



**INTERNATIONAL UNION OF
GEOLOGICAL SCIENCES
COMMISSION ON STRATIGRAPHY**

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**SUBCOMMISSION ON DEVONIAN
STRATIGRAPHY**

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I.U.G.S. Subcommittee on Devonian Stratigraphy

Newsletter No. 4, 1987

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The Calgary Offering

The detailed programme for the International Symposium on the Devonian System has just arrived in Bristol. It contains a rich collection of papers of direct interest and importance to the Subcommittee. A quick count suggests that well over 60 papers will contain data, discussions, conclusions and suggestions that the Subcommittee must heed. Not all the authors are known to the S.D.S. or perhaps even closely in touch with the Subcommittee, but their contributions are nonetheless important because of that. What is signified is the real growth of interest in the biostratigraphy of the system and in the palaeobiology of Devonian fossils. All stratigraphically important groups of fossils are featured, including vertebrates. Most regions of the globe and a great variety of facies are figured in these papers. Other relevant topics of increasing interest are those of Plant and Animal Communities, Physical Events and Global Biological Events, Global Reconstructions are represented by another 40 or more presentations.

Many members of the Subcommittee are presenting papers: some are co-chairmen of sessions. There are special sessions dealing with major regions such as the U.S.S.R., China, Australia and of course a major input on the North American Devonian.

Each paper at Calgary adds to our store of knowledge and the ensuing Symposium volumes will surely be worthy successors of those of Calgary '67. There will be so much to digest as a result of Calgary '87 that the Subcommittee would be forgiven if the peristalsis were uneven and given to hiccups. Nonetheless, the Subcommittee will be addressing itself to defining the Series and Stages of the System in time for the I.O.C. in Washington in 1989. The immediate task of the Subcommittee in 1987 will be to examine criteria for the definition of the base of the Pragian, Emsian, Givetian and Famennian stages.

While the S.D.S. is primarily concerned with biostratigraphic matters, other groups are actively seeking an improvement in Devonian global geography and environments. Understanding the physical background to the evolution of life in the Devonian period is important if geographical and stratigraphical distributions of taxa are themselves to be properly understood.

Calgary Schedule

The 1987 Meetings of SDS are being held in conjunction with the International Symposium on the Devonian System in Calgary. The schedule outline is as follows:

Symposium:

- August 10-16 Pre-Symposium field trips
- 16-20 Symposium
- 21-25 Post Symposium trips (conflict with SDS meeting)

SDS Meeting:

- August 21-22 Business Meeting
- 23-26 SDS Field Trip

A preliminary agenda for the Business Meeting is included in this Newsletter.

Preliminary Agenda for Business Meeting, August 21-22, 1987 Calgary, Alberta, Canada

1. Introduction
2. Minutes of 1986 meeting, August 7-8, Prague
3. Review of SDS work since Prague meeting and report on submission to Episodes
4. Membership report/discussion
5. Current tasks
 - A. Base of Famennian, position (?) and stratotype
 - B. Base of Fragian, position and stratotype
 - C. Base of Emsian, position and stratotype
 - D. Base of Givetian, position and stratotype
6. Future meetings
 - A. 1988: Brittany (? and northern Spain)
 - B. 1989, Washington, DC: Nature of meeting?
7. SDS Newsletter
8. Reports
 - A. Marins-nonmarine study group
 - B. Devonian/Carboniferous Boundary Committee
 - C. South American activities
 - D. SDS Financial report
9. Other business
10. Adjournment

Report on Possible Conodont Boundaries

William A. Oliver, Jr., Chairman, SDS

In a memo dated February 10, 1987, sent primarily to conodont workers, I requested the following:

"Please send to me your current choice of conodont boundaries for each of the three stages: base Pragian, base Emsian, base Givetian. I want to try to develop a consensus on what is the most widely recognizable conodont horizon that might be used to define each stage."

This was not an attempt to force a decision or to imply that the definitions should be based on conodonts, but was intended to find out where we stand as regards possible conodont definitions. The response was very good; I received answers from 7 of 10 of those originally addressed and two additional replies that resulted from secondary circulation. In the following discussions, respondents names are cited only where their discussion is quoted or paraphrased.

Base Pragian

Raw results are as follows:

Base of <u>sulcatus</u> Zone	4
Other conodont zones:	
<u>Lat. steinachensis</u> etc	1
<u>Oz. stygia</u>	1
See Spain/France first	4
Further studies needed	3
No opinion	1

14 "votes" from 9 respondents helps indicate that this is a very difficult boundary for the conodont specialists. Most voted to "wait and see."

Schönlauß:

"Entry of Ozarkodina stygia (Flajs). Close but not exactly at the traditional boundary which in most places is a lithostratigraphic boundary. To avoid this, a horizon in the uppermost "Lochkovian" has been chosen which also has the advantage of being recognizable worldwide. At present, lineages within the sulcatus Zone are poorly known except in the Nevada sections."

Ziegler, Bultynck and Walliser:

"There is little stable information and the Prague meeting has underlined this as concerns conodonts ranges."

Base Emsian

Raw results as follows:

Base of <u>dehiscens</u> Zone	7
No opinion	2

There is a clear tendency to look closely at the base of the dehiscens Zone but 4 of the 7 expressed reservations of which the following are typical; additional comments were added by some:

Chlupáč:

"The problem of the Emsian base is complicated but at present, the base of the dehiscens Zone seems to be the best. I hope (but only hope) that the onset of dehiscens is contemporaneous in different parts of the world and not facies controlled."

Ziegler, Bultynck and Walliser:

"Presently we see that the lower range of dehiscens has good arguments for the level marker. However, the amount of upper Pragian that is included seems to vary regionally. We would like to see the dehiscens data somewhat stabilized. Basically, we discussed as a suggestion (not postulation) why the long lasting Emsian could not be subdivided into a twofold stage. As we favor pelagic stages, perhaps into Zlichovian and Dalejan (below Eifelian). A boundary could be drawn at the base of the laticoelatus Zone (see Klapper et al. 1978, *Geologica et Palaeontologica*, vol. 12, p. 106-107), which could be recognized by P. inversus in other regions. We think this might be worth a discussion."

Schölaub (a somewhat more optimistic note):

"Although this level is supposed to be in the upper part of the traditional Lower Emsian it is the best and most worldwide recognizable horizon in the Bohemian facies realm. In addition it has the advantage of being more or less facies independent as shown by its ancestor-descendant relationship with P. pyrenese and P. gronbergi. In a few places, however, the first occurrence of this index conodont is fairly late, i.e. in the lower Zlichovian. Thus careful control with other fossil groups is needed to prove the proposed boundary between the Pragian and Emsian Stages based on the first appearance of P. dehiscens."

Base Givetian

Raw Results as follows:

Base of <u>ensensis</u> Zone	2
Near same	3
Within <u>ensensis</u> Zone	1
Base of lower <u>varcus</u> Subzone	1
Base of <u>varcus-timorensis</u> Subzone	1
No opinion	2

At or near the base of the ensensis Zone is most popular but few are totally satisfied with this as is indicated by the diversity of answers.

Two comments are especially illuminating:

Chlupáč:

"I prefer the base of the ensensis Zone which lies closest to the important Kačák or otomari Event, i.e. to a boundary traceable also in other faunal groups."

Ziegler, Bultynck and Walliser:

"We think that this should be about the ensensis Zone. However, Bultynck's new "preansatus" form (see his talk in Prague) has not yet been duplicated in other parts of the world. We have initiated a study to be carried out by Weddige in the classic Eifel/Ardenne area to find out more about it. Need to stimulate this for other areas. We will be looking into some Russian and North African sections soon."

Frasnian/Famennian Boundary

Although not solicited, I received several comments, oral and written, implied and direct, on this boundary. All made the same point which is expressed in the following:

Ziegler:

"Sandberg and I will submit for the F/F boundary a stratotype proposal. We have been studying more than 20 sections in Eurasia and North Africa and know much more than in 1983 in Montpellier. We will propose to lower the level to the lower triangularis Zone and propose a good section. Walliser and Bultynck will be supporting this."

Additional comments from anyone will be welcome. These will be incorporated into a final discussion paper for use at the Calgary meeting.

Response to Chmn. Oliver's memo of May 15, 1987, to all SDS Members
From J.G. Johnson 1st June 1987

Re. base of Pragian: I agree that this is a difficult boundary to define in terms of conodonts and I also would vote to "wait and see". My thoughts on this boundary were given in brief form in SDS Newsletter no. 3 (1987, p. 3-4).

Re. base of Emsian: The base of the dehiscens Zone wins by the absence of a competitor. It is close to the base of T-R cycle Ib (Johnson, Klapper, Sandberg, 1985; GSA Bull., v. 96, p. 567-587) and may be, in many sections, related; i.e. the dehiscens entry can be in response to a facies shift. In Nevada, we have not yet seen P. pyreneae and F. dehiscens in sequence in a single measured section.

I would not wish to replace Emsian with two stages even though I can recognize both the base of the Zlichovian and the base of the Dalejan as transgressive events in Nevada. Using biostratigraphic zones instead of stages to communicate about short geologic time intervals is very much to be desired. Stages are often used by geologists who don't really know what they're talking about and the stage names are often employed in the place of the fossil evidence. Using zones requires the inclusion of age data.

Re. base of Givetian: The base of the ensensis Zone is at or near the base of T-R cycle If, which represents a widely significant deepening event (Johnson, Klapper, Sandberg, 1985). There probably is not a better level at which to divide the Middle Devonian.

Re. base of the Famennian: Sandberg and Ziegler will propose to lower the boundary to the base of the Lower triangularis Zone so that it will coincide as closely as possible with the F-F event. I'll vote for that.

Comment: The interesting thing about the way boundary defining is being looked at is the trend toward using physical events, and their biologic consequences. This is different in principal than looking for phyletic evolutionary innovations in uniform stratigraphic sequences, as was a previous guideline. With this in mind, we should be thinking about the effect of our boundary choices.

The result may be that the separation of chronostratigraphy from biostratigraphy by certain code mechanics will ultimately be reversed by biostratigraphers who, because of their professional capabilities, are the ones defining the boundaries.

Jeannine Drot

We note sadly the death of CM Jeannine Drot, Paris, on February 28th 1987. Dr. Drot was an active participant in several of our earlier meetings and her contributions will be missed.

Membership

Prof. Aart Brouwer has resigned his corresponding membership on the Subcommittee. Prof. Brouwer is a "charter" member of SDS and actively participated in our meetings for some ten years. He continues his active research on the Devonian of northern Spain. Two paragraphs of Prof. Brouwer's letter are of special interest:

"Would you be so kind and tell the Subcommittee's members how much I have enjoyed to be among them, and appreciated the good companionship during the many field trips and other meetings in which I participated. They will remain among the many happy memories of my life.

"There are still important decisions to be made, and I wish the members wisdom and common sense. Don't forget that in order to reach a common stratigraphic language, agreement on terms and definitions is more important than personal preferences."

Honorary Membership

Dr. T.N. KOREN: a member of the Subcommittee on Silurian Stratigraphy and a graptolite specialist. All-Union Scientific Research Geological Institute (VSEGEI), Srednii Prospekt, Leningrad B-26, U.S.S.R.

**PALAEZOIC TERRANE ANALYSIS IN SOUTHWEST SPAIN: STRUCTURE & SEDIMENTOLOGY
OF DEVONIAN BASINS**

ABSTRACT

DR. J.R. ANDREWS & DR. B.J. BLUCK

A recent geotraverse in Spain (IGCP Project 233, Terranes in the Circum Atlantic Palaeozoic Orogens) highlighted the importance of the boundary between the South Portugese Zone and the Ossa Morena Zone. These two structural provinces (LOTZE, 1956) are the key to deciphering Iberian U. Palaeozoic plate amalgamations and thereby providing a basis for Precambrian and L. Palaeozoic reconstructions. Sheared and metamorphosed remnants of a dismembered ophiolite, the Acebuches amphibolites, mark the probable line of suture. The Upper Palaeozoic docking history lacks constraint due to an almost complete absence of structural, sedimentological, palaeontological and geochronological data. The last will soon be improved (REUTNER & DALLMEYER) and NERC student LAKE is working on the Palaeontology (preliminary results presented at OVIEDO). The project will concentrate on the structure and sedimentology of the P.Q. Group (Devonian) and its probable equivalent, the Pulo de Lobo Formation on the south side of the suture. The Acebuches amphibolites structurally overlie and are imbricated within the top of the Pulo de Lobo Formation. Provenance studies of the sediments (greywackes and mature quartzites) together with isotopic dating of the detritus (including single grain zircon dating) will enable source evaluation and basin evolution modelling. In particular did local potential source blocks make a significant contribution to the sediments? Possible geotectonic models are that of a mature continental source area (Aracena massif) feeding a pull-apart basin contrasted with full volcanic arc development.

News Notes

From Peter Carls we hear of a Spanish student I. Valenzuela of the Palaeontology Department in Zaragoza, Spain, who is studying early Devonian conodonts in the South Central Pyrenees. There are in his study area good exposures and carbonate sequences in offshore facies.

Peter also reports that he and Paul Sartenaer have seen a very interesting section in the Longmenshan, 150km north of Chengdu in Sichuan Province, China. He, Hans Jahnke and friends from Chengdu University have been working on the Emsian section there. Professor Chen Yuan-Ren, of the Chengdu College of Geology, a keen Devonian worker is not able to attend at Calgary. Dr. Tatiana Koren, mentioned elsewhere in this Newsletter has been collecting some very interesting graptolite material in the Lower Devonian of central Asia. She is collaborating with tentaculite specialist V.L. Klishenwich and conodont worker Dr. Bardashev. Dr. Koren is Secretary of the Subcommittee on Silurian Stratigraphy.