by C.A. SANDBERG whe recognized on "P. dombassicus" photographies a new species that he and W. ZIEGLER recently identified as Patrognathus nov. sp. in a lateral biofacies of the Lower Costatus zone.
(11) C.A. SANDBERG rather inferred the existence of a larger gap at Anseremme on the discovery of a Lower Costatus fauna near the top of the Etroeungt equivalent (bed n° 148), two meters below an uppermost Devonian Pelekysgnathus assemblage containing Protognathodus kockeli in the basal bed (n° 159) of the "Calcaire d'Hastière" sensu Conil. Such a large gap is in contradiction with a long tradition of considering the Calcaire d'Etroeungt as a lateral equivalent of the Wocklumer Kalk. The implications were not really discussed at Anseremme and are therefore reported as comments on the biostratigraphic charts.

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* This has been checked again, after the excursion, at Beverire section by E. GROESSENS.

Early Carboniferous time. Altogether with the Clevedon beach section, they offer poorly dated Lower Limestone Shale units (Advanced Siphonodella zone) and higher horizons.

Part of the Shirehampton beds at the Avon Gorge dated by spores (VI zone) was visited but the available time doesn't allow to study the contact with the Portishead beds, known to carry a PL assemblage of spores and therefore the transitional Devonian/Carboniferous sediments were seen nowhere in Britain.

Such transitional sediments with goniatites and spores are described in PADS 78 excursion guide-books but were not demonstrated to the working-party. We have noted locality 19 , in Southwest Wales, localities 20-21 and 30-31, in North Devon, locality 73 in North Cornwall.

Monday 4th September.

The party travelled from Bristol (UK) to Courtmacsherry in Ireland.

Tuesday 5th and Wednesday 6th September.

Old Head of Kinsale, Rocky Bay, Myrtleville, Marino Point, Novohal Cove and Flathead.

Attending : B.F. GLENISTER, K. HIGGS, M. HOUSE, H.R. LANE, M. LYS, B. MAMET, T. MARCHANT, C. MATTHEWS, D. NAYLOR, E. PAPROTH, C.A. SANDBERG, P. SARTENAIR, G.D. SEVASTOPULO, A.G. SLEEMAN, M. STREEL and W. ZIEGLER.

Most the visited section belong to the South Munster late Devonian-Carboniferous basin, which accumulated exceptionally thick shallow marine terrigeneous deposits generally containing spores but also locally megafauna (Goniatites,
(14) Brachiopods) which have been sampled by participants with the hope of better correlations.

These sediments are subdivided in a Devonian Old Head Sandstone Fm. and a Carboniferous Kinsale Fm. The boundary between these formations at Old Head of Kinsale does constitue the base of the COURCEYAN Stage (GEORGE et al. 1976).

The first incoming of zonal (Siphonodellids) conodonts occurs in the overlying Courtmacsherry Fm.

The underlying undifferentiated Old Red Sandstone
(15) has a diachroneous top which according to the locality ranges from LL to LN spore zones. (The O.R.S. ranges into the Carboniferous VI spore zone at Hook Head, a locality of South-east Ireland which was not visited).

Most of the biostratigraphy in this region is thus relying on a spore zonation which partially match the West german spore zonation. 840 meters of Old Head Sandstone
(16) (at Old Head of Kinsale) are the lateral equivalent of a few meters or less of Hangenberg Schiefer in Germany.

The LN/VI boundary (base of the COURCEYAN) corresponds to"an abrupt change in lithology whose sedimentologi-
(17) cal implications need to be understood in case they reflect gaps in the record". Its exact time equivalence with the comparable abrupt changes at the base of the German BALVIAN or the Belgian HASTARIAN has still to be demonstrated.

Thursday 7th September.

The first official meeting of the IUGS working group on the Devonian-Carboniferous boundary was held at Courtmacsherry Public House at 10 a.m. (Chairman : E. PAPROTH)

Attending : same as above.

"Ordre du jour" : 1) Review and comments on the visited exposures.
2) Boundary problems.
3) Next meetings.

1) The prominent characters of each section were reviewed by the Secretary and discussed. Most are pointed with number (1) to (17) in this report. Two correlation charts, one biostratigraphical, one lithostratigraphical based on the evidences shown during the field trip, arose from these and later discussions. These documents were made self explanatoring so that they can be distributed separately.

2) The Chairman first recalled the recommendations of the
(18) Subcommission on Carboniferous Stratigraphy expressed during the 7th Carboniferous Congress at Krefeld (1971). Each participant who marked at Krefeld his agreement on these recommendations and was also present at Courtmacsherry brought again his support. It was also noted that Prof. REITLINGER, although admitting a lower boundary to be better defined using foraminifers, clearly joined,
(19) in a recent paper*, the above agreement that the base of Gattendorfia subinvoluta approximately matches limits in a majority of fossil groups.

There was a discussion about the kind of taxonomic level to be used to characterise the boundary. W. ZIEGLER
(20) would accept a taxon below the generic level but B.F. GLENISTER argued in favor of a definition at the population level in a continuum. Several groups of fossils were then reviewed keeping in mind whether or not they would be acceptable for quantification but also which kind of geographical or facies restrictions they imply.

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* The Devonian-Carboniferous Boundary at the Present State of knowledge. Voprosy Micropaleontologii, 20, 1977. A rough french translation of this russian text is available from the secretary on request.

Finally remembering that each proposed regional boundary stratotype (BALVIAN, HASTARIAN, COURCEYAN) which approximates the first incoming of Gattendorfia subinvoluta level, are based on sedimentary discontinuities, M. STREEL proposed to slightly move away from
(21) these discontinuities : use for instance the first incomingof Siphonodella duplicata, fifteen centimeters higher than the first G. subinvoluta (sensu WALLISER) within the Hangenberg Kalk at the Oberrödinghausen historical section.

At that point of the discussions, the participants did not consider themselves to be entitled to reach any decision before having received the opinions from non-attending working group members as well as from other concerned researchers. It was decided then to diffuse as widely as possible a short report with a few statements inviting specialists to provide new data at the next working group meeting. A copy of this short report was sent for publication to LETHAIA and later to EPISODES.

3) The next meeting of the working group is planned during the Carboniferous Congress at Washington on Thursday 17th
(22) and Friday 18th May 1979 (two half days ?). The party will leave for St Louis on Friday night and has a one day and half excursion trip in the Mississippi valley on Saturday 19th and Sunday 20th joining Urbana on Sunday night. Specialised symposia and discussion groups will be arranged between Monday 21th and Friday 25th of May.

An invitation to the working group for visiting the Omolon River (Magadan, USSR) has been received from Academician N.A. SHILO and Dr. K.V. SIMAKOV. Originally proposed in conjuction with the Pacific Science Congress to be held at Khabarovsk in August 1979, a later date (1981 or 1982) was favoured in order not to compete with the next Carboniferous (1979) or Geological (1980) Congress*. Many attendants deeply regret the absence of soviet delegates to the present field trip and discussions and also the opportunity they would have had to learn more on the interest of the Omolon River region with respect to our problems. Participants also pointed the major interest of the Donets area.

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* However an invitation to arrange the meeting in 1979 in Kabarovsk has been reintroduced by Academician B.S. SOKOLOV during the Devonian symposium at Bristol. Unfortunately very few of the working group members seem to be able to accept this kind invitation at this early date.