its stages, in comparison to other systems (Devonian 7.5 ma, Silurian 3.5 ma, Carboniferous 2.7 ma), there is an objective interest in an even more detailed chronostratigraphical scale which is planned to result in stage subdivisions. Such units have to be based on the whole range of stratigraphical methods and faunal groups, including event stratigraphy, cyclicity, chemostratigraphy, magnetostratigraphy and quantitative stratigraphy. Some progress has been made in the case of the Emsian, Frasnian, and Famennian, and the Givetian discussion is about to start. In order to allow progress SDS Working Groups have been established.

3. SDs has continued to publish regurlarly its Newsletter, edited by its Vice-Chairman Rex CRICK, which not only includes information on persons as well as organisational aspects but always also hard scientific data.
4. As a continuation of past practice, SDS is about to publish, which large support from the Senckenberg Institute, two volumes on the world-wide correlation of decided GSSPs which will show the usefulness of reached consensus and results. A third volume based on the Errachidia meeting is in print in Morocco, supported and edited by CM EL HASSANI.

The Chairman also noted that some members may have been put off and may have lost interest by too much emphasize on conodont work but all members are asked to submit data of their faunal groups in order to have a much broader background for the outstanding discussions. Correlation into neritic and terrestrial environments is still unsatisfactory and this requires more future activities.

4. Devonian substages and possibly additional stages

Diverting from the circulated agenda the Chairman proposed to proceed from stage to stage in ascending time order.

4A. Emsian (Documents 1-2)

The SECRETARY summarized Document 1. It reports on a field trip of the German Emsian Working Group, under guidance of TM GARCIA-ALCALDE and CM TRUYOLS-MASSONI, to Cantabrian sections which show some advantages because of mixed occurences of neritic and pelagic faunal elements. Four sections were visited: Arauz River (Palencia), Villayandre (Léon), La Vid (Léon), and Santa Mária del Mar (Asturias). The transition from *Now. elegans* to *Now. cancellata* is well developed in the first three sections but conodont faunas are poor, with dominance of icriodids. This makes the area unsuitable if a intra-Emsian GSSP shall be defined by polygnathids. The SECRETARY, however, added that the area may have potential for a more neritic auxiliary stratotype. The German Working Group also took the view that better knowledge of the classical German intra-Emsian subdivision is essential in the continuing discussion. A second fiel trip led to the Barrandian and was guided by TM CHLUPAC and CMs HLADIL and SLAVIK. The most promising section is Císarská rokle near Srbsko which has a good record of nowakiids, conodonts, goniatites and trilobites. *Po. laticostatus* was found well above the base of the Daleje Shale but the CHAIRMAN emphasized that it occurs below its base in Morocco. Detailed re-sampling at Císarská rokle is planned (and was conducted) in October 2000. The second Bohemian section to be investigated in more detail is at Ceverný lom Quarry where the Dalejan base lies within the Suchomasty Limestone which yielded rich polygnathids and benthos such as trilobites but the nowakiid record is more discontinuous.

The CHAIRMAN read Document 2 by TM YOLKIN which notes the base of an Upper Emsian substage in Siberia at the base of the *Po. nothoperbonus* Zone (!). Despite some well recorded changes in trilobites and conodonts, there is no other support for such a low level from other members. The Chairman also drew attention to a long report (25 pages) by CM CARLS on the base of the Emsian (focussing, for example, and once again, on der mis-correlation of the *kitabicus* boundary with the base of the classical German Emsian) and it was recommended that such information should be submitted to the Newsletter. CARLS & VALENZUELA-RIGLOS noted that they could not record clearly the Dalejan transgression in their Celtiberian succession. CM SARTENAER reminded not to forget the Armorican sections in the future debate; in this respect Document 2 (BULTYNCK et al.) of the Errachidia Meeting in 1999 should be remembered. The SECRETARY proposed to hold at the 2001 Frankfurt meeting a formal vote on two substages, as it was suggested by the preliminary vote of 1998.

4B. Givetian (Document 3)

The SECRETARY summarized Document 3, jointly authored with S.Z. ABOUSSALAM (Berlin), which deals with conodont diversity around the Taghanic Onlap and its significance for Givetian substage subdivision: More than 100 papers were screened in order to produce a complete data base on the published time ranges and geographical distribution of conodont species of the Middle *varcus* to Upper *hermanni* Zones. Single cone taxa have a too spurious record to be useful and unrevised old records without illustrations had to be neglected. 31 regions were included. The data base gives much higher diversities and longer ranges than in previous compilations. The Taghanic Onlap caused no conodont extinction but the appearance of some new taxa such as *Po. alveoliposticus* and *Po. alatus*. A so far unrecognised small-scale extinction occured near the *varcus/hermanni* Zone boundary whose true extent is somewhat difficult to assess due to unusual ranges of several species (*Bipennatus bipennatus* and others) in Queensland. The fact that the Taghanic Onlap level is not easy recognizable in Middle *varcus* Zone conodont faunas, and the correlation of the basal *hermanni* conodont extinction with the final dismiss of *Maenioceras* faunas in Morocco and North Africa, suggests to place the base of an Upper Givetian substage at the base of the *hermanni* Zone. This level coincided with a second significant global transgression, for example manifested in the deposition of the New York Geneseo black shales.

The CHAIRMAN added that he recently found a single *Bipennatus* also in the Fromelennes Formation of Belgium which gives support for the extended Queensland range. CM MARSHALL than gave a talk on the "Taghanic Onlap, a key event

within the Old Red Sandstone continent". The onlap level has been recognized as grey-green marls with marine scolecodonts between red mudstones, on top of sand dunes, or as marine transgressive shale with acritarchs. The ingression has partly been mis-identified as Permian Kupferschiefer, leading to the re-dating of an oilfield as Devonian. The SECRETARY concluded the discussion with the proposal for a three-fold subdivision of the Givetian which should be further discussed and formally decided at the Frankfurt meeting.

4C. Frasnian (Documents 4-5)

The SECRETARY summarized a written report by CM OVER, submitted in his function as chairman of the Frasnian Working Group. The latter currently comprises 24 members which are actively communicating by e-mails. Concerning the substage subdivision a brief review of important eustatic pulses and T-R-cycles was given: TR IIc of Johnson et al. (1985) = *punctata* Zone (MN 5 Zone), TR IId1 = Rhinestreet Deepening, TR IId2, the *semichatovae* Transgression (within the Early *rhenana* Zone, base of MN 11 Zone), and the Lower Kellwasser Event (near base of the Late *rhenana* Zone, base of old Upper *gigas* Zone, just below base of MN 13 Zone). It was emphasized that there has to be an agreement on taxonomic concepts of marker conodonts such as *Pa. punctata* and *Pa. semichatovae*. The proximity of entries of species with eustatic pulses also requires a consideration of possibly facies-controlled appearances in specific sections. Absolute dating of the Center Hill Ash in Tennessee, which lies close to the Frasnian-Famennian boundary, is under way by R. TUCKER at Washington University. Dating of the Belpre Ash suite at Little War Gap (Chattanooga Shale) has meet difficulties and more zirkons need to be analysed. The SECRETARY briefly drew attention to other important matters that have been raised and discussed in the Working Group:

- proposal of the German Heimberg section as possible stratotype candidate for the *punctata* level (TMs ZIEGLER & SANDBERG)
- first record of *Pa. semichatovae* in the Early *rhenana* Zone of Martenberg (TMs ZIEGLER & SANDBERG, in the meantime published in Courier 225)
- alleged earlier records of *Pa. semichatovae* in Central Asia (CM BARDASHEV)
- review of the type-level of *Pa. punctata* which is probably from the Rhinestreet Shale and, therefore, not from the *punctata* Zone (CM OVER). This requires a clear documentation/review of morphotypes of *punctata* from different successive zones.
- relationship between the entries of *Pa. punctata* and *Ad. curvata* (early morphotype) (TM BECKER).

Further details should be obtained from the Working Group chairman or by subscribing to the mail lists.

CM STREEL commented on the correlation of miospore zones and on the first occurence of marker taxa in relation to the proposed Middle (*punctata*) and Upper (*semichatovae*) Frasnian substages (Document 5). The first entry of *Verrucosisporites bulliferus* lies near or a little below the base of the *punctata* Zone whilst the entry of *Cymbosporites acanthaceus* is a provisional guide (entry between the Late *hassi* and Late *rhenana* Zones) for an Upper Frasnian substage. Unfortunately, there is no straight forward correlation of Western Europe and the Timan miospore zones which are now well correlated with the conodont andf goniatite succession (BECKER et al. 2000, HOUSE et al. 2000). CM SARTENAER pleaded for a better integration of data of other fossil groups such as brachiopods.

The SECRETARY introduced the Chut River section of the southern Timan as a potential stratotype for the base of a Middle Frasnian. The section has been visited and sampled by various SDS members during the Timan field trip after the 1994 Moscow symposium. It is characterized by abundant ammonoid and conodont faunas and various other groups such as bivalves, (few) brachiopods, nautiloids, radiolaria and palynomorphs are present. The base of the MN 5 Zone (*punctata* Zone) lies just above the base of the Domanik Formation and above the *Komioceras* Beds of the topmost Ust´yarega Formation. Within the MN 4-5 and *transitans* to *punctata* Zones there is a detailed sequence of marker conodonts (identified by CMs KUZ´MIN and OVNATANOVA and by TM KLAPPER) which has been published in BECKER et al. (2000) and HOUSE et al. (2000), superceding earlier section descriptions. A document on this GSSP candidate will be presented at Frankfurt where, hopefully, a formal vote on the number of Frasnian substages will be held.

4D. Famennian (Documents 4-6)

The SECRETARY, in his function as Famennian Working Group chairman, summarized the call for contributions on issues (questions) outlined in the Working Group report of Newsletter 16. Regrettably, in this respect there has been little response so far. However, since there has been more focus on the Frasnian and Emsian, it is understood that it is impossible to make equal progress concerning all stages. The Mrakib section of southern Morocco, introduced as possible Upper Famennian GSSP at the Errachidia meeting (BECKER et al. 1999) has been sampled for palynomorphs (CM HARTKOPF-FRÖDER) and conodonts (CMs SPALETTA & PERRI) but results are not yet available and partly unsatisfactory. Acritarchs were found at some levels but miospores are sparse.

The SECRETARY summarized and commented the report of activities of the Upper Devonian Working Group of the German SDS, led by M. PIECHA (Document 5). Classical and new sections have been visited during several field trips: Beringhausener Tunnel (eastern Rhenish Massif, GSSP potential up to the *postera* Zone), Nie Brickwork Quarry (northern Rhenish Massif, more basinal, potential from the Upper *marginifera* to the Upper *postera* Zones), Bohlen (Thuringia, entire Famen-

nian), Kahlleite-East Quarry (Thuringia, most of the Upper Devonian, unfortunately still active and, therefore, not protected), Effenberg (potential for the Upper/Uppermost Famennian), Köstenhof (= Schübelhammer, Franconia, *marginifera* to Late *expansa* Zones).

CM STREEL outlined the correlation of Famennian miospore events with the various proposed substage boundary levels (Document 4). The base of the *rhomboidea* Zone lies close (Late *crepida* to Late *rhomboidea* Zones) to the entry of various species of *Cornispora* in different Euramerican basins. The entry of *Grandispora famenensis* seems to be a good marker near the base of the Early *marginifera* Zone in Belgium and Belorussia. *Retispora macroreticulata* first occurs in the Latest *marginifera* Zone (*velifer* Zone) of Belgium. The globally distributed *Retispora lepidophyta*, one of the most common marker in Paleozoic palynostratigraphy, enters either within the Middle or near the base of the Upper *expansa* Zone. CM Streel continued with Document 6 which includes the call of an international group of Devonian specialists (total of thirty, from Belgium, France, Portugal, U.K., Brasilia, Australia, Belorussia, Russia, and Ireland) for a fourfold substage subdivision. Diverting from former proposals, the base of a Middle Famennian has been suggested to be placed at the base of the Latest *crepida* Zone whilst an Upper Famennian should be defined by the base of the Latest *marginifera* Zone (*velifer* Zone). As before, an Uppermost Famennian substage was proposed to start with the base of the Late *expansa* Zone.

The SECRETARY expressed his hope that the number of substages can be decided at the Frankfurt meeting and acknowledged that the number of proponents of four substages has become larger than the number of voters for three substages in the preliminary poll. In a potential fourfold Famennian, he suggested to make use of the global *Annulata* Event just below the base of the *postera* Zone. CM STREEL answered that the Middle Famennian of their proposal now approaches classical Belgian views. The CHAIRMAN objected to some extent and stated that diversions from traditional boundary will be allowed. TM HOU emphasized that the Strunian is well-developed in Chinese sections, with good records of brachiopods and foraminiferes, but admitted that the question of its lower boundary is not fully understood in terms of the conodont chronology.

5. Marine-Non-marine correlation

An important contribution concerning this topic by CM MARSHALL has been included under 4B. TM TURNER wrote a message explaining that the Microvertebrate IGCP Courier is still in print (but is has been published soon after the Rio meeting).

6. IUGS matters

The CHAIRMAN reported on messages from F. GRADSTEIN and J. OGG, the incoming chairman and secretary of ICS. They have advocated for the creation of new integrated stratigraphic databases, with emphasis on sealevel chages, sequence stratigraphy, orbital cycles, radiometric dating and global geochemical cycles. Information is available from an ICS webpage.

The SDS CHAIRMAN sees no problems with this new direction since SDS has always supported multi- and interdisciplinary stratigraphical methods which has led to various past SDS symposia and close co-operation between representatives of different research fields. Both the Chairman and the Secretary have written statements to the incoming ICS officers explaining past and future SDS activities which was well-received. SDS has been praised as the most succesful and active of the subcommissions.

Following the proposal by the voting commitee (under CM HOUSE), and after unanimous election by TMs, ICS has confirmed the re-election of the CHAIRMAN, VICE-CHAIRMAN and of the SECRETARY (also called 2nd Vice-Chairman in future).

7. Membership

7A. Withdrawals from Membership

TM YU Chang-min has declared to step down as TM and has announced that the Geological Society of China will propose a Chinese replacement. Since the Rio meeting, and via TM HOU, CM ZHU Min has been put forward and the formal election will take place at Frankfurt.

7B. Election of CMs

There were two written nominations presented prior to the meeting:

U. JANSEN, Forschungsinstitut Senckenberg (proposed by TM ZIEGLER and seconded by TM BECKER): specialist in Lower/Middle Devonian brachiopods.

MA Xueping, Beijing University, Department of Geology (proposed by the outgoing CM BAI, seconded by TM BECKER): specialist in Middle/Upper Devonian brachiopods.

Elections were deferred to the Frankfurt meeting.

7C. Election of TMs

TM CRICK, seconded by the CHAIRMAN, has proposed to elevate the status of CM EL HASSANI to Titular Membership, but due to the poor attendance, election was deferred to the Frankfurt Meeting.

7D. Address List

The Secretary pleaded to supply address updates, especially e-mail addresses, to VICE-CHAIRMAN CRICK in order to provide the membership in the next Newsletter with a new and correct list.

8. Reports

8A. Financial Report

The CHAIRMAN gave the financial report which is as follows:

Income for 2000	in US $
• carried forward from 1999	598.95
• IUGS subvention for 2000	1.800.00
• Total	2.398.95

Expenditure until August 2000	
• Secretary expenses	200.00
• Newsletter allocation for no. 17	400.00
• Support for attendance Rio meeting	1,000.00
• Bank commission	11.54
• Expenses for editing SDS Courier volumes	100.00
• Total	1.711.54

Provisional balance **687.41**

8B. German SDS (Document 13)

(see Documents 1 and 5 in Topic 4)

8C. Radiometric Dating (Document 7)

CM Streel drew attention to the fact that the late Famennan zirkon age of TUCKER et al. (1998) is not tied in correctly with palynostratigraphy. Miospores from the Carrow Formation obviously have to be revised and suggest a much older age (*pussilites-fructicosa* Zone, ca. Latest *marginifera* Zone) instead of the *pussilites-lepidophyta* Zone (Late *expansa* Zone), giving a biostratigraphically based time difference of up to 5 ma. There are also discrepancies between brachiopod on conodont ages in case of the Chattanooga Shale of Tennessee.

9. SDS Publications

The first SDS correlation volume had finally appeared as Courier Forschungsinstitut Senckenberg, Vol. 220 (P. BULTYNCK, Ed. "Subcommission on Devonian Stratigraphy. Fossil groups important for boundary definitions"). The support of the Senckenberg Institute was thanked for.

[The 2nd volume, Courier 225, was published after the meeting in December]

The Errachidia Fieldguides are in press in Notes de Service géologique du Maroc. Proceedings of the joint SDS and IGCP 421 Meeting of 1999 will be published in 2001 in the Bulletin de l'Institute Scientifique series in Rabat. In both cases CM EL HASSANI has made a big effort to ensure publication.

10. Future Meetings

10A. Meeting in 2001

The Annual Meeting 2001 will be held in conjunction with the 15th International Senckenberg Conference on "Mid-Palaeozoic bio- and geodynamics: The North Gondwana–Laurussia interaction", 11th to 21st May, Frankfurt a.M. The Annual Meeting is scheduled for the afternoon of the 16th May in the Senckenberg Institute. All SDS members are herewith asked to attend. Details can be obtained from the Senckenberg homepage (http://senckenberg.uni-frankfurt./fis/sngc155.htm).

10B. Meetings in 2002

As agreed in Errachidia/Rabat, SDS will hold its 2002 meeting in conjunction with ECOS VIII and with the final meeting of IGCP in Tolouse. Montagne Noire field trips will be offered.

SDS will also officially support an international symposium on the "Geology of the Devonian System", to take place from 9th – 12th July 2002 in Syktyvkar, Timan, Russia. Details will be included in the forthcoming Newsletter and contacts should be made either with CM V.S. TSYGANKO (tsyganko@geo.komisc.ru) or with Tatyana M. BEZNOSOVA (beznosova@geo.komisc.ru). Excursions will allow to visit famous Southern Timan outcrops, including the Chut River Middle Frasnian GSSP candidate, as well as Northern Timan/Polar Urals localities.

No new information concerning the once announced 1st International Palaeontological Congress in 2002 in Sydney has been supplied.

11. Any other business

(none)

R.Thomas Becker
Secretary

ERRATA for SDS Newsletter #17 (December, 2000)

Pages 14-1 & 14-2: Figures for Maurice Streel and Stan Loboziak article

Pages 14-3 & 14-4: Article by Ulrich Jansen (Frankfurt)

CONODONTS			Proposed Substages
OLD ZONATION	STANDARD ZONATION		
S. sulcata	*sulcata*		
L. Protognathodus	*praesulcata*	L	UPPERMOST FAMENNIAN
U. costatus		M	
M. costatus		E	
L. costatus	*expansa*	L	UPPER FAMENNIAN
U. styriacus		M	
M. styriacus		E	
L. styriacus	*postera*	L	
U. velifer		E	
M. velifer	*trachytera*	L	
L. velifer		E	
U. marginifera	*marginifera*	L*	MIDDLE FAMENNIAN
L. marginifera		L	
U. rhomboidea	*rhomboidea*	E	
L. rhomboidea		L	
U. crepida	*crepida*	E	LOWER FAMENNIAN
M. crepida		L*	
L. crepida		L	
U. triangularis	*triangularis*	M	
M. triangularis		E	
L. triangularis		L	
U. gigas*	*linguiformis*	M	
U. gigas	*rhenana*	E	
L. gigas		L	
		E	

Figure 1.Famennian Substages proposed by the Uppermost Famennian Working Subgroup.

NOTE: This figure is to accompany article on Page 12:

CORRELATION OF THE PROPOSED CONODONT BASED UPPER DEVONIAN SUBSTAGE BOUNDARY LEVELS INTO THE NERITIC AND TERRESTRIAL MIOSPORE ZONATION

(Maurice Streel and Stan Loboziak, Rio SDS meeting, 07/08/2000)

(Marine-Non Marine Correlation / Frasnian and Famennian Substages Working Groups)

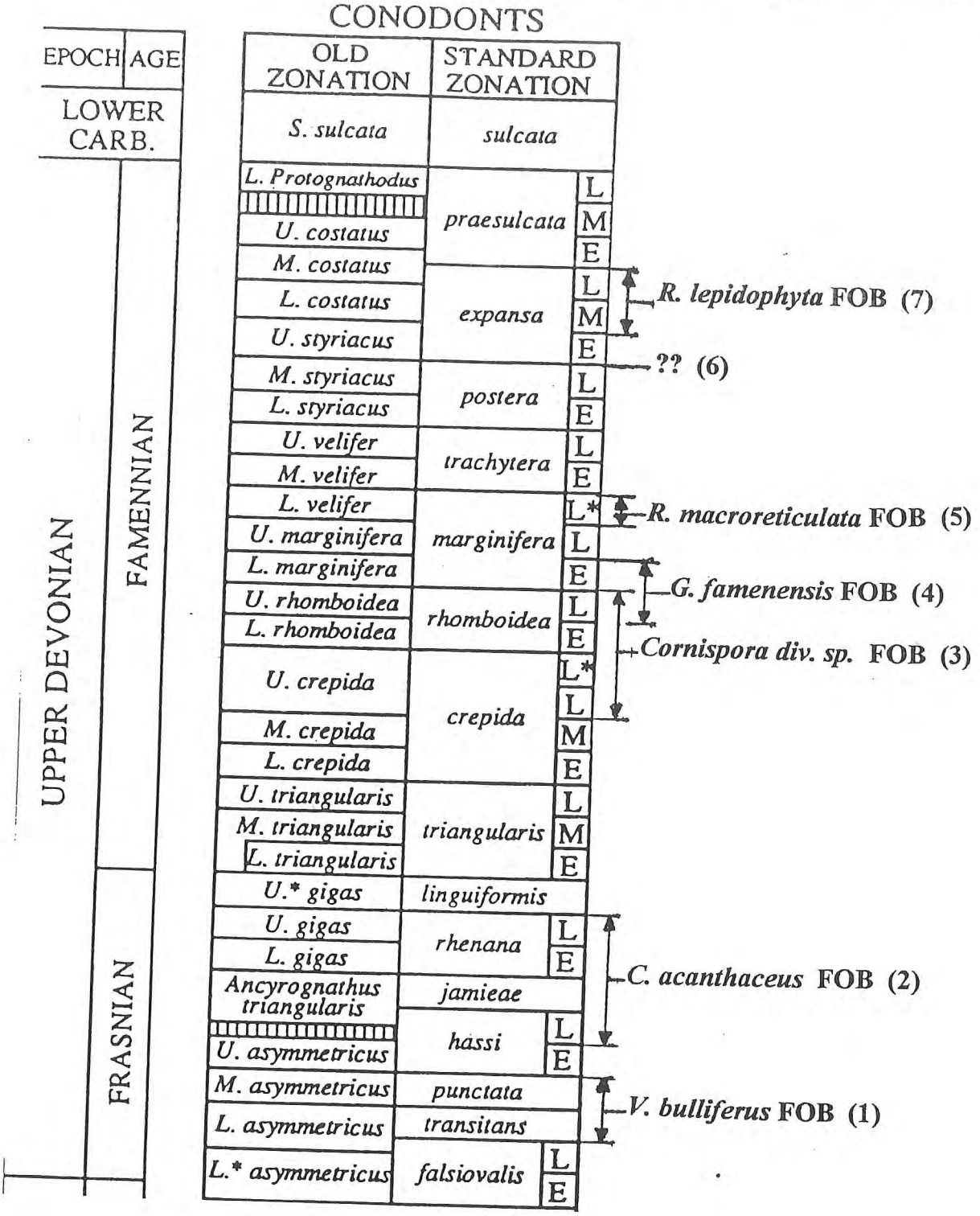

Figure 1.Correlation of proposed conodont based Upper Devonian Substage boundary levels into the neritic and terrestrial miospore zonation.

NOTE: This figure is to accompany article on Page 12:

CORRELATION OF THE PROPOSED CONODONT BASED UPPER DEVONIAN SUBSTAGE BOUNDARY LEVELS INTO THE NERITIC AND TERRESTRIAL MIOSPORE ZONATION

(Maurice Streel and Stan Loboziak, Rio SDS meeting, 07/08/2000)

(Marine-Non Marine Correlation / Frasnian and Famennian Substages Working Groups)

1. Any other business

none)

R.Thomas Becker
Secretary

... FROM THE GERMAN SDS CONCERNING THE SUBDIVISION OF THE EMSIAN STAGE

...ch Jansen, Frankfurt

Early Devonian sections in the Cantabrian Mountains are informative in the context of an international subdivision of the Emsian stage; the general situation has recently been outlined by GARCÍA-ALCALDE et al. (1998). The German SDS is interested in these sections, especially because it is possible to elucidate stratigraphical relationships between neritic and pelagic facies there. The Emsian in its classical sense can be recognized, and correlations with its pelagic equivalents are possible (see e.g. GARCÍA-ALCALDE et al. 1990, TRUYÓLS et al. 1990, GARCÍA-ALCALDE & TRUYÓLS-MASSONI 1994, TRUYÓLS-MASSONI & GARCÍA-ALCALDE 1994, JAHNKE & JANSEN 1998). The author of this submission coordinates the activities of the German SDS concerning the Emsian subdivision.

Under the guidance of TM J. GARCÍA-ALCALDE and CM M. TRUYÓLS-MASSONI (Oviedo), the German SDS members CM P. CARLS (Braunschweig) and U. JANSEN visited in October 1999 four Emsian sections in the Cantabrian Mountains (northern Spain) being most interesting with regard to correlational aspects: Arauz river (Palencia), Villayandre (León), La Vid (León) and Santa María del Mar (Asturias).

The Arauz river section is developed in Palentinian resp. predominantly deep water facies, whereas the other three sections are developed in Asturo-Leonesian resp. merely shallow water facies. The sections visited are well-exposed and well accessible. Thanks to many stratigraphical investigations, the ranges of fossils are well known. In our opinion, tectonics plays a role but is not very serious in the sections mentioned except for the Santa María del Mar section. Conodonts are generally rare and mainly represented by icriodontids. Dacryoconarids are common, and the transition *Nowakia elegans – N. cancellata*, which is regarded as an important stratigraphical level, is documented in three of the four sections. In the Santa María del Mar section, both species are present, but there is a gap in the nowakiid documentation between the occurrences of the two species.

More or less above and below the boundary interval, shallow water sediments with brachiopods and trilobites occur in all sections allowing correlations with the Ardenno-Rhenish Mountains. In April 2000, the Emsian working group of the German SDS held its third meeting in Göttingen in order to discuss new aspects concerning the subdivision of the Emsian stage. The main viewpoints are listed below:

- It was generally accepted that the Cantabrian Mountains are an important area for correlating and testing taxon ranges. An advantage of the Cantabrian sections is the occurrence of both pelagic, "Hercynian" fossils (especially goniatites, dacryoconarids) and neritic, "Rhenish" fossils (brachiopods, trilobites). Rhenish and Hercynian facies can be correlated. It is possible to recognize Early and Late Emsian in the classical sense on the one hand and Zlichovian and Dalejian on the other hand.
- In case it is desired that a GSSP is defined by polygnathid conodonts, the Asturo-Leonesian sections are surely not suitable for an international boundary definition. Only the Arauz river section and other sections in Palencia have yielded few polygnathids, but it is questionable that their abundance is high enough to draw a sharp boundary based on them. With respect to the nowakiids, there seem to be better possibilities. In any case, it is generally wanted that polygnathids and nowakiids co-occur in a stratotype section.
- The suitability of the Cantabrian sections with respect to the definition of a GSSP has been evaluated slightly different by the SDS members. On the one hand, the Cantabrian Mountains have been considered as no suitable area because of the rarity of polygnathids. Therefore, it was proposed to put focus on the Barrandian area. On the other hand, the possibilities of correlating neritic and pelagic facies in the Cantabrian Mountains have been emphasized, and the situation especially in Palencia has been regarded more optimistic with respect to a potential stratotype. Independent of the diverging attitudes, the working group members agree that the Cantabrian sections should be kept in mind in future because of the correlational possibilities.
- CM O.H. WALLISER pleaded for a subdivision of the Emsian into two separate stages, which should be named Zlichovian and Dalejian. The boundary between the two stages should be defined in the Barrandian and the boundary Pragian/Zlichovian could be re-defined there as well.
- The Rheinisches Schiefergebirge is the classic type region of the Emsian, and the first subdivision into Early and Late Emsian was defined there by means of brachiopods and trilobites. Because the working group members are of the opinion that the classical intra-Emsian boundary should be taken into account when defining an international boundary it is important to document for the international public what the classical boundary actually is. It has been pointed out that latest Early Emsian and earliest Late Emsian faunas should be newly investigated and described in detail. Besides, sedimentology and facies of the Emsian strata with special focus on the boundary interval are to be re-investigated as well. This could be done in the frame of one or two PH.D. theses.
- It has already been emphasized several times that the Barrandian area must be considered when searching a boundary stratotype (CHLUPÁČ & LUKEŠ 1998, 1999, JANSEN & SCHINDLER 1997, JANSEN 1998). Therefore, it has been decided to visit the Barrandian area.

The German Emsian working group visited Early Devonian sections in the Barrandian area in June 2000. The field trip was guided by TM I. CHLUPÁČ, CM J. HLADIL and CM L. SLAVIK. The group regarded the following sections as very important with respect to a possible Early/Late Emsian boundary stratotype: Císařská rokle near Srbsko and Červený lom near Suchomasty. The sections have already been described in CHLUPÁČ et al. (1979) and CHLUPÁČ & LUKEŠ (1999).

The most promising section is Císařská rokle near Srbsko. A continuous and undisturbed succession is exposed here containing the uppermost part of the Zlíchov Limestone, the Daleje Shale, the Třebotov Limestone and the base of the Choteč Limestone. The Zlíchov Limestone contains conodonts of the *Polygnathus gronbergi* Zone. In some layers, *Nowakia barrandei* has been found, and *Nowakia elegans* occurs at the top of the limestone. Trilobites are common (*Phacops*, *Reedops*, *Odontochile*, *Crotalocephalus* etc.) in this succession. The Daleje Shale (about 11 m thick) consists of shales alternating with thin layers and lenses of micritic limestones. *Nowakia cancellata* is abundant and well-preserved here marking the Zlichovian/Dalejian boundary. It has its first occurrence 70 cm above the base of the Daleje Shale. In several layers, *Gyroceratites gracilis* has been found. A limestone layer 11 m above the base of the Daleje Shale has yielded *Polygnathus laticostatus*. The Daleje Shale also contains other goniatites, trilobites, orthocone nautiloids, bivalves, styliolinids, brachiopods etc. The Daleje Shale grades into the Třebotov Limestone (about 20 m thick) by increasing amount of red limestone concretions and layers. The latter contains important index fossils like *Nowakia richteri*, *N. holynensis* and *Polygnathus serotinus*. The Choteč Limestone (35-40m thick) consists of grey bioclastic and micritic limestones bearing a fauna which is considerably different from the fauna of the Třebotov Limestone, e.g. different trilobites. The section is regarded as especially interesting, because polygnathid conodonts and dacryoconarids co-occur so that their ranges can be correlated.

In Červený lom quarry near Suchomasty, a well-exposed succession contains the following stratigraphical units: Kon• prusy Limestone – disconformity with hiatus – Suchomasty Limestone (23 m thick) – base of the *Acanthopyge* Limestone. The boundary interval Zlichovian/Dalejian is situated within the Suchomasty Limestone. This unit is composed of well-bedded bioclastic and micritic limestones. The section is remarkable because of its rich conodont faunas. *Polygnathus inversus*, *P. laticostatus*, *P. serotinus* and other stratigraphically important conodonts have been found here (KLAPPER et al. 1978). On the other hand, the dacryoconarids *Nowakia elegans*, *N. cancellata* and *N. holynensis* occur in some levels, but are not as abundant and well-preserved as in the Císařská rokle section. The section has yielded rich trilobite faunas as well (proetids, scutelluids, phacopids) and also some brachiopods, ostracodes, etc. Our group agreed that this section also must be taken into account in the discussion on possible stratotype sections, especially because of the good conodont faunas. Unfortunately, the succession begins just below the Zlichovian/Dalejian boundary, so that the earlier development of the conodonts and dacryoconarids cannot be observed.

It was decided to start a co-operation with the Czech colleagues. In November 2000, the Císařská rokle section has been visited again by a Czech-German group (TM I. CHLUPÁČ, O. FATKA, TM K. WEDDIGE, CM E. SCHINDLER, R. BROCKE, U. JANSEN) and sampled bed by bed. The fossil content of this highly interesting section will be re-investigated. We are optimistic that this section will be one of the first-order candidates to be proposed for an inner-Emsian boundary stratotype.

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