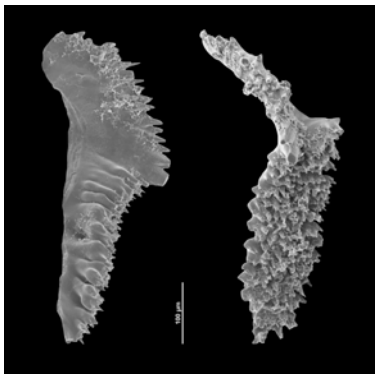
INTERNATIONAL UNION OF
GEOLOGICAL SCIENCES
COMMISSION ON STRATIGRAPHY

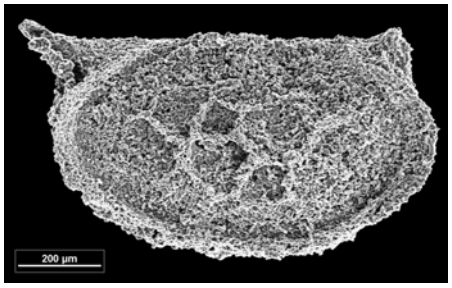
-----s-----D-----s-----

SUBCOMMISSION ON DEVONIAN STRATIGRAPHY

NEWSLETTER No. 25

R.T. Becker, Editor
WWU Münster
Germany





February 2010 ISSN 2074-7268

CONTENT

Editorial

The SDS Newsletter is published annually by the International Subcommission on Devonian Stratigraphy of the IUGS Subcommission on Stratigraphy (ICS). It publishes reports and news from its membership, scientific discussions, Minutes of SDS Meetings, SDS reports to ICS, general IUGS information, information on past and future Devonian meetings and research projects, and reviews or summaries of new Devonian publications.

Editor: Prof. Dr. R. Thomas BECKER
SDS CHAIRMAN
Institut für Geologie und Paläontologie
Westfälische Wilhelms-Universität
Corrensstr. 24
D-48149 Münster, Germany
rbecker@uni-muenster.de

Circulation: 120 hard copies, pdf files of current and past issues are freely available from the SDS Homepage at www.unica.it/sds/

Submissions have to be sent electronically, preferably as Word Documents or pdf files, to the Editor or to Mrs. S. KLAUS, IGP, Münster (sklaus@uni-muenster.de).
Submission deadline is the end of each calendar year.

MESSAGES FROM THE CHAIRMAN

First of all, a healthy, joyful, peaceful and successful year 2010 to all of you.

2009 has seen a lot of activities and achievements of SDS, which have been summarized in the annual report to ICS included in this issue. If you read it carefully, you will notice that we definitely have to make progress this year concerning the formal proposals of our decided Givetian and Frasnian substages. During a recent meeting with some ICS officers the procedure for ICS ratification of formal substages has been questioned (once again). Certainly, it will be discussed during the forthcoming **Prague Workshop** of ICS, which details are included in the Meetings section. As it has been announced, this general workshop on chronostratigraphy and ICS activities and methods is open to everybody and I hope to see several SDS members – apart from our local specialists - in Prague. In November the proceedings volume of our 2007 Nevada meeting came out in the **Palaeontographica Americana** series (No. **63**). The content is shown in the Publications section. The volume is highly recommended to all members. It is especially useful to have the abstracts of all those presentations included that did not lead to a full manuscript. The added CD with the Nevada Fieldguide should be emphasized, too. Congratulations to Jeff OVER for this considerable effort and for the fine editing job. Now that several important Famennian papers are available to everybody, Famennian votes will go ahead.

The highlight of 2009 was the **NAPC** meeting in late June/early July with its two Devonian symposia, jointly with IGCP 499, our business meeting (see Minutes by John MARSHALL), and the splendid excursions to the Devonian of Kentucky, Ohio, and Michigan, which SDS had never visited previously. Carl BRETT, Alex BARTHOLOMEW, Gordon BAIRD, Mike DESANTIS, and many others made an excellent job to lead us in the field, copied and distributed old papers and monographs that are difficult to access outside the U.S., and prepared wonderful field books with many unpublished data. However, there is still much to learn about the Devonian and its regional and international correlation of those regions and some of the samples taken during the field trip already provided new and sometimes surprising results. The incredible dropstone of probable "Hangenberg age", deposited far away from the obviously glaciated Appalachian Mountains, was one of the most intriguing outcrops shown in the field. A paper on this terminal Devonian tropical mountain glaciation has just been published in the Bulletin of the Geological Society of America, (BREZINSKI et al., 2010, vol. 122 (1/2), pp. 265-281).

2009 ended for SDS, unfortunately, with an event of great sadness. Rather unexpectedly, but after prolonged illness, **Zhenya YOLKIN**, our most respected long-term SDS member from Russia, died shortly after Christmas. Zhenya not only had a most impressive Devonian research record and immense scientific knowledge but he was a most thorough, likeable and stimulating person that influenced many of our colleagues from Novosibirsk and other (former) Soviet regions. He was one of the first Russian Devonian workers that I met when I started to attend international meetings and, therefore, knew him for more than twenty years. I am very sad that he now passed away. SDS hoped that he would be the mentor of our planned field symposium in the next year, as he was at our highly successful 2005 meeting. John TALENT and our colleagues from Novosibirsk have sent a well written obituary that gives a lively summary of Zhenya´s work, life, and personality. It allow us to keep him in our best memory.

The German Devonian Subcommission and the international community of ostracode workers has also to mourn the loss of one of its most active and experienced specialists. **Gerhard BECKER** died in December at the age of 81, leaving an incredible amount of Devonian ostracode publications. He was always good to stimulate discussions at our German Subcommission meetings. When I met him first in 1984 he suggested that I should change my name since there could be only one BECKER in Devonian stratigraphy. Well, I did not but we kept a rather friendly communication, even after I dared to describe a few ostracods.

SDS has continued in 2009 its high level of publication production, often in association with IGCP 499. Apart from the Nevada volume mentioned above, **Geological Society of London, Special Publication 314** on "Devonian Change – Case studies in Palaeogeography and Palaeoecology", edited by Peter **KÖNIGSHOF,** has to be strongly recommended. Its content was advertised in Newsletter 24. The **Bulletin of Geosciences** continues to publish important Devonian papers, for example, as part of her Ph.D., the update on conodont stratigraphy around the Chotec Event by Stanislava BERKYOVÁ (No. 84

(4), pp. 667-686). This newsletter includes a review of the wonderful monograph on the Devonian reef complexes of the Canning Basin, published by Phil PLAYFORD, Roger HOCKING, and Tony COCKBAIRN as a **Bulletin of the Geological Survey of Western Australia** (No. **145**). Carl BRETT, Eberhard SCHINDLER, and Peter KÖNIGSHOF have almost finished their job with the **Middle Devonian volume** to be published in Palaeogeography, Palaeoclimatology and Palaeoecology, hopefully still this year. I have finished the draft for an update of the Devonian chapter for the future new **Geological Timescale** volume and Felix GRADSTEIN and I will have to ponder about the absolute scaling of the new stratigraphical charts in the next months to come. Unfortunately, there are no good new absolute ages to be incorporated. I would be most thankful to learn about any new age determinations that might be in the pipeline. The claimed extreme duration between the ages from the lower Eifelian Tioga ashes and those from the Wettelsdorf GSSP tuff and lower Emsian Hunsrück Slate volcanite are causing the biggest headache. Finally, I like to draw your attention to the important data on Devonian climate coming from the continuing analyses of oxygen isotopes from conodont phosphate (ELLRICK et al. 2009, "Palaeo x 3", No. 276 (1/4), pp. 170-181; JOACHIMSKI et al. 2009, Earth and Planetary Science Letters, No. 284, pp. 599-609).

The coming SDS highlight of this year will be our symposium on Devonian events, the field trip to the Old Red Continent Devonian, to be led by John MARSHALL, and our annual business meeting, all in conjunction with the **3rd International Palaeontological Congress** in London. Abstracts are due at the end of February. For details see this issue and, more important, the website at www.ipc3.org/. Please submit documents and proposals concerning our membership. In order to stimulate progress concerning the revision of the Devonian/Carboniferous boundary, I have agreed with the IPC3 organizers and the Pander Society that a **D/C Boundary Conodont Workshop** will take place after our SDS Business Meeting, probably in the afternoon of the 1st July. Our conodont workers can outline taxonomic problems and new results by short, informal presentations and should bring material for joint examination and discussions. Several workers have already promised to come. Following a gentle push, Harald TRAGELEHN has agreed to provide an overview of his important results concerning pre-Hangenberg siphonodellids for this newsletter, prior to formal publication, hopefully later this year.

At our Uzbekistan business meeting in 2008 it was agreed that (preliminary) results concerning the **revision of the Emsian GSSP** should be submitted until 2010, as a base for general discussion and for later joint formal publication. Together with Kenneth DE BAETS and Svetlana NIKOLAEVA I have made a start concerning the early ammonoids from the Khodzha-Kurgan Gorge, which are relevant for the Emsian substage discussion, not for the Emsian base. Our conodont workers, unfortunately, have not yet been too successful. As you can gather from their Membership News, polygnathids are rather poor at the proposed/intended future GSSP level. However, there are several other documents that deal with the Emsian, which shows that we can have a lively Emsian debate, based on some new data, at London.

At the end of January, during a brief visit to Oslo, I had the chance to take part in a **Time Scale Creator** Workshop led by Jim OGG, current Chairman of the International Subcommission on Stratigraphic Information. TS Creator is a wonderful programme that allows you to create your own stratigraphic charts and at the same time holds access to a vast stratigraphic database, from the stratigraphic chart of GTS 2004 to the Phanerozoic Zonations of Russia and the Australian datapack of biostratigraphy and regional stratigraphy, etc. The programme is available free of charge from www.tscreator.org and includes tours to the programme and exercises for simple learning. I have promised Jim to submit the latest Devonian stratigraphic charts for inclusion in the database and we should consider to use it for the extension and update of charts that formerly were submitted to the Devonian Correlation Table. Please take some time and look at the programme, which is also to be recommended for student classes.

Finally I like to thank Mrs. KLAUS for her fine editing job of this newsletter.

Hope to see many of you in London, yours, sincerely

R. Thomas BECKER

OBITUARY: Prof. Dr. Gerhard BECKER
1928 - 2009

On 14 December 2009 German ostracodologist Prof. Dr. Gerhard BECKER passed away at the age of 81. After he studied geology and palaeontology at the University of Frankfurt Gerhard BECKER continued there and became an academic teacher, retiring in September 1993. As he had been a member of the Senckenberg Gesellschaft für Naturkunde since 1961, and had been given the status of an Honorary Scientist (Ehrenamtlicher Mitarbeiter) in 1967, he worked at the Senckenberg Research Institute with the Devonian working group until he became ill in mid-2009. Gerhard BECKER was also a member of the German SDS from 1976 – for many years as a titular member, only stepping down to a be a corresponding member when his health and mobility became weaker.

Gerhard BECKER was well-known among specialists on Palaeozoic ostracods, having his main research focus on the Lower and Middle Devonian representatives of this group. He published more than 250 papers from different areas and with a number of co-authors. Regionally, one of his special fields of interest was the Eifel area, but he also worked on other regions of central and southern Europe, contributing much to knowledge of ostracod systematics and palaeoecology including biostratigraphical aspects. From the mid-seventies onwards he made the 'Thuringian Ecotype' a widely applied concept.

The 'Devonian Family' has lost one of its long-time members whom we will always remember as a vivid, determined and uncompromising colleague.

Eberhard SCHINDLER & Alan LORD
(Senckenberg Forschungsinstitut und Naturmuseum Frankfurt)

OBITUARY: **Evgeny A**. **YOLKIN**
29.01.1934 – 29.12.2009

After a prolonged illness, Evgeny Aleksandrovich ('Zhenya') YOLKIN, a prominent Russian paleontologist and stratigrapher, passed away on 29 December 2009 at his home in Akademgorodok, Novosibirsk, Russia. Zhenya came from a coal-mining family, originally Cossacks, living east of Donetsk in the eastern Ukraine. The family home, built by

his father, could not have been closer to the Russia/Ukraine border: the border coincided with an insignificant gully between the house and the toilet. In the immediate post-war period, Zhenya worked in a factory recycling materials from automobile batteries; he believed this had impacted on his subsequent health.

As a senior student of geology of Moscow State University, he had been a member of a field party doing geological fieldwork in the Taymyr Peninsula of Arctic Russia; his youngest brother, Viktor, was also a participant in this expedition. Zhenya regarded this experience in the Arctic tundra with magnificent Devonian stratigraphy, teeming with fossils, as having been the most enjoyable experience of his life. In 1958, he graduated from the Moscow University and, with his mathematician wife, Valentina Nikolaevna

('Valya'), came to the Academy of Science's very new Akademgorodok, a satellite city of Novosibirsk. There he commenced field and laboratory work in the then-infant Institute of Geology and Geophysics and, later, in an excised portion of it, the Trofimuk Institute of Petroleum Geology and Geophysics of the Siberian Branch of the Russian Academy of Science.

Zhenya's research for many years focused on the Silurian and Devonian stratigraphy and palaeontology of the Kuznetsk Basin ('Kuzbass') and the Altai, initially in the Gorny Altai but, in recent years, extending (with his research group) into the Rudny Altai. His palaeontology focused initially on trilobites, mostly Proetina—the principal group for both of his doctoral degrees: his Kandidat Nauk (regarded as more or less equivalent to a PhD) and his DSc. Theses for these two degrees became the basis of two stand-alone monographs (1968, 1983) and for development of his views on evolutionary events (including stasis) and their possible connection with global tectonics and sedimentary events.

Zhenya worked closely with Rimma Trofimovna GRATSIANOVA, a meticulous worker on the high-diversity Devonian and occasionally Early Carboniferous brachiopods of the Gorny Altai. It soon became apparent that there were biostratigraphic problems in that region; resolution of these problems required scrupulously accurate stratigraphic and structural mapping. This he carried out, demonstrating that stratigraphic intervals with faunas as old as Early Silurian (Llandovery) had been tectonically jumbled up with Early Devonian (Lochkovian) horizons; earlier sampling had thus resulted in unexpected associations… For many years, Zhenya's group focused on the Altai in preference to the Carboniferous and older sequences 'framing' the enormous, economically important, coal-bearing Kuznetsk Basin where, incidentally, his father had worked as a coal miner during the Great Patriotic War. That region, primarily the domain of the Ministry of Geology, had resulted in a massive output of basic research, much of it, including superb mapping, remained essentially unpublished. Published research included, inter alia, several outstanding paleontological monographs, among them major works on the biostratigraphy and brachiopods of the Devonian by the inimitable Mariya Adolfovna Rzhonsnitskaya.

As a consequence of his 35-year involvement with International Committee on Stratigraphy, commencing from its genesis in 1974, Zhenya kept abreast of the latest developments in international correlations and was the first in the USSR to plunge into using conodonts for improved stratigraphic alignments in the Devonian of south-western Siberia (especially the Altai-Sayan and the margins of the Kuzbass) and the Tien Shan (especially the Zeravshan Range) of eastern Uzbekistan—the last (and especially fruitfully) with, among many others, Aleksey ('Alyosha') KIM and Maya ERINA.

Zhenya and his Russian and Uzbek colleagues were determined to demonstrate their most important sequences to colleagues from elsewhere in the USSR as well as the rest of the world. To this end, Zhenya led a large group of Russian and Uzbek colleagues to the 1977 meeting of SDS in Czechoslovakia and, in 1978, reciprocated by mounting an international field excursion demonstrating the principal Early and Middle Devonian sections in what later became the Kitab State Geological Reserve in the Zeravshan Range. This was coupled with a remarkable symposium in Samarkand with presentation of papers from seemingly all significant regions of the USSR and from many regions elsewhere in the world. It was a huge, superbly organised meeting, led by Alyosha Kim and Zhenya. Something like a re-run of that meeting was mounted for the 27th International Geological Congress in 1984. An enormous diplomatic initiative, undertaken principally by Alyosha and Zhenya, resulted in matching legislation being promulgated by the Government of Uzbekistan and the Supreme Soviet of the USSR for establishment of the Kitab State Geological Reserve in 2002. In 1997, Zhenya and Alyosha were the principal driving forces in successfully proposing to the International Commission on Stratigraphy that the Global Stratotype and Point (GSSP) for the base of the Emsian should, most appropriately, be located in the Zinzilban Gorge of the Kitab State Geological Reserve.

Zhenya was slow to accept plate-tectonics, the reigning global tectonic hypothesis that had come into vogue following his undergraduate days at the Moscow State University. This was understandable, considering that the majority of his most-admired teachers had remained 'fixists', some defiantly so, compared with the bulk of 'mobilist' earth scientists in the rest of the world. Nevertheless, discussions between him, Rimma GRATSIANOVA and John TALENT at the XIV Pacific Science Congress in Khabarovsk (in 1979) resulted in the three of them deciding to test if Devonian brachiopod and trilobite data, mathematically analysed time-slice by time-slice, might provide insights

into the relative motions of crustal blocks through the time-interval latest Silurian and Devonian, with a possibility of extending the analysis to perhaps the end of the Early Carboniferous. Because consistency of taxonomy was essential, all available data had to be evaluated before any sort of expert analysis could be broached. As a consequence, each winter from 1981 to 1992 brought TALENT to Akademgorodok where he and GRATSIANOVA worked through the Devonian and latest Silurian brachiopods of the hemisphere from the west flank of the Urals to New Zealand, accepting, synonymising or rejecting previous determinations. A large number of publications resulted (about 30 in all, including conference abstracts), culminating with publication in 2001 of the Pridoli/Givetian part of their brachiopod database as Courier Forschungsinstitut Senckenberg 236, preceded in 2000 by an expert-systems analysis based on the Pragian part of the database (W. Aust. Mus. Rec., Supp. 58: 349–384). Zhenya had taken responsibility for evaluating the ages and considering the nomenclature of all stratigraphic units, but had not been able to find time to develop the trilobite database that had been planned at the beginning of the project.

The linkage developed between the Novosibirsk and Macquarie groups led to reciprocal undertakings focused mainly on younger workers unlikely, in normal circumstances, to obtain support for international field ventures. A group from Novosibirsk and Tashkent were given a brief course in contemporary reef dynamics at Heron Island, followed by a field program in the Broken River region in the Townsville hinterland of north-eastern Australia. A Macquarie group were given an extended field program on the stratigraphy of the Altai-Sayan and Kuzbass.

Zhenya worked hundred-hour weeks, but there were always too many demands on his time. For a few years he derived pleasure from giving lectures on palaeontology and stratigraphy at the Novosibirsk State University, but his self-imposed workload eventually required him to terminate this commitment. Overseeing his conodont laboratory and providing guidance for his group of young stratigrapher-palaeontologists consumed a lot of time, as did administrative chores connected with his Institute.

Zhenya provided meticulous supervision for his students, helpfully criticising every aspect of their theses, insisting on reading every word they wrote. This generosity was extended to several doctoral candidates from other institutions. Demonstrating the mid-Palaeozoics of the Altai-Sayan and Kuzbass regions and, with his long-time friend, Alyosha Kim, the Palaeozoics of the Tien Shan, was his principal passion from the 1970s until his death. Numerous voluminous field guides were prepared, or revised, incorporating the latest results of research by his and Alyosha's groups. Such were generated for field meetings of International Geological Correlation Programs IGCP 421 and 499, the last conjoined with an SDS meeting.

Zhenya's conodont initiatives required development in Novosibirsk of a major acid-leaching program in 1979 developed around a team of three technicians undertaking the picking of acid-insoluble residues. Because of compelling evidence for numerous conodont technicians and researchers having died from the effects of separations using carbon tetrachloride or tetrabromoethane (both highly toxic), and lack of a convenient source within the USSR for the non-toxic sodiumpolytungstate, the acid-insoluble residues were picked without specific-gravity separation into heavy and light fractions. Because finest-quality sable- or camel-hair brushes were not readily available, brushes were made from the hair of Valya and Zhenya's Persian cats. The Macquarie University group provided picking trays and initial storage units for slides. Excellent results, obtained swiftly, demonstrated that conodont biostratigraphy would provide a precise key for stratigraphic alignments between the enormous areas of Devonian marine sediments in South-Western Siberia and the Tien Shan. A major presentation of results utilizing all groups of organisms including conodonts was made at the Second International Symposium on the Devonian System in Calgary in August 1987.

Valya, Zhenya's wife, was a renowned mathematician. She was Zhenya's sounding board and intellectual ally. She insisted that her dream was to spend her retirement as a housewife: cooking, attending to the plants (a large collection of succulents, especially cacti) in their apartment, knitting and so on. However, on the personal invitation of Ministry of Agriculture in late 80th, Valya became leader of a team modelling the agricultural system of the entire USSR, but this project ended in 1991 when its 16 constituent republics became autonomous.

Valya and Zhenya's dream of owning their own home eventually came to fruition. They bought

an apartment 'off the plan' for a large apartment-block scheduled to be built near the old building of the Institute of Geology and Geophysics and a relatively new building constructed specifically for the geophysicists of the Siberian Branch of the Russian Academy of Science. It is within a stone's throw each way from these two buildings. They were happy that construction of their apartment block took more than a year. This had provided opportunities to examine other buildings under construction and choose not only the nicest fittings and finishes available in Novosibirsk, but to evaluate the workmanship and contract the best people to work on the interior of their apartment. They moved into their apartment in 2005.

Valya's death at the end of August 2007, following surgery for cancer, was a colossal blow to Zhenya, himself already suffering affliction in many ways. He was having frequent injections, so many of them that one could excused from thinking he had been injected with almost every element on Mendeleev's Periodic Table — some of them believed to inhibit movement of cancer cells through the bones and thus reduce the rate of metastasis. It seemed a wonder he did not glow in the dark! In the morning, he would be able to move slowly around his apartment with two walking sticks, but by evening he would be too frail to do so, thoroughly debilitated. Fortunately, soon after Valya's death, Zhenya's ebullient youngest brother, atomic physicist-engineer Viktor, moved into the apartment to do the cooking and other chores.

Nonetheless, in the wake of personal tragedy and in the throes of illness and apprehension, Zhenya continued to organize his decades of thought and research on the geology of SW Siberia and Uzbekistan. The success of the combined SDS and IGCP 499 international conference (25 August - 3 September 2008) on the Devonian of the Kitab Reserve in Uzbekistan, which he had done so much to organise, provided new stimulus. Zhenya had expansive plans for more permanent publication of all useful data on all the stratigraphic units with which he had worked.

Zhenya remained heroic to the end. He was saddened that intellectual seriousness seemed to be on the wane. He regarded it as tragic that in Russia and perhaps almost everywhere else in the world, people's respect for one another had declined greatly and that there had been a major loss of compassion. He once opined that "Our generation may be the last that has cared deeply about cultural values". He once confided lightheartedly that, if he were reincarnated (he in fact had no religious beliefs), he would be happy to be reborn as a Persian cat, preferably in Akademgorodok, but somewhere in Australia would also be OK. He and Valya were intensely attached to their Persian cats, Jesik and Dymok.

Long before he died, Zhenya had become Russia's leading Devonian worker. In 1974 he had become a foundation titular member of the Subcommission on Devonian Stratigraphy (SDS) of the International Commission on Stratigraphy. He had also been an active member of the Ordovician and Silurian subcommissions, as well as a member of the Russian Stratigraphic Committee. He was an Honoured Scientist of the Russian Academy of Sciences, and Corresponding Member of the Senckenbergische Naturforschende Gesellschaft.

During more than 50 years with the Siberian Branch of the Academy of Science, Zhenya produced more than 200 publications (including several monographs) on Palaeozoic palaeontology — especially on trilobite and conodont taxonomy, phylogenesis and zonation — as well as on biostratigraphy, lithostratigraphy (including event-stratigraphy), regional geology, paleogeography, paleobiogeography, petroleum geology and geodynamics. A stunning number of these publications were major teamwork initiatives — such as copious excursion guides articulated by Zhenya. Such labours, generally undertaken at short notice, sharpened the skills of the numerous members of his team.

Zhenya was convinced that major advances in stratigraphy and paleontology benefited from well-organized team work. He believed passionately that international collaboration based on personal linkages produced far better results than 'faceless' research programs organized through bureaucratic channels in far away places. A substantial part of Zhenya's life had been devoted to establishing cooperation between Russian and foreign geologists and paleontologists. As a facilitator (never seeking adulation) and team leader he had been without peer!

J. TALENT, N. BAKHAREV, N.IZOKH, T. KIPRIYANOVA, O. OBUT, N. SENNIKOV

REPORTS

International Commission on Stratigraphy - Subcommission on Devonian Stratigraphy Annual Report 2009

1. TITLE OF CONSTITUENT BODY

Subcommission on Devonian Stratigraphy

Submitted by:
R. THOMAS BECKER, *Chair of SDS*
Westfälische Wilhelms-Universität, Institut fürGeologie and Paläontologie, Corrensstr. 24, D-48149 Münster, Tel. –49-251-83 339 51, fax – 49-251-83 339 68; rbecker@uni-muenster.de

2. OVERALL OBJECTIVES, AND FIT WITHIN IUGS SCIENCE POLICY

Since SDS has formally defined all its series and stage boundaries since many years, it has worked in the last years on the formal definition of substages, on the revision of GSSPs (after 10 years of moratorium), on the improvement of multidisciplinary international correlation, on the organisation of Devonian stratigraphic symposia, and on the publication of monographic books/volumes. SDS objectives for 2009 can be summarized as:

- Work on formal definitions of Pragian, Givetian, Frasnian, and Famennian substages
- Revision of the basal Emsian GSSP in Uzbekistan
- Revision of the D/C boundary in the frame of a new D/C Boundary Working Group and in close collaboration with the Carboniferous Subcommission
- Publication of volumes on Devonian stratigraphy in close co-operation with IGCP 499
- Compilation and distribution of SDS Newsletter 24
- Official Business meeting in conjunction with the 9th North American Paleontological Convention in Cincinnati, USA
- Devonian field trips in conjunction with the 9th NAPC
- Support for additional international Devonian symposia (Paleozoic Seas Symposium, Graz 2009)
- Revision of Devonian chapter for the GTS 2010 volume
- Intensive cooperation with ICS

All listed objectives fit the directions of IUGS and ICS:

- development of an internationally approved chronostratigrapical timescale for the Devonian with maximum time resolution;
- promotion of new and modern stratigraphical techniques and their integration into Devonian multidisciplinary schemes;
- application of GSSP decisions internationally and as a base for a better understanding of patterns and processes in Earth History, including Devonian major global environmental changes.

3. ORGANIZATION

Officers for 2008-2012
Chair: Prof. Dr. R. Thomas BECKER, WWU Münster, Germany
Vice-Chair: Prof. Dr. Ahmed EL HASSANI, Institute Scientifique, Rabat, Morocco
Secretary: Dr. John E. MARSHALL, University of Southampton, U. K.

The Subcommission has currently further 18 Voting Members that cover many major Devonian outcrop areas and many stratigraphical disciplines (see Appendix).

The SDS Membership covers currently the following 29 countries (in alphabetical order): Australia, Austria, Belarus, Belgium, Bolivia, Bulgaria, Canada, China, Czechia, Estonia, France, Germany, Great Britain, Iran, Italy, Latvia, Lithuania, Morocco, Myanmar, New Zealand, Pakistan, Poland, South Africa, Spain, USA, Uzbekistan, Tadzhikistan, Turkey, Vietnam. There is still a lack of active workers from other countries with important Devonian outcrop, especially from Brazil, Argentine, Chile, Algeria, Libya, Kazakhstan, Kyrgisia, Caucasian countries, and Thailand.

At national level several Devonian Subcommissions exist in various countries, partly under different organisational names (e.g., Germany, Russia, “Friends of the Devonian” at GSA meetings).

Website: http://www.unica.it/sds/

4. INTERFACES WITH OTHER INTERNATIONAL PROJECTS

SDS is traditionally strongly tied with IGCP projects that have a Devonian focus. This is currently IGCP 499 on "Devonian land-sea interaction: evolution of ecosystems and climate" (DEVEC), led by P. KÖNIGSHOF and colleagues from the Senckenberg Institute, Frankfurt a. M., Germany. IGCP 499 runs out in 2009 but there a plans for a new successor project. Its meetings have been advertised on the official SDS Homepage. In 2009 two joint symposia were organized during the 9th NAPC in Cincinnati, Symposium S3 on "Rapid Evolution of Terrestrial Ecosystems and their Influence on Marine Realms – Land-Sea Interactions in the Devonian" (Convenors P. KÖNIGSHOF and SDS Secretary J.E.A. MARSHALL: 9 talks) and Symposium S19 on "Biological Response to Devonian Sea-Level and Paleoclimate Changes" (Convenors: SDS Chairman R.T. BECKER and TM C.E. BRETT: 10 talks, 3 posters). Further presentations with a focus on Devonian stratigraphy were given in other Topical Sessions and Symposia.

5. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2009

Chronostratigraphic definitions: The SDS Report to ICS for 2008 summarized the main arguments for and the importance of formally defined substages, which is not repeated here (see also SDS Newsletter 18, p. 13-14).

PRAGIAN SUBSTAGES
With respect to the huge amount of work already done in the Zinzilban Gorge and since it has been proposed to use the well documented current basal Emsian GSSP to define in future the base of an Upper Pragian or Zinzilbanian substage, only specific further research on the Pragian subdivision into two substages is needed. Current work in progress includes a refined correlation of the Zinzilban GSSP into the neritic brachiopod succession of the classical Emsian type region of Germany, utilizing the conodont-brachiopod co-occurrences in Celtiberia (Spain). An outline was published, right after the last SDS report, by CARLS et al. (2008, 2009) in Bulletin of Geosciences (vol. 83/4) and in SDS Newsletter 24. At the Annual Business Meeting in 2009, VALENZUELA-RIOS & CARLS provided a correlation of the "*kitabicus* boundary" into the Iberian Chains and outlined the problems of correlation of European successions with the fine eognathodid zonation of western North America.

REVISION OF BASAL EMSIAN GSSP
Different groups (conodont specialists, multidisciplinary Czech group) and individual members are currently working on samples and faunas taken through the (current) lower Emsian in the Zinzilban Gorge. Preliminary reports are due for the next SDS Newsletter (early 2010) and shall eventually lead to a multi-authored paper on the revision and precise stratigraphy across the transition from the *kitabicus* to the *excavatus* conodont zones. This work includes conodonts, dacryoconarids, trilobites, early ammonoids, magnetostratigraphy (magnetic susceptibility), isotope stratigraphy, and facies studies. An outline of the conodont and dacryoconarid lineages that are in the focus of current studies was recently given by CARLS et al. (2008, 2009). The new GSSP will be placed in the Zinzilban Gorge, in uninterrupted successions above the current GSSP (future basal Upper Pragian GSSP).

EMSIAN SUBSTAGES
SDS has decided to delay the subdivision of the Emsian into two formal substages until its basal GSSP has been revised. In spring 2009 the transition from typical lower Emsian limestones (with typical dacryoconarid, conodont and ammonoid faunas) into overlying Daleje Shale equivalents (with rich ammonoids) has been re-sampled in the Tafilalt of southern Morocco.

GIVETIAN SUBSTAGES
The formal submissions to ICS concerning the definitions of formal Middle and Upper Givetian substages (voted on by SDS in 2007) are still in preparation. The Middle Givetian shall start with the base of the *varcus-rhenanus*, the Upper Givetian with the base of the *hermanni* conodont zones. New important data on the Middle/Upper Givetian transition and on the Taghanic Biocrisis, including conodont, goniatite, sequence and magnetostratigraphy, were published after the last report by BAIRD & BRETT (2008) or are currently in press by SDS members in the Middle Devonian thematic volume to be published in Palaeogeography, Palaeoclimatology, Palaeoecology (ELLWOOD et al. in press; ABOUSSALAM & BECKER, in press; MARSHALL et al. in press). BOCKWINKEL et al. (2009, Berliner Paläobiologische Abhandlungen, vol. 10) started to document in detail the extraordinary Upper Givetian ammonoid radiation that gives a strong difference to the much simpler Middle Givetian goniatites. The Guidebook to Field Trip No. 10 of the 9th NAPC (TM BRETT et al., 2009) includes many new data on the Givetian of Kentucky, Ohio, and Michigan, especially concerning sequence stratigraphic correlations; these are useful for the correlation of the substage levels into the Appalachian foreland. A corresponding publication by TM

BRETT et al. is in print in the mentioned Middle Devonian volume.

FRASNIAN SUBSTAGES

As in the case of the Givetian, the formal submissions to ICS concerning the definition of Middle and Upper Frasnian substages, voted on by SDS in 2007, are still in progress. The Middle Frasnian shall start with the base of MN Zone 5 (= base of *punctata* Zone), the Upper Frasnian with the transgressive spread of *Pa. semichatovae* low in MN Zone 11. An important new monograph on conodonts of the Russian Platform by CM N.S. OVNATANOVA and L.I. KONONOVA (2008, Paleontological Journal, vol. 42/10) helps to correlate into more shallow self settings.

FAMENNIAN SUBSTAGES

A formal vote on Famennian substage levels was held up by the fact that important new data are still not published. These (HARTENFELS & BECKER in press, KAISER et al. in press) are included in the joint IGCP 499/SDS volume that is just being printed in the Palaeontographica Americana series. The volume should be out still in 2009. The important update of the conodont-miospore correlation was published by STREEL (2009) in the new IGCP 499 volume on "Devonian Change". The new data underline the proposal to place the Upper Famennian base at the base of the Upper *expansa* Zone, which can be recognized by four different conodonts of four different lineages (genera) that enter simultaneously: *Palmatolepis gonioclymeniae, Bispathodus ultimus, Pseudopolygnathus trigonicus*, and *Branmehla suprema*. HARTENFELS & BECKER (2009) reviewed in SDS Newsletter 24 the conodont succession across potential levels for a Middle/Upper Famennian substage boundary and proposed to use the base of the global Lower *Annulata* Event for definition. A publication on Australian faunas by BECKER & HOUSE (2009, Bulletin of the Geological Survey of Western Australia, vol. 145) clarified the conodont-goniatite correlations in the Famennian, which is of importance for the potential Lower/Middle Famennian substage boundary. The base of the globally widespread and easily identifiable (Lower) *marginifera* Zone correlates with the Prototethys (Australia to Europe/North Africa) spread of advanced paratornoceratines (*Acrimeroceras*).

REVISION OF D/C BOUNDARY

CM KAISER published in spring 2009 (Newsletters on Stratigraphy, vol. 43/2) the critical new conodont data that required a fundamental revision of the current La Serre D/C boundary GSSP. The new D/C Boundary Working Group had a first meeting during the ICOS 2009 Symposium in Calgary, which field trip to the Rocky Mountains offered the possibility to re-examine boundary sections in Alberta (Guidebook by HENDERSON et al., 2009). The necessity for a special conodont workshop in 2010, with a focus on the taxonomy of early siphonodellids and protognathodids, was underlined. H. TRAGELEHN presented at a Field Meeting of the German Subcommission on Devonian Stratigraphy in June 2009 a detailed review of siphonodellids across the D/C boundary of Franconia; a corresponding manuscript with several new taxa and documenting complex evolution in different lineages (genera) is close to completion. Conodont samples from the Kule section near the Uzbekistan/Tadzhikistan boundary border have been processed in 2009 (CM KAISER & TM BECKER) but carbon isotope data are not yet available. These hopefully will allow to recognize the significant positive carbon isotope peaks recognized in Europe and, more recently (CRAMER et al. 2008, Epeireic Seas volume, Geological Association of Canada, Paper series, vol. 48) in North America.

A new boundary section with neritic carbonates across the Hangenberg Crisis (*Bi. ultimus* and *Protogn. kockeli* faunas) into shales with *Gattendorfia* was discovered by the Chairman in spring 2009 in southern Morocco (northern edge of Maider region). A general paper on the D/C boundary of the eastern Anti-Atlas (CM KAISER et al. in press) was submitted to Palaeogeography, Paleoclimatology, Palaeoecology and is currently in review. Some new protognathodid material was sampled from just at the boundary at the Oese section in the Rhenish Massif and should help the taxonomic revision. The Guide to Field Trip No. 2 in association with the 9th NAPC (ETTENSOHN et al., 2009) includes two important contributions in relation to the D/C boundary: Dropstones from Kentucky as evidence for Appalachian mountain glaciers during the peak of regression and new data on the palynology across the boundary in Kentucky by HEAL et al. BAIRD et al. (2009) presented in the Guide to Field Trip 10 of the 9th NAPC a proposal to correlate formations around the D/C boundary of Ohio into previously poorly studied successions of Pennsylvania, however so far with poor conodont control.

These data together document the current and parallel research efforts by several working groups that should lead to a revised conodont stratigraphy and improved regional correlations using isotope and sequence stratigraphy. The amount of progress is encouraging.

Publications: SDS has been very active concerning publications in Devonian thematic issues, in its Newsletter, and in numerous journal contributions that are not listed here:

- BECKER, R. T. (Ed.) 2009. SDS Newsletter 24. - 127 pp., Westfälische Wilhelms-Universität Münster.
  [The **SDS Newsletter** has left the status of "grey literature" It is now a formal publication, with **ISSN No. 2074-7268**, that can be quoted in all publications/journals.]
- BRETT, C.E., BARTHOLOMEW, A.J. & DESANTIS, M.K. (Eds.) 2009. Middle and Upper Devonian Sequences, Sea Level, Climatic and Biotic Events in East-Central Laurentia: Kentucky, Ohio, and Michigan. – North American Paleontological Convention – 2009. Field trip No. 10, 186 pp.
- KAISER, S.I. 2009. The Devonian/Carboniferous boundary stratotype section (La Serre, France) revisited. – Newsletters on Stratigraphy, **43** (2): 195-205.
- OVER, D.J. (Ed.) 2009 (just in print). Studies in Devonian Stratigraphy: Proceedings of the 2007 International Meeting of the Subcommission on Devonian Stratigraphy and IGCP 499. – Paleontographica America, **63**, ca. 205 pp.

SDS members contributed significantly to the following other Devonian volumes:

- KÖNIGSHOF, P. (Ed.) 2009. Devonian Change. Case Studies in Palaeogeography and Palaeoecology. – Geological Society, London, Special Publication, **314**, 298 pp.
- KÖNIGSHOF, P., OBUT, O. & IZOKH, N. (Eds.) 2008. Bulletin of Geosciences, **83** (4): 357-506.

A special issue on Middle Devonian stratigraphy, with guest editors TM C.E. BRETT and TM E. SCHINDLER, is in press with Palaeogeography, Palaeoclimatology, Palaeoecology and should be published in the first half of 2010. Another Devonian volume is in preparation in the Memoirs series of the Association of Australasian Palaeontologists.

The Devonian chapter for the GTS 2010 volume has been significantly revised and is close to completion.

Meetings:

- SDS Annual Business Meeting at the 9th North American Paleontological Convention, Cincinatti, 26th June
- Paleozoic Seas Symposium, Graz 14-18th September 2009 [with formal SDS support]

Membership:
A very experienced new corresponding members from the USA (B. WITZKE) was elected.

6. CHIEF PROBLEMS ENCOUNTERED IN 2008

The wide array of activities, carried forward by a highly active core of SDS Members, especially the high numbers of papers and thematic volumes, did not leave the time to finalize the formal submissions for the ratification of Givetian and Frasnian substages. The delayed publication of important new Famennian data caused a delay of formal voting on Famennian substages; the levels for the base of the Middle and Upper Famennian require a new discussion in the light of the now (end of 2009) available new rich conodont data. The program in 2009 was too full for members of the D/C Boundary Working Group to organize a special conodont workshop and field work in China but conodont specialists of the WG met at the ICOS in Calgary.
SDS is stick lacking formal members from a range of countries with extensive and important Devonian outcrop, such as Algeria, Libya, Brazil, Bolivia, Argentine, Turkey, and Caucasian countries. However, there are promising contacts with Devonian stratigraphers from some of these, especially in the frame of IGCP 499, which resulted in important publications on the Devonian of Algeria, Argentine, and Bolivia.

7. SUMMARY OF EXPENDITURES IN 2008

INCOME	
carried over from 2008	206 $
IUGS subvention 2009	1600 $
Sum	1806 $
EXPENSES	
SDS Newsletter 25, due 01/2010 printing/mailing	450 $
Support to members to attend the 9th NAPC and SDS Symposia	1000 $
balance early 2010	356 $

8. WORK PLAN, CRITICAL MILESTONES, ANTICIPATED RESULTS AND COMMUNICATIONS TO BE ACHIEVED NEXT YEAR (2010)

- Finalize and submit proposals for the formal definition of Givetian and Frasnian substages to ICS for ratification
- Publication of volume on Middle Devonian stratigraphy and multi-disciplinary correlation in Palaeogeography, Palaeoclimatology, Palaeoecology (TMs C.E. BRETT & E. SCHINDLER, Eds.)
- Publication of SDS Newsletter 25 in early 2009
- Compilation of results from the various specialists groups that re-sampled the interval for a revised basal Emsian GSSP in the Zinzilban Gorge
- Publication of Devonian chapter (BECKER, HOUSE & GRADSTEIN) in GTS 2010 (GRADSTEIN et al.)
- Annual Meeting at 3rd International Paleontological Congress, London, 28th June – 3rd July 2010, with SDS Symposium (formally approved by organizers) on "Devonian Bioevents – timing, ecological and evolutionary patterns"
- SDS Field trip in relation with IPC3 to the terrestrial Devonian of the Old Red Continent (Scotland), organized and led by SDS Secretary J.E.A. MARSHALL
- Initiate special volume on Devonian Bioevents in high-level journal, based on contributions to London symposium
- Update of SDS homepage
- Formal vote on Uppermost Famennian substage (end of 2009/early 2010) - discussion of the definition of Middle and Upper Famennian substages at London Business Meeting
- Participation in ICS Workshop in Prague, spring 2010, as part of intense cooperation with ICS and its bodies (e.g., SCS, ISSC)
- Formal support and participation in the 4ème Congrés Francais de Stratigraphie, 30th August to 2nd September 2010, Université Pierre et Marie Currie, Paris, with a field trip to the Devonian of the Ardennes (northern France-Belgium)

9. BUDGET AND ICS COMPONENT FOR 2007

INCOME

balance from 2008	356 $

EXPENSES

SDS Newsletter 26	500 $
support for SDS member from Uzbekistan (´Chairman of Working Group on Emsian revision) to attend Annual Business Meeting and SDS Symposium at IPC3, London	1500 $
SUM	2000 $

request for support/subvention from IUGS/ICS 2000 $

APPENDIX A
Subcomission officers

CHAIRMAN + SDS NEWSLETTER EDITOR
R. Thomas BECKER
Westfälische Wilhelms-Universität, Geologisch-Paläontologisches Institut, Corrensstr. 24, D-48149 Münster, Tel. –49-251-83 339 51, fax – 49-251-83 339 68; rbecker@uni-muenster.de

VICE-CHAIRMAN
Ahmed EL HASSANI, Département de Géologie, Institut Scientifique, B.P. 703-Rabat-Agdal, Marokko; elhassani@israbat.ac.ma

SECRETARY
John E. MARSHALL, School of Ocean and Earth Science, University Southampton, Southampton Oceanography Centre, European Way, Southampton SO14 3 ZH, U. K., jeam@soc.soton.ac. uk

WEBMASTER
Carlo CORRADINI, Dipartimento di Scienze della Terra, Università di Cagliari, Via Trentino 51, I-09127 Cagliari, Italy; corradin@unica.it

List of voting members, country, special fields, email:

1. A. BLIECK: France, micro- and macro-vertebrates; alain.blieck@univ-lille1.fr
2. C.E. BRETT: Eastern U.S., sequence and cyclostratigraphy;carlton.brett@uc.edu
3. J.-G. CASIER: Belgium, ostracods; casier@naturalsciences.be
4. CHEN Xiuqi: Nanjing, brachiopods; xqchen@nigpas.ac.cn
5. J. HLADIL: Czechia, stromatoporoids, tabulate corals, various modern stratigraphic methods; hladil@gli.cas.cz
6. N. IZOKH: Siberia, Asian Russia, conodonts; izokhn@uiggm.nsc.ru
7. MA Xueping: Beijing, brachiopods;maxp@pku.edu.cn
8. R. MAWSON: Australia, conodonts; rmawson@laurel.ocs.mq.edu.au
9. OVER: U.S., conodonts; over@geneseo.edu
10. M.C. PERRI: Italy, conodonts;perri@geomin.unibo.it
11. G. RACKI: Poland, brachiopods, event and sequence stratigraphy; racki@uranos.cto.us.edu.pl

12. J. DAY, USA/Canada, brachiopods, sequence stratigraphy; jeday@ilstu.edu
13. E. SCHINDLER: Germany, tentaculites, event stratigraphy; eberhard.schindler@senckenberg.de
14. V. TSYGANKO: European Russia, corals; tsyganko@geo.komisc.ru
15. J.I. VALENZUELA-RIOS, Spain, conodonts; jose.i.valenzuela@uv.es.
16. U. JANSEN, Germany, brachiopods; ulrich.jansen@senckenberg.de
17. G. YOUNG: Australia, micro- and macrovertebrates, general stratigraphy; gyoung@geology.anu.edu.au
18. ZHU Min: Beijing, vertebrates; zhumin@ht.rol.cn.net

MINUTES OF THE SDS BUSINESS MEETING

TUC 400C, Tangeman University Centre, University of Cincinnati, Cincinnati, USA.
Friday 26th June 2009

The SDS business meeting for 2009 took place during the 2009 North American Palaeontological Convention (NAPC).

Attendances The Chair (R.T. BECKER) & Secretary (J. MARSHALL), **TM's** E. SCHINDLER, C. E. BRETT, J. DAY, U. JANSEN, **CM's** B. ELLWOOD, G.C. BAIRD, A. J. BARTHOLOMEW, R. BROCKE, **Guests** B. WITZKE, P. BUdil, C. DOJEN, S. HARTENFELS, A. BUSH, P. KÖNIGSHOF, J. HANNIBAL, J. ZAMBITO, M. DESANTIS, N. SAVAGE, C. CRÔNIER, B., HUBERT, T. SCHRAMM, R. LINDEMANN, M. TUITE, T. ALGEO.

1. Introduction and apologies for absence

The meeting started at 16:48. The Chairman welcomed the participants with thanks to the organisers of the NAPC for supporting the SDS Devonian Session and the Business Meeting. The agenda was distributed and 'membership' added as an agenda item. An attendance list was also circulated. Attention was drawn to circulars advertising two new Devonian volumes recently published.

Documents were presented and numbered as follows:
1. Brief comments on the future Pragian Subdivision and revision of the Emsian base, J. I. Valenzuela-Ríos & P. Carls.
2. Upper Devonian miospores and conodont zone correlation in Western Europe, M. Streel.

The list of apologies was reported: **TM's** EL HASSANI, BLIECK, CASIER, HLADIL, MA, MAWSON, OVER, RACKI, VALENZUELA-RÍOS, TSYGANKO; **CM's** BIGEY, BLIECK, BULTYNCK, BURROW, CARLS, CHEN XIU-QIN, CORRADINI, EBERT, GOUWY, IVANOV, KIRCHGASSER, LUKSEVICS, MURPHY, OVNATANOVA, PARIS, SANDBERG, SLAVIK, STREEL, TURNER, UYENO, VER STRAETEN, WRIGHT.

2. Approval of 2008 Minutes

The CHAIR reported that SDS Newsletter 24 had been circulated 3 weeks earlier. A show of hands revealed that it had been received by all SDS members present. The newsletter has changed as it now has an ISSN. It includes the minutes of the two SDS business meetings held in 2008. The CHAIR then asked for any corrections to both Oslo and Uzbekistan. There were none and the minutes were approved by all those present.

3. Chairman's Business

The CHAIR then reported that 110 copies of the Newsletter had been mailed out. It was also available on the web from the SDS homepage as a pdf for download. Now that it has an ISSN it is no longer grey literature. This is important for both external review and citation in publications.

The Newsletter includes both the annual report and plan as presented to the ISC in Oslo. There was much positive feedback on the report and it is acknowledged that the SDS has been very active and has organised much multi-disciplinary activity. In addition Carl Brett was awarded the Digby MCLAREN Medal for life-time achievements in stratigraphy and this positively reflected on his Devonian research and the SDS.

SDS activities in Oslo were not very good with a low attendance. There were three SDS contributions to a symposium which resulted in it being merged into a general symposium with no recurrent theme or in fact temporal thread. There were a number of organisational

problems, in particular the SDS business meeting was moved without notice and at a very late stage. For example, the SECRETARY found himself arriving after the SDS meeting had taken place. We have still had no explanation for these late changes from the organisers.
However, the CHAIR was able to meet with the SCS and proceed on the Devonian Carboniferous boundary discussion.

In contrast the SDS had a wonderful meeting at the Kitab Reserve in Uzbekistan. It was probably the best Devonian field symposium despite the difficulties with travel. There was a long discussion on the Lower Devonian and the Pragian/Emsian boundary. The SDS met with many new workers from Uzbekistan. We have been invited to return. The local committee was very helpful and particularly Aleksej KIM, Irina KIM, Natalia MESHCHANKINA, Maya ERINA, and Utkir RAKHMONOV, not to forget the significant input of the Novosibirsk Team. The meeting also benefited substantially from the official support by the State Committee on Geology and Mineral Resources, notably by Nariman MAVLYANOV and Ilkhombay TURAMURATOV, who both attended.

4. ICS Matters

The CHAIR reported that *Episodes* had moved to India with a new editor. Manuscripts now need to be submitted to India.

Membership: It was noted that Aye Ko AUNG, the CM from Myanmar, had retired [but he now intends to move to Malaysia]. The Devonian of Myanmar has been neglected as regards the SDS.

There was a report from John TALENT noting two conodont workers from Ufa (Olga ARTYUSHKOVA and Victor MASLOV) have studied over 1000 sections including conodonts from shales and cherts. All the major zones were present in the southern Urals. It was hoped that the SDS would meet in Ufa in the future. There were at least three years to consider this offer to visit Bashkiria and the Urals.

The latest SDS membership list was circulated and those present were encouraged to check it.

Nominations for CM's are now required as written proposals. Following a proposal by J. DAY Bryan WITZKE from Iowa (Geological and Water Survey, Iowa Geological Survey, witzke@dnt.iowa.gov) was approved as CM.

The CHAIR made a call for new CM nominations for the 2010 meeting.

4.1 Quaternary and other chronostratigraphic boundaries
The ICS was active at the Oslo IGC. All GSSP's were supposed to be formally ratified by the Oslo IGC. However, the discussions were overshadowed by the Quaternary. There were two formal proposals on the Quaternary and the Neogene.

The GTS 2004 timescale had the Quaternary removed. After much discussion (since 2004) the IUGS had requested the reinstatement of the Quaternary or would remove support for the ICS. There were two votes against with the rest voting for the reinstatement. But it should be noted that the base of the Quaternary is now at 2.6 Ma rather than the 1.8 Ma as previously defined. The Gelasian is now in the Quaternary as the lowest stage of the Pleistocene. As Brooks ELLWOOD noted this now means that the Pliocene is now sub-divided into Lower and Upper rather than Lower, Middle and Upper.
The CHAIR then reported on the decision concerning the base of the Jurassic. This was accepted with 19 votes in favour, 5 against with 1 abstention. This new GSSP is in the Austrian Alps at Kujoch and is based on the first *Psiloceras*. It is not defined on isotopes. This new definition now means that the last conodonts remain in the Triassic, which would not have been the case if an isotope peak boundary was chosen. There is an auxiliary GSSP in Nevada, USA.

4.2 GTS 2010
GTS 2010 is now going to replace GTS 2004 with all scheduled revisions to be completed by September 2009. The Chairman is checking the GTS2004 timescale to see what needs changing and will require input in the Lower Devonian. All Devonian biostratigraphy and boundaries are now tied to geochronology. Mark SCHMITZ (Boise State University, Indiana, USA) has revised all the high resolution Devonian geochronological dates. For example the Kalkberg supposed *Icriodus woschmidtii* zone 417.6 date used in GTS 2004 is now known to have errors in both precision and the decay constant which moves it to 415.5 ± 2.7 [but new data, see this Newsletter, pushes its biostratigraphical age into the late lower Lochkovian]. Similarly the Esopus date from the lower Emsian moves from 408.3 ± 1.9 to 405.4 ± 1.16. The Tioga Ash moves from 391.4 to 389.2 with the Heisdorf at the base Eifelian being 397.76. These revisions are not yet published.

SDS members were reminded that V. DAVIDOV and J. CROWLEY were systematically measuring dates from Devonian bentonites and required ash samples with secure biostratigraphy. New zircons from the Wettelsdorf GSSP section are badly needed but obviously not available without re-sampling.

The D-C boundary has a new date from a section east of Hasselbach based on dates above and below the Hangenberg of 358.7 and 359.4. This places the D-C boundary at 359 ± 0.1.

4.3 ICS Workshop, Prague 2010
The CHAIR reported that from 30th May to 3rd June 2010 the ICS is going to hold a workshop in Prague. This will be a discussion of the GSSP concept including problems, definition and proposals. Since more that 10 years have elapsed from their original definition it is now possible to discuss the base Emsian and D-C boundary GSSP's. The offer to attend the workshop has gone to all chairs together with vice-chairs and secretaries (although without any financial support for the latter). All other interested parties are invited to attend [see programme in this Newsletter].

5. Chronostratigraphic Boundaries

5.1/5.2 Pragian and Emsian substages
The CHAIR proposed not to repeat any of the discussion of last years meeting and instead referred the members to Document 1. The organizers of the Uzbekistan meeting were not happy to change the base of the Emsian stage as there were only poor brachiopod and conodont faunas at this level in the German type region. This means that the Celt-Iberia area was now critical with its Rhenish brachiopods and conodonts. The Kitab GSSP has taken at least half the classical Pragian which means that the German Emsian now starts at a very high level in relation to the traditional definition. So, the proposed revision is to define a new Upper Pragian sub-stage (possibly named as Zinzilbanian) based on the current Emsian GSSP and *Polygnathus* (or *Eocostapolygnathus*) *kitabicus*. The level for the revised Emsian GSSP will be close to the incoming of the *Polygnathus* (or *Eocostapolygnathus*) *excavatus* group. During the SDS fieldtrip several groups re-sampled the Zinzilban section for conodonts, trilobites, brachiopods, dacryoconarids, magneto- and isotope stratigraphy. Initial reports were required for the next (this) SDS Newsletter.

5.3 Eifelian, Givetian and Frasnian substages
The definition of the base of the Eifelian was not on the agenda. But the Chairman reported that it was proposed to sub-divide the Eifelian into two formal sub-stages. The base of the *australis* zone being the proposed base of the Upper Eifelian.

The sub-division of the Givetian and Frasnian had been agreed by the SDS. The ICS in Oslo discussed some of the formal rules for the sub-stage sub-division. There is no requirement for GSSP's but a necessary formal ICS approval, with a formal sub-stage proposal as per GSSP's and with a requirement to designate sections that could become GSSP's. SDS is not alone in having to do this work as it is required for the Quaternary where there are even more units at the chron and sub-chron level. The proposals will be formulated by:

Base Mid Givetian: Pierre BULTYNCK et al.
Base Upper Givetian: Pierre BULTYNCK, Thomas BECKER et al.

Base Mid Frasnian: Jeff OVER et al.
Base Upper Frasnian: Jeff OVER et al.

These definitions now require sections from different continents. It was suggested that Jed Day could add details for North America.

5.4 Famennian substages
It had been proposed to hold a special discussion in Oslo but not enough members were present. The formal vote will be held at an unspecified later date.

There are three important contributions in the Nevada volume (now published). This includes a Middle/Upper Famennian discussion and a contribution by Sven HARTENFELS & Thomas BECKER on the *Annulata* Events.

The original contribution by SANDBERG & ZIEGLER proposed a Lower *expansa* boundary but this has proved most difficult to recognise because *Pa. gracilis expansa* has a very irregular distribution. Now that the SDS Newsletter 24 is out, everyone has access to the new *Annulata* Event data.

So, there will be a vote on
the base of the Uppermost Famennian (base of Upper *expansa* Zone)
the base of the Upper Famennian (still a problem)
the base of the Middle Famennian (either base of *rhomboidea* or base *marginifera* Zone)

In the recent SDS Newsletter HARTENFELS & BECKER proposed using the (Lower) *Annulata* Event. This has been traced into neritic facies

in Belgium and can be recognised using conodonts, ammonoids and brachiopods.

5.5 Devonian-Carboniferous Boundary
There is now a new working group appointed to reinvestigate the D-C boundary. This has 10 members from the SDS and 10 from the SCS.

The Devonian members are:
Thomas BECKER, Germany, Chair of SDS: ammonoids <rbecker@uni-muenster.de>
Denise BRICE, France: brachiopods <d.brice@isa-lille.fr>
Carlo CORRADINI, Italy: conodonts <corradin@unica.it>
Brooks ELWOOD, USA: magnetostratigraphy <ellwood@lsu.edu>
JI Qiang, China: conodonts <Jirod@cags.net.cn>
Sandra KAISER, Germany: conodonts, isotope stratigraphy <kaiser.smns@naturkundemuseum-bw.de>
John MARSHALL, UK: miospores <jeam@noc.soton.ac.uk>
Hanna MATYJA, Poland: conodonts <hanna.matyja@pgi.gov.pl>
Claudia SPALLETTA, Italy: conodonts <claudia.spalletta@unibo.it>
WANG Cheng-yuan, China <cywang@nigpas.ac.cn>

The Carboniferous members are:
Jim BARRICK, USA: conodonts <jim.barrick@ttu.edu>
Paul BRENCKLE, USA: foraminifers <saltwaterfarm1@cs.com>
Geoff CLAYTON, Ireland: palynomorphs <gclayton@tcd.ie>
Jiri KALVODA, Czech Republic: foraminifers <dino@sci.muni.cz>
Rich LANE, USA: conodonts <hlane@nsf.gov>
Svetlana NIKOLAEVA, Russia: ammonoids <44svnikol@mtu-net.ru>
Vladimir PAZUKHIN, Russia: conodonts <pazukhin@mail.ru>
Edouard POTY, Belgium: corals <e.poty@ulg.ac.be>
Barry RICHARDS, Canada, incoming Chair of SCCS: stratigraphy, Sedimentology <brichard@NRCan.gc.ca>
YUAN Jin-Liang, China: trilobites <yuanjl403@sohu.com>

There may be extra members studying brachiopods from Queensland and South China. The group met at the ICOS meeting in Calgary and considered first the conodont problem. An important statement of this problem is in the new paper by Sandra KAISER in *Newsletters on Stratigraphy*. This will be circulated to the working group members as a pdf.

Harald TRAGELEHN has studied in the last decade many Famennian sections in Franconia, some of which range into the Carboniferous. Conodonts have been sampled with yields of 3-15k elements per kg. The *Siphonodella* species below the Hangenberg Event level include forms that previous authors would have assigned to *S. sulcata*. Therefore *S. sulcata* s.l. (in fact different new taxa) is in the Wocklum below the Hangenberg Event. There is a new ancestral genus closely related to *Siphonodella* in a manuscript that also discusses the evolution of the group across the boundary. But it should be noted that the type of *S. sulcata* is lost and that it differs from the form that has been used to define the GSSP level.

Carlo CORRADINI, Sandra KAISER, Claudia SPALETTA, and Jim BARRICK will lead the conodont studies and investigate the *Protognathodus* conodont lineage.

There has been an invitation to a conodont workshop in Beijing, China, with study of D-C boundary sections in South China. However, this workshop may take place instead at the IPC3 in London.

Gordon BAIRD reported on a possible new D-C boundary section in NW Pennsylvania with Thomas BECKER noting another in Morocco. Brooks ELLWOOD reported that Jeff OVER had found a new boundary section in the Woodford Shale, Oklahoma. This is well exposed in a roadcut on Interstate 31.

It was also reported that John MARSHALL had found another terrestrial boundary section in East Greenland.

Document 2 was circulated, which was a new paper by Maurice STREEL on Upper Devonian miospores and conodont zone correlation in western Europe. This has been published in the 2009 *Geological Society of London Special Publication* **314** on Devonian Change.

6. SDS Publications

Relevant Devonian publications include

A special issue of *Palaeo*^{3} on the Middle Devonian, edited by Carl BRETT, Eberhard SCHINDLER etc.

Selected papers from the Uzbekistan meeting will be published in the *Bulletin of Geosciences* including details of the P/E boundary by Nacho VALENZUELA-RÍOS et al.

The papers from IGCP 499 has been published in a *Geological Society of London Special Publication* (No. 314) on Devonian change, edited by Peter KÖNIGSHOF. This includes 12 papers from different disciplines and different countries (from Canada to South America).

Palaeontographica Americana from the Nevada meeting was now in press [and has appeared in the meantime]. An earlier volume of *Palaeontographica Americana* (**62**) was the conodont volume to celebrate 150 years since the first conodont was described together with 40 years of the Pander Society. The Silurian and Devonian papers are:

BARRICK, J.E. et al. Conodont biostratigraphy, $\delta^{13}C$ chemostratigraphy, and recognition of Silurian/Devonian boundary in the Cherry Valley, New York region of the Appalachian Basin.

SUTTNER, T.J. Lower Devonian conodonts of the "Baron von Kottwitz" quarry (southern Burgenland, Austria).

OVER, D.J. et al. Upper Devonian conodonts from black shales of the high latitude Tomachi Formation, Madre de Dios Basin, northern Bolivia.

The volume on the *Devonian of Germany* which had been in preparation since 1988 was published in 2008. It is in German but contains many correlation charts. It contains 500 pp and costs 50€ or 30€ via the DGC website. Further details are in SDS Newsletter 24.

There had been a request for contributions for the *Memoir of Australaisian Palaeontology* on Asian Devonian stratigraphy.

Another notable contribution is a major monograph by Nona OVNATANOVA and Ludmilla KONONOVA on Russian Frasnian conodonts, published in *Palaeontological Journa*l **42** (10).

7. Financial Report

This year the SDS had been given $1600 together with $206 remaining from 2008. Out of this $1806 some $34 had been spent on printing for the Cincinnati meeting and the 2010 Newsletter will cost an estimated $500. Previously this had been subsidised by the University of Munster at $300 per edition. Remaining funds will be used for the support of active members to attend this meeting ($ 300) and the London IPC3. It was agreed to support A. KIM to come to London.

8. Future Meetings

On 11th-19th August there is a field meeting organised by the Carboniferous Sub-Commission to Moscow and the Southern Urals.

There is a meeting on Palaeozoic Seas in Graz, Austria from 14-18th September 2009. SDS Members have been invited. Registration is 150 €.

The most significant forthcoming meeting for the SDS is the 2010 IPC3 in London, England. We have applied for a symposium on *Devonian bioevents- ecology and evolutionary patterns*. This will cover all Devonian bioevents in all facies. It is hoped to publish a volume. We can discuss this further in London.

The SDS will also hold a conodont workshop with a particular focus on the D-C boundary.

There is also an SDS sponsored fieldtrip to the ORS of Scotland which will be held before IPC3.

Bruno GRAGNIER informed the SDS about the 4th French Congress on Stratigraphy. This is an international meeting in both English and French. It will be held at the University of Pierre et Marie Curie in Paris from 13th August to 2nd September 2010. Further information is available from http://paleopolis.rediris.es/STRATI2010/

Following IPC3 the next official SDS meeting will be to Novosibirsk and the Kuznetsk Basin in July/August 2011. We have now a formal meeting offer from the Trofimuk Institute of Petroleum Geology and Geophysics (Siberian Branch of the Russian Academy of Sciences) and the Siberian Research Institute of Geology, Geophysics and Mineral Resources.

In 2012 the next IGC will be held in Brisbane, Australia.

In April 2012 there are plans for a small meeting in Morocco to investigate Devonian and Lower Carboniferous section that the SDS has not yet visited. Ahmed EL HASSANI has agreed to be involved with such a meeting and it will provide an alternative for members unable to get to Brisbane.

In 2010 there is an Event Meeting in Wuhan, China. It is organised by the Chinese

University of Geosciences. The theme is *Geobiology of bioevents in deep time: mass extinction and recovery*. This includes D-C and F/F sessions with field excursions to South China and Tibet. The D-C boundary working group is very keen that we attend and it should be excellent field excursions. However, the dates (June 8th-10th) are very close to the IPC3 meeting.

In 2011 there is the Carboniferous and Permian Congress in Perth, Australia, at the University of Western Australia. This meeting includes an excursion to the Canning Basin to investigate the Devonian to Lower Permian interval. The excursion will be July 3rd-5th (pre conference).

9. Any Other Business

Peter KONIGSHOF reported that IGCP 499 had been awarded an extension and so it was still ok to use the logo on publications. The reception to the IGCP in Paris had been very good with 48/50 points awarded. A small group had submitted a new project with the 1st draft due at the end of October and the full proposal by February 2010. The proposed title is *Climate change and ecosystems in the Mid Devonian.* It is hoped to visit sections in the US and Arctic Canada.

The Secretary suggested that the SDS fieldtrip at IPC3 could be given an IGCP 499 logo.

The meeting closed at 18:38

John E. MARSHALL
SDS Secretary
January 2010

Excerpt from:

The IGCP project no. 499 "Devonian land sea interactions: evolution of ecosystems and climate" (DEVEC) – final report

In January 2009 the project received the status on extended term (OET). Even if we did not receive funding, the leaders and other colleagues organized two meetings in this year. The first one took place in Cincinnati, Ohio, from June 21-26 in conjunction with the 9th North American Paleontological Convention (NAPC 2009) where two special sessions have been organized. One session was entitled "Rapid evolution of terrestrial ecosystems and their influence on marine realms – land-sea interactions in the Devonian" chaired by R. BROCKE, P. KÖNIGSHOF, and J.E.A. MARSHALL, the other one had the focus on "Biological response to Devonian sea-level and paleoclimate changes, chaired by R.T. BECKER, E. SCHINDLER, and C.E. BRETT. A special volume on sea level and climate, cyclicity and bioevents in Middle Devonian marine and terrestrial environments will be published in 2010 (edited by BRETT et al. in press).

In September 2009 a joint meeting of IGCP 497, 499 and 503 entitled "Paleozoic Seas Symposium" was organized by T.J. SUTTNER, B. HUBMANN, and W. PILLER at Graz, Austria from September 14th –18th. The symposium was followed by a field trip to the Devonian of the Graz Palaeozoic and to Carboniferous localities of the Carnic Alps.

Additionally, there have been many activities in the regional and local working groups in different countries over the past years.
Regarding outreach activities we have improved our main websites (English and German version) and we have also linked our website with other "geo-sites".

All in all, even if there are many open questions left which especially concern the land-sea transitional settings or sequence stratigraphy vs. global bioevents, it should be stressed that this project has been a highly successful IGCP. Relationships of regional geological features and open questions with respect to biostratigraphy, facies interpretation and depositional environment, especially land-sea transitional settings generated vivid discussions in all of these meetings and workshops mentioned above and helped identify topics requiring future research. They also acted as a catalyst for future collaborative research between groups all over the world, as well as offering a network for collaboration between researchers involved in the IGCP 499 and forthcoming activities.

Furthermore, the last six years have shown that successful research is based on multidisciplinary cooperation. On the other hand, there are many open questions left and

there are some disciplines where we should concentrate research in the Devonian. Based on a profound knowledge of organisms sequence stratigraphic correlations should be brought into agreement with available biostratigraphic data. Another focal point could be a better correlation between terrestrial events and the correlation with marine realms, and in the neritic settings we need a better biostratigraphic and sedimentary record. Palynomorphs are a useful tool in this context. Another interesting aspect could be the evolution of the terrestrial vegetation and the interaction with the arthropods as well as the evolution of early terrestrial ecosystems. The meetings and workshops of IGCP 499 clearly have shown that there is a huge potential for special topics requiring future research and perhaps successor project of IGCP 499.

KÖNIGSHOF, P., LAZAUSKIENE, J., SCHINDLER, E., WILDE, V., YALÇIN, M.N.

Important publications for 2009/2010

KÖNIGSHOF, P. [ed.], 2009, Devonian Change: Case Studies in Palaeogeography and Palaeoecology. The Geological Society, London, Special Publications, 314, 1-298.

NANCE, D. [ed], 2010, The Rheic Ocean: Palaeozoic Evolution from Gondwana and Laurussia to Pangaea. Gondwana Research, v. 17, no 3-4, 189-614 (in press).

SUTTNER, T.J., HUBMANN, B. and PILLER, W.E., 2009, Palaeozoic Seas Symposium. Berichte des Institutes für Erdwissenschaften, Karl-Franzens-Universität, Band 14, 1-94, Graz, Austria.

SDS DOCUMENTS

Document submitted to the SDS business meeting, Cincinnati, June 2009

Brief comments on the Future Pragian Subdivision and Revision of the Emsian base

José Ignacio VALENZUELA-RÍOS & Peter CARLS

During last two decades we have presented numerous arguments and contributions regarding the very low position of the Emsian base and the need for revision. Most important data and detailed arguments can be found in CARLS & VALENZUELA-RÍOS, (2000, 2007) and CARLS *et al*. (2008). Therefore, here we want only to stress a few key points regarding the Pragian subdivision and the base of the Emsian, as these two aspects are intimate linked.

First, we want to stress, as we agreed in the Kitab meeting last year, that the base of the Emsian shall be placed close to the entry of *Polygnathus excavatus* 114 (=*Pol. excavatus gronbergi* sensu YOLKIN et al. 1994), in the evolutionary trend from *Pol. exc. excavatus*. This position is 114 m (although after field work in Kitab, we learn that not in thickness, but along slope) above the entry of *Pol. kitabicus* in Zinzilban Gorge section (current position of Emsian GSSP). Also, we agree that due to the extraordinary good conditions of the sections at Kitab, the new GSSP shall be placed there. However, we would like to call the attention on a, somehow, puzzling fact in Kitab. There, the two very close sections, Zinzilban Gorge and Khodzha-Kurgan seem to show some differences in faunal content, and this shall be analysed by, mainly, Uzbek and Siberian colleagues prior to set the new position of the GSSP in Kitab.

The new position of the Emsian base implies also a change in the current extension of the Pragian, to become closer to the original Pragian. This, in turn, facilitates the subdivision of the Pragian and the correlation of this subdivision. We agree in subdividing, initially, the Pragian in two parts, being the boundary between them at the entry of *Po. kitabicus*. This is a good reference point that can be correlated in many areas; in the Iberian Chains the position of the *kitabicus* boundary will be close to the d2c alpha/d2c beta boundary. By means of trilobites and brachiopods evolution, this upper part of the Pragian (from the *kitabicus* boundary to the base of the Emsian) will last, at least, about 4 My. CARLS *et al*. (2008) have recently correlated the position of this boundary in several key areas (Zinzilban, Nevada, Spain, Barrandian, Rhenish Mountains). Current knowledge on conodonts from this interval needs to be increased and carefully evaluated for global application.

In the lower part, the sequence of conodonts is rich but somehow different in various areas. In a recent elegant paper by MURPHY (2006) a sequence of eognathids allows fine subdivision and correlation of this lower part in Nevada. However, lack of such rich eognathids faunas in European key sections precludes tie correlations based on this important group. In Europe, there are other relevant taxa that are important for further subdivision and correlation of the lower part of the Pragian, these are, mainly, the stock of *Icriodus steinachensis* and pelekysnathids (see SLAVÍK et al., 2007). Both groups are restricted to the lower part of the Pragian (below *kitabicus* boundary), and are followed by *Pol. pireneae* and *Pedavis mariannae*. As these last two taxa are recorded in many places, they can be of relevance for further global correlation, but more research in the interval is needed before a due correlation can be established (compare VALENZUELA-RÍOS, 1997).

NEW AMMONOID RECORDS FROM THE LOWER EMSIAN OF THE KITAB RESERVE (UZBEKISTAN) – PRELIMINARY RESULTS

R. Thomas BECKER, Kenneth DE BAETS & Svetlana NIKOLAEVA

- In memory of Zhenya YOLKIN –

Introduction

Following their initial discovery by A.I. KIM in 1957 and joint examinations with H.K. ERBEN, the lower Emsian (Zlichovian) ammonoids of the Kitab Reserve area, in the SW of the Zeravshan Range in SE Uzbekistan, were systematically studied by B.I. BOGOSLOVSKIY (1980). Material collected by A.I. KIM, M.V. ERINA, and M.A. RZHONSNITSKAYA from the Khodzha-Kurgan Gorge comprised eight species at that time assigned to the genera *Erbenoceras, Teicherticeras (Convoluticeras), Mimosphinctes, Mimagoniatites, Kimoceras*, and *Gyroceratites*. Since the exceptional outcrops of the Kitab Reserve area were of highest importance for SDS during the discussion of the Lower/Middle Devonian boundary and the search for a basal Eifelian GSSP, several taxa were illustrated and named as *nomina nuda* in the Field Guide to the 1978 SDS Meeting by KIM et al. (1978), which also gives stratigraphic ranges. The lower Emsian specimens occur in the upper part of the Norbonak Beds (formerly Kimovsk Beds, poorly preserved material from Unit 11) and, mostly, in the lower to middle part of the Dzhaus Beds (Units 15-16). A later field guide with somewhat different data was published by KIM et al. (1984) in conjunction with the 27th International Geological Congress.

BOGOSLOVSKIY (1980) also described well preserved specimens of *Erb. kimi*, including the holotype, from the Dzhaus Beds of Shirdak (= Shirdagh) in the same region but did not provide any details of that less well-exposed and less fossiliferous section. A fauna with two different taxa, *Teicherticeras (Convoluticeras) flexuosum* and *Gaurites sperandus*, was discovered by A.I. KIM in the Dzhaus Beds of the Yusupkul´ area in the Shirdak Stow, ca. 5-7 km S of the Khodzha-Kurgan-Gorge (BOGOSLOVSKIY 1984). Another early ammonoid assemblage with *"Erb." khanakasuense, Mimosphinctes*, and *Gyroceratites* occurs in the neighbouring Khanakasu River area of the Zeravshan-Gissar area (BOGOSLOVSKIY 1980, YATSKOV 1990). RZHONSNITSKAYA et al. (1982) noted the presence of faunas with *Erbenoceras*, teicherticeratids, *Mimosphinctes* and *Fasciculoceras* in the Fergana Valley of Central Asia, which lies several hundred kilometres to the NE of the Zeravshan Range. These are not yet properly described.

Types and typical representatives of all taxa from the Kitab region were re-figured in the magnificent compendium of Uzbekistan faunas by KIM et al. (2007). A refined summary of some ranges in correlation with conodonts and dacryoconarids was presented at the 2008 joint SDS-IGCP 499 Field Symposium (YOLKIN et al. 2008), with photographic documentations in the Atlas by KIM et al. (2008). This report presents the results of sampling for ca. 1 ½ days at the Khodzha-Kurgan Gorge in 2008.

Taxonomic notes

Erbenoceras kimi and *Erbenoceras khanakasuense*

YATSKOV (1990) assigned the syntypes of *Erb. kimi* with intercalated secondary ribs to his new species *Erb. khanakasuense*. This applies to all three figured *kimi* types (Bogoslovsky, 1978, pl. 44, fig. 2-4) from the Khanakasu River, whilst the *kimi* holotype is from Shirdak. The unfigured Khodzha-Kurgan *kimi* material could belong to either of the two species. This cannot be decided without re-examination. Therefore, previous unfigured *kimi* records from the Khodzha-Kurgan-Gorge are here referred to as *Erb. kimi* s.l. In addition, intercalated ribs are the apomorphic feature of the Mimosphinctinae and *khanakasuense* should become the type-species of a new, initial genus of that subfamily. It would differ from the related but older *Talenticeras* by more slowly increasing whorls (lower whorl expansion rate) and from *Mimosphinctes* by the lack of dorsal lobes and complete absence of a small dorsal concavity (mentioned for *Mimosph. tripartitus*, the type-species, by EICHENBERG 1931). Consequently, *khanakasuense* is here provisionally placed in "Gen. aff. *Mimosphinctes*". *Erbenoceras* sp. A of WANG (in XIAN et al. 1980) is related and congeneric.

Mimosphinctes erbeni

BOGOSLOVSKIY (1980) based *Mimosphinctes erbeni* on the original material of *Mimosphinctes* n.sp. A described by ERBEN (1964, 1965) from the Harz Mts. of Germany. It seems that the holotype (ERBEN, 1965, pl. 27, fig. 9) is not conspecific and perhaps not even congeneric with the rich material from the Zeravshan Range. ERBEN´s specimen lacks a

dorsal concavity and, which is especially important, a dorsal lobe. The Central Asian material, which is also somewhat more evolute than the holotype, should be given a new species name; it is here provisionally referred to as *Mimosphinctes* n. sp. (*erbeni* auct.).

Mimosphinctes rudicostatus

As outlined by KLUG (2001), *Convoluticeras* has been restricted to convolute forms similar to its type-species, with rather fast expanding whorls and at maturity with weak ornament apart from widely spaced, distinctive, arched lirae. *Teicherticeras (Convoluticeras) rudicostatum* has a rather well-developed dorsal concavity of the whorls but clearly (see KLUG 2001 and KIM et al. 2007) falls into *Mimosphinctes*. The very closely related or perhaps even conspecific *Mimosphinctes discordans* has also been reported from the *elegans* and *cancellata* Zones of the Czech Republic (CHLUPAC & TUREK 1983) and Guangxi, China (RUAN 1981, YU & RUAN 1988). *Convoluticeras flexuosum*, although very similar in coiling to other convoluticeratids, has a very particular, flexuous ribbing.

Teicherticeras

The type-species of *Teicherticeras*, *Gyroceratites desideratus* TEICHERT (1948), was re-named *T. teicherti* by CHLUPAC & TUREK (1983), because it was a secondary junior homonym of *Goniatites desideratus* WALCOTT, 1884. As outlined by ERBEN (1965), it clearly lacks a concave dorsal zone of the whorls and a dorsal lobe. This is confirmed by a series of topotypes collected by RTB in the Buchan type region (Victoria) in 1989. Convolute forms with a well-developed dorsal lobe, previously placed in *Convoluticeras*, such as *Teicherticeras (Convoluticeras) planum*, therefore fall in a different and not yet named genus, here provisionally named as "Gen. aff. *Teicherticeras*". Since the holotype (by monotypy) of *Gon. desideratus* WALCOTT possesses a small concave whorl zone (its dorsal suture, unfortunately, is not known), it does not belong to *Teicherticeras*. The inclusion of WALCOTT´s species in a new convolute genus will remove the secondary homonymy and, as a result, TEICHERT´s species name will have to be reinstated under Article 59.4 of the Code.

.

Ammonoid record of the Khodzha-Kurgan Gorge

Most Khodzha-Kurgan ammonoids are squashed, apart from some specimens from rare black limestone nodules. These are micritic, conodont-poor, hexactinellid-bearing ammonoid coquinas, mostly with crushed shells. It is strange that no polygnathids could be recovered from a new concretion collected at 28-29 m. All recovered conodont elements appear to belong to *Criteriognathus prolatus*, the presence of which in the formation and locality has previously been documented by KIM et al. (2008).

The new collections include the first records for Central Asia of the *Anetoceras hunsrueckianum* Group, recently transferred to the genus *Ivoites* by DE BAETS et al. (2009). *Ivoites* was introduced as a replacement name for *Teneroceras* CHLUPAC & TUREK 1983 because of its homonymy with a Jurassic ammonite. It is not a synonym of *Luofoceras* RUAN 1996, which was erroneously included in the synonymy list of DE BAETS et al (2009, p. 372); the latter has much more slowly expanding, loosely coiled whorls as in *Borivites*.

There is also a strange widely evolute cyrtoconic form, almost without ornament, but with mature ventrolateral double furrows. Only compressed fragments are available. The dorsal side shows some growth crenulae and one specimen suggests concavo-convex ornament with a high outer salient. This new form resembles *Cyrtobactrites sinuatus* ERBEN, 1960, but because of the spiral double furrows it requires a new genus. The available material is too poor for a formal description. A single very loosely coiled specimen from 28-29m of Unit 16, here provisionally identified as *?Metabactrites* n. sp., has relative weak ribbing unlike as in any described loosely gyroconic member of the Anetoceratinae.

It is strange that the fairly abundant cyrtoconic to widely evolute gyroconic forms have not been recorded previously. Possibly they were mistaken for fragments of shells of other genera and not collected. On the other hand it is surprising that the new collections do not contain any *Mimosphinctes* n. sp. (*erbeni* auct.). Also, no new ammonoid material was found in the Norbonak Beds (Unit 11) or near the base of Unit 15 in the Dzhaus Beds, but little collecting time was spent at these levels. The rather variable published bases and tops of conodont and dacryoconarid occurrences are given for correlation but are subject to revision ([1] = based on KIM et al. 1978, [2] = record of KIM et al. 1984, [3] = last update, record in YOLKIN et al. 2008). It is clear that some previous ranges, such as very low occurrences of *Now. cancellata* and *Now. richteri* in KIM et al. (1978, 1984), are in strong conflict with the wealth of records elsewhere and, consequently, were not upheld in YOLKIN et al. (2008). The Khodzha-Kurgan ammonoid record now is as follows (bold = new material):

Unit 7, base	base *Po. gronbergi*[2]
Unit 9, 53m	base *Now. zlichovensis*[3]
Unit 11, ca. 92m	base *Po. nothoperbonus*[3]
Unit 11, top	*Erbenoceras* sp. *?Gyroceratites* sp.
Unit 12, base	base *Now. barrandei*[1]
Unit 12, top	top *Now. zlichovensis*[3]
Unit 13, base	base *Now. elegans*[1] base *Po. perbonus*[2]
Unit 15, base	base *Po. inversus*[3]
Unit 15, 5m	base *Now. barrandei*[3] *Erbenoceras kimi* s.l. *Mimosphinctes rudicostatus* *Mimosphinctes tripartitus* *Gyroceratites laevis*
Unit 15, 0.73m below top	***Erbenoceras kimi*** ***Mimagoniatites* sp.**
Unit 15, 0.3m below top	***Erbenoceras kimi***
Unit 16, 0m	***Ivoites* cf. *hunsrueckianus*** ***Gyroceratites laevis***
Unit 16, 0.5m	***Erbenoceras kimi***
Unit 16, 1m	*Mimosphinctes* n. sp. (*erbeni* auct.)
Unit 16, 2-3m	***Erbenoceras kimi*** (abundant)
Unit 16, ca. 5m	*Mimosphinctes tripartitus*
Unit 16, 11m	***Erbenoceras kimi,*** ***Gyroceratites laevis***
Unit 16, 12m	base *Po. inversus*[1,2]
Unit 16, 13m	***Mimagoniatites* cf. *fecundus*** ***Gyroceratites laevis***
Unit 16, 16m	base *Now. cancellata*[1,2]
Unit 16, 18m	base *Now. richteri*[2]
Unit 16, 23-24m	base *Now. richteri*[2] ***Erbenoceras kimi*** *Mimosphinctes* cf. *tripartitus* ***Gyroceratites laevis***
Unit 16, ca. 28m	*Mimosphinctes* n.sp. (*erbeni* auct.)
Unit 16, 28-29m	black limestone nodule hexactinellid sponge spicules ***?Metabactrites* n. sp.** ***Ivoites* cf. *hunsrueckianus*** (abundant)
	Gen. aff. *Mimosphinctes khanakasuensis* (abundant) ***Mimagoniatites fecundus*** (abundant) ***Kimoceras lentiforme*** (three fragments with typical lateral sulcus)
Unit 16, 29-30m	**Gen. aff. *Cyrtobactrites* n. sp.** (common) ***Ivoites* cf. *hunsrueckianus*** ***Mimagoniatites* cf. *fecundus*** ***Gyroceratites laevis***
Unit 16, ca. 30m	*Gyroceratites laevis*
Unit 16, 33m	***Gyroceratites laevis***
Unit 16, 37m	***Mimosphinctes rudicostatus***
Unit 16, 38m	***Mimosphinctes rudicostatus*** (abundant) ***Mimagoniatites fecundus*** ***Gyroceratites laevis***
Unit 16, 39m	***Mimagoniatites fecundus*** ***Gyroceratites laevis***
Unit 16, 40-41m	***Ivoites* cf. *hunsrueckianus*** (abundant) ***Gyroceratites laevis*** ***Mimosphinctes rudicostatus*** (abundant)
Unit 16, 42m	***Mimosphinctes rudicostatus*** ***Gyroceratites laevis***
Unit 16, 43m	base *Po. gilbert*[3] *Mimosphinctes* n.sp. (*erbeni* auct.) ***Mimosphinctes rudicostatus*** *Mimagoniatites fecundus* (figured in KIM et al. 1978 as aff. *fecundus*) *Convoluticeras* sp. (or cf. *flexuosum*; figured in KIM et al. 1978)
Unit 16, 43-44m	***Mimosphinctes rudicostatus***
Unit 16, 44-45m	***Mimosphinctes rudicostatus***
Unit 16, Sample X	***Mimosphinctes rudicostatus***
Unit 16, 45m	***?Mimosphinctes rudicostatus***
Unirt 16, 46-47m	***Ivoites* cf. *hunsrueckianus*** (loose specimen)
Unit 16, 47m	base *Now. cancellata*[3] *Mimosphinctes* n.sp. (*erbeni* auct.) *Mimosphinctes rudicostatus* *Kimoceras lentiforme* *Gyroceratites laevis* *Mimagoniatites* sp.
Unit 16, 48-49m	***?Gyroceratites laevis***

Unit 16, ca. 70 m *Gyroceratites laevis*

Unit 16, 71m base *Po. serotinus*[2,3]

Unit 16, 74m *Gyroceratites laevis*

Unit 16, 79 m *Gyroceratites laevis* (figured in KIM et al. 1978)

Unit 16, 80 m *Gyroceratites laevis*

Ammonoid stratigraphy, regional and international correlations

The sparse fauna with *Erbenoceras* and *Gyroceratites* recorded previously from the Norbonak Beds (Unit 11) falls in the *nothoperbonus* Zone. Its base apparently predates slightly the base of the *Now. barrandei* Zone. This oldest Kitab fauna correlates roughly with the lower to middle part of the *Anetoceras* Limestone of southern Morocco (Tafilalt and Maider, BECKER & HOUSE 1994, KLUG 2001) that, around the *Now. praecursor/Now. barrandei* Zone boundary, is characterized by an association of *Erbenoceras* and *Anetoceras* s.str. (= *Ruanites* auct.). The latter genus is characteristic for LD III-C (BECKER & HOUSE 1994) and a better generic marker than *Teicherticeras*, which needs revision and the type-species of which seems to enter in Australia (MAWSON 1985) below the *perbonus/nothoperbonus* Zone. *Gyroceratites* occurs below the Moroccan *Anetoceras* Limestone but is absent from the oxygenated cephalopod limestone facies. Roughly contemporaneous, often still insufficiently documented *Erbenoceras* faunas are known from other regions, such as the Barrandian (CHLUPAC & TUREK 1983), the Dra Valley of southern Morocco (DE BAETS & KLUG 2008, BECKER et al. 2008), Novaya Zemlya (YATSKOV 1990), perhaps Alaska (BECKER & HOUSE 1994), the Fergana Valley of Central Asia (RZHONSNITSKAYA et al. 1982), and Guangxi, South China (e.g., Sanchahe, Hanshan and Liujing sections, YU & RUAN 1989, RUAN & MU 1989).

The new samples from the top of Unit 15 to the middle part of Unit 16 can be assigned to four successive assemblages:

1. *Erbenoceras-Mimagoniatites-Ivoites-Gyroceratites* (-0.7 to 28m)
2. Gen. aff. *Mimosphinctes-Kimoceras* (28-38m; *Mimagoniatites, Ivoites* and *Gyroceratites* continue)
3. *Mimosphinctes rudicostatus* (37-46m; *Ivoites* continues into the lower part)
4. *Gyroceratites laevis* (the only remaining species, 47-100m)

The correlation with previous ammonoid collections from the Khodzha-Kurgan Gorge and with the international record faces several conflicts. Notably it is surprising that the new material includes no *Mimosphinctes* below 38m of Unit 16, from low in the *inversus* Zone, or from below (YOLKIN et al. 2008) or just above (KIM et al. 1978) the entry of *Now. elegans*. This suggests that Assemblages 1 and 2 from the *inversus* Zone (upper *Now. barrandei* to lower part of *Now. elegans* Zone) correlate with the dark to bluish upper part of the Moroccan *Anetoceras* Limestone that also yielded *Mimagoniatites. Mimagoniatites* faunas of similar age (LD III-D of BECKER & HOUSE 1994) occur in the Blue Limestone of the Saoura Valley of Algeria (ALBERTI 1981; GÖDDERTZ 1989), in the Cantabrian Mts. (deepening phase of lower Vañes Beds with *Erbenoceras*, KULLMANN 1960, MONTESINOS 1991, GARCÍA-LOPEZ et al. 2002), in Celtiberia (upper part of dark to black d4bα with *Now. elegans*, GARCÍA-ALCALDE 2007, CARLS & VALENZUELA-RÍOS 2002), in the *Zorgensis* Limestone of the Harz Mts. (e.g., ERBEN 1953), in the lower Schönau Limestone of the Kellerwald (Unit 2 of ALBERTI 1971), at the top of the Zlichov Limestone of Bohemia (CHLUPAC et al. 1979), there also associated with the last *Erbenoceras*, perhaps in the Dede Formation of the Bosphorus region (e.g., HAAS 1982), and in many regions of Guangxi, South China (Nandan facies, part of the *Erb. elegantulum* Zone, YU & RUAN 1989, RUAN 1996). *Erbenoceras* (identified as *Teicherticeras* sp.) ranges also into the deepening interval of the Kuvash Beds (with *Now*. cf. *elegans*) in the Gorny Altai of southern Siberia (YOLKIN et al. 2000). Records from various regions show that locally different members of the Auguritacea are also typical for this interval: *Weyeroceras* in southern Morocco (KLUG 2001), *Celaeceras* in northern Spain (MONTESINOS & GARCÍA-ALCALDE 1996; Carls 1999), and Czech Republic (CHLUPAC & TUREK 1983), *Kimoceras* in the Khodzha-Kurgan Gorge (new oldest record), and, probably, *Gaurites* in the neighbouring Yusupkul´ area (BOGOSLOVSKIY 1984). But the lineage continued to the top of the Zlichovian in the Kakva region of the eastern slope of the northern Urals (BOGOSLOVSKIY 1969).

The transitional nature of Gen. aff. *Mimosphinctes khanakasuense* between *Erbenoceras kimi* and *Mimosphinctes* suggests that the later entry of the latter follows the phylogenetic path, rather than representing a sampling bias. *Ivoites* was apparently most common in the latest Zlichovian but in Novaya Zemlya it first occurs in an assemblage of the

Now. barrandei Zone that apparently lacks *Mimagoniatites* (YATSKOV 1990, 1994).
In Bohemia (CHLUPAC et al. 1979, CHLUPAC & TUREK 1983), in the Cantabrian Mountains (MONTESINOS 1991, GARCÍA-LÓPEZ et al. 2002), in Guangxi, South China (YU & RUAN 1989: *discordans* Zone), probably also in the *Zorgensis* Limestone (or Lauterberg Limestone) of the Harz Mts. (EICHENBERG 1931, conodont data in KLAPPER & JOHNSON 1975), *Mimosphinctes*, the generic marker of LD III-E of BECKER & HOUSE (2000), is typical for the main/upper part of the *Now. elegans* to basal *Now. cancellata* Zone. Based on data from the La Grange Limestone (where *Mimosphinctes* is lacking), this interval correlates with the lower part of the *laticostatus* Zone (BULTYNCK et al. 1999). The presence of *Po. gilberti*, that first occurs well above the base of the *laticostatus* Zone at La Grange (BULTYNCK et al. 1999), at Unit 16, 43m, is in good accord with a correlation of new Kitab, Bohemian, and Cantabrian *Mimosphinctes* faunas. *Ivoites* co-occurs with *Mimagoniatites* and *Mimosphinctes* in Bohemia (CHLUPAC et al. 1979), in the Russian Far East (BOGOSLOVSKIY 1982), and in Guangxi, South China (Luofo, *Now. elegans* Zone, level of *Mimosph. discordans* of other sections, such as Nayi and Duan, YU & RUAN 1989) and, perhaps, also in the famous Hunsrückschiefer of Germany (ERBEN 1964). NIKOLAEVA (2007) described an assemblage of *Mimosphinctes, Mimagoniatites, Erbenoceras*, and others from the Northern Caucasus; this fauna has not yet been correlated with conodont and nowakiid zones. *Convoluticeras* s.str. is also known elsewhere from the *Now. elegans* to basal *Now. cancellata* Zone, e.g. from the La Grange Limestone (BULTYNCK et al. 1999).

So far, no *Mimosphinctes* from Unit 15 and the lower part of Unit 16 have been illustrated. If these can be confirmed by re-sampling or documentation of well-positioned previous specimens, the distinction of successive *Mimagoniatites* (LD III-D) and *Mimosphinctes* Zones (LD III-E) may not be valid, at least in the Khodzha-Kurgan Gorge. A change of bed labelling in the course of research, sample mixing and the misplacing of loose material has to be excluded, too. Possibly, the new collections are too small to document the full regional range of *Mimosphinctes*. The rare limestone nodules contain different assemblages than the siliceous shales, which resulted in the discovery of *Kimoceras* below its previous position, well within the *rudicostatus* interval. KLUG (2001) placed *Teicherticeras rotatile* WANG in XIAN et al. (1980, which pre-dates the supposed original description in RUAN 1981), in *Mimosphinctes*. XIAN (1990) and RUAN (1996) assigned this species to the regionally widespread *Anetoceras obliquecostatum-Erbenoceras elegantulum* Zone, which includes the oldest *Mimagoniatites* and which falls in the *Now. barrandei* Zone. XIAN (1990) similarly noted *Mimosphinctes* sp. from the main part of the *Now. barrandei* Zone at Dalian, Nanning County. A shale with squashed *Mimosph. bipartitus* and *Erbenoceras* from the more basinal facies of Harzgerode (Harz Mts., Germany) was placed by ALBERTI (1998) between nodules with *Now. barrandei* and *Now. elegans*; this section is tectonically too complex to allow any conclusions.

The higher part of Unit 16, between 47 and 70m, the main part of the *cancellata* Zone, clearly falls in the upper Emsian, characterized by the disappearance of last members of the Mimosphinctacea. This interval below the entry of *Po. serotinus* (at 71m) correlates with the lower part of the main Daleje Shale Interval of Bohemia and southern Morocco that carries *Gyroceratites* (LD IV-A) and, subsequently, early anarcestid faunas (LD IV-B). The rarity of goniatites in the thick *serotinus* Zone of the Kitab area is remarkable and reflects unfavourable biofacies conditions.

Emsian substages
The Khodzha-Kurgan ammonoid faunas are of the highest importance in the search of an intra-Emsian substage boundary. From the ammonoid point of view, it would be desirable to keep faunas dominated by members of the Mimosphinctacea in the lower Emsian. The last *Mimosphinctes discordans* occur in Bohemia well in the Daleje Shale. Unfortunately, there is no biostratigraphic marker that enters in the Khodzha-Kurgan Gorge between the last *Mimosphinctes* and the first *Po. serotinus*. The distinctive faunas with first *Icriodus* s.str. (*fusiformis* or *corniger ancestralis*) that co-occur with oldest anarcestids in Europe and North Africa (BECKER 2007) are lacking. An upper Emsian defined by *Now. cancellata* would at least approximate the upper limit of "*Anetoceras* Faunas", more closely than the entry of *Po. gilberti* that has been proposed by P. BULTYNCK in 2004 as a potential substage index form. The ongoing revision of nowakiids from Khodzha-Kurgan should give more precision for the correlation with the ammonoids.

Acknowledgements
KDB thanks the Swiss National Science Foundation (project No. 200021-113956/1) and the Swiss Paleontological Association for financial support. SVN's fieldwork was supported by the Program of the Presidium of the Russian Academy of Sciences "Origin and Evolution of the Biosphere". The Uzbek colleagues from the State Committee on Geology and Mineral Resources of the Republic of Uzbekistan (Tashkent) and the Kitab State Geological Reserve kindly provided help with visas and permits for the export of samples. Our colleagues from Novosibirsk and Uzbekistan kindly guided us in the field.

References

Alberti, G.K.B. (1971). Tentaculiten (Nowakiidae) aus dem Grenzbereich Zlichovium/Eifelium und Bemerkungen zur Unter-/Mittel-Devon-Grenze nach Nowakiidae. – Senck. leth. 52 (1): 93-113.

Alberti, G.K.B. (1981). Daten zur stratigraphischen Verbreitung der Nowakiidae (Dacryoconarida) im Devon von NW-Afrika (Maroko, Algerien). Senck. leth. 62 (2/6): 205-216.

Alberti, G.K.B. (1998). Planktonische Tentakuliten des Devon. III. Dacryoconarida Fisher 1962 aus dem Unter-Devon und oberen Mitteldevon. – Palaeontogr., Abt. A 250 (1/3): 1-46.

Becker, R.T. (2007). Emsian substages and the Daleje Event – a consideration of conodont, dacryoconarid, ammonoid and sealevel data. SDS Newsletter 22: 29-32.

Becker, R.T. & House, M.R. (1994). International Devonian goniatite zonation, Emsian to Givetian, with new records from Morocco. – Cour. Forsch.-Inst. Senckenberg 169: 79-135.

Becker, R.T. & House, M.R. (2000). Devonian ammonoid zones and their correlation with established series and stage boundaries. - Cour. Forsch.-Inst. Senckenberg 220: 113-151.

Becker, R.T., Aboussalam, Z.S. & Brett, C.E. (2008). High-resolution biostratigraphy of Emsian mixed siliciclastic-carbonate successions of the western Dra Valley (Anti-Atlas, SW Morocco). – In: Kim, A.I., Salimova, F.-A. & Meshchankina, N.A. (Eds.), International Conference "Alignments of Lower Devonian Carbonate and Clastic Sequences" (IGCP 499 Project/SDS joint field meeting), Contributions: 14-18.

Bogoslovskiy, B. I. 1969. Devonskiye ammonoidei. I. Agoniatity, - Trudy Paleont. Inst., 124: 1-341.

Bogoslovskiy, B.I. (1980). Rannedevonskiye ammonoidei Zeravshanskogo khrebta. – Paleont. Zh. 1980 (4): 51-66.

Bogoslovskiy, B.I. (1982). Early Devonian and Eifelian ammonoids of the USSR, extent and zonation of the Eifelian. - Proceedings of Field Symposium of the International Subcommission on Devonian Stratigraphy, Samarkand, USSR, 1978: 23-26. [in Russian]

Bogoslovskiy, B.I. (1984). Novyy rod semeystva Aguritidae i soputstvuyushchiye yemu ammonidey iz nizhnego devona Zeravshanskogo khrebta. – Paleont. Zh. 1984 (1): 30-36.

Bultynck, P., Lardeux, H. & Walliser, O.H. (1999). On the correlation of middle-Emsian Conodonts, Dacryoconarids, and Goniatites. – Doc. Subcomm. Dev. Strat., Morocco, April 1999, 3 pp.

Carls, P. 1999. El Devónico de Celtiberia y sus F´siles. – In: Memorias de las VI Jornadas Aragonesas de Paleontología: 25 años de paleontologia aragonesa, homenaje al Prof. Leandro Sequeiros: 101-164.

Carls, P. & Valenzuela-Ríos, J.I. (2002). Early Emsian Conodonts and associated shelly faunas of the Mariposas Fm (Iberian Chains, Aragón, Spain). – Cuad. Museo Geomin. 1: 315-333.

Chlupac, I. & Turek 1983. Devonian goniatites from the Barrandian area, Czechoslowakia. – Rozpr. Ùstr. úst. geol. 46: 1-159.

Chlupac, I., Lukes, P. & Zikmundova, J. (1979). The Lower/Middle Devonian boundary beds in the Barrandian area, Czechoslovakia. - Geol. et Palaeont. 13: 125-156.

De Baets, K. & Klug, C. (2008). Correlation of the marine Zlíchovian sedimentary rocks of the Dra Valley and Tafilalt areas, Morocco. – In: Kim, A.I., Salimova, F.-A. & Meshchankina, N.A. (Eds.), International Conference "Alignments of Lower Devonian Carbonate and Clastic Sequences" (IGCP 499 Project/SDS joint field meeting), Contributions: 26-27.

De Baets, K., Klug, C. & Korn, D. (2009). Anetoceratinae (Ammonoidea, Early Devonian) from the Eifel and Harz Mountains (Germany), with a revision of their genera. – N. Jb. Geol. Paläont., Abh. 252 (3): 361-376.

Eichenberg, W. (1931). Die Schichtenfolge des Herzberg-Andreasberger Sattelzuges. – N. Jb. Min. Geol. Paläont., Beil.-Bd. 65: 141-196.

Erben, H.K. (1953). Stratigraphie, Tektonik und Faziesverhältnisse des böhmisch entwickelten Unterdevons im Harz. – Beih. Geol. Jb. 9, 98 pp.

Erben, H.K. (1964). Die Evolution der ältesten Ammonoidea (Lieferung I). – N. Jb. Geol. Paläont., Abh. 120 (2): 107-212.

Erben, H.K. (1965). Die Evolution der ältesten Ammonoidea (Lieferung II). – N. Jb. Geol. Paläont., Abh. 122 (3): 275-312.

García-Alcalde, J.L. (1997). North Gondwanan Emsian events. – Episodes 20 (4): 241-246.
García-López, S., Jahznke, H. & Sanz-López, J. (2002). Uppermost Pridoli to Upper Emsian stratigraphy of the Alto Carríon Unit, Palentine Domain (Northwest Spain). - Cuad. Museo Geomin. 1: 229-257.
Göddertz, B. (1989). Unterdevonische hercynische Goniatiten aus Deutschland, Frankreich und der Türkei. – Paleontogr. Abt A 208 (1/3): 61-89.
Haas, W. (1982). Preliminary notes of the Devonian SE of Istanbul (Turkey). – In: Sokolov, B.C. & Rzhonsnitskaya, M.A. (Eds.), Biostratigraphy of Lower and Middle Devonian boundary deposits. - Proceedings of Field Symposium of the International Subcommission on Devonian Stratigraphy, Samarkand, USSR, 1978: 144-147. [in Russian]
Kim, A.I., Yolkin, E.A., Erina, M.V. & Gratsianova, R.T. (1978). Type sections of the Lower and Middle Devonian boundary sediments in Middle Asia. – A Guide to Field Excursions, Field Session of the International Subcommission on the Devonian Stratigraphy, Samarkand, 1978, 48 pp., 78 pls. (Tashkent).
Kim, A.I., Yolkin, E.A., Erina, M.V., Korsakov, V.S. & Tsoy, R.V. (1984). The middle Palaeozoic of Southern Tien Shan. – Internat. Geol. Congr., 27th Sess., Moskva 1984, Guide-Book, Uzbekistan, Excursion 100, pp. 128-146 (Moscow).
Kim, A.I., Salimova, F.A., Kim, I.A. & Meshchankina, N.A. (Eds., 2007). Palaeontological Atlas of Phanerozoic Faunas and Floras of Uzbekistan, Volume I, Palaeozoic. – 707 pp. (Republic of Uzbekistan State Committee on Geology and Mineral Resources, Tashkent).
Kim, A.I., Erina, M.V. & Kim, A.I. (2008). Atlas of the Paleontological Plates. - Supplement to a Guidebook of the Field Excursion, Internat. Conf. “Global Alignments of Lower Devonian Carbonate and Clastic Sequences” (SDS/IGCP 499 Project joint field meeting), 34 pls. (Publishing House of SB Ras, Novosibirsk).
Klapper, G. & Johnson, D.B. (1975). Sequence in conodont genus Polygnathus in Lower Devonian at Lone Mountain, Nevada. – Geol. et Palaeont. 9: 65-83.
Klug, C. (2001). Early Emsian ammonoids from the eastern Anti-Atlas (Morocco) and their succession. – Paläont. Z. 74 (4): 479-515.
Kullmann, J. (1960). Die Ammonoidea des Devon im Kantabrischen Gebirge (Nordspanien). – Abh. math.-naturwiss. Kl., Akad. Wiss. Lit. Mainz 1960 (7): 105 pp.
Mawson, R. 1987. Early Devonian conodont faunas from Buchan and Bindi, Victoria, Australia. – Palaeont., 30 (2): 31-41.
Montesinos, R. (1991). Ammonoideos de las Capas de Vañes (Formacíon Abadia, Devónico Inferior) del Dominio Palentino (Palencia, NO de España). - Cuad. Lab. Xeol. Laxe 16: 193-201.
Moentesinos, J. R. & García-Alcalde, J. L. 1996. An occurrence of the auguritid ammonoid Celaeceras in the Lower Devonian of Northern Spain. – Paleont., 39 (1): 149-155.
Nikolaeva, S.V. 2007. Discovery of Emsian Ammonoids in the Northern Caucasus. – Paleont. Zh., 2007 (5): 34-39.
Ruan, Y.-P. (1981). Devonian and earliest Carboniferous Ammonoids from Guangxi and Guizhou. – Mem. Nanjing Inst. Geol. Palaeont., Acad. Sin. 15: 1-152.
Ruan, Y.-P. (1996). Zonation and distribution of the Early Devonian primitive ammonoids in South China. – In: Wang, H. & Wang, X. (Eds.), Centennial Memorial Volume of Professor Sun Yunzhu (Y.C. Sun), Palaeontology and Stratigraphy: 104-112 (China University of Geoscience Press, Bejing).
Ruan, Y.-P. & Mu, D.-C. (1989). Devonian tentaculitoids from Guangxi. – Mem. Nanjing Inst. Geol. Paleont. 26: 1-234.
Rzhonsnitskaya, M.A., Kulikova, N.M. & Petrosyan, N.M. (1982). The section of the Lower Devonian and the lowermost Middle Devonian of South Fergana. - In: Sokolov, B.C. & Rzhonsnitskaya, M.A. (Eds.), Biostratigraphy of Lower and Middle Devonian boundary deposits, Proceedings of Field Symposium of the International Subcommission on Devonian Stratigraphy, Samarkand, USSR, 1978: 123-129. [in Russian]
Teichert, C. (1948). Middle Devonian goniatites from the Buchan District, Victoria. - J. Paleont. 22 (1): 60-67.
Walcott, C.D. (1884). Palaeontology of the Eureka district (Nevada). – U.S. Geol. Surv. 8: 298 pp.
Xian, S. (1990). Late early Devonian brachiopod fauna and its bionomic environment of silicalite facies, Nanning, Guangxi. – Prof. Pap. Strat. Palaeont., 1990: 37-80. [in Chinese]
Xian, S., Wang, S., Zhou, X. et al. (1980). Nandan typical stratigraphy and paleontology of Devonian in South China. – 161 pp. (Guizhou People´s Publishing House, Guiyang). [in Chinese]
Yatskov, S.V. (1990). Devonian ammonoid zonation on Novaya Zemlya. – Newsl. Strat. 30 (3):
Yatskov, S.V. (1994). O drevneyshem semeystve ammonoidey Anetoceratidae. – Paleont. Zh. 1990 (3): 25-32.

Yolkin, E.A., Bakharev, N.K., Alekseenko, A.A., Klets, A.G., Mezentseva, O.P., Rodina, O.A. & Udodov, Y.V. (2000). Emsian (Lower Devonian) ammonoids and tentaculites from the Kuvash Reference section of the Gorny Altai (southern West Siberia). – News of Paleontology and Stratigraphy, Geologiya i Geofizika, Supplement 2/3: 189-193 [in Russian].

Yolkin, E.A., Kim, A.I. & Talent, J.A. (Eds., 2008). Devonian Sequences of the Kitab Reserve area. – Field Excursion Guidebook, Internat. Conf. "Global Alignments of Lower Devonian Carbonate and Clastic Sequences" (SDS/IGCP 499 Project joint field meeting), 97 pp. (Publishing House of SB Ras, Novosibirsk).

Yu, C.-M. & Ru, Y.-P. (1989). Proposal and comment on the definition of Emsian. – Can. Soc. Petrol. Geol., Mem. 14 (III): 179-191.

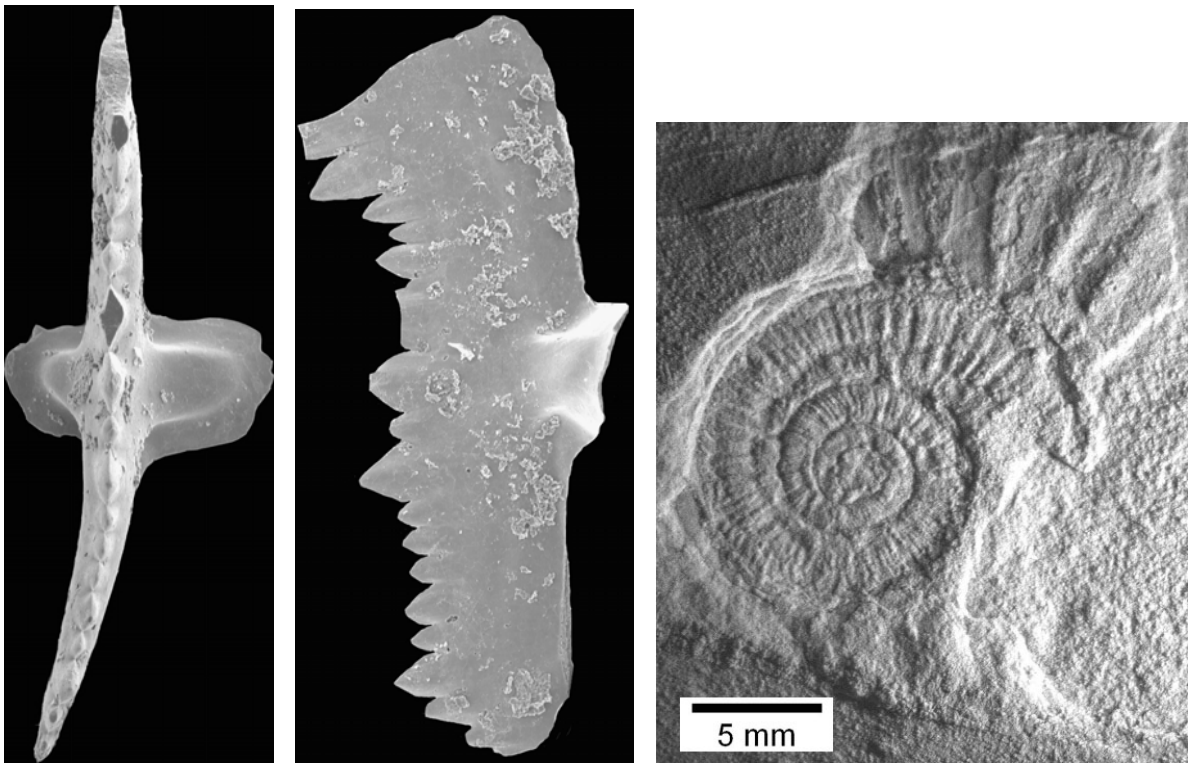
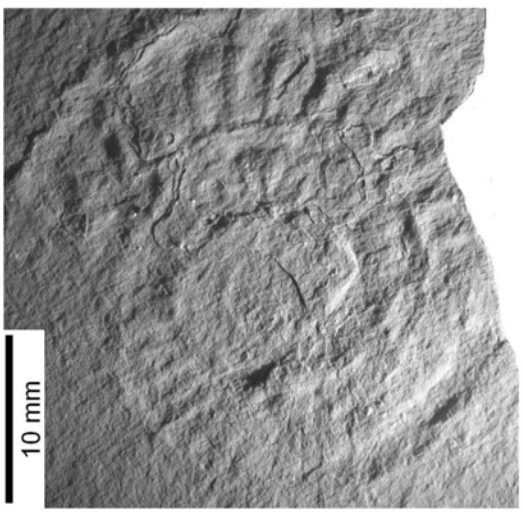
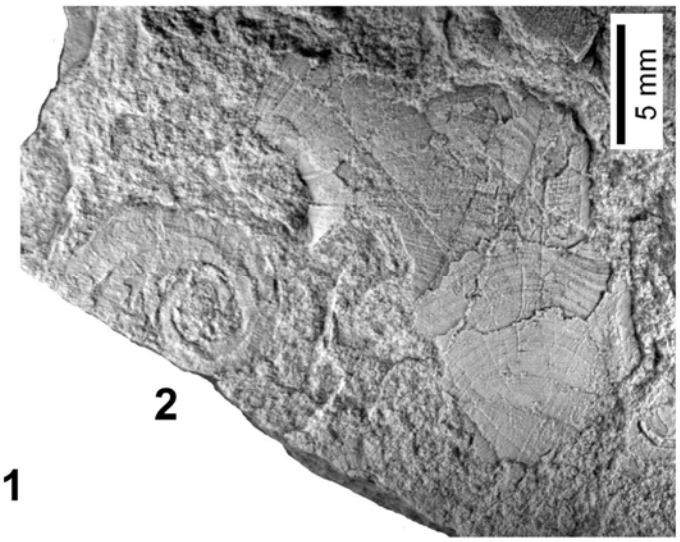


Fig. 1.
1. *Criteriognathus prolatus* (MAWSON 1987) limestone lense at 28-29m
2. *Mimosphinctes rudicostatus*, Unit 16, 37m

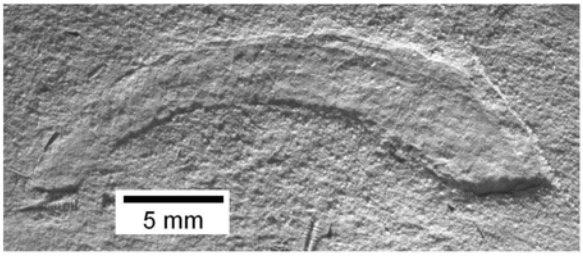
Fig. 2. Various goniatites from the Khodzha-Khurgan Gorge
1. *Erbenoceras kimi*, 30 cm below top of Unit 15
2. *Mimagoniatites* sp., 70 cm below top of Unit 15
3. Gen. aff. *Cyrtobactrites* n. sp., poorly preserved specimem from Unit 16, 29m
4. Gen. aff. *Cyrtobactrites* n. sp.,, two fragments, the upper with dorsal crenulae and strong mature double furrows, Unit 16, 30m
5. *Ivoites* cf. *hunsrueckianus*, very base of Unit 16
6. *?Metabactrites* n. sp., Unit 16, 28-29m
7. *Mimosphinctes rudicostatus*, loose specimen with fine juvenile ribbing
8. Gen. aff. *Mimosphinctes khanakasuensis*, Unit 16, 28-29m



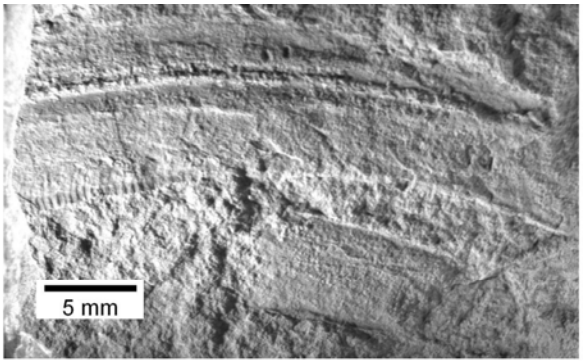
1



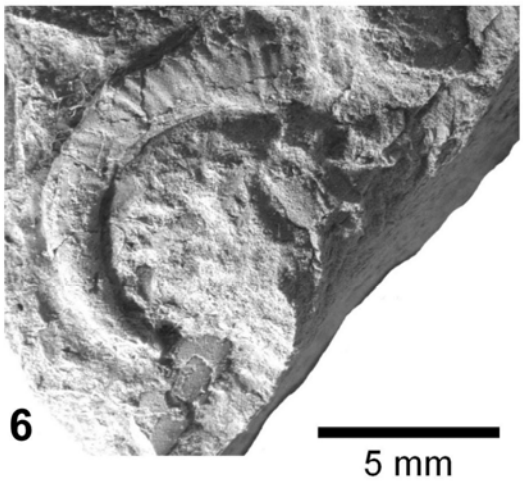
2



3

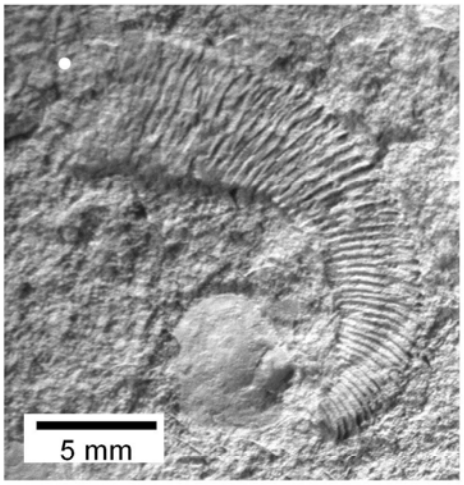


4

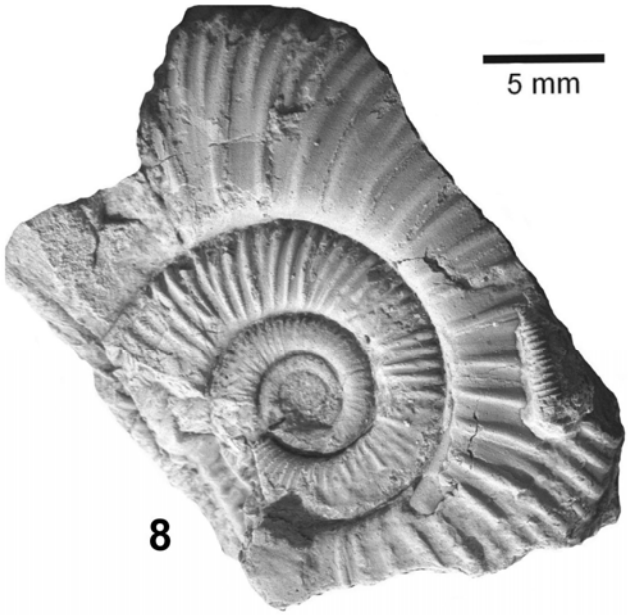


6

5 mm

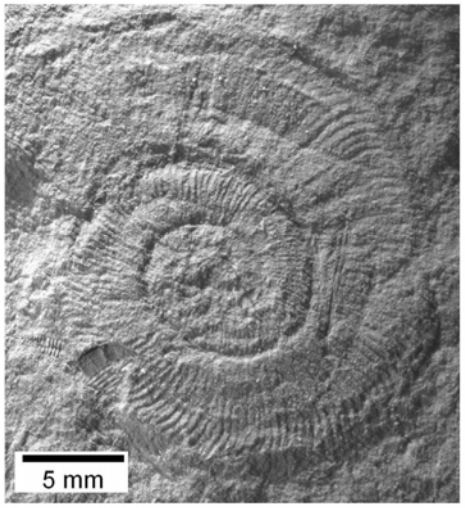


5



8

5 mm



7

New Early Devonian (Emsian) facies of Myanmar

Kyaw MIN and Aye Ko AUNG
DEPARTMENT OF GEOLOGY, DAGON UNIVERSITY, MYANMAR

Introduction

The study area, around the environs of Anisakan, is located about 8 km southwest of Pyin Oo Lwin, Mandalay Division. It is situated between northern latitude 96° 21' and 96°. 30', eastern longitude 22° 0' to 22°. 30'. It lies on the one-inch topographic map 93 C / 5. The area coverage is about 11 sq. km enclosing the villages of Anisakan, Paung daw, Kangyigon, Twin-nge, Sitha, Dobin, and Dattaw Fall. The area is accessible by train or motor vehicle as it is located near the Mandalay-Lashio railway and motor highway. Therefore, the study area is accessible throughout the year (Fig. 1).

The study area is mainly composed of Ordovician Units (Khunlein Formation, Caradocian, and "Sitha Fromation", Llanvirnian-Llandeilian), a Silurian Unit, the Nyaungbaw Formation (Llandoverian-Wenlockian), and of Devonian Units, the Zebingyi Formation (Pragian – Emisian) and Maymyo Formation (Eifelian - Frasnian).

For many years, very limited occurrences of Devonian strata have been known in Myanmar. In recent years, more than ten new localities of Devonian fossils have been recorded from both the Pyin Oo Lwin township and the southern Shan State. In Pyin Oo Lwin township, fossil localities are Zebingyi, Pyintha, Thondaung-Kangyigon, Anisakan, Paung daw, and Padaukpin. In the southern Shan State, fossils have been found in the Taunggyi town area in the Taunggyi township, in the the Myozo area in the Kalaw and Lawksawk townships, and in the Thayetpya area in the Pindaya township (Aye Ko AUNG, 2000). The oldest recognized Devonian unit is the Zebingyi Formation. The confirmation for the age of the formation is based on the presence of graptolites (JAEGER, 1983; Kyi SOE, 2000), dacryoconarid tentaculites, and conodonts (Aye Ko AUNG, 2002), indicating a Pragian and possibly Emsian age. Although an Emsian (late Early Devonian) age for the Zebingyi Formation has been questioned by previous workers, no strong faunal evidence for such objection has been given.

During the field season of 2004, 2005, 2006, the first author (KM) and a group of final year geology students from Dagon University have carried out mapping in the area. During these field works, some specimens of rugose corals were collected by Mg Chit Zayar LIN (2001 intake), Mg Saw Myo Nwe LIN (2002 intake), and (2003 intake) students, from the upper part of the Doganaing Chaung Orthoquartzite Member (Zebingyi Formation). The exposure is represented by narrow and restricted outcrops in the area. It is mainly composed of lime pebble conglomerates.

The present paper, for the first time, provides the record of an undoubted Emsian mixed carbonate-clastic unit in the Paung daw area, east of Anisakan, Pyin Oo Lwin township, Mandalay Division (Fig. 1). The Emsian age is confirmed by valuable fossil findings: solitary rugose corals, tabulate corals, bryozoa, brachiopods, and conodonts. The objectives of this investigation were: (1) the precise lithostratigraphy of the new mixed carbonate-clastic unit; (2) accurate age constraints from conodonts and rugose corals; (3) the interpretation of the depositional environment; (4) carbonate-clastic petrology; (5) a comparison of the Paung daw-Anisakan area with approximately coeval sediments from elsewhere along the western margin of the Shan State.

Stratigraphic setting

Aye Ko AUNG (2008) redefined the Zebingyi Formation, based on outcrops at Zebingyi village located at 4 km north of junction of Mandalay-Pyin Oo Lwin highway and along the Zebingyi car road on one inch topographic map, 93 C/5, Pyin Oo Lwin township, Mandalay Division. The Zebingyi Formation is divided into three members. At the base lies the Khinzo Chaung Limestone Member, composed of fine-grained, hard, brecciated lime-mudstone intercalated with fissile calcareous shale-siltstone. It is overlain by a whitish to light grey, flaggy, thin-bedded, partially dolomitized unit of the In-ni Chaung Limestone Member. This is succeeded by thin-bedded, closely jointed, reddish brown orthoquartzite of the Doganaing Chaung Orthoquartzite Member. The new facies represents the upper part of the Doganaing chaung Orthoquartzite Member.

The Emsian Limestone Unit is located at 1 km north of Paung daw village, N 21° 59'E 96° 26' (GR.971653). The unit is about 50m (150ft) thick in the section. The unit forms a narrow stretch of outcrop only at (GR.971653) on the Taungchun Hill (Fig. 2). It wedges out laterally so that the lateral extension can not be estimated. In this area, different from the type area, the In-ni Chaung Limestone Member is missing, possibly due to a lateral facies change

from the micritic limestone of the In-ni Chaung Limestone Member to the Doganaing Chaung Orthoquartzite Member, which is the most exposed unit in the area (Fig. 3).

The whole sequence of the Zebingyi Formation is overlain by the Maymyo Formation (Eifelian-Frasnian), which consists predominantly of rugose coral-brachiopod fossils associated with minor calcareous siltstone and shale.

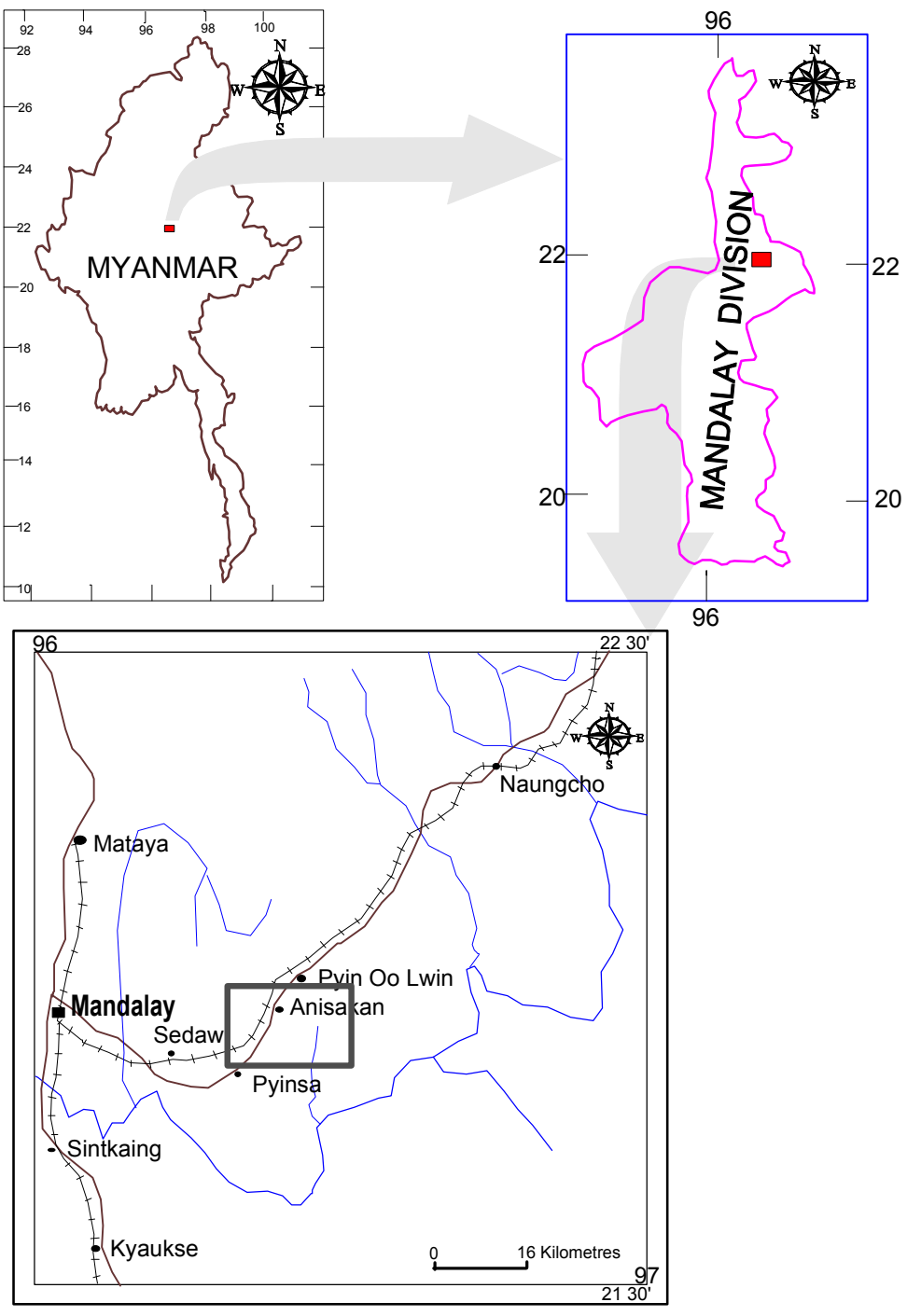


Fig. 1. Location map of the study area

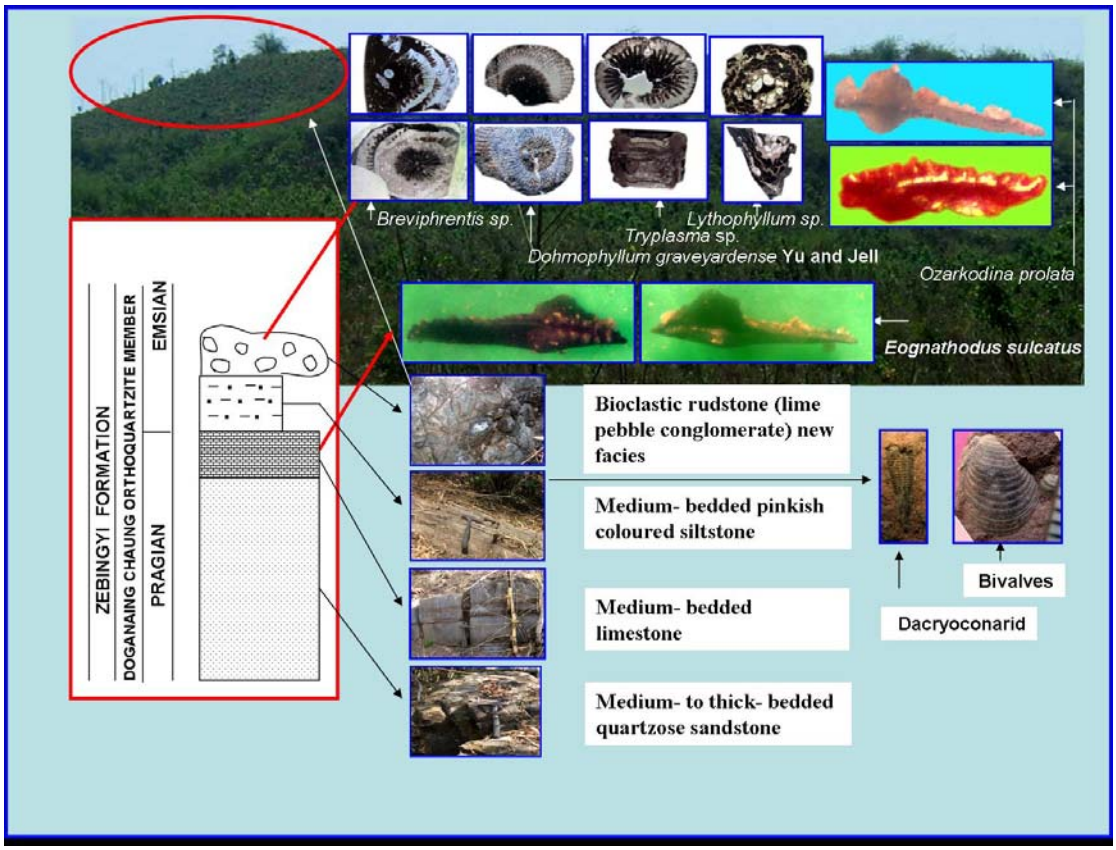


Fig. 2. The stratigraphic and paleontological data of the new Emsian limestone unit

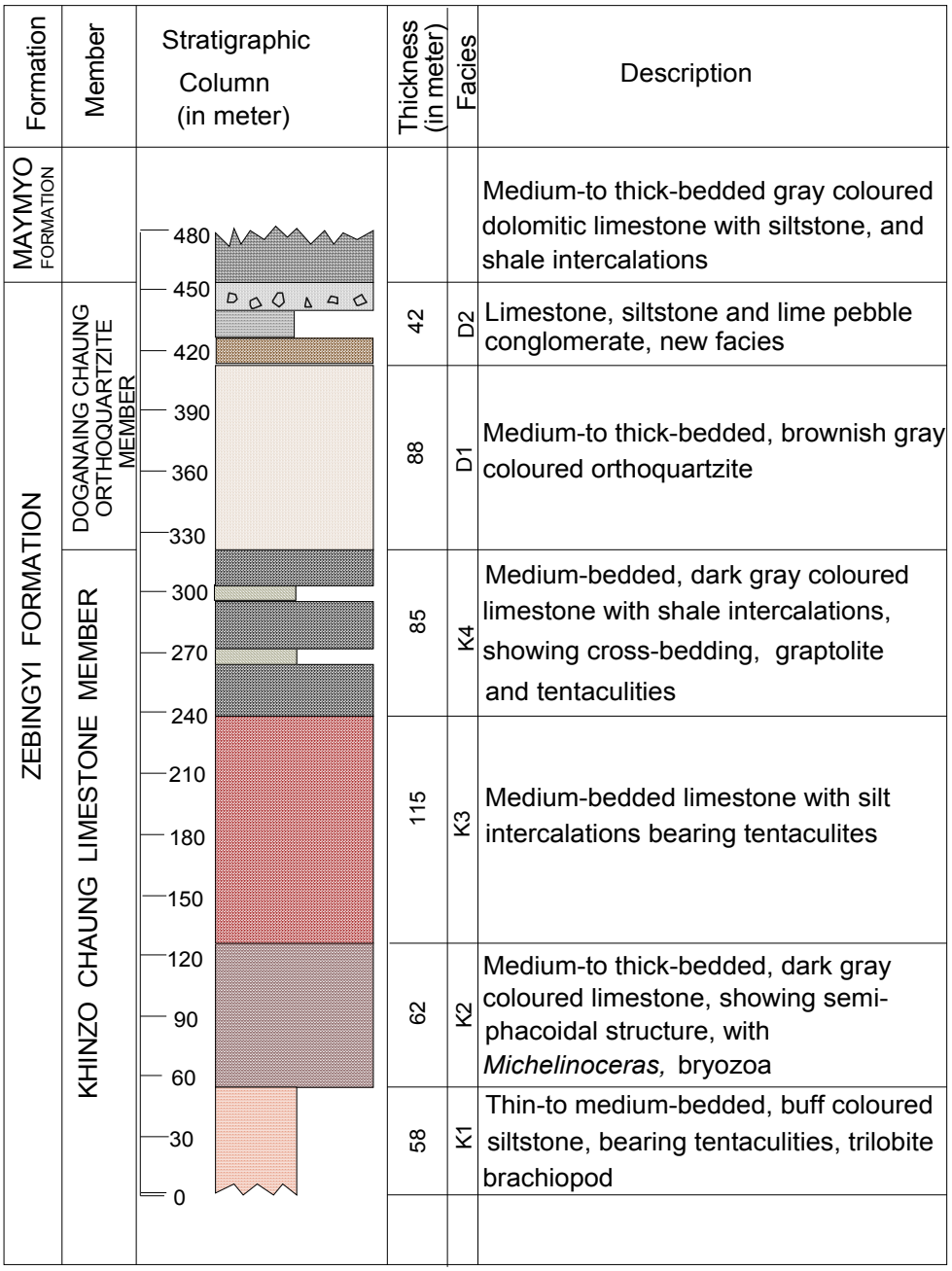
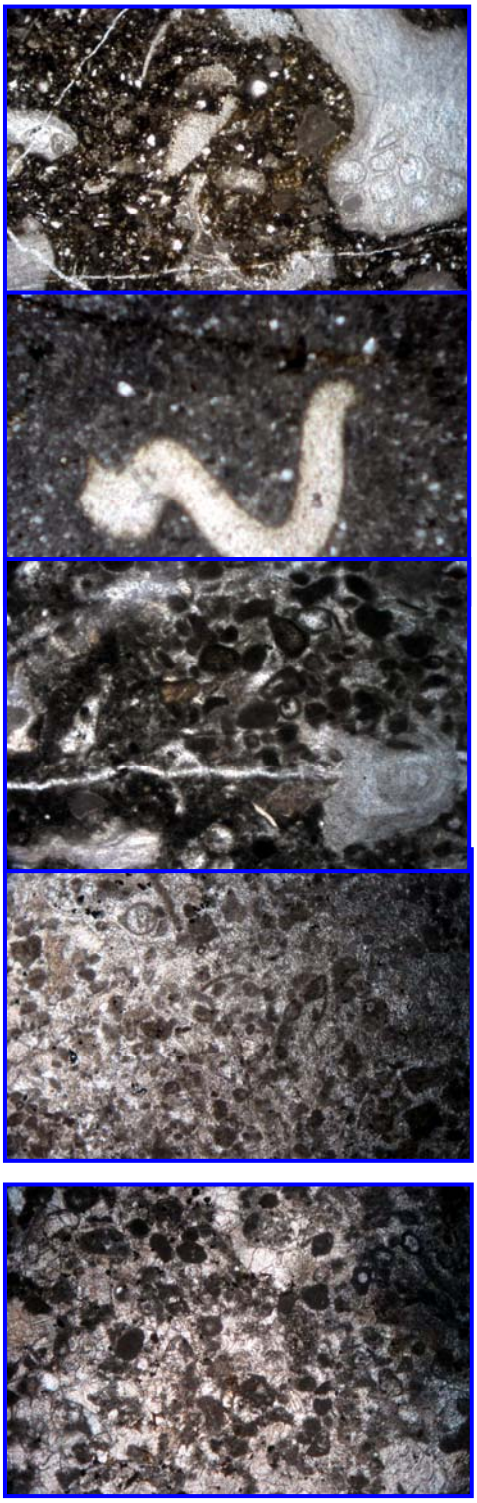


Fig. 3. Stratigraphic section of the Zebingyi Formation in the Paung daw area.



Matrix of lime pebble conglomerate

Intrabiomicrite

Biomicrite

Pelmicrit

Clast of lime pebble conglomerate

Bioclastic peloidal packstone

Peloidal grainstone

Fig. 4. Photomicrographs of the Emsian.

Lithology
The Emsian limestone unit is lithologically distinguishable from the Zebingyi Formation by the presence of clast supported conglomerates composed predominantly of clasts ranging in size from lime pebbles to gravels in places; it is best interpreted as a lime pebble conglomerate (bioclastic rudstone). Such lithology has never been recognized previously in the Zebingyi Formation, which is chiefly composed of (from bottom to top), silty limestone, micrites and orthoquartzite. This limestone unit, with the intraclasts ranging from fine-sand size to gravel size, are mixed with silt, mud and bioclasts. It lacks grading, stratification and any recognizable fabric, and is a mud matrix- to clast-supported conglomerate. The associated lithology is medium-bedded, reddish brown colored siltstone.

Petrography
The microscopic interpretation based on thin sections show that in the matrix of the lime pebble conglomerate three major lithologies can be recognized: intrabiomicrite, pelmicrite, and biomicrite. The Intrabiomicrite is composed of micrite, intraclast and bioclasts. The micrite is fine-grained calcite mud. Lithoclasts are of various shape and size, scattered in the micrite. The pelmicrite consists mainly of micrite with scattered pellets. The biomicrite is mainly composed of micrite, bioclasts and a minor amount of neospar. Microscopically, the clasts are mostly peloidal grainstone and bioclastic peloidal packstone. The peloidal grainstone is composed of a majority of moderately sorted peloids. The carbonate grains are cemented by sparry calcite cement. The bioclastic peloidal packstone is composed of peloids and bioclasts with microsparitic micrite matrix. Most of the bioclasts are bryozoans and crinoids (Fig. 4).

Fauna and age
The limestone unit yields fairly abundant fossils, such as solitary and tabulate corals, bryozoa, brachiopods and conodonts. The upper part of the unit contains the following fossils:

Rugose corals	*Dohmophyllum graveyardense* YU & JELL
	Tryplasma sp.
	Lythophyllum sp.
	Breviphrentis sp.
Conodonts	"*Ozarkodina" prolata* MAWSON
	Bipennatus bipennatus BISCHOFF & ZIEGLER

Dohmophyllum graveyardense YU & JELL is common in the late Emsian Db1 Member of the Burges Formation, Broken River Province, north Queensland (Aye Ko AUNG 1991). The species of the genera *Tryplasma, Lythophyllum,* and *Breviphrentis* are closely comparable to those from the Lower Devonian (Emsian) of the Izarne Formation, Montagne Noire, Southern France (PEDDER & FEIST, 1998). This faunal assemblage is not found in the proper Zebingyi Formation. The age of this fossil assemblage is confidently identified by the presence of "*Ozarkodina" prolata* MAWSON, which is not known earlier than the Emsian (Early Devonian) worldwide and typical for the lower Emsian. The lower part contains a useful zonal index conodont, *Eognathodus sulcatus* PHILIP, which indicates the *sulcatus* Zone of Pragian age.

Thus, the time span of the Zebingyi Formation in the Pyin Oo Lwin township, as a whole, is regarded as Pragian to (lowrer) Emsian.

Depositional Environment
The lithology of the new unit is composed of pebble- to cobble-sized limestone clasts, bioclasts, sand- and silt-sized intraclasts. It contains terriginous material (silt and mud). This unit is not laterally extensive, suggesting a channel lag deposit (EINSELE, 1992). In thin section, intraclasts of lime pebble conglomerates are set in peloidal grainstone. Grainstone, sparite cement, and pellets may be formed in an intertidal setting. Thus, the lime pebble conglomerates may have been deposited in an intertidal channel.

Conclusion
The new Emsian facies is recognizable by the presence of a lime pebble conglomerate containing a faunal assemblage with rugose corals, bryozoa, tentaculitids, bivalves, and conodonts. The preliminary identification of the Rugosa provides some genera and species (*Dohmophyllum graveyardense* YU & JELL, *Tryplasma* sp., *Lythophyllum* sp., and *Brevizaphrentis* sp.). This faunal assemblage is not found in the proper Zebingyi Formation and the age of the assemblage is confidently identified by the evidence of the conodont "*Ozarkodina" prolata* MAWSON, which represents Early Devonian (lower Emsian) age. The sequence of debrites is the indicator for a depositional environment of the new limestone unit, interpreted as intertidal-channel.

References

Aye Ko Aung, 1991. Early to Middle Devonian rugose coral and conodont faunas of the Burges Formation, Broken River Province, north Queensland. Unpublished Ph. D. Thesis, University of Queensland, Australia, 306p.

Aye Ko Aung, 2000. Devonian of Shan State, Myanmar. Palaeontology Down Under 2000, Geological Society of Australia, Abstracts, 61, 144p.

Aye Ko Aung, 2002. On the age of the Devonian Zebingyi Formation, Myanmar – with references to conodont, dacryoconarid, and graptolite faunas. Annual Paper Reading and Prize Presenting Ceremony in Memory of Dr. Myint Lwin Thein (Feb.,2002), Abstract, 10-11.

Aye Ko Aung, 2008. Revision of the stratigraphy and age of the Early Devonian Zebingyi Formation Myanmar. Universities Research Journal, vol. 1, no. 2, 31-48.

Einsele, G., 1992. Sedimentary Basins-Evolution, Facies, and Sediment Budget. Springer-Verlag Berlin Heidelberg, 310p.

Jaeger, H., 1983. Underdebonniche graptolithen aus Burma. Geologishes Jahrbuch. Band 126, Heft 2, 245-257.

Kyi Soe, 2000. Graptolites from the Zebingyi Formation, Pyin Oo Lwin township. Paper read at Yangon University Paper Reading Ceremony (December, 2000), unpublished.

Pedder, A.E.H, & Feist, R., 1998. Lower Devonian (Emsian) Rugosa of the Izarne Formation, Montagne Noire, France. Journal of Paleontology, vol.72(6), 967-991.

EUSTATIC EVENTS AND UPPER EMSIAN SUBSTAGE (LOWER DEVONIAN)

TSYGANKO, V. S.

The character of sedimentation of the Emsian of current definition in the territory of the western slope of the Ural Mountains and in the east of the Russian Platform testifies centuries of research concerning sedimentary and biotic events. The sedimentary development begins in the bottom part and in the majority of outcrops with terrigenous units, the Takata Suite, and with the base of the Kojva and Bija Suites of the upper part of the Emsian stage – aleurolites, sandstones and clays up to 15 m, named by various researchers also the Yaiva Suite. In those section, where the bottom part of the stage is made up by carbonate deposits (limestones or dolomite), deposits of the Kojva and Bija suites are represented by clay limestones, aleurolites and sandstones (Vjasovaja Suite) with characteristic, numerous, large ostracodes of the genus *Molleritia*. F.N. TCHERNYSHEV (1887) included the ostracods layers (Vyasovaja Suite) in the "horizon with *Pentamerus baschkiricus*". S.M. DOMRACHEV, V.S. MELESHCHENKO and N.G. CHOCHIA (1948) assumed that the ostracods (Vjasovaja) deposits replace the *Calceola* (= Kojva and Bija) layers. Therefore, there is a question in the Ural Mountains concerning the contemporaneous equivalents of the Kojva and Vjasovaja Suites. Acknowledgement of the reality of such correlation is established in the stratotype sections of the Vyasovaja Suite in its Southern Ural Mountains transgressive overlap on more ancient (Pragian or Lochkovian) deposits of the Vanyashkino Suite (Bogoyavlenskaya et al., 1983), and also by the origin of a pack of sandstones as analogue of sandstones of the Yaiva Suite at its base (IVANUSHKIN, 1996).

At the western slope of Ural Mountains and in the East of the Russian Platform Vjazovaja-Kojva-Bija deposits are widespread. As noted above, this is also true for the terrigenous deposits of the Takata Suite and its analogues. At this boundary essential changes of the majority of communities of organisms are observed: Coelenterata, brachiopods, ostracodes, etc. At the base of this interval conodonts were studied in the stratotype sections of the Vjasovaja Suite, which belong to the *Polygnathus serotinus* Zone (BOGOJAVLENSKAJA et al., 1983). These results testify the transgressive character of the deposits of the Vyasovaja Suite. This allows to consider the phenomena named as Vjazovaja Event. The Vjazovaja regressive-transgressive Event is the regional expression of a global Event that occurred practically on all continents. It confirm for the given period of Devonian geological history common features of the development of sea basins, their deposits, and the development of organisms complexes (Allen, 1979; Krebs, 1979; Johnson and Murphy, 1984; Johnson et al., 1985; Bai and Bai, 1988; Mawson et al., 1988; Ver Straeten and Brett, 2001; Devonian …, 2008).

In the fullest and consecutive sections Emsian Stage in Barrandien and Central Asia the beginning latest Emsian biogenic and sedimentary events has been dated for level konodonts zone Polygnathus inversus and and

tentakulinids zone Novakia cancellata the bases Daleian substage of Barrandien and Dzaus beds of the Republic Uzbekistan (Chlupach and al., 1998, 2001; Yolkin and al., 1994; Kim and al., 1988; Weddige and Ziegler, 1977; YOLKIN et al., 2008).

The comparison of studies on the Dalejan substage of the Emsian stage allows to establish now with sufficient accuracy the consequences of the event with the same name practically in all regions. In typical Emsian sections of the Rhenohercynian Fold Belt the early stage of Dalejan events is expressed in the Emsquarzit Fm. Above follow quarzitic sandstones and silty, sandy shales of the Hohenrhein Formation and Kieselgallen-Schiefer (Jahnke and Michels, 1982; Spaeth, 1975).

On a considerable part of the American and Canadian territories of Euramerica, as well as in the East of Australia, the Dalejan Event was preceded by a break in sedimentation as the consequence of long eustatic fall of the sea level, which began already at the end of the Pragian (Johnson and Murphy, 1984; Oliver et al., 1968). The beginning of the Dalejan Event is noted here by the *Inversus* Transgression, a short-term fall of the sea level with the beginning of the *serotinus* Zone, and by the subsequent eustatic rise in the late *serotinus* time. The noted event was reflected in the biodiversity of almost all groups of organisms. As an example, the biodiversity of brachiopods genera was essentially reduced at the boundary between the Zlichovian and Dalejan (Johnson, 1986; Johnson and Sandberg, 1988; Yolkin et al., 2008).

Because the Dalejan is widely known as the name of the event and since it extends through all the upper Emsian substage, it is necessary to give preference to this term. The Upper Emsian Substage section in the Kitab Reserve consists of the Dzhaus and Obisafit Beds, which can serve as “Parastratotype sublevels”.

References

Allen, J.R.L. 1979. Old Red Sandstone facies in external basins, with particular reference to southern Britain. Palaeont. Ass. of London. Spec. Papers, 23, p. 65–80.

Bai, Z. and Bai, S. 1988. Conodont biostratigraphy of the Devonian Zdimir from Bahe, Guangxi, China. Can. Soc. Petrol. Geol., Mem., 14 (III), p. 529–534.

Bogoyavlenskaya, O.V., Rzhonsnitskaya, M.A., and Chibrikova, E.V. 1983. Tipovye razrezy srednego devona Yuryuzano-Aiskogo rayona zapadnogo sklona Yuzhnogo Urala. Ufa, p. 1–42.

Chibrikova, E.V. 2006. Vanyashkinskaya suite–stratigraphic unit invalid. Otechestvennaya geologia, 3, p. 48–53.

Chlupac, I. and Lukes, P. 1999. Pragian/ Zlicovian and Zlicovian/Dalejan boundary sections in the Lover Devonian of the Barrandian area, Czech Republic. Newsl. Strat., 37 (1/2), p. 75–100.

Chlupac, I. and Hladil, J. 2001. Barrandian area. Post-conference field trip (May 20–21, 2001), 15th International Senckenberg Conference, Field trips guidebook. p.117–151.

E.A.Yolkin, A.I.Kim, J.A.Talent, Eds. 2008. Devonian sequences of the Kitab reserve area. Field excursion guidebook, Publ. House of SB RAS., p. 3–100.

Domrachev S.M., Meleshshenko V.S., and Chochya N. G. 1948. Stratygraphiya devonskich otlogeniy sapadnogo sklona Urala v predelach Ufimskogo amfiteatra i Kara–Tau (basseiny rek Ufy, Aya, Yuresani i Sima). Izv. AN USSR. Ser. Geol., 1: 69–100 (in Russian).

Jahnke, H and Michels, D. 1982. Upper Emsian to Middle Devonian at Haiger Hütte (Dill Syncline). SDS Field Meeting on Lower and Lower Middle Devonian Stages in Ardenno-Rhenish Type Area, Frankfurt am Main, p. 205–212.

Johnson, J.G. 1986. Revision of Lower Devonian (Emsian) brachiopod biostratigraphy and biogeography, Central Nevada. J. Paleont., 60, p. 825–844.

Johnson, J.G. and Sandberg, C.A. 1988. Devonian eustatic events in the Western United States and their biostratigraphic responses. Can. Soc. Petrol. Geol., Mem., 14 (III), p. 171–178.

Johnson, J.G. and Murphy, M.A. 1984. Time-rock model for Siluro-Devonian continental shelf, western United States. Geol. Soc. of America, Bull., 95, p. 1349–1359.

Johnson, J.G., Klapper, G., and Sandberg, C.A. 1985. Devonian eustatic fluctuation in Euramerica. Geol. Soc. of America, Bull., 96 (5), p. 567–587.

Ivanushkin, A.G. 1996. Devonskie otlozheniya Karatauskogo strukturnogo kompleksa i zilimsko-Nugushskoj structury. Materialy po stratigrafii i paleontologii Urala, Ekaterinburg, p. 50–75.

Kim, A.I., Erina, M.V., Yolkin, E.A., and Sennikov, N.V. 1988. Subdivision and correlation of the Devonian of the Devonian of South Fergana (Turkestan-Alai- Mountain Area, USSR). Can. Soc. Petrol. Geol., Mem., 14 (III), p. 703-714.

Mawson, R., Talent, J.A., Bear, V.C. et al. 1988. Conodont data in resolution of stage and zonal boundaries for the Devonian of Australia. Can. Soc. Petrol. Geol., Mem., 14 (III), p. 485–527.

Spaeth, O. 1975. Palaozoologische Ausdeutung einer Fossilgestatte in den Hohenrheiner Schichten der Moselmulde. Wissenschaftliches Prufungsamt Bonn. p. 1–90.
Ver Straeten, C.A. and Brett, C.E. 2001. Late Pragian to Eifelian Sequence Stratigraphy and Stratigraphic Unificacion, Appalachian Foreland Basin, Eastern United States. 15th International Senckenberg Conference, Abstracts. p. 99.
Tchernyshev, F.N. 1887. Fauna srednego i verchnego devona zapadnogo sklona Urala. Trudy geol. Komiteta, 3 (3), p. 3–156.
Weddige, K. and Ziegler, W. 1977. Correlation of lower/Middle Devonian boundary beds. Newsl. Strat., 6 (2), p. 67–84.
Yolkin, E.A., Weddige, K., Izokh, N.G., and Erina, M.V. 1994. New Emsian conodont zonation (Lower Devonian). Cour. Forsch.-Inst. Senckenberg, 168, p.139–157.

Palaeoecological and biogeographical interpretation of Devonian ostracodes (Emsian to basal Givetian) of the Western Dra Valley, Morocco (sections Bou Tserfine, Rich Tamelougou and Hassi Mouf)

DOJEN, C., ABOUSSALAM, S.Z., & BECKER, R.T. Westfälische Wilhelms-University, Institute of Geology and Palaeontology, Corrensstr. 24, 48149 Muenster, Germany;
email: c.dojen@uni-muenster.de

IN MEMORY TO G. BECKER

The Anti-Atlas Devonian of southwest Morocco is world-famous for its extensive outcrops that are rich in well-preserved faunas, but the western part of the region Dra Valley (Fig. 1) is still poorly known and especially Early Devonian ostracodes are little studied. We present first results on ostracodes of Emsian to basal Givetian age from the sections Bou Tserfine, Rich Tamelougou and Hassi Mouf near Assa (Fig. 1), which are well dated by the means of conodonts. The geological outline and a detailed description of the sections can be found in EL HASSANI (2004).

From entire Morocco nearly more than 250 ostracode taxa are reported, but most of them are from Middle respectively upper Devonian strata of the Tafilalt as, e.g., described by BECKER (1987) and CASIER et al. (2010). From the Eastern Dra Valley, 80 taxa of Emsian to Givetian age are reported by BECKER et al. (2004). So far, 23 genera and eight species described by G. BECKER are also found in our sections, whereas another 24 genera have not been found, but this might be partly due to the temporarily level of our research. On the other hand, eight species from our sections were not reported previously.

At present, about 45 benthic ostracode taxa have been tentatively identified (Tab. 1), most of them from the Emsian *Hollardops* Limestone (basal Khebchia Fm.) and the Eifelian *Pinacites* Limestone (lower Yeraifa Fm.). The *Hollardops* Limestone is a regionally distinctive limestone that has furnished frequently *Caudicriodus culicellus - Icriodus corniger ancestralis* conodont assemblages (Fig. 2), which indicate a very early late Emsian age. However, the basal limestone bed at Bou Tserfine may be latest early Emsian, as it yielded *Polyzygia vinea,* an ostracode taxon which ranges only up to the late early Emsian so far. In accordance, the first occurrence at Bou Tserfine of *Bufanchiste sotoi*, which has its earliest record in the late Emsian, is above the basal beds. The basal bed of the *Hollardops* Limestone also yielded many specimens which belong probably to a new species of the *Polyzygia insculpta* lineage, which if true, is the oldest record of this lineage. The ostracode assemblages of the *Hollardops* Limestone (Fig. 3) belong to the so-called “mixed faunas” with only few palaeocopes but rich in metacopes (some of them with small spines), indicating an offshore position probably in deeper and less agitated water below wave base. This is supported by the macrofaunal association, which points to a deep neritic setting.

The *Pinacites* Limestone has three marker limestone beds at the base followed upwards by thin-bedded light grey limestones and then by dark marls. It contains *Pinacites*, *Fidelites*, and conodonts of the lower Eifelian *costatus* Zone (Fig. 3). The ostracode fauna is partly similar to those of the *Hollardops* Limestone: long ranging taxa such as *Ulrichia* ex gr. *acricula* and *Jenningsina planocostata* occur throughout the sections. *Polyzygia symmetrica* and *Bufina* aff. *bicornuta* replace *Polyzygia kroemmelbeini* and *Bufanchiste sotoi*. But besides these, several spiny taxa of Thuringian Provenance, such as *Semibolbina, Loquitzella*, *Berounella* or *Tricornina* occur, thus, reflecting slightly deeper and calmer water conditions than during the sedimentation of the *Hollardops* Limestone. This is in accord with the mixed pelagic-neritic macrofauna and the conodont biofacies. Some of the ostracode

taxa are probably new and will be described in a forthcoming publication.

Remarkably, there is no evidence for a faunal change of the ostracodes at the Eifelian / Givetian boundary, but so far, the Givetian samples are rather poor in ostracodes, and the taxa found are all known for their long ranges.

All in all, the ostracode associations indicate an offshore position below wave base. Palaeobiogeographically, most taxa belong the Palaeotethyan Province, but a few North-American taxa are also present and corroborate migration paths between both areas via N-Africa.

References

BECKER, G. (1987): Ostracoda des Thüringer Ökotyps aus dem Grenzbereich Devon/Karbon N-Afrikas (Marokko, Algerien). Paleontographica, Abt. A, **200**: 45-104.

BECKER, G., LAZREQ, N. & WEDDIGE, K. (2004): Ostracods of Thuringian provenance from the Devonian of Morocco. Paleontographica, A **271**: 1-109.

CASIER, J.G., El HASSANI, A.& PREAT, A. (2010): Ostracodes du Dévonien moyen et supérieur du Tafilalt (Maroc). Revue de Micropaleontologie, **53**: 29-51.

EL HASSANI, A. (2004): Devonian neritic-pelagic correlation and events in the Dra Valley (Western Anti-Atlas, Morocco). Doc. Inst. Sci., Rabat, 19.

JANSEN, U.(2001): Morphologie, Taxonomie und Phylogenie unterdevonischer Brachiopoden aus der Dra-Ebene (Marokko, Prä-Sahara) und dem Rheinischen Schiefergebirge (Deutschland).Abh. senckenberg. naturfosch. Ges., **554**: 1-389.

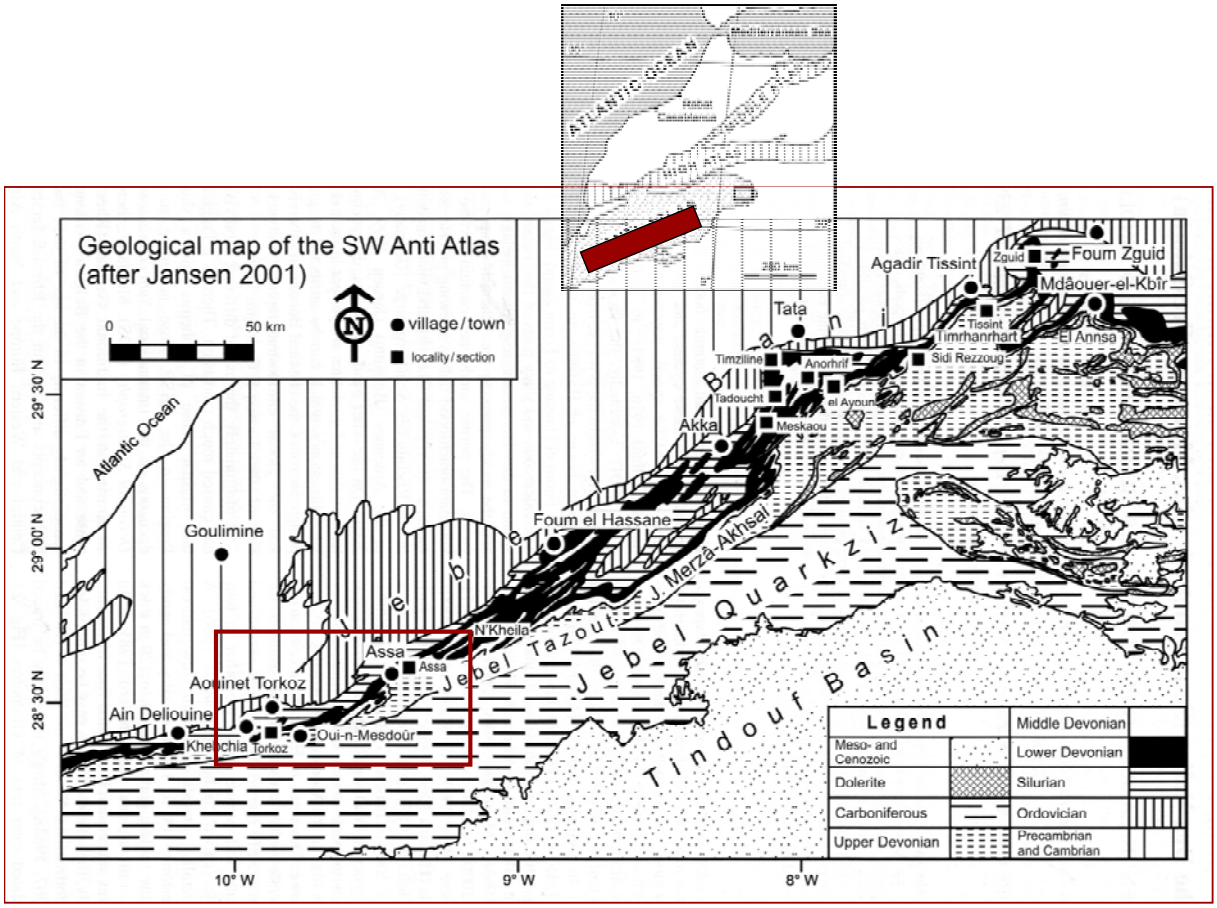


Fig. 1: Geological map of the SW Anti Atlas (based on JANSEN 2001).

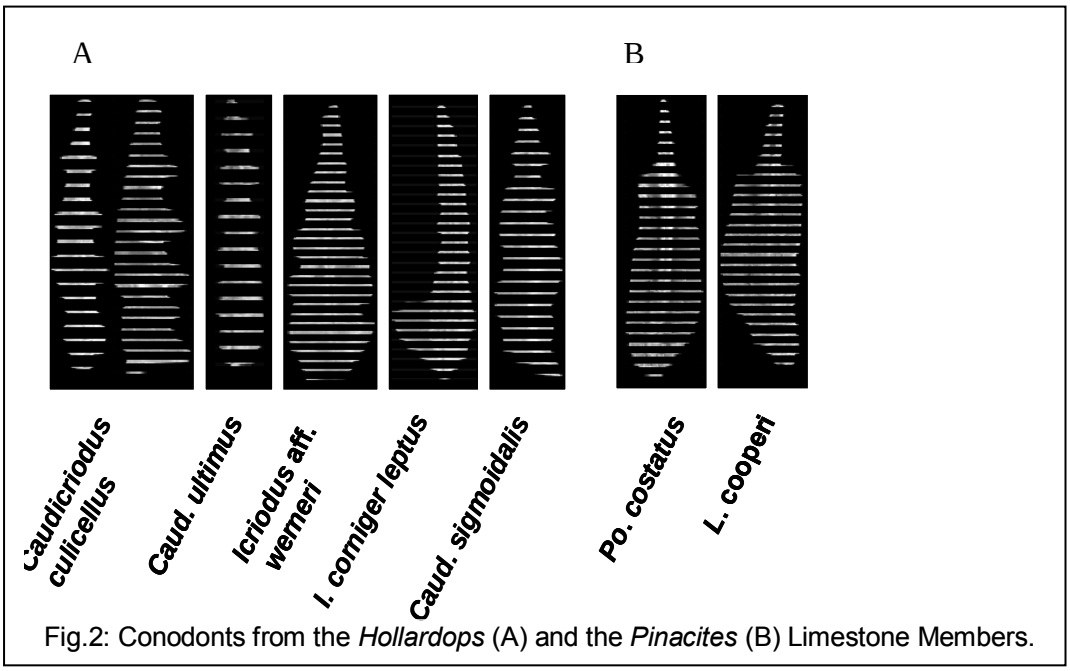


Fig.2: Conodonts from the *Hollardops* (A) and the *Pinacites* (B) Limestone Members.

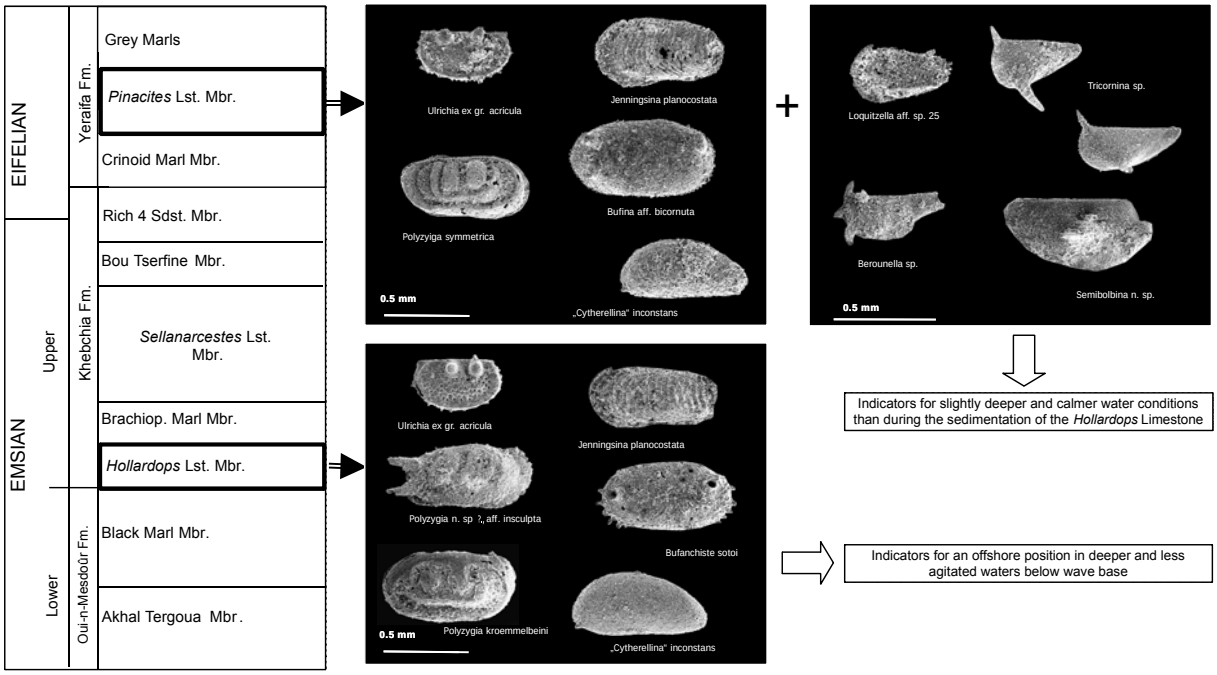


Fig. 3: Some ecological important taxa from the the *Hollardops* and *Pinacites* Limestone Members.

Tab. 1: Distribution of Emsian to Givetian ostracode taxa from the *Hollardops* and *Pinacites* Limestone Members.

	Lower Devonian		? late early Emsian	late Emsian		Eifelian		Givetian
	Rich Tame-lougou	Bou Tserfine	Bou Tser-fine, base *Hollardops* Lst.	Rich Tame-louguo	Bou Tserfine	Bou Tserfine	Hassi Mouf South	Hassi Mouf South
Berdanella sp.				x				
Parabolbina sp.				x				
Polyzygia kroemmelbeini	x		x					
Polyzygia vinea			x					
Polyyzgia? n.sp., aff. *insculpta*			x					
Obotritia sp.				x				
*Healida kirchbergensi*s				x				
Mircocheilinella sp. sp.				x				
Zeuschnerina sp.				x				
Cryptophyllus sp.	x			x				
Ulrichia acricula	x	x		x				
Knoxiella?		x				?		
Jenningsina planocostata	x			x		x	x	x
Bythocyproidea sp.			x		x	x		
Bufanchiste sotoi				x		x		x
Cytherellina inconstans				x		x		
Praepilatina sp.			x	x				x
Leptoprimitia sp.				x			x	
Healdia sp.				x	x	x		
Acanthoscapha sp. sp.				x		x	x	
Aechmina sp. 1				x		x	x	
Aechmina sp. 2				x		x		
Tricornina sp. sp.				x	x	x	x	x
Ulrichia sp. sp.							x	
Semibolbina n.sp.				x		x	x	?
Jenningsina catenulata						x		
Bufanchiste bufinoides						x		
Roundyella sp.						x		
Roundyella angustoi						x		
Zeuschnerina aff. *bediae*						x		
Loquitziella aff. sp. 25						x		
Loquitziella n. sp.?						x		
Kummerowia sp.						x		
Acratia sp.						x		
Pseudozygobolbina sp.						x		
Refrathella? n.sp.						x		
Sulcella sp.						x	x	
Polyzyiga symmetrica						x	x	
Polyzygia sp.						x	x	x
Bufina aff. *bicornuta*						x	x	
Favulella frankenfeldi						x	x	
Zeuschnerina aff. *espana*						x	x	
Kirkbyrhiza sp.							x	
smooth podocopids indet.	x	x	x	x		x	x	

Short Note on the Origin of the conodont Genus *Siphonodella* in the Uppermost Famennian

Harald TRAGELEHN
Spitalstr. 4a, D-96346 Wallenfels, Germany, htragelehn@aol.com

Several outcrops of Late Devonian nodular limestones in Northern Bavaria (Franconia) provided more than 400 Pa elements of very early *Siphonodella*-type conodonts. The material includes seven new taxa, thus providing a very differentiated and new view upon the ancestors and phylogeny of this group. Below, some main aspects are presented preliminarily and in open nomenclature, in order to enable a productive discussion within the workshop on D/C-boundary conodonts, planned to take place at the IPC3 meeting in London this year. A detailed description according to proper terms of taxonomy will be in press at that time.

1) The *Siphonodella praesulcata* / *sulcata* concept

Siphonodella praesulcata, the present index conodont for the uppermost Famennian *praesulcata* Zone, is usually very rare within most sections all over the world. The majority of the specimens described in literature derive from the lowermost Mississippian *sulcata* Zone and from above the anoxic Hangenberg Event. Various authors (SANDBERG, 1972, in his original description; also FLAJS & FEIST, 1988) have already mentioned the existence of a large number of transitional specimens between both taxa.

The new material studied from below the Hangenberg Event now allows the reconstruction of phylogenetical relationships (Fig. 1). Deriving from a common ancestor, two early species of *Siphonodella* are present. The first species is characterized by a narrow platform with straight (morph. 1) or curved (morph. 2) outline, thus indicating an ancestor of both *Siph. praesulcata* and *Siph. sulcata* (sensu SANDBERG´s description from 1972). The second species with its wide, ornamented platform is showing significant characteristics of the holotype of *Siph. sulcata* HUDDLE (1934). In this regard, *Siph. "sulcata"* sensu SANDBERG (1972) appears to be either a separate species or just a morphotype of *Siph. praesulcata* and, therefore, requires revision.

2) Consequences for biostratigraphy and the present D/C boundary

The stratigraphical range of early *Siphonodella*-type conodonts, as figured below (Fig. 2), affects two major problems. Firstly, there is some serious uncertainty concerning the base of the present *praesulcata* Zone (see KAISER et al. 2009, pp. 121/122). Typical specimens of *Siph. praesulcata* are restricted to the last third of the range of *Bispathodus ultimus*, whereas the first *Siphonodella*-type conodonts are already present within the first third. The beginning of the *praesulcata* Zone, therefore, depends on each author's individual view of identifying a *Siphonodella*-type specimen as *Siph. praesulcata* or as some untypical *Polygnathus* sp.

Secondly, there is no more a named index conodont species, which might be used for fixing the presently defined D/C-boundary. Recent studies on the D/C-bundary stratotype at La Serre, France (KAISER, 2009) have already suggested the occurrence of both *S. praesulcata* and *S. sulcata* far below the present D/C boundary GSSP. The diagram presented in Fig. 1 now even suggests that *Siph. sulcata* in its present use is an artefact. Moreover, the stratigraphical range of *praesulcata*- and "*sulcata"*-type conodonts is almost identical and precedes the base of the GSSP defined Carboniferous and even the anoxic Hangenberg Event.

3) Other *Siphonodella*-type conodonts

The phenomenon of continuously increasing phosphatization of the Pa-element's basal part (due to uncertain reasons) is not restricted to polygnathids forming the *Siphonodella*-branch. It is described from various times of the Devonian (e.g. in DZIK, 2006, for the early Famennian *crepida* Zone). Fig. 3A to D shows different types of polygnathid elements (cited as "N. gen n. sp" in Fig. 2) with complete or incomplete, large basal pits of *Siphonodella*-type.

Considering that early *Siphonodella* elements usually are very rare, those co-occurring *Siphonodella*-type elements may be very helpful for biostratigraphy as well. They appear close to the FAD of *Siphonodella* n. sp. 1 and 2 and mostly become extinct along or below the Hangenberg Event. Some of them, however, persist into the Carboniferous, contributing to the Mississippian "*Pseudopolygnathus*-" and *Polygnathus*-faunas.

References

Dzik, J. (2006): The Famennian „Golden Age“ of conodonts and ammonoids in the Piolish part of the Variscian sea. - Palaeontologica Polonica, 63, 1-360.

Flajs, G. & Feist, R. (1988): Index conodonts, trilobites and environment of the Devonian-Carboniferous boundary beds at La Serre, (Montagne Noire, France). - Courier Forschungsinstitut Senckenberg, 225, 77-82.

Kaiser, S. I. (2009): The Devonian/Carboniferous boundary stratotype section (La Serre, France) revisited. – Newsletters on Stratigraphy, 43/2, 195-205.

Kaiser, S.I., Becker, R.T., Spaletta, C., & Steuber, T. (2009): High-resolution conodont stratigraphy, biofacies, and extinctions around the Hangenberg Event in pelagic successions from Austria, Italy, and France. – Palaeontographica Americana, 63, 99-143.

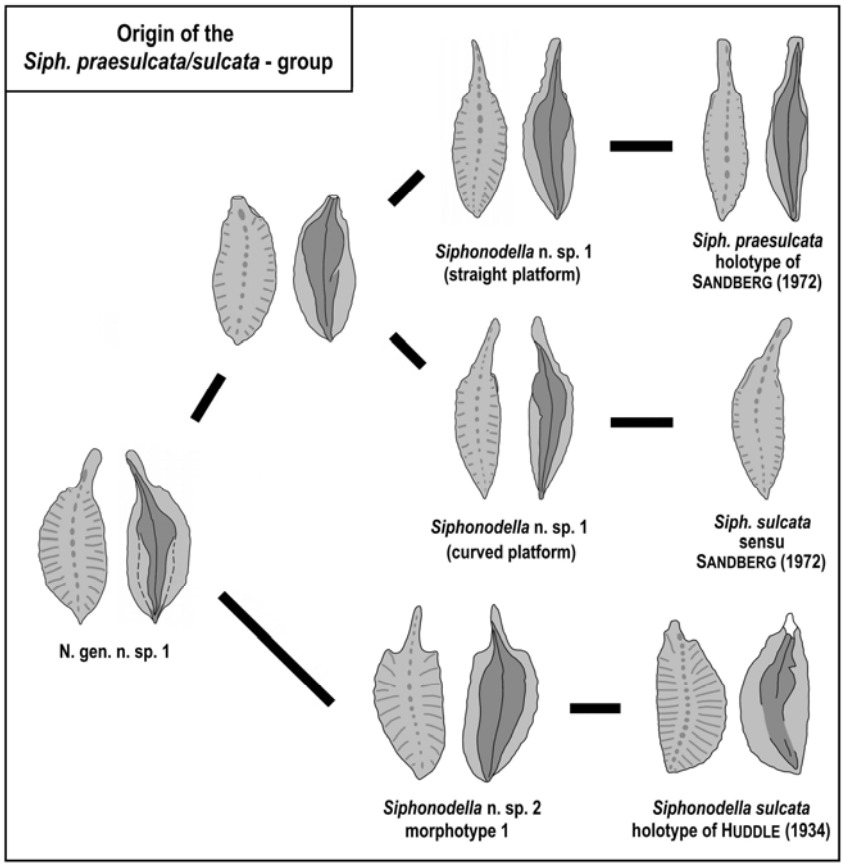


Fig. 1

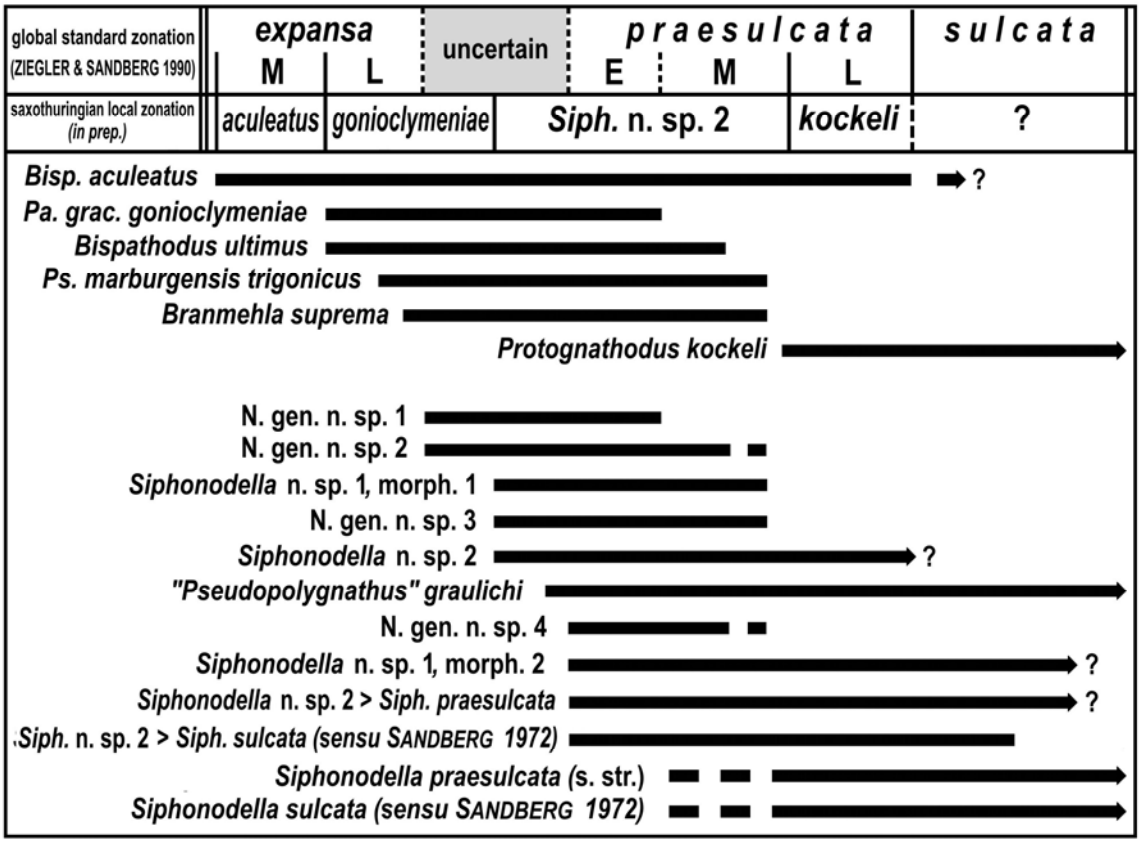

global standard zonation (ZIEGLER & SANDBERG 1990)
expansa
M
L
uncertain
praesulcata
E
M
L
sulcata
saxothuringian local zonation (in prep.)
aculeatus
gonioclymeniae
Siph. n. sp. 2
kockeli
?
Bisp. aculeatus
Pa. grac. gonioclymeniae
Bispathodus ultimus
Ps. marburgensis trigonicus
Branmehla suprema
Protognathodus kockeli
N. gen. n. sp. 1
N. gen. n. sp. 2
Siphonodella n. sp. 1, morph. 1
N. gen. n. sp. 3
Siphonodella n. sp. 2
"Pseudopolygnathus" graulichi
N. gen. n. sp. 4
Siphonodella n. sp. 1, morph. 2
Siphonodella n. sp. 2 > Siph. praesulcata
Siph. n. sp. 2 > Siph. sulcata (sensu SANDBERG 1972)
Siphonodella praesulcata (s. str.)
Siphonodella sulcata (sensu SANDBERG 1972)

Fig. 2

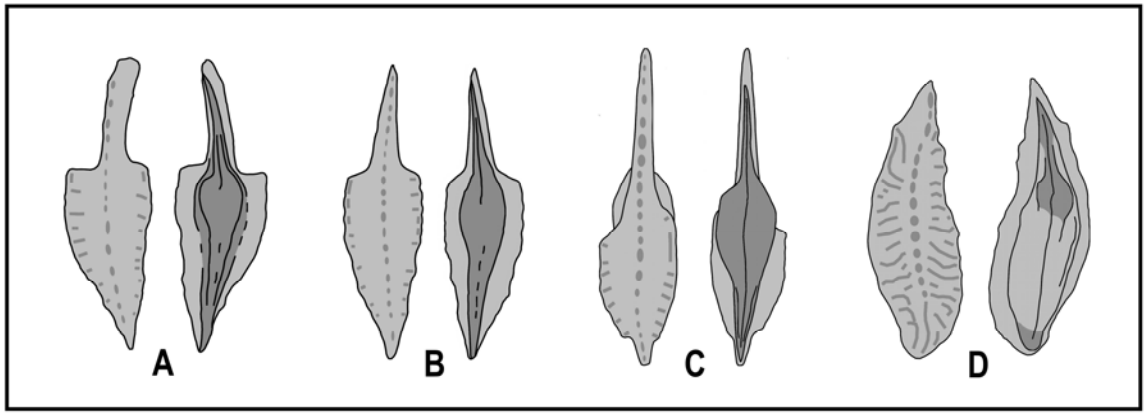

A
B
C
D

Fig. 3

SDS-MEETINGS

EGU 2010 session: Refining the Geological Time Scale

Dear Colleagues,

We invite you to participate in a special stratigraphy session at EGU co-sponsored by the International Association of Sedimentologists (IAS) and by the Stratigraphy, Sedimentology and Palaeontology Geosciences session of the **General Assembly of the Europea Geosciences Union** (EGU). The EGU will be held in **Vienna** on 2-7 May, 2010.

The theme of session SSP2.1 is "Recent ad-vances in refining the geological time-scale: GSSPs, holostratigraphy and new dating tech-niques"

The development and refinement of the geolo-gical time scale over the past decade has pro-gressed in leaps and bounds. With develop-ments in instrumen-tation, analytical approaches and stratigraphic sections, the timescale has been refined. This session will include all aspects of the current and future geological timescale, including GSSPs, numerical dating, biostratigraphy, cyclo-stratigraphy, holostratigraphy, integration of physical and geochemical trends, and other methods.

This session will also honor Professor Felix Gradstein, who will receive the Jean Baptiste Lamarck Medal from the European Geo-sciences Union. This special award, in recognition of the scientific achievements of Jean Baptiste Lamarck, is to honor outstanding scientists whose work is related to Stratigra-phy, Sedimentology and Paleontology. The 2010 award is for Gradstein's achievements and scientific leadership in the fields of stratigraphy, the geologic time scale and micropaleontology.

Additional details about the session and abstract submission are at:
"http://meetingorganizer.copernicus.org/EGU2010/session/2988"
"http://meetings.copernicus.org/egu2010/abstract_management/how_to_submit_an_abstract.html"

We are looking forward to welcome your contributions to this session, and hope to see a large participation! Moreover, we especially encourage you to relay this announcement to your colleagues, and especially to students and young scientists.

With best regards, Darren R. GROCKE and James OGG (co-conveners)

Darren R. GROCKE
Division President of SSP of EGU
Dept. Earth Sciences, Durham University, UK
d.r.grocke@durham.ac.uk; Phone: +44 (0) 191 33 42282

James OGG
Dept. Earth & Atmospheric Sciences, Purdue University, USA
jogg@purdue.edu; Phone: (001) 765 494-8681 / -0257

Prague 2010 - ICS Workshop

The GSSP Concept

Prague, Czech Republic

30 May – 3 June 2010

2nd Circular

Invitation

The Organizing Committee warmly invites all members of the full commission of ICS (ICS executive officers and chairs of all subcommissions), all members of ICS subcommissions (both titular and corresponding) and other interested members of the stratigraphic community, including young scientists, to attend the ICS workshop in Prague. Both plenary, topical, and subcommissions workshops will be held in lecture rooms of the Geoscience Building of the Faculty of Science of Charles University in Prague. Field trip scheduled for the second day will bring participants to Lower Paleozoic GSSPs situated near Prague along with some Carboniferous, Cretaceous and Quaternary outcrops of stratigraphic importance.

Sponsors:

International Commission on Stratigraphy;
International Union of Geological Sciences;
Institute of Geology and Palaeontology, Charles University;
Institute of Geology, Academy of Sciences of the Czech Republic; National Museum, Prague;
Stratigraphic Commission of the Czech Republic;
Czech National Geological Committee

Organizing Committee:

Stan Finney (Chair – ICS); Shanchi Peng (Vice-chair – ICS); Paul Bown (Secretary – ICS); Petr Kraft (Inst. of Geology and Palaeontology, Charles University, Prague); Petr Storch (Inst. of Geology, Academy of Sciences of the Czech Republic, Prague)

Objectives:

The goals of the workshop are expressed in the list of agenda items. The primary focus is on the success of the GSSP process. Discussion will include examples of successes and their broader implications, but also problems that have arisen will be discussed with suggestions for best addressing them. Preparing GSSP proposals, leading ICS subcommissions, resolving differences in usage of stratigraphic nomenclature and classifications, revising ICS statutes, setting ICS standards are additional topics that will receive considerable attention. If possible, recommendations will be made on some of these issues and formal votes may be taken on them by the ICS full commission.

Format of Workshop:

No abstracts will be submitted; no publications will be produced directly from the workshop. The format will be open discussions in both full meetings of all participants and smaller groups focusing on specific agenda items. Of course, we will recruit specific presentations that lead or open discussions, and we will consider requests of participants to make specific presentations, but these will be accepted and organized solely for promotion of the agenda. Focused group discussions on agenda items should result, in most instances, in recommendations to the ICS full commission on the closing day of the workshop and possibly formal votes on them. Of course, publications based upon these recommendations may be produced after the workshop.

Agenda Items:

1. The GSSP Concept: its success, its shortcomings, problems that have arisen, difficult boundary issues remaining.
2. The exemplary GSSP proposal – essential components, definition and correlation; how best to present a GSSP proposal.
3. Leadership of ICS subcommissions: ensuring progress on GSSPs; addressing difficult boundaries; managing conflicts, rivalries, and difficult personalities. (restricted to subcommission chairs)
4. New subcommission initiatives.
5. Future of ICS and its role in IUGS.
6. Dual versus single stratigraphic classification of geologic time and time-rock units.
7. Dual usage of "Stage".
8. Integration of varied stratigraphic records and calibrated ages with the International Chronostratigraphic Chart.
9. Revisions to ICS statutes.
10. Collaboration with national stratigraphic committees.
11. The ICS website and educational products and outreach.

Suggestions for additional items are welcome.

Program:

30 May Welcoming Reception (evening) at National Museum central hall

31 May	Opening ceremony, Review of ICS and Subcommission matters; Discussion groups address agenda items (afternoon)
1 June	Discussion groups address agenda items (morning); Discussion groups report to full meeting (afternoon); ICS Commission considers recommendations of discussion groups; Walking tour of Old Town, Prague (evening)
2 June	Field Excursion (base Devonian GSSP at Klonk, base Pridoli GSSP at Pozary, base Pragian GSSP at Velka Chuchle, Silurian succession in Kosov Quarry, Upper Carboniferous and Upper Cretaceous in Pecinov Quarry, Quaternary at Svaty Jan). Two alternative routes will be organized in case of larger number of participants.
3 June	Full meeting for final discussion of workshop recommendations and votes, if appropriate; directives for further deliberations (morning); Workshop Dinner (evening)

Patrons:

Each system-based subcommission chair can rely on Czech or Slovak advisor or patron – a person familiar with local stratigraphy and research on the respective "System". Principal task of such patrons will be to arrange for special meetings and requirements of the subcommissions. Subcommission chairs are encouraged to get in touch with respective patrons in advance.

Precambrian and Neoproterozoic -	Doc. Václav Kachlík; kachlik@natur.cuni.cz
Cambrian –	Doc. Olda Fatka; fatka@natur.cuni.cz
Ordovician –	Doc. Petr Kraft; kraft@natur.cuni.cz
Silurian –	Dr. Petr Štorch; storch@gli.cas.cz
Devonian –	Dr. Petr Budil; petr.budil@geology.cz
Carboniferous –	Prof. Jiří Kalvoda (marine); dino@sci.muni.cz
	Doc. Stanislav Opluštil (continental) oplustil@natur.cuni.cz
Permian –	Dr. Jaroslav Zajíc; zajic@gli.cas.cz
Triassic –	Doc. Jozef Michalík; geolmich@savba.sk
Jurassic –	Doc. Petr Skupien; petr.skupien@vsb.cz
Cretaceous –	Doc. Martin Košťák (marine); kostys@centrum.cz
	Dr. Jiří Kvaček (continental); jiri_kvacek@nm.cz
Paleogene –	Doc. Ján Soták; sotak@savbb.sk
Neogene –	Doc. Katarina Holcová; holcova@natur.cuni.cz
Quaternary –	Dr. Jaroslav Kadlec; kadlec@gli.cas.cz

Subcommission on Stratigraphic Classification and Subcommission for Stratigraphic Information will be supported by Petr Storch (storch@gli.cas.cz) and Petr Kraft (kraft@natur.cuni.cz).

Registration and fee:
Registration fee 250 USD involves costs of Welcoming Reception, Workshop Dinner, public transportation in Prague, workshop materials, and one-day field excursion. Accommodation will be paid separately.

Payment:
Payments must arrive before March 31, 2010 by **international bank transfer** on the following bank account. Cheques and credit card payments are not accepted. Transfer costs must be covered by participants.
IBAN : CZ76 0100 0000 0000 3853 3021
SWIFT : KOMBCZPP
Bank Name: Komerční banka a.s.
Bank adress: Václavské nám. 42, Prague 1
Account Name: Přirodovědecká fakulta UK
Account Adress: Albertov 6, Prague 2
Account number: 38533021/0100
ID number: 90-910 599
Posting text: your name (important to recognize sender)

***********Registration and payment are due until March 31, 2010.*********

Venue:
Lecture rooms at Faculty of Science of the Charles University, Albertov 6, Praha 2

Lodging:
Participants are encouraged to make hotel reservation on their own. A broad selection of housing facilities is available in the city of Prague
Downtown hotels in a close vicinity of the Faculty of Sciences:
Best Western City Hotel Moran **** 100,- EUR (No 7 on the map)
http://www.bestwestern.at/hotels/Česká_republika-Praha-City_Hotel_Moran-rates-66-cz.html

Hotel U Šemíka *** 100,- EUR (No 8 on the map)
http://www.usemika.cz/en/hotel/

Hotel U Sv. Jana Accom plus *** 70,- EUR (No 3 on the map)
http://www.accomprague.cz/praha-hotel-u-sv-jana.htm

Green garden hotel **** 70,- EUR (No 4 on the map)
http://www.hotelgreengarden.cz/index.html?page=home

Royal Court Boutique Hotel and Spa **** 70,- EUR (No 5 on the map)
http://www.hotel-praha-ubytovani.cz/praha-2/royalcourt/

Hotel Standard *** 60,- EUR (No 6 on the map)
http://www.hotele.cz/praha-2-hotel-standard,detail-c-standardhotel.cz.html

Park Inn Prague **** 70,- EUR (No 2 on the map)
http://www.prague.parkinn.cz/

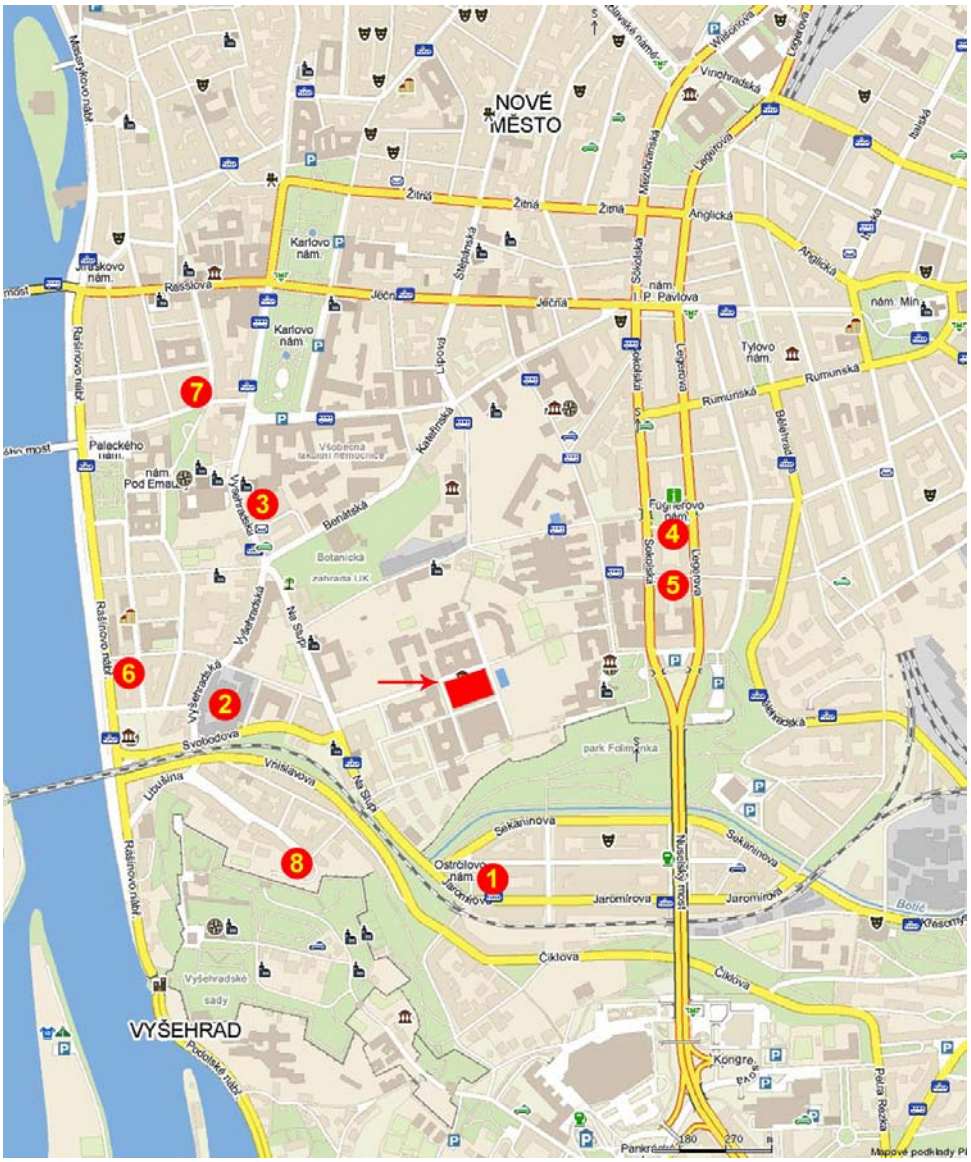
Hotel Union Praha **** 60,- EUR (No 1 on the map)
http://www.hotelunion.cz/

Other hotels of interest (outside of the map):
Hotel Kampa Garden Accom tgravel *** 85,- EUR (hotel situated in historical and quiet part of Mala Strana district)
http://www.hotelsprague.cz/kampagarden

Hotel Krystal *** 45,- EUR (University hotel in Praha 6, on the way to Prague Airport)
http://www.ubytovani-hotel-krystal.cz/

Many more hotels can be found on the following web addresses:

http://www.booking.com/city/cz/prague.html?aid=320737&label=GEOczech
http://www.hrs.com/web3/
http://www.book-travel-prague.com/accommodation/hotels/prague-2/
University Host House (bed and breakfast 430.- Kč : ca **24 USD**) will be reserved by organizers. If applicable, e-mail to conference secretary Mrs Ilona Horychova: horycho@natur.cuni.cz



Dining:
Neighboring student dining hall offers daily menu for about 4 EUR or 5 USD. There are also various restaurants in the walking distance from the Faculty with lunch menu for almost the same price.

Transportation:
Prague Airport is offering direct flights from 108 destinations in 50 countries. Transfer from the airport involves taxi, shuttle minivans or buses. Visitors can take advantage of dense network of public transport based on trams and underground (metro).

Third circular:
Third circular with detailed program and excursion itinerary will be distributed in April 2010.
Participants will be encouraged to register and pay the fee as soon as possible since the number of the workshop participant is limited to 150.

THIRD INTERNATIONAL PALAEONTOLOGICAL CONGRESS (IPC3)

LONDON
28 JUNE TO JULY 3, 2010

IPC is a major international meeting held once every 4 years under the auspices of the International Palaeontological Association. The meeting provides a showcase for all that is exciting and new in the fields of palaeontology and palaeobiology. IPC3 in 2010 is hosted by the Palaeontological Association and partner organizations, and will be based in Imperial College and the Natural History Museum in the heart of London's 'Albertopolis'. The programme will comprise field trips, plenary lectures, workshops, contributed talks and posters, and thematic symposia.

Host organizations

IPC3 is being supported financially by The Palaeontological Association, and hosted by The Palaeontological Association and partner organizations: the International Palaeontological Association, the Natural History Museum, Palaeontographical Society, and The Micropalaeontological Society.

Programme and Deadlines

Abstract submission and registration is currently open.
Abstract submission deadline February 28, 2010.
Early Bird Registration deadline February 28, 2010

This is a provisional programme and there may be some minor changes once all abstracts have been received. However, we do not expect significant changes in the general structure.

Plenary and keynote talks 30 minutes, all others 15 minutes (this includes time for questions/-discussion)

Symposia and Workshops

1. The Lyell Symposium - Comparing the geological and fossil records in deep-sea, shallow marine shelf and terrestrial habitats: implications for biodiversity studies
2. Macroevolution and the Modern Synthesis
3. The micropalaeontological record of global change
4. Microfossil contribution to understanding the tree of life
5. The Acquisition, Curation and Conservation of Palaeontological Collections
6. Palaeontological Data Analysis
7. Origin, evolution and phylogeny of the Brachiopoda
8. The Great Ordovician Biodiversification Event: Causes and Consequences
9. **Devonian Bioevents - Timing, Palaeoecological and Evolutionary Patterns , (29th June, morning!)**

10. Geomicrobiology at critical periods of Earth History
11. Palynology and the Palaeozoic Earth System
12. Chemosynthetic communities: palaeoecology, systematics and evolutionary history
13. Biotic recovery after mass extinction events
14. Molecular Palaeobiology: molecular clocks, evolutionary rates and geological dates
15. Modelling the climate of Palaeozoic Earth
16. Rates of Morphological Evolution: Size, Shape, and Character Change in Fossil Lineages
17. Functional morphology at the intersection between biology and engineering
18. From teeth to Tibet - new techniques and views on mammals and Cenozoic environmental change
19. Major transitions in the early evolution of life
20. From death to data: the taphonomy of skeletons and soft tissues
21. The wood from the trees: phylogenetic approaches to large-scale events in the history of life
22. Mechanisms that guide evolutionary change for vertebrate dentitions: co-option of ancient patterns
23. Recent discoveries and advances in the palaeontology of China
24. The origin of life on land and its geological consequences
25. Late Palaeozoic terrestrial biotas and changing climate
26. Time-specific facies: the colour and texture of biotic events
27. Open Symposium

Workshops

W1. Recent advances in Echinoderm phylogeny
W2. Annual Business Meeting of the International Subcommission on Devonian Stratigraphy
W3. Restoration of marine ecosystems following the Permian-Triassic mass extinction: lessons for the present
W4. PaleoParks and the threat to our basic data
W5. Virtual palaeontology techniques
W6. How conodonts lived and ate: food processing functions of conodont elements
W7. Palaeobiology, palaeoecology and stratigraphy of graptolites
W8. Chelicerate Phylogeny

Venues

Most of the symposia and workshops will be held in the lecture theatres of Royal School of Mines building (home to the Department of Earth Science and Engineering) at Imperial College. Some symposia will also take place in the nearby Flett Lecture Theatre of the Natural History Museum.

Plenary lectures will take place at the Royal Geographical Society.

The conference dinner will take place in the stunning surroundings of the Natural History Museum's Central Hall, complete with *Diplodocus*. This will undoubtedly be an evening to remember.

Accommodation

Registration for the meeting **does not include accommodation**, and conference participants are responsibe for making their own bookings.

We have negotiated special rates for accommodation at Imperial College (see below) who are holding a number of rooms for us. These rates are only available if you quote '**International Paleontological Congress**' when making your booking. Quoting this is essential.

A mixture of University rooms and hotel accomodation are available to book online via Imperial College's conference accommodation site.

Please note that London is a very busy venue especially in the summer holiday season and hotels get booked up so early booking is essential.

Accommodation is available in the following categories:

Southside House
Single rooms @ £72.00 per night
Twin Rooms @ £85.00 per night
Double Rooms @ £87.00 per night
All of the above rooms are ensuite and the price per night includes full English breakfast and VAT.

Beit Hall
Single rooms @ £45.00 per night.These are standard rooms and bathrooms are located nearby. Full English breakfast and VAT are ncluded.
Imperial take full pre-payment at the time of booking and their cancellation policy is 48 hours prior to arrival.
All rooms are provided with Tea and Coffee making facilities, biscuits, mineral water (on arrival) and full toiletries. Rooms are cleaned on a daily basis.

SDS fieldtrip to the ORS of Scotland (22nd-29th July 2010)

The trip will visit the best of Scottish Old Red Sandstone geology. Localities will be visited throughout Scotland including the classic development of lacustrine Middle Devonian on Orkney. Particular emphasis will be paid to the climatic expression of Devonian Events in terrestrial environments (e.g. the Kačák, Taghanic and 'Hangenberg') and what this tells us about evolution of the Devonian Earth System. The trip starts in Inverness with 4 days in the Orcadian Basin followed by 2 days studying the Lower and Upper Old Red Sandstone in the Midland Valley finishing at Hutton's Unconformity, Siccar Point south of Edinburgh.

Other details
The trip starts at London, Euston on the 22nd June to catch the night sleeper to Inverness. It returns to London early in the morning of the 29th June in time to participate in the IPC3 opening sessions. 11 participants minimum, 33 maximum.

Cost
£500 - The cost does not include overnight sleeper trains from London to Inverness and Edinburgh to London. This is because IPC3 has used a professional organiser who is liable for 17.5% local tax. Therefore I have removed various fixed costs from the total cost so participants pay less. Primarily these fixed costs are the sleeper train from London to Inverness and Edinburgh to London. These tickets can, in fact, be bought direct over the internet at a lower price than the group ticket if purchased by a certain date. Full instructions will be given to all participants on exactly what to do. Participants may be required to pay for certain meals and entry to optional tourist sites.

ITINERARY

Date		**Night**	**Travel**	**Localities**
22	Tuesday	sleeper	arrive London, night sleeper to Inverness	
23	Wednesday	Stromness	arrive Inverness, drive to Thurso, late evening Orkney ferry	Portgower (Jurassic), Red Point
24	Thursday	Stromness	Orkney	Stromness Shore, Skara Brae (lunch), Cruaday Quarry, Yesnaby
25	Friday	Stromness	Orkney	Roeberry, Wha' Taing, Hoxa, Fish Museum (lunch), Berstane, East Scapa
26	Saturday	Cromarty	early ferry to Thurso, drive to Cromarty	John o'Groats, Port Tarsuinn, Cadboll, Cromarty, Hugh Miller's Cottage
27	Sunday	Perth	drive Cromarty to Perth	Tillywhandland etc
28	Monday	sleeper	drive Perth to Dunbar	Siccar Point, Pease Bay, Museum visit and evening in Old Town
29	Tuesday		early morning arrival Euston, London	

Provisional List of Localities

Portgower	World famous Jurassic debris flow deposits, we are passing by the locality and you will like the break from driving. They are full of Devonian clasts. One of these is 45m in length.
Red Point	Exposed metamorphic basement with marginal Devonian lake facies
Stromness Shore	Best locality for Eifelian lake cycles, permanent lakes, playa lakes and fish
Skara Brae	Lunch at a Neolithic village complete with houses, furniture, hearths, cool boxes, streets and drains
Cruaday Quarry	Sandwick fish bed for fish collecting
Yesnaby	Spectacular bedding plane exposures of stromatolites
Roeberry	Eday Marl, the terrestrial Taghanic
Wha' Taing	base of Eday Marl with carbonate lakes
Hoxa	Givetian lacustrine cycles
Fish Museum	Exactly what it says. Complete specimens of all Orkney fish
Berstane	Marine incursion into the Orcadian Basin
East Scapa	Gypsum preserved within the Eday Marl
John o'Groats	Marginal Givetian lake facies within fluvial andstones
Port Tarsuinn	Marginal Eday Marl equivalent represent by aeolian dunes with overlying transgression
Cadboll	Eifelian lakes developed within a fluvial sequence
Cromarty	Famous lacustrine fish bed. Excellent for spores.
Hugh Miller's Cottage	Cottage of Hugh Miller who described many Orcadian fish. Author of *The Old Red Sandstone* (1841)
Tillywhandland	Lockhovian lake with fish
Siccar Point	Hutton' Unconformity, where deep time was invented.
Pease Bay	Upper Old Red Sandstone and the Carboniferous transition

The Classical Type-Localities of the Devonian and Carboniferous of Northern France and Southern Belgium

During this excursion many of the classical localities of the type area of the French-Belgian Upper Devonian - Lower Carboniferous will be visited, including the Devonian sections at Givet (type-locality of the Givetian), Frasnes-les-Couvin (Couvinian, Frasnian), and from the areas of the Famenne and the Avesnois (type-localities of the Famennian and Strunian). Carbonifeorus sections will be visited at many classical localities, in the areas of Tournai (Tournaisian), Dinant (Dinantian) and Namur (Namurian), including stops at Hastière (Hastarian), Yvoir (Ivorian), the Molignée valley (Moliniacean), Lives-sur-Meuse (Livian), and others. Fossil collecting is possible at many of these sections. The transport will be organised by mini-bus (not including the travel to and from Lille-Europe). Accomodation for the three nights will be organised in traditional hotels at Givet (France), Dinant and Namur (Belgium).

Other details
Organiser: Palaeontology Department, CNRS, Lille
Field-guides: B. Hubert, B. MISTIAEN (Univ. Catho. Lille), T. Servais (Univ. Lille 1)

Dates: Sunday, July 4th to Wednesday, July 7th 2010.
Departure: Sunday, July 4th, 10am
Return: Wednesday, July 7th, 4 pm
Departure and return: Lille. The excursion will start and return at Lille-Europe, International Railway Station. Lille Europe can be reached easily by Eurostar (< 90 minutes from London), Thalys (< 45 minutes from Brussels) and TGV (< 60 minutes from Paris) high speed trains.

Minimum number of participants: 7, Maximum number of participants: 24

Cost
450 Euro - including transport, accomodation in twin-bed or single bed hotel rooms, all meals (local restaurants with traditional French-Belgian cuisine), and field guides.

STRATI 2010
Sous l'égide du
Comité Français de Stratigraphie
4ème Congrès Français de Stratigraphie
30 août/2 septembre 2010
Université Pierre et Marie Curie - Paris 6
4th "French" Congress on Stratigraphy
From August 30 to September 2 - UPMC - Paris 6
II - Comité local / Local Committee*
P.-Y. Collin (Président / President), D. Desmares, L. Le Callonec, C. Randon, J. Schnyder, ...
III - Comité scientifique / Scientific Committee*
Comité de représentants du CFS et des associations partenaires, des conférenciers invités et d'experts internationaux / To be constituted by representatives of the CFS and its partner associates, the invited speakers and international experts: J.-L. Rubino, P.W. Skelton, A. Blieck, A. Le Hérissé, ...
* Liste prélimaire (les listes définitives seront arrêtées courant 2010)
Preliminary list (final lists should be available by 2010)
Calendrier des inscriptions
Calendar for Registration
Début des inscriptions : 1er février 2010 / Starting date: 1 February 2010
Clôture des inscriptions (pour les auteurs) : 15 avril 2010
Closing date (for authors): 15 April 2010
Date limite de soumission des résumés : 30 avril 2010
Closing date for submittal of abstracts: 30 April 2010
Inscription et soumission des résumés en ligne à
Online registration and submittal of abstracts
www.univ-brest.fr/geosciences/conference/ocs/index.php/CFS/
Tarifs des inscriptions (avant le 15 avril 2010) : 120 euros (4 déjeuners inclus) sauf
- étudiants / chercheurs d'emploi : 100 euros
- employés d'un organisme (privé ou public) non sponsor : 160 euros
- après le 15 avril 2010 : 240 euros
- inscription à la journée : 60 euros
Registration Fees (before 15 April 2010): 120 euros (4 lunches included)
- For students and employment seekers: 100 euros
- For employees of a private or public non-sponsoring company: 160 euros
- Registration after 15 April: 240 euros
- One day registration: 60 euros
Renseignements / Contact
pelopolis.rediris.es/STRATI2010
Bruno GRANIER - bruno.granier@univ-brest.fr
Pierre-Yves COLLIN - pierre-yves.collin@upmc.fr
UPMC
PARIS UNIVERSITAS
SGF
CFS
Carnets de Géologie

Présentation générale du congrès

La Stratigraphie est une des disciplines majeures des Sciences de la Terre. C'est une discipline transverse, un caractère révélé notamment par ses relations étroites avec la cartographie, la sédimentologie et la paléontologie, car elle mêle approches naturalistes et approches physiques. Le 4ème Congrès Français de Stratigraphie représente une opportunité unique de rencontrer chercheurs, spécialistes, utilisateurs, ... d'en découvrir les diverses approches, de dresser des bilans de l'état actuel des connaissances (avancées, progrès à réaliser, ...).

Purpose of the Congress

Stratigraphy is one of the major disciplines of the Earth Sciences. It is many-sided, for it has close relationships with cartography, sedimentology and paleontology, all of which intermesh the natural and physical aspects of their approaches. The 4th "French" Congress on Stratigraphy is a unique opportunity for you to meet researchers, specialists, users, ... to become aware of the latest methods and procedures, to review the current status of the discipline and its potential for advancement.

Le site web (en construction) sera régulièrement actualisé :
The web site (under construction) will be updated regularly:
paleopolis.rediris.es/STRATI2010/

Une liste de diffusion dédiée est accessible sous :
A dedicated mailing list can be accessed at:
www.univ-brest.fr/geosciences/dada/mail.cgi/list/strati2010/

L'UPMC en bref

Située au coeur de Paris, dans le "Quartier latin" (5ème arrondissement), l'université scientifique Pierre & Marie Curie - Paris 6 accueille quelques 30.000 étudiants. Quant au personnel, l'effectif de l'UPMC est de l'ordre de 10.000, dont un tiers d'enseignants-chercheurs, de chercheurs et d'hospitalo-universitaires. La recherche y est organisée en 4 pôles : (1) Modélisation et Ingénierie, (2) Energie, Matière et Univers, (3) Terre vivante et Environnement (comprenant les Sciences de la Terre) et (4) Vie et Santé (pour en savoir plus : www.upmc.fr).

Meeting Site: the Pierre & Marie Curie University (UPMC)

The UPMC is located in the heart of Paris, the "Latin Quarter" (5th arrondissement). It accomodates 30,000 students and a staff of 10,000 of whom a third are involved in teaching and research. Research is organized into four categories: (1) Modeling and Engineering, (2) Energy, Matter and Universe, (3) the Living Earth and Environment (including the Earth Sciences), and (4) Life and Health (to learn more: www.upmc.fr).

Liste préliminaire des 24 symposiums (30 août – 2 septembre 2010)
Preliminary List of the 24 Symposiums (30 August –2 September 2010)

"3D Geomodels", "Sequence stratigraphy, seismic stratigraphy and seismic geomorphology", "Chemostratigraphy", "Geologic Rates: Sedimentation, Evolution, ... illustrated by Cretaceous cases", "Paris Basin Subsurface", "Stratigraphy in continental settings", "Middle East Stratigraphy (the Ibn Sina/Avicenna session)", "French GSSP and stratotypes", "Nannofossils", "Stratigraphy and Palynology", "Planktonic Foraminifera","Cyclostratigraphy", "Stratigraphies and paleoclimates of the Cenozoic" ...

Conférences invitées / *Invited Speakers*

Une dizaine de conférenciers invités parmi lesquels / *About ten, among them*
J.-C. Guttierrez-Marco (Madrid), M. Joachimski (Erlangen), W. Kuhnt (Kiel), G. Cassinis (Pavia), ...

Excursions pré- et post-congrès / *Pre- and Post- Congress Excursions**

Chaque association partenaire propose une ou deux excursions (par exemple, Paléozoïque normand et breton pour le GFP, Bathonien-Callovien de Dijon et ses environs pour le GFÉJ, ...). Les renseignements seront affichés début 2010.

Each partner association proposes one or two excursions (for example, the GFP will host a tour of the Paleozoic of Normandy and Brittany, the GFEJ the Bathonian-Callovian of Dijon and vicinity, ...). Information concerning these tours will be posted early in 2010.

Comités d'organisation / *Organizational Committees*

1 - Comité national (Comité du programme) / *National Committee (Program Committee)*
Le Président du CFS / *The President of the CFS*: B. Granier
The Président d'Honneur / *The Honorary President*: M. Renard
Le Vice-Président du CFS / *The Vice President of the CFS*: M. Moullade
Les Associations / *The Associations*:

- Le Comité Français de Stratigraphie
  The French Committee on Stratigraphy
- Groupe Français du Paléozoïque et son représentant
  The French Group on the Palaeozoic and its representative
- L'Association des Géologues du Permien et du Trias et son représentant
  The Association of Permian and Triassic Geologists and its representative
- Le Groupe Français d'Étude du Jurassique et son représentant
  The French Group Studying the Jurassic and its representative
- Le Groupe Français du Crétacé et sa représentante
  The French Group on the Cretaceous and its representative
- Le Groupe d'Étude du Cénozoïque et ses représentantes
  The French Group Studying the Cenozoic and its representatives
- L'Association des Géologues du Bassin de Paris (association invitée)
  The Association of Geologists of the Paris Basin (invited to participate)

Land–sea interactions in the Phanerozoic

At the joint meeting of the 'Geologische Vereinigung' (GV) and the 'Deutsche Gesellschaft für Geowissenschaften' (DGG) entitled "**GeoDarmstadt 2010**" to be held in Darmstadt (Germany) from October 10 – 13, 2010, a scientific session will be dedicated to land–sea interactions in the Phanerozoic. See below for the scope of the session – further information concerning the meeting can be found at the meeting website www.GeoDarmstadt2010.de.

Conveners: Eberhard SCHINDLER, Rainer BROCKE, Achim WEHRMANN, Volker WILDE

Session language: English

The land–sea transition is characterized by specific environments throughout the entire history of the Earth. There are a number of special ecosystems developed within the transitional zone, such as tidal flats (like those of the North Sea), tropical mangrove systems, large delta systems such as the Indus or the Mississippi, or rocky shores such as those of Brittany. Different processes on each side of the coastline and their manifold interactions play a key role for the development not only of the adjacent ecosystems, but even for distant areas through system interactions. Therefore, the effects of major changes can be traced in both directions far beyond the land–sea transitional area. This is especially seen during times of marked climate and/or sea-level changes (e.g., shifts from icehouse to greenhouse conditions) or important evolutionary steps (e.g., when life colonised terrestrial environments). One of the periods of special interest in relation to land–sea interactions is the mid-Palaeozoic, namely the Devonian. During this key period continental surfaces were progressively invaded by life and terrestrial environments diversified quickly. Due to coupling effects, numerous consequences on weathering processes and products, soil formation and depositional systems may be seen even in the marine realm.

Due to the complex patterns of interaction, we encourage colleagues from a range of different disciplines to participate. We are seeking contributions spanning the whole Phanerozoic to the present time.

Eberhard SCHINDLER, Rainer BROCKE, Achim WEHRMANN, Volker WILDE
(Senckenberg Forschungsinstitute und Naturmuseen)

34th International Geological Congress, Brisbane, Queensland, Australia, 2nd to 10th August 2012

As at every IGC, SDS will be requested by ICS to hold its Business Meeting at the 34th IGC and to take an active role in the programme and in ICS symposia. The organizers have set up a homepage (www.34igc.org) and have started to ask for proposals for the scientific programme. As a first step the CHAIRMAN has submitted a proposal for a symposium on "The Devonian of Asia and Australia". It is hoped that a field trip to visit the Devonian of Eastern Australian localities can be organized and, in addition, the option to see the Devonian of some Southeast Asian countries needs to be explored.

R.T. BECKER

International Conference

"MIDDLE-UPPER DEVONIAN AND LOWER CARBONIFEROUS BIOSTRATIGRAPHY OF SOUTH URALS AND KUZNETSK BASIN"

SDS joint field meeting, to be held in Novosibirsk (Russia),
20 July – 10 August, 2011,

dedicated to the memory of Evgeny A. YOLKIN.

The proposal for this conference was approved during the Subcommission on Devonian Stratigraphy and IGCP 499 business meetings in the Kitab State Geological Reserve (Uzbekistan Republic) in September, 2008. Main aims of the meeting are:

1) to demonstrate reference sections and to discuss in the field the inter-regional correlation (lithologic and biostratigraphic) of Kuznetsk Basin and South Urals Devonian marine basins;
2) brief introduction to transitional reference sequences of the Upper Devonian-Lower Carboniferous of the Kuznetsk Basin and South Urals Paleozoic marine basins.

Pre-and Post-conference field excursions will be held in the South Urals and Kuznetsk Basin (south of West Siberia), which will allow an examination of the complete Middle-Upper Devonian and Lower Carboniferous marine sequences in terrigenous, bedded and reef carbonate, as well as volcanic facies with abundant and diverse faunal remains.

Fig. 1. Frasnian-Famennian section, right bank of Ryauzyak River, South Urals.

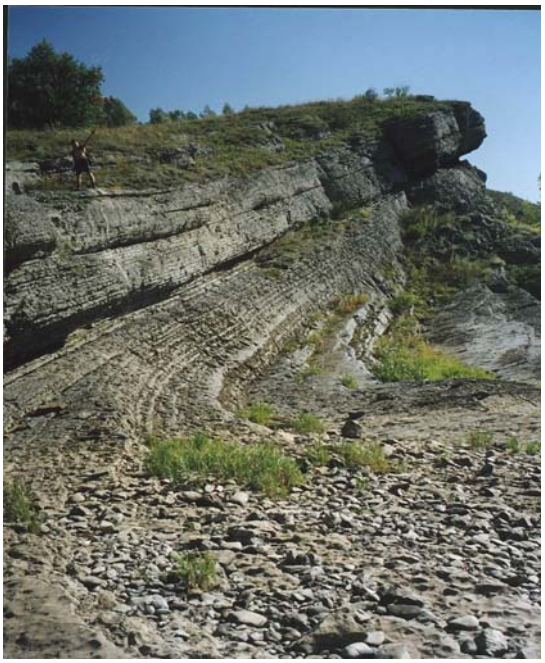


Fig. 2. Frasnian-Famennian section, right bank of Tom' River, Kusnetsk Basin (SW Siberia).

Organizers
Siberian Branch of Russian Academy of Sciences (SB RAS)
Trofimuk Institute of Petroleum Geology and Geophysics (IPGG SB RAS, Novosibirsk)
Ufa Scientific Center of Russian Academy of Sciences (Ufa SC RAS)
Institute of Geology Ufa SC RAS (IG USC RAS, Ufa)
Siberian Research Institute of Geology, Geophysics and Mineral Resources (SNIIGGiMS, Novosibirsk)
International Subcommission on Devonian Stratigraphy (SDS)
Russian Interdepartmental Stratigraphic Committee (RISC), Devonian and Carboniferous commissions

For further information please visit **http://www.ipgg.nsc.ru**,
Secretary e-mail: **devon@ipgg.nsc.ru**
The formal First circular will be distributed in spring 2010

DEVONIAN PUBLICATIONS

Palaeontographica Americana, Vol. 63

Devonian Reef Complexes of the Canning Basin, Western Australia

Geological Survey of Western Australia, Bulletin 145, 444 pp.

by Phillip E. PLAYFORD, Roger M. HOCKING and Anthony E. COCKBAIN

Published August 2009
Price $77 (Australian currency) plus postage. To order and determine postage in your area, email bookshop@dmp.wa.gov.au).

This Bulletin is a remarkable testament to the work of the geologists of the Geological Survey of Western Australia in their studies of the Devonian rocks of the Canning Basin in the southern Kimberley. The senior author of this book, Phil PLAYFORD, has been mapping, logging and researching the area for more than 50 years; the co-authors Roger HOCKING and Anthony COCKBAIN have spent many field seasons there. This Bulletin summarizes the Survey's recent work, their numerous publications, along with the results of studies by others from the GSWA, and students and

staff of universities in Australia and elsewhere. But what a spectacular book; this GSWA Bulletin is a fitting tribute to one of the most famous and best exposed reef complexes in the world – the Devonian reefs of the Canning Basin.

After a fascinating introduction explaining the history of the discovery of the area, notes on the natural history and human occupation, around 100 pages deal with the facies, lithostratigraphy and sequence stratigraphy of the Devonian reef complexes, as well as the role of tectonics in platform development, the diagenesis and burial. The next section deals with the conglomerates, an interesting story one rarely hears about – of coarse clastics being supplied from the nearby Precambrian Kimberley block, deposited in alluvial fans-fan deltas, and interfingering with peritidal carbonates. Of note is their interpretation as highstand facies, rather than lowstand as one might have thought, and linked to active regional tectonism.

The section on metre-scale cyclicity in the Pillara Limestone will be of wide interest since we are still trying to fathom out the causes of such cycles. The ones here are quite typical for the Devonian, many shallowing-upward and subtidal dominated, others peritidal with tidal-flat facies. However, in view of the close source of clastics, many are mixed, with shallow-subtidal, often stromatoporoid-rich limestones passing up into terrigenous deposits of shoreline, mud flat and fluvial facies. Here in the Pillara Limestone, the cycle duration is in the range of 12-20 kyr, and cycles are bundled into 'megacycles' (parasequence-sets), always a good argument for orbital forcing. However, local tectonic influences were also significant.

There are both epi- and syn- genetic mineral deposits within the Devonian limestones and Pb-Zn deposits of the MVT-type have been worked in the past. Of especial interest are the exhalative mineral deposits, notably barite, and the associated microbial precipitations there – amazing stuff – a great story of cool-water venting on the seafloor, bacteria thriving and minerals precipitated there. The barite is intriguing – forming 'shrubs' of fibrous crystals and plumose structures, and closely associated with stromatolites, mostly composed of radiating fibrous calcite.

The most remarkable aspect of the Canning Basin for me is the role of the Permian glaciation, that much of the scenery we now see was created then. The famous gorges of Windjana and Geikie are reckoned to be sub-glacial melt-water channels; many of the karst features – solution dolines, karst corridors, limestone towers and arches, even the cave systems, are also part of the Permian glaciation. The Permian karst scenery has been altered somewhat since then of course, but in a quite minor way. Clearly then, and not just here in the Canning Basin, karst scenery is often much older than one would imagine – and certainly many areas of karst are really palaeokarst. It is difficult to imagine out there in the outback that, 280 million years ago, the whole area was covered by ice, and we can still the effects of that in the scenery today.

The last section describes the main localities of the Devonian strata with maps and details of what to see. Coming with Bulletin 145 are 8 separate maps of the various areas at scales from 1:25,000 to 1:500,000, invaluable if you are visiting the area. This Bulletin will be of wide interest; anybody working on reefs of any age should have a copy, and it is not just for carbonate sedimentologists either. People interested in the geography, the landscape, the people, will also get much from this book. It should be on the recommended reading list for students – it will show them how diverse the sedimentary record is, how beautiful limestones are. And if you get the chance, buy the book and go-see.

The authors, the GSWA, publishers, all those involved, are to be congratulated on producing such a fabulous book.

Maurice TUCKER
Durham University, England
24 November 2009

[This review has been printed with the permission of the Reviewer. A somewhat shortened version has just been published in the February 2010 issue of ***Geoscientist***. Other, similarily enthusiastic reviews have been published by others and elsewhere.
This outstanding volume is a must for all Devonian workers, not only for those dealing with reefal environments and their faunas. In relation to its content and outstanding printing quality the price is incredibly low.
R. Th. BECKER]

The Revised Geological Timescale (GTS) – Devonian Chapter

As announced during the Business Meetings of the last two years, I have spent considerable time in 2009 to update and improve the Devonian chapter for the forthcoming new edition of the Geological TimeScale. The previous chapter in GTS 2004 was co-authored by our former Chairman Michael HOUSE and by Felix GRADSTEIN, former Chairman of ICS. Both will continue as co-authors. Felix will update the correlation of relative and absolute ages and the vertical scaling of the Devonian time slice.

The main aim of the revision was to create more complete and more detailed biostratigraphical scales and to add the recent data from non-biostratigraphical methods, notably from event, sequence, chemo-, cyclo-, isotope, and magneto-stratigraphy (magnetic susceptibility). The chronostratigraphic paragraphs will include the current problems (Emsian, D/C Boundary) and, briefly, our substage decisions and discussions. In the biostratigraphy part, charts will show all the zonations of conodonts (old and new/revised zones, naming the index taxa), ammonoids (genozones only), dacryoconarids (nowakiids), pelagic ostracodes, and, up to the Emsian, pelagic graptolites. A separate chart will show the successions of miospores (only western/central Europe and eastern Europe), chitinozoans, sharks, armoured fish (pteraspidomorphs, placoderms), and acanthodians. A third chart will summarize the trends of carbon (only Europe-North Africa), oxygen (based on conodont phosphate), and strontium (based on brachiopods) isotope curves.

In comparison to GTS 2004, the given literature will be greatly expanded. The following list includes in abbreviated style all references that so far have been ADDED to the 2004 references. They were selected with respect to their significance for international correlation and for the application of new methods. Included biostratigraphical publications update, improve and add to the international zonations and their correlation with the conodont scale, but space does not allow to consider regional zonal schemes and taxonomic work. Unfortunately, there is so far no scheme of brachiopod or trilobite zonations that could have been added. The wealth of other papers deal with chronostratigraphic problems and definitions (e.g., GSSP sections), global events, their chemostratigraphical signatures, with the revision and subdivision of eustatic cycles, with new absolute ages and/or their biostratigraphical position, and with magnetic susceptibility studies or Milankovitch cyclicity.

Apart from a range of older papers that could have been quoted in the first GTS edition, the following list gives you an overview of papers that are especially relevant for international Devonian stratigraphy. I am sure that I am biased and that I have missed and overlooked several others. Therefore, I am looking forward advice from the membership, which papers (hopefully not too many) should/might be included additionally. You will understand that papers that just repeat and summarize previous data can not be included. With thanks – in advance – for your input.

R.T. Becker

Aboussalam, Z.S., 2003, Münster. Forsch. Geol. Paläont. 97: 1-332.
Aboussalam, Z.S. & Becker, R.T., 2002, SDS Newsl. 19: 25-34.
Aboussalam, Z.S. & Becker, R.T., 2007, Geol. Quart. 51 (4): 345-374.
Aboussalam, Z.S. & Becker, R.T., 2010 (in press). „Palaeo x 3“.
Aitchison, J.C., Davis, A.M., Stratford, J.M.C., & Spiller, F.C.P., 1999, Micropaleont. 45 (2): 138-162.
Alberti, G.K.B., 1982, Senck. leth. 63 (5/6): 451-463.
Alberti, G.H.K, 1998, Palaeontogr. A 250 (1-3): 1-46.
Bábek, O., Prikryl, T., & Hladil, J., 2007, Facies 53: 293-316.
Bai, S.-L., 1995, Intern. Geology Review 37: 1109-1114.
Baird, G.C. & Brett, C.E., 2003, Courier Forsch. Senckenberg 242: 141-156.
Baird, G.C. & Brett, C.E., 2008, Bull. Geosci. 83 (4): 357-370.
Balinski, A., Olempska, E., & Racki, G., eds., 2002, Acta Palaeont. Polonica 47 (2): 186-404.
Balinski, A., Olempska, E., & Racki, G., eds., 2006, Acta Palaeont. Polonica 51 (4): 606-832.
Blieck, A. & Turner, S., eds., 2000, Courier Forsch. Senckenberg 223, 1-575.
Bratton, J.F., Berry, W.B.N., & Morrow, J.R., 1999, „Palaeo x 3“ 154: 275-292.
Becker, R.T., 1996, Ann. Soc. géol. Belgique 117 (1) : 19-45.
Becker, R.T., 2005, IGCP 499 Project / SDS joint field meeting, Novosibirsk, Russia, July 25 – August 9, 2005, Contributions, pp. 29-31.

Becker, R. T., 2007a, SDS Newsl. 22: 2.
Becker, R.T., 2007b, SDS Newsl. 22: 29-32.
Becker, R.T., 2009, SDS Newsl. 24: 12-15.
Becker, R.T. & Aboussalam, Z.S., 2004, International Meeting on Stratigraphy, Rabat, March 1-10, 2004, Abstracts, pp. 8-10.
Becker, R.T. & House, M.R., 1999, SDS Newsl. 15: 17-22.
Becker, R.T. & House, M.R., 2009, Geol. Surv. West. Australia, Bull. 145: 415-439.
Becker, R.T. & Kirchgasser, W.T., eds., 2007, Geol. Soc., Spec. Publ. 278: 1-280.
Becker, R.T., Feist, R., Flajs, G.., House, M.R., & Klapper, G., 1989, C. r. Acad. Sci. 309 (Série II): 259-266.
Becker, R.T., House, M.R., Menner, V.V., & Ovnatanova, N.S., 2000, Acta Geol. Pol. 50 (1): 67-97.
Becker, R.T., House, M.R., Bockwinkel, J., Ebbighausen, V., & Aboussalam, Z.S., 2002, Münster. Forsch. Geol. Paläont. 93: 159-205.
Becker, R.T., Ashouri, A.R., & Yazdi, M., 2004a, N. Jb. Geol. Paläont., Abh. 231 (1): 119-143.
Becker, R.T., Jansen, U., Plodowski, G., Schindler, E., Aboussalam, Z.S., & Weddige, K., 2004b, Doc. Inst. Sci. 19: 3-18.
Becker, R.T., Aboussalam, Z.S., Bockwinkel, J., Ebbighausen, V., El Hassani, A., & Nübel, H., 2004c, Doc. Inst. Sci. 19: 29-43.
Belka, Z., Kaufmann, B., & Bultynck, P., 1997, Geol. Soc. America, Bull. 109 (6): 643-651.
Bless, M.J.M., Becker, R.T., Higgs, K., Paproth, E., & Streel, M., 1993, Ann. Soc. géol. Belgique 115 (2): 689-702.
Blieck, A., Clement, G., Blom, H., Lelievre, H., Luksevics, E., Streel, M., Thorez, J., & Young, G.C., 2007, Geol. Soc., Spec. Publ. 278: 219-235.
Brand, U., 2004, Chem. Geol. 204: 23-4.
Brand, U., Legrand-Blain, M., & Streel, M., 2004, „Palaeo x 3“ 195: 99-124.
Brett, C.E., Baird, G.C., Bartholomew, A., DeSantis, M., & Ver Straeten, C., 2010, „Palaeo x 3“
Buggisch, W. & Joachimski, M.M., 2006, „Palaeo x 3“ 240: 68-88.
Buggisch, W. & Mann, W., 2004, Inter. J. Earth Sci. 93: 521-541.
Bultynck, P., 1987, Bull. Inst. R. Sci. Nat. Belgique, Sci. de la Terre 57: 149-181.
Bultynck, P., 2003, Rev. Esp. Paleont. 35 (3): 295-314.
Bultynck, P., 2005, SDS Newsl. 21: 20-22.
Bultynck, P., 2007, Geol. Quarterly 51 (4): 339-344.
Bultynck, P. & Gouwy, S., 2002, Proceedings of the International Symposium, Syktyvkar, Komi Republic, July 9-12, pp. 142-144.
Bultynck, P. & Walliser, O.H., 2000, Notes Mém. Serv. Géol. 399: 11-20.
Caputo, M.V., Melo, J.H.G., Streel, M., & Isbell, J.L., 2008, Geol. Soc. Am., Spec. Pap. 441: 161-173.
Carls, P. & Valenzuela-Ríos, J.I., 2002, Cuad. Museo Geominero 1: 315-333.
Carls, P. & Valenzuela-Ríos, J.I., 2007, SDS Newsl. 22: 24-28.
Carls, P., Slavík, L., & Valenzuela-Ríos, J. I., 2007, Bull. Geosci. 82 (2): 145-164.
Carls, P., Slavík, L., & Valenzuela-Ríos, J.I., 2008, Bull. Geosci. 83 (4): 383-390.
Chen, D. & Tucker, M.E., 2003, „Palaeo x 3“ 193: 87-111.
Chen, D., Qing, H., & Li, R., 2005, Earth and Plan. Sci. Letters 235: 151-166.
Chlupac, I., 2000, N. Jb. Geol. Paläon., Abh. 215 (1): 97-124.
Chlupac, I. & Lukes, P., 1999, Newsl. Strat. 37 (1/2): 75-100.
Chlupac, I. & Turek, V., 1983, Rozpr. Ùstr. úst. geol. 46: 1-159.
Claeys, P., Kyte, F.T., Herbosch, A., & Casier, J.-G., 1996, Geol. Soc. America, Spec. Pap. 307: 491-504.
Clark, S., Day,. J., Ellwood, B., Harry, R., & Tomkin, J., 2009, SDS Newsl. 24: 27-35.
Corradini, C., 2008. Rev. Micropaléont. 51: 123-132.
Cramer, B.D., Saltzman, M.R., Day, J., & Witzke, B.J., 2008, Geol. Ass. Canada, Pap. 48: 103-118.
Da Silva, A.-C. & Boulvain, F., 2002, Facies 46: 89-102.
Da Silva, A.-C. & Boulvain, F., 2006, „Palaeo x 3“ 240: 373-388.
Da Silva, A.-C. & Boulvain, F., 2008, „Palaeo x 3“ 269: 189-204.
Day, J., Uyeno, T., Norris, W., Witzke, B.J., & Bunker, B.J., 1996, Geol. Soc. America, Spec. Pap. 306: 259-275.
DeSantis, M.K., Brett, C.E., & Ver Straeten, C.A., 2007, Geol. Soc., Spec. Publ. 278: 83-104.
Dopieralska, J., Belka, Z., & Haack, U., 2006, „Palaeo x 3“ 240: 108-119.
Ebbighausen, V., Becker, R.T., & Bockwinkel, J., 2010 (in press), N. Jb. Geol. Paläont.
Ebert, J., 2009, SDS Newsl. 24: 81-82.
Ebneth, S., Diener, A., Buhl, D., & Veizer, J., 1997, „Palaeo x 3“ 132: 79-96.
Elrick, M., Berkyova, S., Klapper, G., Sharp, Z., Joachimski, M. & Fryda, J., 2009, „Palaeo x 3“ 276 (1/4): 170-181.

Ellwood, B.B., Benoist, S.L., El Hassani, A., Wheeler, C., & Crick, R.E., 2003, Science 300: 1734-1737.
Ellwood, B.B., García-Alcalde, J.L., El Hassani, A., Hladil, J., Soto, F.M., Truyóls-Massoni, M., Weddige, K., & Koptikova, L., 2006, Tectonoph. 418: 31-49.
Flajs, G. & Feist, R., 1988, Courier Forsch. Senckenberg 100: 53-107.
García-Alcalde, J.L., 1997, Episodes 20 (4): 241-246.
García-López, S. & Bastida, F., eds., 2002, Cuad. Museo Geominero 1: 438 pp.
Geldsetzer, H.H.J., Goodfellow, W.D., McLaren, D.J., & Orchard, M.J., 1987, Geology 15: 393-396.
Gersl, M. & Hladil, J., 2004, Geol. Quart. 48 (3): 283-292.
Ginter, M. & Ivanov, A., 2000, Courier Forsch. Senckenberg 223: 325-339.
Ginter, M., Hairapetian, V., & Klug, C., 2002, Acta Geol. Polonica 52 (2): 169-215.
Girard, C. & Albarède, F., 1996, „Palaeo x 3“ 126: 195-209.
Girard, C., Robin, E., Rocchia, R., Froget, L., & Feist, R., 1997, „Palaeo x 3“ 132: 391-397.
Girard, C., Klapper, G., & Feist, R., 2005, Developments in Palaeontology & Stratigraphy 20: 181-198.
Gong, X., Huang, H., Zhang, M., & Huang, Q., 1991, The stratigraphic classification and correlation of carbonate rocks of Upper Devonian and Lower Carboniferous in Guilin Karst region. 106 pp.
Gonzáles, F., Moreno, C., & Santos, A., 2006, Geol. Mag. 143 (6): 821-827.
Gordon, G.W., Rockman, M., Turekian, K.K., & Over, J., 2009, American Journal of Science 309: 420-430.
Goodfellow, W.D., Geldsetzer, H.H.J., McLaren, D.J., Orchard, M.J., & Klapper, G., 1988, Canadian Soc.f Petr. Geol., Mem. 14 (III): 9-21.
Gouwy, S. & Bultynck, P., 2000, Bull. Ins. R. Sci. Nat. Belgique, Sci. de la Terre 70: 25-52.
Gouwy, S. & Bultynck, P., 2003, Rev. Esp. Micropaleont. 35 (3): 315-344.
Gouwy, S., Haydukiewicz, J., & Bultynck, P., 2007, Geol. Quart. 51 (4): 375-392.
Grahn, Y., 2003, Rev. Esp. Paleont. 35: 1-8.
Grahn, Y., 2005, Acta Geol. Polonica 55: 211-227.
Grahn, Y. & Melo, J.H.G., 2004, Rev. Micropaléont. 47: 71-85.
Grandjean-Lécuyer, P., Feist, R., & Albarède, F., Geoch. Cosmoch. Acta 57: 2507-2514.
Halas, S., Balínski, A., Gruszczynski, M., Hoffman, A., Malkowski, K., & Narkiewicz, M., 1992, N. Jb. Geol. Paläont., Mh. 1992 (3): 129-138.
Hartenfels, S., Becker, R.T., & Tragelehn, H., 2009, SDS Newsl. 24: 40-48.
Hartenfels, D. & Becker, R.T., 2009, Palaeontogr. Americana 63: 71-97.
Hartkopf-Fröder, C., Kloppisch, M., mann, U., Neumann-Mahlkau, P., Schaefer, R.G., & Wilkes, H., 2007, Geol. Soc., Spec. Publ. 278: 173-196.
Henderson, C.M., Richards, B., & Johnston, D., 2009, ICOS 2009 Permophiles 53, Suppl. 2, 115 pp.
Hladíková, J., Hladil, J., & Kríbek, B., 1997, „Palaeo x 3“ 132: 225-241.
Hladil, J., Pruner, P., Venhodová, D., Hladíkova, T., & Man, O., 2002, Coral Res. Bull. 7: 65-71.
Hladil, J., Gersl., M., Strnad, L., Frana, J., Langrova, A., & Spisiak, J., 2006, Inter. J. Earth Sci. 95: 703-723.
Holdsworth, B.K. & Jones, D.L., 1980, Geology 8: 281-285.
House, M.R., 1996, Proc. Ussher Soc. 9: 79-84.
House, M.R. & Kirchgasser, W.T., 1993, Geol. Soc. Spec. Publ. 70: 267-292.
House, M.R. & Kirchgasser, W.T., 2008, Bull. American Paleont. 374: 1-288.
Izokh, N.G., Obut, O.T., Morrow, J., & Sandberg, C.A., 2008, 20th International Senckenberg Conference and 2nd Geinitz Conference, Final Meeting of IGCP 497 and IGCP 499, Abstracts and Programme, pp.186-188.
Jansen, U., 2008, IGCP 499 Project/SDS joint field meeting, Kitab State Geological Reserve, Uzbekistan, August 25 – September 3, 2008, Contributions: 42-45, Tashkent.
Ji, Q. et al., The Dapoushang Section, an excellent section for the Devonian-Carboniferous boundary stratotype in China, pp. 66-79, Beijing.
Joachimski, M.M., 1997. „Palaeo x 3“ 132: 133-145.
Joachimski, M.M. & Buggisch, W., 2002, Geology 30 (8): 711-714.
Joachimski, M.M., Ostertag-Henning, C., Pancost, R.D., Strauss, H., Freeman, K.H., Littke, R., Sinninghe Damsté, J.S., & Racki, G., 2001, Chem. Geol. 175: 109-131.
Joachimski, M.M., van Geldern, R., Breisig, S., Buggisch, W., & Day, J., 2004, Inter. J. Earth Sci. 93: 542-553.
Joachimski, M.M., Breisig, S., Buggisch, W., Talent, J.A., Mawson, R., Gereke, M., Morrow, J.R., Day, J., & Weddige, K., 2009, Earth and Plan. Sci. Letters 284: 599-609.
Kaiser, S.I., 2007, Jb. Geol. Bundesanstalt 147 (1/2): 301-314.
Kaiser, S.I., 2009, Newsl. Strat. 43 (2): 195-205.
Kaiser, S.I., Steuber, T., Becker, R.T., & Joachimski, M.M., 2006, „Palaeo x 3“ 240 (1-2), 146-160.
Kaiser, S.I., Steuber, T., & Becker, R.T., 2008, Geol. J. 43: 241-260.

Kaiser, S.I, Becker, R.T., & Spaletta, C., 2009, Palaeontogr. Americana 63: 99-143.
Kaiser, S.I., Becker, R.T., Steuber, T., & Aboussalam, Z.S., 2010 (in press), „Palaeo x 3“.
Kaufmann, B., 2006, Earth-Science Rev. 76: 175-190.
Kaufmann, B., Trapp, E., & Mezger, K., 2004, J. Geol. 112: 495-501.
Kaufmann, B., Trapp, E., Mezger, K., & Wedige, K., J. Geol. Soc. 162: 363-371.
Klapper, G., 1971, Geol. et Palaeont. 5: 59-79.
Klapper, G., 1992, Oklahoma Geol. Surv. Bull. 145: 127-135.
Klapper, G., 1997, Geol. Soc. America, Spec. Pap. 321: 113-129.
Klapper, G., 2007a, J. Paleont. 81 (3): 513-537.
Klapper, G., 2007b, Stratigraphy 4 (1): 67-76.
Klapper, G. & Oliver, A. jr., 1995, Can. J. Earth Sci. 32: 1070-1073.
Klapper, G., Kirchgasser, W.T., & Baesemann, J.F., 1995, SEPM Special Publication 53: 177-184.
Klapper, G., Kuz´min, A., & Ovnatanova, N.S., 1996, J. Paleont. 70 (1): 131-152.
Klapper, G., Uyeno, T.T., Armstrong, D.K., & Telford, P.G., 2004, J. Paleont. 78 (2): 371-387.
Kleffner, M.A., Barrick, J.E., Ebert, J.R., Matteson, D.K., & Karlsson, H.R., 2009, Palaeontogr. Americana 62: 57-73.
Klug, C., 2002, Courier Forsch. Senckenberg 238: 1-109.
Koptikova, L., Berkyova, S., Hladil, J., Slavik, L., Schnabl, P., Frana, J., & Bohmova, V., 2008, IGCP 499 Project/SDS joint field meeting, Kitab State Geological Reserve, Uzbekistan, August 25 – September 3, 2008, Contributions: 60-62.
Korn, D., 1999, Abh. Geol. Bundesanstalt 54: 147-179.
Korn, D. & Weyer, D., 2003, Mitt. Museum Naturkd. Berlin, Geowiss. Reihe 6: 79-124.
Kürschner, W., Becker, R.T., Buhl, D., & Veizer, J., 1993. Ann. Soc. géol. Belgique 115 (2): 595-622.
Liashenko, G.P., 1967, International Symposium on the Devonian System, Calgary 1967, vol. II, pp. 897-903.
Loboziak, S. & Melo, J.H.G., 2002, Rev. Palaeobot. Palyn. 121: 133-148.
Lottmann, J., 1990, Gött. Arb. Geol. Paläontol. 44: 1-98.
Ma, X.-P., Wang, C.-Y., Racki, G., & Racka, M., 2008, „Palaeo x 3“ 269: 130-151.
Marini, F., Casier, J.-G., Claude, J.-M., & Théry, J.-M., 1997, Sphaerula 1 (1): 4-19.
Marshall, J.E.A., Astin, T.R., Brown, J.F., Mark-Kurik, E., & Lazauskiene, J., 2007, Geol. Soc., Spec. Publ. 278: 133-155.
Matyja, H. & Turnau, E., 2008, IGCP 499 Project/SDS joint field meeting, Kitab State Geological Reserve, Uzbekistan, August 25 – September 3, 2008, Contributions: 67-71, Tashkent.
Mawson, R., 1985, Palaeontology 30 (2): 251-297.
Mawson, R., 1995, Courier Forsch. Senckenberg 182: 389-398.
Maziane, N., Higgs, K.T., & Streel, M., 1999, J. Micropalaeont. 18: 17-25.
Melo, J.H.G. & Loboziak, S., 2003, Rev. Palaeobot. Palyn. 124: 131-202.
Morrow, J.R., Sandberg, C.A., Malkowski, K., & Joachimski, M.M., 2009, „Palaeo x 3“ 282: 105-118.
Murphy, M.A., 2005, Rev. Esp. Paleont. 20 (2): 177-206.
Murphy, M.A. & Valenzuela-Ríos, J.I., 1999, Boll. Soc. Paleont. Italiana 37 (2/3): 321-334.
Nawrocki, J., Polechonska, O., & Werner, T. 2008, „Palaeo x 3“ 269: 176-188.
Obukhovskaya, T.G., Avkhimovitch, V.I., Streel, M., & Loboziak, S., 2000, Rev. Palaeobot. Palyn. 112: 229-246.
Obut, O.T. & Shcherbanenko, T.A., 2008, Bull. Geosci. 83 (4): 371-382.
Over, D.J., 1997, Geol. Soc. America, Spec.Pap. 321: 161-177.
Over, D.J., 2002, „Palaeo x 3“ 181: 153-169.
Over, D.J. & Rotondo, K.A., 2001, SDS Newsl. 18: 91-92.
Ovnatanova, N.S. & Kononova, L.I., 2008, Paleont. J. 42 (10): 997-1166.
Paris, F., Winchester-Seeto, T., Boumendjel, K., & Grahn, Y., 2000, Courier Forsch. Senckenberg 220: 39-55.
Pisarzowska, A., Sobstel, M. & Racki, G., 2006, Acta Palaeont.Polonica 51 (4): 609-646.
Playford, P.E., McLaren, D.J., Orth, C.J., Gilmore, J.S., & Goodfellow, W.D., 1984, Science 226: 437-439.
Pujol, F., Berner, Z., & Stüben, D., 2006, „Palaeo x 3“ 240: 120-145.
Racki, G., 1999, Geol. Rundschau 87: 617-632.
Racki, G., 2005, Developments in Palaeontology & Stratigraphy 20: 5-36.
Racki, G. & Koeberl, C., 2004, Science 303: 471.
Racki, G., Piechota, A., Bond, D., & Wignall, P.B., 2004, Geol. Quart. 48 (3): 267-282.
Racki, G., Joachimski, M.M., & Morrow, J.R., eds., 2008, „Palaeo x 3“ 269: 127-204.
Rimmer, S.M., Thompson, J.A., Goodnight, S.A., & Robl, T.L., 2004, „Palaeo x 3“ 215: 125-154.
Riquier, L., Tribovillöard, N., Averbuch, O., Joachimski, M.M., Racki, G., Devleeschouwer, X., El Albani, A., & Riboulleau, A., 2005, Developments in Palaeontology & Stratigraphy 20: 199-224.

Riquier, L., Averbuch, O., Tribovillard, N., El Albani, A., Lazreq, N., & Chakiri, S., 2007, Geol. Soc., Spec. Publ. 278: 197-217.
Robl, T.L. & Barron, L.S., 1988, Can. Soc. Petrol. Geol., Mem. 14 (II): 377-392.
Sáez, R., Moreno, C., & González, F., 2008, Comte R. Geosci. 340: 829-839.
Saltzmann, M.R., 2002, „Palaeo x 3“ 187: 83-100.
Sandberg, C.A., Ziegler, W., & Bultynck, P., 1989, Courier Forsch. Senckenberg 110: 195-230.
Sauerland, U., 1983, Göttinger Arbeiten zur Geologie und Paläontologie 25: 1-86.
Schieber, J. & Over, D.J., 2005, Developments in Palaeontology & Stratigraphy 20: 51-69.
Schindler, E., 1990, Gött. Arb. Geol. Paläont. 46: 1-115.
Schmitz, B., Ellwood, B.B., Peucker-Ehrenbrink, B., El Hassani, A., & Bultynck, P., 2006, Earth Plan. Sci. Letters 249: 162-172.
Schöne, B.R., 1997, Gött. Arb. Geol. Paläont. 70: 1-140.
Schülke, I., 1999, Geol. et Palaeont., SB 3: 1-124.
Schwartzapfel, J.A. & Holdsworth, B.K., 1996, Cushman Foundation Foram. Res., Spec. Publ. 33: 1-275.
Selby, D. & Creaser, R.A., 2005, Geology 33 (7): 545-548.
Simon, L., Goddéris, Y., Buggisch, W., Strauss, H., & Joachimski, M.M., 2007, Chem. Geol. 246: 19-38.
Slavík, L., 2004a, Newsl. Strat. 40 (1/2): 39-71.
Slavík, L., 2004b. Newsl. Strat. 40 (3): 137-153.
Slavík, L., Valenzuela-Ríos, J.I., Hladil, J., & Carls, P., 2007, Geol. J. 42: 499-512.
Stephens, N.P. & Sumner, D.Y., 2003, „Palaeo x 3“ 191: 203-219.
Streel, M., 2000. SDS Newsl. 17: 59.
Streel, M., 2009, Geol. Soc., Spec. Publ. 314: 163-176.
Streel, M. & Loboziak, S., 2000, SDS Newsl. 17: 12-14.
Streel, M., Brice, D., Degardin, J.-M., Derycke, C., Dreesen, R., Groessens, E., Hance, L., Legrand-Blain, M., Lethiers, F., Loboziakl, S., Maziane, N., Milhau, B., Mistiaen, B., Poty, E., Rohart, J.-C., Sartenaer, P., Thorez, J., Vachard, D., & Blieck, A., 1998, SDS Newsl. 15: 47-52.
Streel, M., Brice, D., & Mistiaen, B., 2006, Geol. Belgica 9 (1/2): 105-109.
Trapp, E., Kaufmann, B., Mezger, K., Korn, D., & Weyer, D., Geology 32 (10): 857-860.
Tribovillard, N., Averbusch, O., Devleeschouwer, X., Racki, G., & Riboulleau, A., 2004, Terra Nova 16: 288-295.
Turgeon, S.C., Creaser, R.A., & Algeo, T.J., 2007, Earth. Plan. Sci. Letters 261: 649-661.
Valenzuela-Ríos, J.I. & Murphy, M.A., 1997, Geol. Soc. America, Spec. Pap. 321: 131-144.
Van Geldern, R., Joachimski, M.M., Day, J., Jansen, U., Alvarez, F., Yolkin, E.A., & Ma, X.-P., 2006, „Palaeo x 3“ 240: 47-67.
Veizer, J., Buhl, D., Diener, A., Ebneth, S., Podlaha, O.G., Bruckschen, P., Jasper, T., Korte, C., Schaaf, M., Ala, D., & Azmy, K., 1997, „Palaeo x 3“ 132: 65-77.
Ver Straeten, C.A., 2004, Geol. Soc. America, Bull. 116 (3/4): 474-489.
Ver Straeten, C.A., 2007, Geol. Soc., Spec. Publ. 278: 39-81.
Ver Straeten, C.A. 2009. Devonian T-R Cycle 1B: Palaeontogr. Americana 63: 33-47.
Wang, K., 1992, Science 256: 1547-1550.
Wang, K., Orth, C.J., Attrep, M. jr., Chatterton, B.D.E., Hou, H., & Geldsetzer, H.H., 1991, Geology 19: 776-779.
Wang, K., Geldsetzer, H.H.J., & Chatterton, B.D.E., 1994, Geol. Soc. Am., Spec. Pap. 293: 111-120.
Wang, K., Geldsetzer, H.H.J., Goodfellow, W.D., & Krouse, H.R., 1996, Geology 24 (2): 187-191.
Wang, Y.-J., Fang, Z.-J., Yang, Q., Zhou, Z.-C., Cheng, Y.-N., Duan, Y.-X., & Xiao, Y.-W., 2000, Acta Micropalaeont. Sinica 17 (3) 235-254.
Warme, J.E. & Sandberg, C.A., 1006, Geol. Today 6 (1): 1-7.
Weddige, K., 1982, Courier Forsch. Senckenberg 55: 26-37.I
Whalen, M.T. & Day, J.E., 2008, SEPM Spec. Publ. 89: 291-314.
Witzke, B., Day, J. & Bunker, B., 2009, Palaeontog. Americana 63: 229-231.
Yans, J., Corfield, R., Racki, G. & Préat, A., 2007, Geol. Mag. 144: 263-370.
Yolkin, E.A., Weddige, K., Izokh, N.G. & Erina, M.V., 1994, Courier Forsch. Senckenberg 168: 139-157.
Yu, C.-M., ed., 1988, Devonian-Carboniferous Boundary in Nanbiancun, Guilin, China – Aspects and Records. 379 pp.
Zhang, N., Xia, W., Dong, Y., & Shang, H., 2008, Marine Micropaleontology 67: 180-190.
Zheng, Y., Hou, H.-F., & Ye, L.-F., 1993. „Palaeo x 3“ 104: 97-104.
Ziegler, W. & Sandberg, C.A., 1984, Geol. Soc. America, Spec. Pap. 196: 179-194.
Ziegler, W. & Sandberg, C.A., 1997, SDS Newsl. 14: 11-12.

MEMBERSHIP NEWS

CM Gordon C. BAIRD

During this past year, I have continued with a mapping project in northwest Pennsylvania to deconvolute stratigraphic relationships of end-Devonian units across that region. A proximal objective of this work is to establish chronostratigraphic links of various local units (topmost Riceville Formation, Drake Well Formation, Corry Formation, Cussewago Sandstone) to key divisions (Chagrin Shale, Cleveland Shale, Bedford Formation, Berea Sandstone) long recognized in Ohio and elsewhere. A longer-term goal is to identify the respective signatures of the global Dasberg and Hangenberg events along an outcrop transect, extending from the Cleveland, Ohio area, eastward to Warren, Pennsylvania. I am working closely with Jeff OVER at S.U.N.Y. Geneseo (conodonts), Scott MCKENZIE at Mercyhurst College (macrofauna), as well as others.

This past year we measured 61 new sections, essentially doubling the number of examined outcrops from the previous year's tally when this project started. Moreover, key outcrops in the Cleveland, Ohio metropark system were examined in June with the help of Carlton BRETT (University of Cincinnati), Joe HANNIBAL (Cleveland Museum of Natural History) and Bob CARR (Ohio University: Athens) as part of preparations for the NAPC post-meeting Devonian field trip (see references below). The most important outcome of the year's fieldwork was confirmation of the long-enigmatic, temporal relationship of the widespread Corry Formation in central and eastern Crawford County with the Cussewago Sandstone in central and western parts of that county. The Corry is found to distinctly underlie the Berea Sandstone-equivalent Cussewago where the two units overlap locally. This now allows us to place all key area units in a relative-age temporal sequence for chronostratigraphic comparison to successions elsewhere. Moreover, recent discovery of a major transgression-related, detrital pyrite and fish bone-rich lag deposit along the base of the Corry, may allow us to recover key conodont elements and other vertebrate material potentially at or near the Hangenberg bioevent position. Two guidebook articles, outlining work completed on this project, were published in 2009 (see below).

Publications:

Baird, G.C. and Brett, C.E., 2008, Late Givetion Taghanic bioevents in New York State: new discoveries and questions. Bulletin of Geosciences 83 (4) 357-370. Czech Geological Survey, Prague.

Zambito, J.J., IV, Baird, G.C., Brett, C.E. and Bartholomew, A.J., 2009, Depositional sequences and paleontology of the Middle-Upper Devonian transition (Genesee Group) at Ithaca, New York: a revised lithostratigraphy for the northern Appalachian Basin, 49-69. **In**, Over, D.J. (ed.), *Studies in Devonian Stratigraphy: Proceedings of the 2007 International Meeting of the Subcommission on Devonian Stratigraphy and IGCP 499.* Palaeontographical Americana, No. 63, Ithaca.

Baird, G.C., Carr, R.K., Hannibal, J.T., Brett, C.E. and Brett, B., 2009, Uppermost Devonian (Famennian) stratigraphy of the Cleveland area, northeastern Ohio, 154-168, **In**, Brett, C.E., Bartholomew, A.J. and DeSantis, M.K., *Middle and upper Devonian sequences, sea level, climatic and biotic events in east-central Laurentia.* North American Paleontological Convention, Field Trip No. 10, Cincinnati.

Baird, G.C., Carr, R.K., Hannibal, J.T., Brett, C.E. and Brett, B., 2009, Day 6: Roadlog and stop descriptions: Upper Devonian of Cleveland, Ohio vicinity, 170-185, **In**, Brett, C.E., Bartholomew, A.J. and DeSantis, M.K. (eds.), *Middle and Upper Devonian sequences, sea level, climatic and biotic events in east-central Laurentia.* North American Paleontological Convention, Field Trip No. 10, Cincinnati.

Baird, G.C., Gryta, J.J., McKenzie, S.C., Over, D.J., Pulawski, S. and Sullivan, J.S., 2009, Deconvoluting the end-Devonian story in the "Oil Lands Region" of northwest Pennsylvania, 5-31, **In**, Harper, J.A. (ed.), *History and Geology of the Oil Regions of northwestern Pennsylvania.* Guidebook, 74th Annual Field Conference of Pennsylvania Geologists, Pennsylvania Geological Survey, Middletown.

CM Alex J. BARTHOLOMEW

The highlight of the last year was most definitely the North American Paleontological Convention (NAPC) held in June-July in Cincinnati. The meeting was wonderful (it was quite fun to be back in Cincinnati where I did my graduate work!) and it was great to see all of my local and international friends. After the meeting I helped to lead an extended field excursion with Carlton BRETT, Mike DESANTIS, Gordon BAIRD, and many others, showing Middle and Upper Devonian sections in Kentucky, Indiana, Ohio, and Michigan. We had some great weather, found some great fossils, and I think folks had a swell time.

I helped to present 5 posters at the NAPC meeting, each authored by a different student I have worked with at SUNY New Paltz where I currently teach. C.J. HARTWELL conducted an interesting study of niche-partitioning within the Eifelian to Givetian Onondaga-Union Springs-Oatka Creek formations in New York, Ohio, Ontario, and Michigan. This important interval contains two major faunal turnover events, with the influx of warm-water Stony Hollow fauna that displaced the colder-water Onondaga fauna during the Union Springs interval, only to be replaced again by a colder-water Hamilton Fauna during the Oatka Creek interval. We were able to show some interesting patterns of ecospace utilization between the three faunas in the different areas and we hope to work this into a publication in the near future.

Chris GAHN prepared a poster documenting our work on cephalopod preservation based on experiments with pressurized infilling of modern Nautilus shells and comparisons with goniatites collected from the Emsian of Morocco. This work hopes to shed light on differential preservation seen in the sectioned goniatites from Morocco and is still ongoing.

Jackie MARTIN's poster documenting faunal gradients along a single time-plane from the Givetian Staghorn Point Coral Bed in central New York was well-received and we obtained some great feedback on our project. This September we collected some much-needed data from various points along the gradient with help from some other students at New Paltz along with folks from Cincinnati as well as Bob CARR from Ohio University. Jackie and I are finalizing our analyses of the data and are about to start writing up our work.

Katy HANSON prepared a great poster on a recent find of a terrestrial arthropod trackway from the Middle Devonian of the Catskill Front in eastern New York. We hypothesized about possible trace-makers of the tracks as well as attempting to calculate the gait at which the animal was moving. This was a fun exercise and we are preparing a short paper on this interesting find.

Finally, Tom SCHRAMM, who has this fall begun his Masters' work at the University of Cincinnati with Carlton BRETT, presented a poster based on our work in the Devonian outlier in southeastern-most New York State in the vicinity of Skunnemunk Mountain. This fascinating area preserves a syncline of Lower to Middle Devonian sediments that was thrust in from the east and is currently separated from the main outcrop belt of Devonian rocks by about 30km; however, based on facies analysis, the true distance of separation must have been far greater during the deposition of the sediments as the rocks in the outlier preserve some of the oldest near-shore environments for this interval in the area. Our initial hope was to document the previously unreported anomalous Stony Hollow Fauna from these rocks and Tom presented on our initial reconnaissance that yielded several elements of this fauna including proetid trilobites and small rugose corals similar to those found in the main outcrop belt in the same stratigraphic interval. Much work is needed to further unravel story of faunal change in this poorly-exposed and highly deformed area.

Carl and I are in agreement that the SDS field excursion associated with the meeting was a great success, made in part only by the massive amount of assistance and kindness of the many people associated with the trip. Experts on the stratigraphy and paleontology of all areas visited were very forthcoming and willing to share their knowledge with the broadly interested group of people we had on the trip. Additionally, the trip would have been no where near as successful as it was without the kind consideration of the various quarry operators and land owners we encountered. Many new findings were made in all areas visited along the way and we are in the process of working the guidebook into a publication through the Cincinnati Museum Center. We sincerely hope those in attendance had as much fun on the trip as we did leading it.

Once back in New York for the rest of the summer and the fall, I focused on writing up a fieldtrip guidebook article on the Dave Elliot Bed for the New York State Geological Association meeting that was held at SUNY

New Paltz at the end of September. Tom Schramm and I prepared our initial findings on this project that included a biofacies analysis along the depositional gradient preserved within the interval from north to south along the Hudson Valley, as well as including information on new goniatite finds from the bed, kindly identified by Thomas BECKER as *Tornoceras* aff. *mesopleuron,* which helps to further refine the basal Givetian in this area (and beyond). Additionally, Jeff OVER provided some interesting Magnetic Susceptibility data through the interval for our paper. In the end our fieldtrip was combined with Chuck VER STRAETEN's trip, as he could not attend the meeting, and Carl BRETT and Gordon BAIRD stepped in to help with some of the stops. Despite the rain and the culling of stops from both plans, the trip went off well and we were able to put together a great story on the upper Eifelian-lower Givetian of the Catskill Front for the people who attended. It was great to see many of the New York State SDS members at this meeting including Bill KIRCHGASSER who had previously taught at New Paltz in the mid 1960's. Tom and I are in the final stages of preparing a paper on our biofacies analysis of the Dave Elliot Bed and we have recently set up to organize a paper on the newly found goniatites from our area with Thomas BECKER.

I close by wishing you all health and happiness in the year ahead and I look forward to seeing you all at the IPC this summer in London. Alex

TM R. Thomas BECKER and the Münster Group

In 2010 field work continued in the South of Morocco (together with Sven HARTENFELS, VOLKER EBBIGHAUSEN and Jürgen BOCKWINKEL), in the Rhenish Massif, and, during the splendid SDS Excursion led by Carl, Alex, Gordon, and others, in Kentucky-Ohio-Michigan.

The Moroccan trip was short and concentrated on the re-sampling of the Upper Givetian to Middle Frasnian at Seheb-el-Rhassal, Section C, on the Famennian of Djebel Erfoud, and of the Rheris Basin of the northern Tafilalt (El Gara), and on the basal upper Emsian of the Hamar Laghdad area. At Djebel Erfoud the middle Famennian *Sulcoclymenia* Zone, previously known from the Mrakib (Maider) and southern Tafilalt (Hassi Nebech), is well-developed and underlain by levels rich in *Sporadoceras angustisellatum* and *Planitornoceras euryomphalum*. Therefore, the Maider ammonoid zonation (BECKER et al. 2002) can now easily be correlated into the central Tafilalt Platform. Towards the Rheris Basin rare prolobitids appear in the *Sulcoclymenia* interval and above the *Annulata* Event there are many nice, small *Platyclymenia pseudoflexuosa*, as in the Maider Basin. This contributes to the increasing evidence of bathymetric influence on the distribution of Famennian marker ammonoids. W of Hamar Laghdad we examined an alternation of shales and marls at the base of the Daleje Shale equivalents in hope to document the entry of oldest anarcestids, below the level of the index form that so far, but erroneously, has been called *Latanarcestes noeggerathi*. The oldest upper Emsian faunas are dominated by *Gyroceratites* and *Rherisites*. *Latanarcestes* will be revised this year jointly with Volker and Jürgen.

One of the surprises was the discovery of a new Devonian-Carboniferous boundary section at the northern margin of the Maider, very close to the Lalla Mimouna locality of KORN et al. (2004). Latest Famennian, but pre-Hangenberg crinoidal debris limestones with *Bispathodus ultimus* seem to lie unconformably on the Ordovician. The last bed of this detrital succession yielded athyrid brachiopods and protognathodids, which suggests a terminal Devonian, post-Hangenberg age. The limestones are overlain by shales with rare imitoceratids and two species of *Gattendorfia*. We have not yet found in this section the Stockum-equivalent level of *Postclymenia evoluta* and *Acutimitoceras (Stockumites) hilarum* but this spring we will continue sampling. The new section differs considerably from the thicker D/C boundary sections of the southern Maider and Tafilalt that will be published this year in the joint paper led by Sandra KAISER (submitted in fall 2009 to "Palaeo x 3"). It is remarkable that there is no equivalent of the Hangenberg Shale and Sandstone intervals. There are poorly studied Devonian and Carboniferous outcrops even further to the North and this March Sven and I will search for D/C transitions in those regions.

North Africa is the best region on a global scale to study Upper Gibetian pharciceratid ammonoid faunas. As a first step we (BOCKWINKEL et al. 2009) have published in the volume in honour of Helmut KEUPP, the famous Mesozoic ammonoid worker from the Free University Berlin (and one of my palaeontology

teachers), our first contribution on their detailed morphometrics, taxonomy and stratigraphy. Faunas from the Lower Marker Bed (Dar Kaoua) made the start but at least five more publications will follow in the next few years. This year we hope to finish a manuscript on the famous Hassi Nebech fauna (well known from the monograph of BENSAID 1973) and on the youngest Givetian *Petteroceras* faunas. The previously mentioned joint paper on the Emsian/Eifelian ammonoids of Oufrane (Dra Valley) should appear in the first half of this year (EBBIGHAUSEN et al. in press).

During a student field trip to the eastern Sauerland sampling around the Frasnian/Famennian boundary of the Beringhauser Tunnel section was completed. Material from the bioclastic brachiopod limestone that sits immediately at the boundary was sent to Jed DAY, who provided some first identifications. There are also rare fenestellids and abundant placoderm remains in the same bed that proves a significant boundary regression ABOVE the Upper Kellwasser level. The drastic sea level fall did not result in any conodont reworking/mixing, which suggests that the brachiopods, which are also well-preserved, were not reworked from older upslope strata. It seems that the significant cooling reported by JOACHIMSKI & BUGGISCH (2002) from Beringhauser Tunnel conodont phosphate coincided with this terminal Frasnian regressive episode, not with the underlying, very thin and discontinuous true Upper Kellwasser level. Previously published logs are too imprecise to show all the important details of this important seamount section, which obviously provided a refuge for shelly benthos at the boundary.

From October on I was busy with a revision of the Devonian chapter for the next Geological Timescale, planned for this year. This task meant more work than anticipated since I had to digest the wealth of Devonian stratigraphical literature of the last decade. The stratigraphical charts will be completely new and a critical review of the biostratigraphical age of the published absolute ages was also necessary. The number of Devonian references of the new and certainly much more voluminous new GTS will be significantly expanded.
This coming spring our SDS Member from Myanmar, Aye Ko AUNG, will hopefully come for a scientific visit to Münster in order to study possible Devonian ammonoids and conodonts from his country. After the Frankfurt IGCP 499 meeting colleagues from Bulgaria sent some photos that prove that there are clymenids, possibly from *Annulata* Shale equivalents, in one of their sections.

Sarah ABOUSSALAM is busily continuing her work on Upper Givetian to Frasnian conodonts. A manuscript on the new faunas from around the Middle/Upper Devonian boundary of the Montagne Noire will be finished soon (ABOUSSALAM & BECKER in prep.). As presented at various meetings (Cincinnati, Bonn, Berlin) there are several strange and new forms. But some are so rare that open nomenclature will be applied until re-sampling provides additional specimens. At the London IPC3 we will present a revision of the Giebringhausen section in the eastern Sauerland that was important at the time when the Givetian conodont zones were established (ZIEGLER et al. 1976). But the section was never described or sampled in sufficient detail. Together with some unusual new faunas from the Tafilalt, there will be a sufficient data base to summarize the impact of the global Frasnes Events on conodonts. The project on the Moroccan Meseta, unfortunately, has not yet been funded. Sarah has started to identify conodonts from the samples collected during the 2009 SDS Field Trip, which produced already some unexpected results that will affect the age assignment and correlation of some units of Kentucky. Later this year attention will shift to the Lower/Middle Frasnian of the Tafilalt with its complex records of events (Timan, Rhinestreet) and sea level changes.

Sven HARTENFELS is currently finishing his Ph.D. on the *Annulata* Events and Dasberg Crisis, with a focus on conodont stratigraphy and microfacies. In the last years he has identified almost 80.000 conodonts from the *trachytera* to Middle *expansa* Zones. The main part of his dissertation will be published soon after completion, probably still this year, in our Münster journal. You can expect 40 to 50 conodont plates and a number of new taxa. Some new subspecies will replace previous morphotypes whose distinctive distributions in time and space clearly indicate evolutionary trends that need to be recognized formally. Currently, there is no stringent system in Famennian conodont systematics but it will need more efforts to sort out all problems. This is in contrast to the perception that Famennian taxonomy has been mostly settled by the large amount of previous work. Even worse, there is no good or complete summary of ranges and a system of regional zonations needs to be established which correlation will eventually result in a revised zonation scheme. Results of diversity analysis were presented at the Annual Meeting of the Paläontologische Gesellschaft in Bonn (see abstracts). The previously announced, equally voluminous monograph on Famennian conodonts from the Frankenwald

(TRAGELEHN & HARTENFELS in prep.) is still not finished and now will appear after Sven´s Ph.D.

Claudia DOJEN was still working in 2009 on her two main projects. First, on a new late Silurian ostracode fauna from Turkey (in cooperation with Ulrich MANN from the Forschungszentrum Jülich and Friedrich LUPPOLD from the LBEG Hannover), and secondly, on Lockovian ostracodes from the Coal Canyon sections (Northern Simpson Park Range, central Nevada) in cooperation with Mike MURPHY from the University of California in Riverside. Manuscripts of both studies are in progress. Besides, first studies on the palaeoecological and biogeographical interpretation of Devonian ostracodes (Emsian to basal Givetian) of the Western Dra Valley, Morocco, have been made. The results of these studies have been presented at the Subcommision on Silurian Stratigraphy Field Meeting in Sardinia, at the 9th North American Paleontological Convention in Cincinnati, at the Palaeozoic Seas Symposium in Graz, and at the Jahrestagung of the Paläontologische Gesellschaft in Bonn. Since October 2009, Claudia is working for the Geomuseum Münster.

Two B.Sc. **students** (Anja DABROWSKI, Marie RYTINA) have finished logging the Hemberg Formation of the northern Sauerland below the *Annulata* Events. This will allow us to count the number of pelagic cycles downwards from the Upper *trachytera* Zone on. More sampling, however, is needed to establish the zonal boundaries with precession. Eventually, there is good prospect for a complete cycle count from the Lower *marginifera* Zone to the Hangenberg Blackshale, that subsequently needs to be correlated with sections from Saxothuringia and elsehwhere (e.g., South China).

Carsten SPELLBRINK has finished his Diplom Thesis on ostracods from the Frasian/Famennian boundary of the Winsenberg section just N of Adorf. This study was supervised jointly with Claudia. Daniela ROHKAMP did a nice B.Sc. thesis on an otarionid trilobite from the upper Emsian of the western Dra Valley. It turned out to be a new species (that needs to be published) but its placing in *Cyphaspis* is problematic since that genus requires further revision.

Three students have started M.Sc. Thesis on Devonian matters. Britta HUMBERG will study so far undescribed bactritid faunas from Germany, Morocco and the Canning Basin, using morphometrics and palaeopathology. Stephan EICHHOLT has started to study the phyletic gradualism of Frasnian beloceratids, based on the rich collections from the Canning Basin and Morocco, but also fitting in more isolated material from the Rhenish Massif, Montagne Noire, and Iran. This is a study that, for a long time, was supposed to be done by Michael HOUSE and myself but his death stopped our initial work. Stephan HELLING has started to work on Lower and Middle Devonian trilobite faunas from the eastern and western Dra Valley, including some *Gerastos, Odontochile, Psychopgye, Koneprusia*, phacopids, cornuproetines, etc.

Publications: Papers 2009

Becker, R. T. & House, M. R. (2009): Devonian ammonoid biostratigraphy of the Canning Basin. – In: Playford, P.E., Hocking, R. & Cockbain, A.E. (Eds.), Devonian reef complexes of the Canning Basin, WA, Geological Survey of Western Australia, Bulletin, 145: 415-439.

Bockwinkel, J., Becker, R.T. & Ebbighausen, V. (2009): Upper Givetian ammonoids from Dar Kaoua (Tafilalt, SE Anti-Atlas, Morocco). – Berliner paläobiologische Abhandlungen, 10: 61-128.

Dojen, C. (2009): Late Silurian and Early Devonian Beyrichioidea from Gondwana and Perigondwanan Terranes and their Palaeobiogeographical Implications. - Bulletin de la Société géologique de France, 180 (4): 215-221.

Dojen, C., Evola, G.M. & Murphy, M.A. (2009): Early Devonian Ostracodes from the Coal Canyon Sections (Northern Simpson Park Range, central Nevada). - SDS Newsletter, 24: 36-39.

Dojen, C., Valenzuela-Ríos, J.I. & Carls, P. (2009). Biostratigraphy of Early Devonian ostracodes from Celtiberia and Pyrenees (Spain). - Palaeontographica Americana 63: 145-155.

Hartenfels, S & Becker, R.T. (2009): Marker conodonts around the global Annulata Events and the definition of an Upper Famennian substage. – SDS Newsletter, 24: 40-48.

Hartenfels, S. & Becker, R. T. (2009): The Global Dasberg Crisis – Implications For Famennian Eustasy and Chronostratigraphy. – Palaeontographica Americana, 63: 71-97.

Kaiser, S. I., Becker, R. T., Spalletta, C. & Steuber, T. (2009): High-resolution conodont stratigraphy, biofacies and extinctions around the Hangenberg Event in pelagic successions from Austria, Italy, and France. – Palaeontographica Americana, 63: 99-143.

Nagel-Myers, J., Amler, M.W. & Becker, R.T. (2009): The Loxopteriinae n. subfam. (dualinidae, Bivalvia): Review of a common bivalve taxon from the Late Devonian pelagic facies. - Palaeontographica Americana, 63: 167-191.

Webster, G. & Becker, R.T. (2009): Devonian (Emsian To Frasnian) Crinoids of the Dra Valley, western Anti-Atlas Mountains, Morocco. – In: Königshof, P. (Ed.), Devonian Change: Case Studies in Palaeogeography and Palaeoecology, The Geological Society, London, Special Publications, 314: 131-148.

Papers 2010 in press

Aboussalam, Z.S. & Becker, R.T. (2010 in press): The global Taghanic Biocrisis (Givetian) in the eastern Anti-Atlas, Morocco. - Palaeogeography, Palaeoclimatology, Palaeoecology.

Becker, R. T. & Mapes, R. H. (2010 in press). Latest Devonian ammonoids from Oklahoma and their biogeographic significance. - Acta Geologica Polonica.

Ebbighausen, V., Becker, R.T. & Bockwinkel, J. (2010 in press): Emsian and Eifelian Ammonoids from Oufrane, eastern Dra Valley (Anti-Atlas, Morocco) – Taxonomy, Stratigraphy and Correlation. – Neues Jahrbuch für Geologie und Paläontologie.

Hahn, G., Hahn, R. & Becker, R.T. (2010 in press): Unterkarbonische Trilobiten aus dem Anti-Atlas (Marokko). – Geologica et Palaeontologica.

Kaiser, S.I., Becker, R.T., Steuber, T. & Aboussalam, Z.S. (2010 in press): Climate-controlled mass extinctions, facies, and sea-level changes around the Devonian-Carboniferous boundary in the eastern Anti-Atlas (SE Morocco). - Palaeogeography, Palaeoclimatology, Palaeoecology.

Troth, I., Marshall, J. E. A., Racey, A. R. & Becker, R. T. (2010 in press): Mid Devonian sea-level change at high palaeolatitude: testing the global sea-level curve. – Palaeogeography, Palaeoclimatology, Palaeoecology.

Abstracts 2009

Aboussalam, Z.S. & Becker, R.T. (2009): New Conodont Faunas from around the Middle/Upper Devonian Boundary of the Montagne Noire (S. France). - 9th North American Paleontological Convention, Abstracts, Cincinnati Museum Center Scientific Contributions, 3: 226.

Aboussalam, Z.S. & Becker, R.T. (2009): Aussterben und Radiation bei Conodonten im Zuge der polyphasen, globalen Frasnes-Events (Grenzbereich Mittel-/Ober-Devon). – In: Martin, T. & Kaiser, S.I. (Eds.), Paläontologie – Schlüssel zur Evolution, 79. Jahrestagung der Paläontologischen Gesellschaft, Bonn, 5.-7. Oktober 2009, Terra Nostra, 2009 (3): 15.

Becker, R. T. (2009): Strange Times: Sea-Level and Climate Related Upper Givetian Evolutionary Extremes. – 9th North American Paleontological Convention, Abstracts, Cincinnati Museum Center Scientific Contributions, 3: 458.

Dojen, C., Evola, G. & Murphy, M. A. (2009): Early Devonian Ostracodes from the Coal Canyon Sections (Northern Simpson Park Range, Central Nevada). 9th North American Paleontological Convention, Abstracts. Cincinnati Museum Center Scientific Contributions, 3: 198-199.

Dojen, C. (2009): Biostratigraphy and Palaeobiogeography of Devonian ostracodes from the Ibarmaghian Faunal Province. In: Suttner T. J., Hubmann B. & Piller W. E. (eds.): Paleozoic Seas Symposium, Graz, 14-18th September 2009. Berichte des Instituts für Erdwissenshaften, Karl-Franzens-Universität Graz, 14: 26-28.

Dojen, C. (2009): Late Silurian Ostracodes from the Hazro Anticline (SE Turkey). In: Corriga, M.G. & Piras, S. (eds.): Time and Life in the Silurian: a multidisciplinary approach. Subcommission on Silurian Stratigraphy Field Meeting 2009, Abstracts. Rendiconti della Società Paleontologica Italiana, 3 (3): 279-280.

Dojen, C., Aboussalam, Z.S. & Becker, R.T. (2009): Palaeoecological and biogeographical interpretation of Devonian ostracodes (Emsian to basal Givetian) of the Western Dra Valley, Morocco (sections Bou Tserfine, Rich Tamelougou and Hassi Mouf). – In: Martin, T. & Kaiser, S.I. (Eds.), Paläontologie – Schlüssel zur Evolution, 79. Jahrestagung der Paläontologischen Gesellschaft, Bonn, 5.-7. Oktober 2009, Terra Nostra, 2009 (3): 28.

Hartenfels, S. & Becker, R.T. (2009): The Global Annulata Events in Germany and SE Morocco – Implications for Upper Famennian (Devonian) Eustasy and Chronostratigraphy. - 9th North American Paleontological Convention, Abstracts, Cincinnati Museum Center Scientific Contributions, 3: 460-461.

Hartenfels, S. & Becker, R.T. (2009): Auswirkungen der globalen Annulata-Events und der Dasberg-Krise (Oberdevon) auf die Conodonten-Evolution. – In: Martin, T. & Kaiser, S.I. (Eds.), Paläontologie – Schlüssel zur Evolution, 79. Jahrestagung der Paläontologischen Gesellschaft, Bonn, 5.-7. Oktober 2009, Terra Nostra, 2009 (3): 41-41.

CM Margaret A. BRADSHAW

Last year I retired from a heavy teaching role at Canterbury University (Christchurch, New Zealand) to concentrate on writing up a serious backlog of Devonian research. Fieldwork on Early Devonian sediments at Baton River in New Zealand, which has produced new faunas, as well as a better understanding of the difficult stratigraphy, took second place to Devonian studies in Antarctica over three seasons (2004, 2007, 2008) with the field supervision of three MSc students. The research focussed on the early basin development of the Beacon sedimentary sequence (Taylor Group), and in particular, on a flooding event (probably Early Devonian) that produced the Heimdall Erosion Surface. The surface is particularly obvious north of the Dry Valley region and was traced across the region until it disappeared south of the Dry Valleys. There is a marked change in ichnofaunas across the surface (with the sudden appearance of *Skolithos*). Sedimentary structures suggest that parts of the early Taylor Group record possible marine flooding of the pre-Beacon landscape, followed by a regression that preceded a renewed and more extensive marine flooding event marked by the Heimdall Erosion Surface and overlying sediments. Unfortunately, these lower Taylor Group sediments have been only tentatively dated as Emsian and lie well below the Middle Devonian fish-bearing Aztec Siltstone.

Older Antarctic research on the taxonomy of trace fossils from an unusual marine sequence (Emsian) in the Ohio Range has been written up and is at the final post-review stage. The more recent Antarctic research has provided plenty of data for further trace fossil research.

Currently I am working on a collection of Lower Devonian bivalves from the arenaceous Mt Ida Formation, Victoria, Australia, which was deposited on the western flank of the Melbourne trough. The fauna is particularly rich in small rhynchonellids and bivalves include at least three taxodont genera, various pteriomorphs, modiomorphids and goniophorids.

Publications (Devonian) 2002-2009.

BASSETT, K.N., PALIN, J.M., GILMER, G., SAVAGE, J.E., O'TOOLE, T., BRADSHAW, M.A. & BRADSHAW, J.D., 2009. Provenance of the Devonian Taylor Group, Lower Beacon Supergroup, Antarctica. Geological Society New Zealand Miscellaneous Publication 128A: Abstracts & Programme p. 13

SPENCER, H.G., MARSHALL, B.A., MAXWELL, P.A., GRANT-MACKIE, J.A. STILWELL, J.D., WILLAN, R.C., CAMPBELL, H.J., CRAMPTON, J.S., HENDERSON, R.A., BRADSHAW, M.A., WATERHOUSE, J.B., POJETA JR, J., 2009. Chapter 10, Phylum Mollusca: chitons, clams, tusk shells, snails, squids and kin. In Gordon, D. P. (ed.), New Zealand Inventory of Biodiversity, Canterbury University Press. Volume1 Animalia,: 161-254.

MACFARLAN, D.A.B., BRADSHAW, M.A., CAMPBELL, H.J., COOPER, R.A., LEE, D.E., MACKINNON, D.I., WATERHOUSE, J.B., WRIGHT, A.J., ROBINSON, J.H., 2009. Chapter 11, Phylum Brachiopoda: lamp shells. In Gordon, D. P. (ed.), New Zealand Inventory of Biodiversity, Canterbury University Press. Volume1 Animalia, 255-268.

BRADSHAW, J.D., BRADSHAW, M.A, GILMER, G. & O'TOOLE, T., 2008. The topography of the Kukri Erosion Surface: tectonics of Taylor Group sedimentary basin initiation. New Zealand Annual Antarctic Conference, Dunedin: Abstracts & Programme, p. 23.

BRADSHAW, J.D., BRADSHAW, M.A, GILMER, G. & O'TOOLE, T., 2008. Boulder Conglomerates and breccias at the base of the Devonian Beacon rocks shed new light on the initiation of the Taylor Group basin, Transantarctic Mountains. Geological Society of New Zealand Miscellaneous Publication 124A: Abstracts & Programme, p. 220.

BRADSHAW, M.A., GILMER, G., BRADSHAW, J.D. & BASSETT, K.N., 2007. Contrasted trace fossil faunas separated by the Heimdall Erosion Surface, Olympus Range to Victoria Valley. New Zealand Annual Antarctic Conference, Wellington: Abstracts & Programme, p. 65.

GILMER, G., BASSETT, K.N., BRADSHAW, M.A. & BRADSHAW, J.D., 2007. Examination of spatial variations in the Heimdall Erosion Surface, McMurdo Dry Valleys. New Zealand Annual Antarctic Conference, Wellington: Abstracts & Programme, p. 66.

BRADSHAW, M.A. & HARMSEN, F.J., 2007. The paleoenvironmental significance of trace fossils in Devonian sediments (Taylor Group), Darwin Mountains to the Dry Valleys, southern Victoria Land, in Antarctica: A Keystone in a Changing World – Online Proceedings of the 10th ISAES X, edited by A.K. Cooper and C.R. Raymond et al., USGS Open-File Report 2007-1047, Extended Abstract 133, 5p.

SAVAGE, J.E., BASSETT, K.N., BRADSHAW, M.A. & BRADSHAW, J.D., 2004. Provenance analysis of the Sperm Bluff Conglomerate, southern Victoria Land, Aantarctica. New Zealand Annual Antarctic Conference, Hamilton: Abstracts & Programme, p. 30.

CM Denise BRICE

New brachiopod references for 2009:

Brice, D. (2009). Revision systematique des rhynchonelles (Brachiopoda) Dévoniennes (Emsien-base de l´Eifelien) de Fourmies en Avesnois (N de la France). – Ann. Soc. Géol. du Nord, 16 (2ème série): 35-45.

Brice, D. (2009). A new bio-marker Devonian brachiopod genus Ghorispirifer in the late Famennian from the west Afghanistan. – In: Prospectives en Paléontologie et Palynologie, 4ème Congrès APF, 21ème reunion APLF, 2-5 Juin, Lille, Résumes: 21.

Brice, D. & Ouali Mehadji, A. (2009). Découverte d´une « faune naine » de Pentamerida (Brachiopoda Dévoniens) a Gara Djebilet (flanc sud du Bassin de Tindouf) en Algèrie. – Ann. Soc. Géol. du Nord, 16 (2ème série): 69-77.

Brice, D., Mottequin, B. & Loones, C. (2009). Découverte de nouveaux brachiopodes dans le Givetien (Dévonien) du Boulonnais (N. France). – 1-14.

CM Rainer BROCKE

In 2009 research activities including field work were concentrated on two projects: "Lower Devonian macro plants and spores from marin-terrestrial-transitions in the Rheinisches Schiefergebirge" (together with S. SCHULTKA, Humboldt University Berlin), and "Phytoplankton bloom (prasinophytes) during the basal Choteč Event" (in cooperation mainly with colleagues from the Czech Republic, see list below). First results of these ongoing studies were presented in Cincinnati (NAPC 2009), and in Faro (CIMP Portugal), Graz (Austria) and Dresden (Germany), respectively. Furthermore, work continued on material from the Lower Devonian of Morocco, Lower Devonian siliciclastic sections from the Rheinisches Schiefergebirge (Germany), and subordinated from siliciclastics of Argentina.

A paper about scolecodont geochemistry (DUTTA et al.), and a second dealing with geology and palaeontology from Central and Eastern Taurides, Turkey (WEHRMANN et al.) have been published.

Publications 2009

Berkyová, S., Brocke, R., Fatka, O., Fryda, J., Schindler, E., Filipiak, P., Koptíková, L., Budil, P., Suttner, T.J. (2009). Prasinophyte bloom and intense micritization as evidences for enhanced nutrient load during Basal Choteč Event – A preliminary report. Paleozoic Seas Symposium (14.-18.09.2009), Graz, Austria. Berichte des Institutes für Erdwissenschaften, Karl-Franzens-Universität Graz, 14, 11-12.

Brett, C., Zambito, J., Schindler, E., Hunda, B., Königshof, P., Brocke, R., Bartholomew, A. (2009). Taphonomy of Rhythmic Trilobite Beds in the Lower Devonian of Morocco: The Paradox of "Cyclic Event Beds". 9th North American Paleontological Convention (NAPC) (21.–26. 06.2009), Cincinnati, USA, Cincinnati Museum Center Scientific Contributions 3, 341-342, Cincinnati.

Brocke, R, Schultka, S. (2009). Marine-Terrestrial Sequences in the Lower Devonian of Germany – A Palaeobotanical and Palynological Approach. 9th North American Paleontological Convention (NAPC) (21.–26. 06.2009), Cincinnati, USA, Cincinnati Museum Center Scientific Contributions 3, 51, Cincinnati.

Brocke, R., Fatka, O., Berkyová, S., Budil, P., Fryda, J., Schindler, E. (2009). Early Middle Devonian (Eifelian) phytoplankton bloom associated with the Basal Choteč Event in the Barrandian area (Czech Republic). CIMP Faro'09, II. Joint Meeting of Spores/Pollen and Acritarch Subcommissions (20.-24.09.2009), 79-81, Faro, Portugal.

Dutta, S., Hartkopf-Fröder, C., Mann, U., Wilkes, H., Brocke, R., Bertram, N. (200 9). Macromolecular composition of Palaeozoic scolecodonts: insights into the molecular taphonomy of zoomorphs. Lethaia, 10 Seiten, doi: 10.1111/j.1502-3931.2009.00193.x.

Fatka, O., Kraft, P., Kříž, J., Štorch, P., Vacek, F., Brocke, R. (2009). Lower Palaeozoic of the Barrandian area. In: Lange, L.-M., Linnemann, U., Röhling, H.-G. (Eds.). GeoDresden 2009. Geologie der Böhmischen Masse – Regionale und Angewandte Geowissenschaften im Zentrum

Mitteleuropas, 161. Jahrestagung Deutsche Gesellschaft für Geowissenschaften, (30.09.-02.10.2009), Dresden. - Exkursionsführer und Veröffentlichung der Deutschen Gesellschaft für Geowissenschaften EDGG, 241, 29-46; Excursion guide.

Haude, R., Brocke, R., Heinrichs, T., Riegel, W. (2009). Silici-organic objects in Lower Devonian echinoderm lagerstaetten of Argentina and Bolivia. 79. Jahrestagung der Paläontologischen Gesellschaft, (5.-7.10.2009) Bonn, Terra Nostra, 43-44.

Schindler, E., Wilde, V., Wehrmann, A. Brocke, R. (2009). Siliciclastic Microfacies and Taphonomy of a Lower Devonian Marine-Terrestrial Transitional Environment (Nellenköpfchen Formation, Rheinisches Schiefergebirge, Germany): Implications for Small-Scale Fluctuations in a Complex Setting. 9th North American Paleontological Convention (NAPC) (21.–26. 06.2009), Cincinnati, USA, Cincinnati Museum Center Scientific Contributions 3, 52, Cincinnati.

Schindler, E., Wilde, V., Wehrmann, A., Brocke, R. & Schultka, S. (2009). A Lower Devonian marine–terrestrial transition – implications for small-scale fluctuations in a complex environmental setting (Nellenköpfchen Formation, Rheinisches Schiefergebirge, Germany). In: Röhling, H.-G.,.Linnemann, U., Lange, L.-M. (Eds.). GeoDresden 2009. Geologie der Böhmischen Masse – Regionale und Angewandte Geowissenschaften im Zentrum Mitteleuropas, Jahrestagung Deutsche Gesellschaft für Geowissenschaften, (30.09.-02.10.2009), Dresden. Schriftenreihe der Deutschen Gesellschaft für Geowissenschaften, 63, 70, Hannover.

Wehrmann, A., Yılmaz, I., Yalçın, M.N., Wilde, V., Schindler, E., Weddige, K., Saydam Demirtas, G., Özkan, R., Nazik, A., Nalcıoğlu, G., Kozlu, H., Karslıoğlu, Ö., Jansen, U., Ertuğ, K., Brocke, R., Bozdoğan, N. (2009). Devonian shallow-water sequences from the North Gondwana coastal margin (Central and Eastern Taurides, Turkey): Sedimentology, facies and global events. Gondwana Research, doi:10.1016/j.gr.2009.09.011.

CM Pierre BULTYNCK

Projects

1. In collaboration with K. NARKIEWICZ a manuscript on “The late Givetian *subterminus* conodont Zone in North America, Europe and North Africa” was submitted to Journal of Paleontology in November 2009 and accepted for review. The abstract is shown here below.

ABSTRACT – Upper Givetian and Lower Frasnian conodont communities with *Icriodus subterminus* have been revised on the basis of collections from Iowa (USA) , the Boulonnais and the Ardennes (N France and Belgium), the Radom-Lublin area and Holy Cross Mountains (Poland) and the Ma’der-Tafilalt region (SE Morocco). As a result an *Icriodus subterminus* Zone with a threefold subdivision is defined. The three subzones correspond approximately to the Lower and Upper *subterminus* Fauna and the *insita* Fauna commonly used in N America for the study of shallow-water platform carbonate successions.

The *subterminus* Zone and subzones are correlated with deeper marine conodont reference zonations. The base of the *subterminus* Zone corresponds to a level within the uppermost part of the *hermanni* Zone. Its top is characterized by the occurrence of the earliest *Ancyrodella* taxa, Montagne Noire Zone MN1- base MN 2 or slightly above the base of the *falsiovalis* Zone.

The diagnosis of *Icriodus subterminus* is amended and two morphotypes are recognized. The stratigraphic range of the alpha morphotype is confined to an interval between the uppermost part of the *hermanni* Zone and the top of the MN 3 Zone, the beta morphotype may range into the MN 6 Zone. It appears that the holotype of *Icriodus subterminus* from the North Liberty beds in Iowa is most likely a specimen that was reworked from the Cedar Valley Limestone. *Icriodus cedarensis* and *Icriodus tafilaltensis* are described as new species and the diagnoses of *Icriodus excavatus* and *Icriodus expansus* are amended. Between the *Icriodus difficilis* and *Icriodus subterminus* zones an *Icriodus expansus* Zone is defined. *Pandorinellina insita* first occurs slightly below the first occurrence of *Skeletognathus norrisi.* All conodont taxa relevant to the biostratigraphic interpretation of the studied interval are figured.

2. A manuscript in collaboration with the late M. WEYANT, Y. PLUSQUELLEC and P.R. RACHEBOEUF on “Reassessment of Lochkovian- Pragian conodont faunas from the Rade the Brest and the Presqu’île de Crozon (Massif Armoricain, W France) is in press in the N. Jb. Geol.- Paläont., Abh. The most important results are summarized herein. Due to shallow-marine environmental conditions the conodont faunas are in general not abundant, poorly diversified and largely dominated by icriodids. Four informal Lochkovian-Pragian faunal intervals (FI) have been recognized. The oldest FI-1 is dominated by the co-occurrence of *Latericriodus lotzei* (CARLS 1969) and *Caudicriodus vinearum*

(CARLS 1975) in strata below the first occurrence of *Lat. fallax* (CARLS 1975). The first occurrence of the latter species defines the base of the FI-2 and its top corresponds with the last occurrence of *Lat. fallax.* In FI-2 occur rare specimens of *Masaraella pandora* (MURPHY, MATTI and WALLISER, 1981), beta and gamma morphotypes indicating most likely an upper Lochkovian age (SLAVIK et al., 2008). The conodont content of FI- 3, above the last occurrence of *Lat. fallax,* is very low. The most characteristic taxon is the occurrence of a new morphotype of *Caudicriodus angustoides angustoides* (CARLS and GANDL 1969) morphotype beta (see BULTYNCK, 1976, pl. 5, fig. 12). The base of FI-4 corresponds with the first occurrence of *Lat. simulator* (CARLS 1969). However, the first occurrence of this species seems to be diachronic in different areas. In one of the Armorican sections *Lat. simulator* occurs together with the more geographically spread *Caud. curvicauda* (CARLS and GANDL 1969). In the Barrandian area the latter species is known from the upper part of the Pragian.

3. The study in collaboration with O.H. WALLISER and K. WEDDIGE on the ranges, diversity and variability of conodont taxa in a larger Eifel-Givetian boundary interval will be completed this year. This project started with the study of WALLISER 's extensive conodont collection from the GSSP for the base of the Givetian at Jebel Mech Irdane (Tafilalt). The conodont collections from other relevant upper Eifelian-lower Givetian sections in the Ma'der-Tafilalt area , the Rheinisches Schiefergebirge and the Ardenne will be updated comparing with the results from the Jebel Mech Irdane section.

Published Conference Abstracts

Bultynck P. 2009. To be or not to be: can conodonts be vertebrates? In P. Godefroit and O. Lambert (eds). Darwin-Bernissart meeting, Brussels, February 9-13, 2009. Programme, abstracts and field trips guidebook: 24. Royal Belgian Institute of Natural Sciences, Brussels.

Bultynck P. 2009. Possible function of the elements in the Polygnathus linguiformis linguiformis apparatus. In C.M. Henderson and Ch. MacLean (eds), ICOS 2009, July 13-17,

Calgary. Abstracts. Permophiles Issue 53: 11. University of Calgary.

TM Jean-Georges CASIER

During 2009, and in collaboration with A. PRÉAT (University of Brussels) for the sedimentological analysis, J.-G. CASIER (Royal Belgian Institute of natural Sciences) has published a paper on ostracods from the Nismes section. This section has been chosen by the SDS (Prague, 1986) as auxiliary stratotype for the G/F boundary in neritic facies. However, its exact temporal relationships with the GSSP for the G/F boundary defined in the Montagne Noire is still in debate (KLAPPER, 2000). The study of ostracods and the sedimentological analysis of the GSSP (CASIER & PRÉAT, 2007) showed that the the G/F boundary corresponds to the beginning of a sea-level rise. Consequently this boundary should be fixed in the Nismes section closer the Givet Group / Frasnes Group boundary, certainly a better position.

In collaboration with X. DEVLEESCHOUWER and E. PETITCLERC, both at the Royal Belgian Institute of natural Sciences, A. PRÉAT and J.-G CASIER have started the study of ostracods, and the sedimentological and magnetic susceptibility analysis of the Givetian at the Mont d'Haurs, close to Givet. A first paper intitled "ostracods, rock facies and magnetic susceptibility of the Trois-Fontaines and Terre d'Haurs Formations (Early Givetian) in the Rancennes quarry at the Mont d'Haurs (Givet, France) has been submitted for the next issue of the Bulletin of the Royal Belgian Institute of natural Sciences. The Rancennes quarry is located along the western rampart of an entrenched camp at the Mont d'Haurs and the succession straddling the Trois-Fontaines / Terres d'Haurs boundary is continuous, very rich in fossils and can be reached easily. Consequently, the section exposed in the Rancennes quarry is proposed in order to complete the stratotype of the Terres d'Haurs Fm located on the southeastern flank of the entrenched camp of the Mont d'Haurs. In the stratotype, the Trois-Fontaines Fm / Terres d'Haurs Fm boundary is not visible.

Devonian related publications and abstracts 2009

CASIER, J.-G. & PRéAT, A., 2009. Late Givetian to Middle Frasnian ostracods from Nismes (Dinant Synclinorium, Belgium) and their lithological context. Bulletin de l'Institut royal des Sciences naturelles de Belgique, Sciences de la Terre, 79: 87-115.

Casier, J.-G., Devleeschouwer, X., Petitclerc, E. & Préat, A., 2009. Ostracods, lithofacies and magnetic susceptibility of the Givetian / Frasnian Parastratotype at Nismes (Dinant Synclinorium, Belgium). Abstract of the 9th North American Paleontological Convention, Cincinnati, Ohio, USA. Cincinnati Museum Center Scientific Contributions, 3: 228.

Casier, J.-G., Cambier, G., Devleeschouwer, X., Petitclerc, E., & Préat, A., 2009. Ostracodes, rock facies and magnetic susceptibility of the Trois-Fontaines / Terres d'Haurs transition in the type locality for the Givetian. Abstracts with Programs Geological Society of America Annual Meeting, Portland, Oregon, USA, 41, 7: 107. http://gsa.confex.com/gsa/viewHandout.cgi?uploadid=379

Petitclerc, E., Devleeschouwer, X., Spassov, S., Casier, J.-G. & Préat, A., 2009. Givetian / Frasnian boundary (Nismes and Sourd d'Ave sections, Southern Belgium): tracing the magnetic mineralogy signal. 27th IAS Meeting, Sedimentary of Mediterranean Island(s), 20-23 September, Alghero, Italy: 641.

Devleeschouwer, X., Cambier, G., Petitclerc, E., Casier, J.-G. & Préat, A., 2009. Givetian platform carbonates (Givet, France): rock magnetism versus microfacies analysis. Livre des résumés du 12ième Congrès Français de Sédimentologie, Rennes, France. Publication de l'Association des sédimentologistes français, 64: 362.

Devleeschouwer, X., Cambier, G., Petitclerc, E., Casier, J.-G., Spassov, S. & Préat, A., 2009. Detrital magnetite grains control the magnetic susceptibility evolutions established for the Trois-Fontaines - Terres d'Haurs Formations (Lower Givetian) in Givet (France). First IGCP 580 Meeting, Magnetic susceptibility correlations and paleoenvironments, 2-6 Decembre, Liège, Belgium: 23.

Petitclerc, E., Devleeschouwer, X., Spassov, S., Casier, J.-G. & Préat, A., 2009. Constrasting magnetic mineralogy and magnetic susceptibility curves at the Givetian-Frasnian boundary in Belgium: detritism versus diagenesis. First IGCP 580 Meeting, Magnetic susceptibility correlations and paleoenvironments, 2-6 Decembre, Liège, Belgium: 42-43.

CM Carlo CORRRADINI

My research is mainly devoted to conodont biostratigraphy in Sardinia, the Carnic Alps and other North Gondwana regions, specially on time intervals across the Silurian/Devonian and the Devonian/Carboniferous boundaries.

In Sardinia several Silurian and lowermost Devonian outcrops and sections were restudied in connection with the organization of June 2009 Subcommission on Silurian Stratigraphy meeting. A volume on the Silurian of Sardinia was published, including also some Lower Devonian data.

In the Carnic Alps researched mainly focus on the Silurian-Lower Devonian *Orthoceras* limestones and several sections and localities are in study in the Italian side of the chain (with L. SIMONETTO, M. PONDRELLI, M.G. CORRIGA and P. SERVENTI).

A project with the goal to achieve a formal lithostratigraphic subdivision of the pre-Variscan sequence of the Carnic Alps is in progress: in fact, the different parts of this sequence are mainly denominated with informal names, that derivate either from facies or historical terms. Furthermore, being the region across the state border between Italy and Austria, different terminologies have been adopted on both sides of the mountain chain, which result in a high number of names indicating similar - if not the same - lithological units. Almost none has been formalized according to the ICS rules. The goal is to achieve a common but unified terminology, subdividing the lithostratigraphic column in possible formal units by well defined stratotypes and names of the pre-Variscan sequence of the entire region. The project, coordinated by T. SUTTNER (Graz) and me, involves several colleagues from various countries and is open to everybody can give a contribution.The International Working Group on the redefinition of the D/C boundary met for the first time last July in Calgary, in connection with the conodont symposium. Since both the definition of the boundary and the stratotype section should be changed, it was decided that we need first a new definition for the boundary and only then start thinking to a new GSSP (everybody agree that it should be changed). In this respect, a revision of early Siphonodellids is in press (with S. KAISER, Bonn), and a revision of early Protognathodids will be done in short time (with S. KAISER, Bonn, and C. SPALLETTA, Bologna).

Maria G. CORRIGA is working on a PhD project on conodont taxonomy and biostratigraphy across the S/D boundary in some North Gondwana regions. Researches are now focused on some sections in different sectors of the Carnic Alps, as well as some outcrops in Sardinia and one locality in the Spanish Pyrenees.

Published papers and abstracts related to Devonian (2009)

Corriga M.G. & Corradini C., 2009. Upper Silurian and Lower Devonian conodonts from the Monte Cocco II section (Carnic Alps, Italy). *Bulletin of Geosciences*, 84 (1), 155-168.

Corradini C., Ferretti A. & Storch P. (Eds.) 2009. The Silurian of Sardinia. Rendiconti della Società Paleontologica Italiana, 3 (1), 170 pp.

Corradini C. & Ferretti A., 2009. The Silurian of the External Nappes (southeastern Sardinia). *Rendiconti della Società Paleontologica Italiana*, 3 (1), 43-49.

Corradini C., Corriga M.G., Ferretti A. & Leone F., 2009. The Silurian of the Foreland Zone (southwestern Sardinia). *Rendiconti della Società Paleontologica Italiana*, 3 (1), 51-56.

Corradini C., Ferretti A. & Storch P. (Eds.) 2009. Time and Life in the Silurian: a multidisciplinary approach –Field Trip Guide Book. *Rendiconti della Società Paleontologica Italiana*, 3 (2), 100 pp.

Pillola G.L., Ferretti A., Corriga M.G. & Corradini C., 2009. Highly tectonized Silurian and Lower Devonian sediments at Funtanamare (SW Sardinia). *Rendiconti della Società Paleontologica Italiana*, 3 (2), 247-252.

Corriga M.G. & Corradini C., 2009. Silurian-Lower Devonian conodonts from the Rifugio Lambertenghi Fontana III (RLF III) Section (Carnic Alps, Italy). *Rendiconti della Società Paleontologica Italiana*, 3 (3), 275.

Corradini C. & Kaiser S., 2009. Morphotypes in the early Siphonodella lineage: implications for the definition of the Devonian/Carboniferous boundary. In: Henderson C.M. & MacLean C. (Eds): ICOS 2009 Abstracs. *Permophilies*, 53, s1, 13.

Corriga M.G. & Corradini C., 2009. Conodonts from the Silurian and lowermost Devonian from the Rifugio Lambertenghi Fontana III Section (Wolayer area, Carnic Alps, Italy). In: Henderson C.M. & MacLean C. (Eds): ICOS 2009 Abstracs. *Permophilies*, 53, s1, 13-14.

Corradini, C., Pondrelli, M., Suttner, T.J. & Schnellbächer, P., 2009. On the age of the upper part of La Valute Limestone (Carnic Alps). *Berichte der Geologischen Bundesanstalt,* 79, 12-13.

Corriga M.G., Corradini C., Lehnert O., Joachimski M.M., Pondrelli M. & Simonetto L., 2009. The Silurian-Devonian Boundary in the Rifugio Lambertenghi Fontana III Section (Wolayer area, Carnic Alps, Italy). *Berichte des Institutes für Erdwissenschaften*, Karl-Franzens-Universität Graz, 14, 24-25.

Kaiser S.I., Corradini C. & Becker R.T., 2009. Alternative scenarios for the Devonian/Carboniferous boundary GSSP. Annual Meeting of the Paläontologische Gesellschaft, PalGes 2009 Bonn. *Terra Nostra*, 3: 58.

CM James R. EBERT

Research in the Helderberg Group (Přídolí – Lochkovian) in New York with long-time colleague Damon MATTESON and graduate students Randall WILSON and Kathryn BEVINGTON is yielding new insights into the litho- and bio-stratigraphy. Undergraduate students have also made contributions which will be described below.

Progress on Locating the Silurian/Devonian Boundary in the Appalachian Basin

In the mid-1800's, James HALL described bulbous crinoid "roots," collected by John GEBHARD Jr. in the vicinity of Schoharie, NY, which HALL christened *Camarocrinus*. Now recognized as flotation devices, loboliths are associated with the crinoid genera *Scyphocrinites*, *Carolicrinus*, and *Marhoumacrinus* and are common in proximity to the Silurian-Devonian boundary in many locations around the world, including the auxiliary stratotype at Budňanska skala/Karlštejn in the Barrandian. Damon MATTESON and I have examined Hall's material in the collections of the New York State Museum and reported previously the occurrence of skeletal debris of these crinoids from the Green Vedder Member of the Manlius Formation (BARNETT et al. 2006). Recently, we have collected and observed loboliths from this unit at several outcrops in the Cobleskill, Schoharie and Hudson valleys (MATTESON and EBERT, in preparation).

The Green Vedder Member of the Manlius Formation includes the positive δ13C excursion documented by WILLIAMS and SALTZMAN (2004) which these authors correlate with the global excursion at the Silurian/Devonian boundary. Unfortunately, the conodont data from this interval are insufficient to support this claim in New York (KLEFFNER et al. 2009). However, the combination of loboliths, the isotope excursion and conodont data (KLEFFNER et al. 2009), suggests that the S/D boundary is likely lower than our previous estimates. BEVINGTON and EBERT (See also BEVINGTON, EBERT and DUFKA, in review) have begun an examination of chitinozoans in an attempt to better locate the systemic boundary.

KLEFFNER et al. (2009) examined the conodont biostratigraphy and carbon isotope chemostratigraphy at the Cherry Valley section. Unfortunately, the conodont data is ambiguous. Elements assignable to the *Icriodus woschmidti* group occur in the Manlius and Coeymans formations, though these appear to be "old specimens" (sensu CARLS et al. 2007). Samples from the overlying Kalkberg Formation have yielded elements belonging to the *I. postwoschmidti* group. These results led us to conclude that the Silurian/Devonian boundary may be placed as one of seven levels in the lower Helderberg Group at Cherry Valley; hardly an improvement over the previous status, though two horizons seem more plausible than the others. These are 1) within the Green Vedder Member, which includes the δ13C excursion and loboliths discussed above or 2) within the hiatus represented by the Punch Kill Unconformity between the Coeymans and Kalkberg Formations. It should be mentioned that the portion of the Kalkberg Formation present at Cherry Valley is actually rather high in the formation in comparison to the Hudson Valley. EBERT, et al. (2007) proposed that subunits of the Kalkberg Formation displayed a westward onlapping relationship to the Punch Kill Unconformity. Teams of undergraduate students (KEEFE, et al. in review; MUSCIETTA, et al. in review), directed by CM EBERT, have recently verified this correlation by using a distinctive unit in the Kalkberg Formation that contains abundant holdfasts of *Mariacrinus stoloniferous.*

Age of the Silurian/Devonian Boundary

A U-Pb date from the "Kalkberg" ash at Cherry Valley has been used to set the age of the Silurian/Devonian boundary at 418 Ma (TUCKER et. al. 1998; KAUFMANN 2006). By regional correlation, EBERT et al. (2007) demonstrated that the dated ash actually occurs in the New Scotland Formation and not the Kalkberg, a conclusion supported by additional recent work (KEEFE et al., in review; Muscietta, et al., in review). The biostratigraphic position of this ash was designated as lower Lochkovian based on preliminary work which assigned these strata to the *woschmidti conodont zone.* The recent work of KLEFFNER et al. (2009) identified conodonts from below the ash-bearing interval as assignable to the *postwoschmidti* group.

BEVINGTON and Ebert (in preparation) have recovered a sparse, moderately preserved, low-diversity assemblage of chitinozoans from below, within and above the ash-bearing portion of the New Scotland Formation at Cherry Valley and Schoharie, New York. We have identified the Lochkovian index species *Eisenackitina bohemica* and *Margachitina catenaria* from the ash-bearing interval. Samples from the base of the interval have yielded *Pterochitina megavelata* and *Cingulochitina ervensis* which suggest a middle Lochkovian age for the K-bentonites. Samples from the Becraft Formation, which overlies the New Scotland at Schoharie, produced a late Lochkovian assemblage which includes *Eisenackitina bohemica* and *Fungochitina lata* (BEVINGTON, EBERT and DUFKA, in review).

Our preliminary chitinozoan data suggest that the "Kalkberg" K-bentonite in the New Scotland Formation is middle Lochkovian in age. If this is the case, then the position of the "Kalkberg" ash on Figure 2 of TUCKER et al. (1998) and Figure 9 of KAUFMANN (2006) is lower than it should be. When raised to a middle Lochkovian position (approximately mid-*eurekaensis* zone), the lines on the TUCKER and KAUFMANN graphs shift slightly to the left. This alters the projected age of the Silurian/Devonian boundary from 418 Ma to 420 Ma, making the Devonian even longer than previously thought and extending the duration of the Lochkovian Stage to 6.5 Ma.

Recent Publications

Bevington, Kathryn S., Ebert, James R. and Dufka, Pavel, in review, SILURIAN-Early Devonian (Lochkovian) Chitinozoan Biostratigraphy of the Lower Helderberg Group, Appalachian Basin, New York State and the Age of the "Kalkberg" K-bentonite: abstract submitted for the Joint Northeast/Southeast Geological Society of America Conference, March, 2010.

Ebert, J.R., 2008, Onlapping Units and Converging Unconformities: Stratigraphic Relationships in the Lower Helderberg Group on the Northwestern Margin of the Appalachian Basin: Geological Society of America Abstracts with Programs, v. 40, n. 2, p. 16.

Ebert, J.R., Johnson, E., Grimes, A., Routh, R., Pechenik, N., McCredy, R., Bowler, J., 2007, The Kalkberg Formation (Helderberg Group, L. Dev., Lochkovian) at Cherry Valley, New York is Actually New Scotland – Preliminary Results of Sedimentologic and Stratigraphic Investigations: Geological Society of America Abstracts with Programs, v. 39, n. 1, p. 60.

Keefe, C., Kakolewski, C., Ebert, J.R., Krikorian, J., Todd, R., Muscietta, A., Walsh, M. and Canario, W., in review, Sediment Starvation along the Punch Kill Unconformity and Westward Onlap of the

Kalkberg Formation (Lochkovian, Helderberg Group) in New York State: abstract submitted for the Joint Northeast/Southeast Geological Society of America Conference, March, 2010.

Kleffner, M.A., Barrick, J.E., Ebert, J.R., Matteson, D.K., and Karlsson, H.R., 2009, Conodont Biostratigraphy, δ13C Chemostratigraphy, and Recognition of the Silurian/Devonian Boundary in the Cherry Valley, New York Region of the Appalachian Basin: Chapter 5 in Conodont Studies Commemorating the 150th Anniversary of the First Conodont Paper (Pander, 1856) and the 40th Anniversary of the Pander Society, edited by D. Jeffrey Over, Palaeontographica Americana, v. 62, p. 57-73.

Muscietta, A., Krikorian, J., Todd, R., Ebert, J.R., Walsh, M., Kakolewski, C., Keefe, C., and Canario, W., in review, Sedimentology of the uppermost Coeymans Formation and lower Kalkberg Formation (Lochkovian, Helderberg Group) on I-88 near Cobleskill, NY: abstract submitted for the Joint Northeast/Southeast Geological Society of America Conference, March, 2010.

Wilson, Randall and Ebert, James R., in review, Unconformities and Stratigraphic Relationships within the Manlius Formation, Helderberg Group (Přídolí?) of Central New York State: abstract submitted for the Joint Northeast/Southeast Geological Society of America Conference, March, 2010.

Wilson, R.H. and Ebert, J.R., 2009, Sedimentology of the Green Vedder Member (Manlius Fm.) and New Questions Regarding the Stratigraphic Evolution of the Helderberg Group: GSA Abstracts w/Programs, v. 41, n. 3, p. 27.

TM Jindrich HLADIL

We are intensely working on magnetic susceptibility (MS) based stratigraphic correlation between the Zinzilban Gorge section (ZIN, 0-156.8 m) and the sections from Barrandian area (J. HLADIL, L. KOPTIKOVA, P. SCHNABL, P. CEJCHAN). Unfortunately, a lot of details on magnetomineralogy, as well as those concerning the component analyses on very long and detailed sections (thousands of samples), and of course, the advanced mathematical alignments of the curves require some additional time to be finalized, even for the purposes of the preliminary SDS newsletter report. Although this is all very preliminary, it emerges that the 'basal Emsian', 'Pg/Em' GSSP point zero meters in Zinzilban Gorge corresponds to ~ 82,5 metre mark of the Pozar-3 section in the Barrandian area, i.e., very close above the Lochkovian/Pragian boundary, few meters only, and not more than 300 +/- 150 kyr after this level compared with available assumptions about time. The 'graptolite event' level (HLADIL et al. 1996 JSR or HLADIL & KALVODA 1997 Terra Nova), which is a reasonable level for the projection of the end of Czech Pragian and is in Pozar-3 section between 113 and 114m marks, may have its possible MS alignment level at about ZIN 115 +/- 5 m (in lower part of Norbonakian). Of course, this partial alignment together with all alignments of other beds and horizons will further be particularized. It will take several months, including the cooperation with or consulting by people from Novosibirsk and Taskhent. The MS-based alignment, with currently developed techniques, may significantly contribute to the evidence about 'real stratigraphic correlations' with Kitab in Zeravshan ranges. The chance for good results exists. It is quite likely that the relevant publication with final results of the MS alignment with Kitab section will be submitted this summer.

The magnetic susceptibility stratigraphy studies applied in Devonian limestone sections (and all interconnected background in science) are developing into a new stage of its existence where different schools and teams of the world are cooperating. The recently started IGCP 580 project entitled “Application of magnetic susceptibility as a paleoclimatic proxy on Paleozoic sedimentary rocks and characterization of the magnetic signal” will run for a duration of 5 years. The project co-leaders are from Belgium, Canada, Czech Republic and China. Besides 8 workshops, the 1st all project Conference of IGCP 580 "Magnetic susceptibility and paleoenvironments" was held in Liege, Belgium, on 2th to 6th December 2009. The conference was organized by A.C. DA SILVA and F. BOULVAIN.

Links:

You can find the Belgian web pages of the project (A.C. da Silva, international project leader) http://www2.ulg.ac.be/geolsed/MS/ , Annual Report http://www2.ulg.ac.be/geolsed/MS/Report%202009%20IGCP-580.pdf

On the Czech side, J. HLADIL was responsible for starting up and scope of the project and L. Koptikova accept the role of coordinator for 2010 and beyond. Compare the Czech IGCP pages at http://www.gli.cas.cz/igcp/ .

2009 publications:

Machado, G., Hladil, J., Koptikova, L., Fonseca, P.E., Rocha, F.T., Galle, A., 2009. The Odivelas Limestone: evidence for a Middle Devonian reef system in western Ossa-Morena Zone (Portugal). Geologica Carpathica, 60(2): 121-137.

[Devonian basalt volcanoes, reefs and carbonate slope sediments were partly revised and partly newly described in Alentejo, Portugal, between the Ossa Morena and South Portugal Zone units. The localities are close with Beja Massif, and their position in Variscan orogenic belts and history resemble the case of Sudetes terrane mosaics in central Europe.]

Strnad, L., Ettler, V., Mihaljevic, M., Hladil, J., Chrastny, V., 2009. Determination of trace elements in calcite using solution and laser ablation ICP-MS: calibration to NIST SRM glass and USGS MACS carbonate, and application to real landfill calcite. Geostandards and Geoanalytical Research, 33(3): 347-355.

[The recent analyses of growth rhythms in fossil skeletons and rhythms in Devonian limestone sections require improvement of analytical techniques related to ICP-MS and LA-ICP MS measurements of a broad scale of trace elements. The paper solves the problems related to pure calcite materials, low concentrations of trace elements, currently used, and also newly suggested appropriate standards.]

Hladil, J., Koptikova, L., Galle, A., Sedlacek, V., Pruner, P., Schnabl, P., Langrova, A., Babek, O., Frana, J., Hladikova, J., Otava, J., Gersl, M., 2009. Early Middle Frasnian platform reef strata in the Moravian Karst interpreted as recording the atmospheric dust changes: the key to understanding perturbations in the punctata conodont Zone. Bulletin of Geosciences, 84(1): 75-106.

[The paper aims to contribute to time and space mosaics of environments, using the multi-proxy approach with combination of GRS, MS, geochemical, lithological and paleobiological branches of studies.]

For short communications and several other minor items see also http://home.gli.cas.cz/hladil/www/bibl-simple_20th21stCentury_.pdf .

TM Nadezhda G. IZOKH and the Novosibirsk Group

During the year 2009 our team continued investigation of the stratigraphy of the Devonian sequences from south of West Siberia and the western part of the South Tien Shan. The Research group from the Trofimuk Institute of Petroleum Geology and Geophysics SB RAS, Institute of Geology and Mineralogy SB RAS includes: Drs. E.A. YOLKIN (now deceased), N.K. BAKHAREV, N.G. IZOKH, O.T. OBUT, V.G. KHROMYKH, N.V. SENNIKOV, T.P. KIPRIYANOVA, O.A. RODINA, PhD students O.P. IZOKH and T.A. SHCHERBANENKO.

CM Evgeny A. YOLKIN, TM Nadezhda G. IZOKH in cooperation with Karsten WEDDIGE, Maya V. ERINA & Jose Ignasio VALENZUELA-RIOS revised Pragian and Emsian conodonts from the South Tien Shan (YOLKIN et al., 2010, in print). Eognathodids and polygnathids recovered from a single sequence of mainly carbonate rocks exposed within the Kitab State Geological Reserve area were re-investigated. Phylogenetic and biochronologic interpretation of 16 taxa were done. They are represented by successions of species that constitute the main eognathodid-polygnathid evolutionary stock derived from *Masaraella pandora*, and lateral branches. The biochronological interpretation of this scheme corresponds basically to the standard conodont zonation, included two zones for the Pragian (*juliae* and *kindlei*) and two zones for the lower Emsian (*kitabicus* and *excavatus*).

TM N.G. IZOKH, CM E.A. YOLKIN in cooperation with K. WEDDIGE, M.V. ERINA & J.I. VALENZUELA-RIOS summarized data on taxonomy of early polygnathids from the stratotype section (GSSP) for the lower Emsian boundary, Zinzilban section, South Tien Shan, Uzbekistan. This association is revised in respect to species names. Synonymies for valid taxa (*Po. pireneae, Po. kitabicus, Po. excavatus, Po. nothoperbonus, Po. sokolovi, Po. hindei, Po. tamarae, Po. pannonicus, Po. foveolatus* and *Po. dehiscens*) are compiled and their main diagnostic characters are clarified. One new species (*Po. pannonicoformis*, IZOKH, YOLKIN et ERINA sp. n.) is shortly described (IZOKH et al., 2010, in print).

Dr. Rimma T. GRATSIANOVA and PhD student Tatyana A. SHCHERBANENKO summarized data on Early Emsian chonetoidean brachiopods from the Zeravshan-Gissar mountainous area (Uzbekistan Republic) and Salair (south of West Siberia). They have made first

descriptions of brachiopods from the Pragian-Emsian (GSSP) stratotype (South Tien Shan, Uzbekistan). Eight species are described, four of them are new. New data allow to extend the ranges and distributions of the studied brachiopod genera and species. Comparative taxa analysis of chonetoidean associations from the Zinzilban section of Uzbekistan with other regions (Europe, North Africa, West Siberia, Canadian Arctic Archipelago, North America) has shown that chonetoideans from the Emsian of South Tien Shan are not endemic. Only one species is restricted to the region but its generic assignment is unclear. At the generic level, the assemblage has paleogeographic affinities with chonetoidean faunas of the Old World Realm.

CM Olga T. OBUT obtained first data on Upper Devonian radiolarians from the Kule Gorge section, Kitab State Geological Reserve (South Tien Shan, Uzbekistan). Abundant well-preserved radiolarians together with conodonts were recovered from vary-colored cherts of Akbasay Fm. A paper in cooperation with Dr. Peter CEJCHAN with a description of obtained associations is in preparation.

CM Nikolay K. BAKHAREV started the revision of Upper Devonian ostracods from the Salair and Kuznetsk Basin (Tom'-Kolyvan' folded zone). Close relations between ostracod associations were revealed with that of the western slope of the Urals and the Devonian of Poland.

PhD student Olga P. IZOKH compiled a data basis on carbon (organic and inorganic) and oxygen isotope composition from the Upper Devonian carbonates of the Kuznetsk Basin and South Urals. On December 22, 2009 she successfully defeated her PhD thesis on "Isotope composition of oxygen organic and inorganic carbon from the Upper Devonian carbonates of South of West Siberia".

The research group participated in two IGCP Projects: 499 and 580.

References

Izokh O.P., Izokh N.G., Ponomarchuk V.A., Semenova D.V. (2009): Carbon and oxygen isotopes in the Frasnian-Famennian section of the Kuznetsk basin (southern West Siberia) // Russian Geology and Geophysics, 50(7): 602-609.

Peregoedov L.G., kul'kov N.p., Izokh N.G., rodygin s.a. and sharovka d.s. (2009): Devonian brachiopods and conodonts from the West Siberian Paleozoic Geosyncline // In: V.V. Silantiev, Ed. Upper Paleozoic of Russia: stratigraphy and facies analysis. Contributions of All-Russian Conference on 175 anniversary of N.A. Golovkinskii (September 27-30, 2009). Kazan. P. 110-11. (Kazan State University Press).

Krasnov V.I., Peregoedov L.G., Ratanov L.C., Divina T.A., Yolkin E.A., Bakharev N.K., Dubatolov V.N., Izokh N.G., Fradkin G.S., Makarenko S.N., Rodygin S.A., Savina N.I., Sobolev N.N. Devonian stratigraphy of Siberia. Correlation problems // Upper Paleozoic of Russia: stratigraphy and facies analysis: contributions of the Second All-Russia conference, devoted to 175 anniversary of N.A. Golovkinsky (27-30 September 2009) / Silantiev V.V. Ed.. Kazan': Kazan' State Uni. Press, 2009. P. 29-31.

Khromykh V.G. Stromatoporoids from Emsian stratotype sections of Salair // Regional geology. Stratigraphy and paleontology of Phanerozoic of Siberia. Novosibirsk. SNIIGGIMS Press, 2009. P. 93-104.

Shcherbanenko T.A. Brachiopods of genus Megastrophia from Emsian Salair basin (Lower Devonian, south of west Siberia) // Modern paleontology: classic and bew methods. Abstracts of the 6 All-Russia scientific school for young paleontologitst. 5-7 October 2009/ Paleontological Institute RAS. Moscow, 2009. P. 45-46.

Obut O.T. Paleozoic radiolarians from Gorny and Rudny Altai (SW Siberia, Russia) // Abstracts of the 12th Meeting of the International Association of Radiolarian Paleontologists (Nanjing, China, September 14-17, 2009). Nanjing, China: pp. 130-131.

TM Ulrich JANSEN

The study of Pridolian-Eifelian brachiopod stratigraphy of the Rhenish Massif and neighbouring regions has been continued. In the last year, the focus was put on taxa of the orders Strophomenida, Orthotetida and Orthida. The forthcoming brachiopod monograph is in good progress. Reports on the actual state of this work were given at the *North American Palaeontological Convention* in Cincinnati (USA) and the *Palaeozoic Seas Symposium* in Graz (Austria). Besides, I have worked on Turkish brachiopod faunas from the

Pontides (NW Turkey) and the Taurides (S Turkey) under the umbrella of the DEVEC-TR project.

The project "phylogeny of delthyridoid spiriferids" supported by the German Research Foundation (DFG) has been brought to a termination. In this context, Mena SCHEMM-GREGORY finished her PH.D. thesis and published main results. She gave talks and presented a number of posters on the Cincinnati and Graz meetings, the Annual Meeting of the Spanish Palaeontological Society in Ronda (Spain), the Field Meeting of the Subcommission on Silurian Stratigraphy in Sardinia (Italy) and the 79th Annual Meeting of the German Palaeontological Society in Bonn.We published together a paper in the progress volume of the Nevada meeting that deals with a stringocephaloid taxon from the *Stringocephalus* Beds of central Nevada, which has turned out to be not a late *Stringocephalus*, as had been thought before, but a genus of the Omoloninae.

Nadia KNAPP has finished her diploma thesis on Emsian biofacies and stratigraphy of the northwestern Taunus (southern Rhenish Massif).

A collection project financed by the DFG has been started to record the data of the Hunsrueck Slate, the X-ray photo and (mainly Devonian) brachiopod collections of the Senckenberg and to publish these in the Senckenberg collection database SESAM which is openly accessible online (www.senckenberg.de).

The international Palaeozoic community lost one of its leading ostracode specialists and the German SDS one of its long-time members (since 1974): Gerhard BECKER passed away on December 14th 2009 at the age of 81. He will be deeply missed because of his enormous scientific knowledge especially on Palaeozoic ostracodes. The passing of this lively and loveable colleague and teacher is an irreparable loss to palaeontology and biostratigraphy.

Publications (2009)

Jansen, U. (2009). Biohistory of Lower Devonian Orthotetid and Orthid Brachiopods of the Rhenish Massif (Germany). – 9th North American Paleontological Convention. Abstracts; Cincinnati Museum Center Scientific Contributions, 3: 423.

Jansen, U. (2009). Pridolian to Eifelian history of the Rhenish Sea in the mirror of brachiopod evolution (Rhenish Massif, Germany) – Abstract Volume. – Berichte des Institutes für Erdwissenschaften, Karl-Franzens-Universität Graz, 14: 71; Graz.

Nalcıoğlu, G., Nazik, A. & Jansen U. (2009). Devonian Brachiopoda and Ostracode Assemblages in Western Pontides and Eastern Taurides and Paleogeographic Implications. – 62. Türkiye Jeoloji Kurultayi, 13-17 Nisan 2009, MTA Ankara: Evolutionary steps in Turkish Fossil records, Abstracts: 669; Ankara.

Wehrmann, A., Yilmaz, I., Yalçın, M.N., Wilde, V., Schindler, E., Weddige, K., Saydam Demiray, D.G., Özkan, R., Nazik, A., Nalcioğlu, G., Kozlu, H., Karslioğlu, Ö., Jansen, U., Ertug, K., Brocke, R., & Bozdoğan, N. (2009). Devonian shallow-water sequences from the North Gondwana coastal margin (Central and Eastern Taurides, Turkey): Sedimentology, facies and global events. – Gondwana Research, doi:10.1016/j.gr.2009.09.011. (pre-publication, internet)

Schemm-Gregory, M. & Jansen, U. (2009). New implications on the Upper Givetian "Stringocephalus Bed" in Central Nevada (Brachiopoda, Middle Devonian). Palaeontographica Americana, 63:157-163.

Schemm-Gregory, M. (2009). On the genus Quiringites Struve, 1992 (Brachiopoda, Middle Devonian). – Bulletin of the Peabody Museum of Natural History, 50 (1): 3-20.

Schemm-Gregory, M. (2009). Frequentispirifer, a new spiriferid genus and its phylogenetic position within the Delthyridoidea (Brachiopoda, Lower Devonian). – Neues Jahrbuch für Geologie und Paläontologie – Abhandlungen, 251 (1): 53-70.

Schemm-Gregory, M. (2009). Leonispirifer nom. nud. – eine neue Brachiopoden-Gattung aus dem Kantabrischen Gebirge, Nord-Spanien (Spiriferida, Unter-Devon). – Paläontologie-Schlüssel zur Evolution. Kurzfassungen der Tagungsbeiträge. 79th Jahrestagung der Paläontologischen Gesellschaft in Bonn. – Terra Nostra - Schriften der Alfred Wegener Stiftung, 2009/3: 101.

Schemm-Gregory, M. (2009). Leonispirifer nom. nud. – un nuevo género de braquiópodos de la Montaña Cantábrica (Spiriferida, Devónico inferior). – In: Palmqvist, P. & Pérez-Claros, J.A. (eds.): Comunicaciones de las XXV Jornadas de la Sociedad Española de Paleontología: 293-294.

Schemm-Gregory, M. (2009). Howellella – the root of delthyridoid Spiriferids (Brachiopoda, Silurian to Devonian). – Paleozoic Seas Symposium – Abstract Volume. – Berichte des Institutes für Erdwissenschaften, Karl-Franzens-Universität Graz, 14: 71; Graz.

Schemm-Gregory, M. (2009). The Phylogeny of delthyridoid Spiriferids – How it began (Brachiopoda, Silurian to Devonian). – 9th North American Paleontological Convention. Abstracts; Cincinnati Museum Center Scientific Contributions, 3: 422.

Schemm-Gregory, M. (2009). Howellellid branches at the Silurian/Devonian boundary interval and their importance for delthyridoid spiriferid evolution. – In: Corriga, M. & Piras, S. (eds.): Time and life in the Silurian: a multidisciplinary approach. Abstracts. – Rendiconti de la Società Paleontologica Italiana, 3 (3): 337-338.

Schemm-Gregory, M. (2009). Howellella – ein kleiner Brachiopode mit großer Wirkung. – Paläontologie-Schlüssel zur Evolution. Kurzfassungen der Tagungsbeiträge. 79th Jahrestagung der Paläontologischen Gesellschaft in Bonn. – Terra Nostra - Schriften der Alfred Wegener Stiftung, 2009/3: 102.

Schemm-Gregory, M. (2009). El origen de Cyrtospirifer en el Devónico Medio del Sahara occidental (Noroeste de Africa). – In: Palmqvist, P. & Pérez-Claros, J.A. (eds.): Comunicaciones de las XXV Jornadas de la Sociedad Española de Paleontología: 294-295.

Schemm-Gregory, M. (2009). Brazos howellellidos en el intervalo del límite Silúrico / Devónico y su importancia para la evolución de las esperiferidos delthyridoides. – In: Palmqvist, P. & Pérez-Claros, J.A. (eds.): Comunicaciones de las XXV Jornadas de la Sociedad Española de Paleontología: 292-293.

Schemm-Gregory, M. (2009). Howellella – the root of delthyridoid Spiriferids (Brachiopoda, Silurian to Devonian). – Palaeozoic Seas Symposium – Abstract Volume. – Berichte des Institutes für Erdwissenschaften, Karl-Franzens-Universität Graz, 14: 71; Graz.

Schemm-Gregory, M. (2009). Ecology of the Paraspirifer-like Morphotypes (Brachiopoda, Lower and Middle Devonian). – 9th North American Paleontological Convention. Abstracts; Cincinnati Museum Center Scientific Contributions, 3: 76.

Schemm-Gregory, M. (2009). The oldest of Cyrtospirifer (Brachiopoda, Middle Devonian). – 9th North American Paleontological Convention. Abstracts; Cincinnati Museum Center Scientific Contributions, 3: 242.

Schemm-Gregory, M. & Butts, S. (2009). New implications on the life habit of Cyrtina (Brachiopoda, Lower Devonian). – Geological Society of America Abstracts with Programs, Vol. 41, No. 7, p. 262. GSA 2009, Portland/OR.

CM Sandra I. KAISER

In 2008, I changed from the University Münster, where I worked as curator of the *Geomuseum* and teaching associate, to the University Bonn in 2008. As curator of the *Goldfuß-Museum* and teaching associate in Bonn, I organized several exhibitions and the biggest German palaeontological annual meeting with more than 300 guests from all over the world.

My research concentrated on high-resolution conodont biostratigraphy and geochemistry using carbon and oxygen isotopes. During 2008 and 2009, I have published, in collaboration with R.T. BECKER (Münster), T. STEUBER (Abu Dhabi), C. SPALLETTA (Bologna) and C. CORRADINI (Calgary) conodont and geochemical studies in the Late Famennian and Early Tournaisian in the Carnic Alps, Graz Palaeozoic, and Pyrenees. Palaeoenvironmental changes during the Late Famennian and Early Tournaisian using high resolution stable isotope geochemistry concentrated on Upper Famennian successions in the Circummediterranean area. New condont data from La Serre (France) which were collected for my doctoral thesis at the University Bochum and during my employment at the Natural History State Museum in Stuttgart, were presented on different national and international meetings, and published in Newsletters on Stratigraphy. These new results reveal problems with the current D/C boundary GSSP in La Serre, and based on these results, an international working group was established on the redefinition of the D/C boundary.

Several papers are in review, or in preparation, respectively. These studies deal with taxonomic problems of the early siphonodellids, with sequence stratigraphy and sea-level changes at the D/C boundary in Morocco, as well as with high-resolution conodont biostratigraphy from D/C boundary sections in the Rhenish Massif.

Published papers and abstracts related to the D/C boundary (2008-2009)

Kaiser, S.I. & Corradini, C. (in rev.): The early siphonodellids (Conodonta, Late Devonian-Early Carboniferous): overview and taxonomic state. - N. Jahrb. Geol. Pal.

Kaiser, S.I., Becker, R.T., Steuber, T. & Aboussalam, Z.S. (in rev.): Climate-controlled mass extinctions, facies, and sea-level changes around the Devonian-Carboniferous boundary in the eastern Anti-Atlas (SE Morocco). - Palaeogeography, Palaeoclimatology, Palaeoecology.

Kaiser, S.I. (in prep.): Conodont faunas from D/C boundary sections in the Rhenish Massif (Sauerland, NW Germany).

Kaiser, S.I., Becker, R.T., Spalletta, C. & Steuber, T. (2009): High-resolution conodont stratigraphy, biofacies and extinctions around the Hangenberg Event in pelagic successions from Austria, Italy and France. – Palaeontographica Americana, 63: 97-139.

Kaiser, S.I. (2009): The Devonian/Carboniferous stratotype section La Serre (Montagne Noire) revisited. – Newsletters on Stratigraphy, 43 (2): 195-205.

Kaiser, S.I. (2009): Lower Carboniferous "shallow-water" conodont faunas from the Rhenish Massif (Germany). – PalGes 2009, Bonn. Terra Nostra, 3: 57.

Kaiser, S.I., Corradini, C. & Becker, R.T. (2009): Alternative scenarios for the Devonian/Carboniferous boundary GSSP. - PalGes 2009, Bonn. Terra Nostra, 3: 58.

Corradini C. & Kaiser S. 2009. Morphotypes in the early Siphonodella lineage: implications for the definition of the Devonian/Carboniferous boundary. In: Henderson C.M. & MacLean C. (Eds): ICOS 2009 Abstracts. Permophilies, 53, suppl.1: 13.

Corradini, C. & Kaiser, S.I. (2008): Towards a redefinition of the Devonian/Carboniferous Boundary. – Rendiconti online della Società Geologia Italiana 3 (2008).

Kaiser, S.I., Steuber, T., Becker, R.T. (2008): Environmental change during the Late Famennian and Early Tournaisian (Late Devonian – Early Carboniferous) – implications from stable isotopes and conodont biofacies in southern Europe. – In: Aretz, M., Herbig, H.-G. & Somerville, I. D. (eds.): Carboniferous platforms and basins. - Geological Journal Special Issue, 43 (2-3): 241-260.

Kaiser, S.I. & Corradini, C. (2008): The siphonodellids: overview and taxonomic state. – 20th International Senckenberg Conference & 2nd Geinitz Conference: "From Gondwana and Laurussia to Pangaea: Dynamics of oceans and supercontinents" – Final Meetings of IGCP 497 & IGCP 499, Frankfurt, September 30. – October 10. 2008.

Corradini, C. & Kaiser, S.I. (2008): Towards a redefinition of the Devonian/Carboniferous Boundary. - 84th Congress of the Italian Geological Society, Sassari, 15-17 September 2008.

CM Semen A. KRUCHEK and the Belarussian Devonian Group

(CM Tamara G. OBUKHOVSKAYA (Miospores), Victor I. PUSHKIN (Bryozoa, Brachiopods), Dimitry P. PLAX (Ichthyofauna), Sergey V. ANTIPENKO (Cyanobacteria, Calcareous Algae), Veronica Yu. OBUKHOVSKAYA (Miospores, Acritarchs), Tathyana F. SACHENKO (Brachiopods), Yuriya V. ZAIKA (Corals).

Published papers and abstracts (2007-2009)

2007

ANTIPENKO S.V. (2007): Lower Famennian organogenic deposits of Prypiat' Trough (stratigraphy, paleoecology, organic remains). – In: BESKOPYLNY V.N., POROSHIN B.D. (Eds.). Ways of effective search, exploration and reservoir engineering of oil in Belarus. Conference Materials of Scientific-Practical Conference (Gomel, October 4-6 2006). Gomel: 148-151 (in Russian).

ANTIPENKO S.V. (2007): Classification of the Lower Famennian organogenic deposits of the Prypiat Trough as the base of effective revelation and correlation of congeneric oil-reservoirs in Belarus. – In: VYSOTSKI E.A. (Ed.). Geological Innovations as a Way towards the Effective and Integrated Resource Development. Proceedings of the International Scientific-Practical Conference (Minsk, December 19-21 2007). Minsk: 19-26. (in Russian).

ANTIPENKO S.V., OBROVETS S.M., KRUCHEK S.A., YASHIN I.A. (2007): Specifics of sedimentogenesis of the Lower Famennian organogenic rocks in the North Oil-Bearing Formation of the Prypiat Trough. – In: AISBERG R.E., GARETSKY R.G. (Eds.). Geology, Prospection and Exploration of Mineral Resources in Belarus. Memoir 2. Minsk: 107-118 (in Russian).

OBROVETS S.M., KRUCHEK S.A., YASHIN I.A. (2007): Lito-facial regionalism of the Devonian Intersalt complex of deposits of the Prypiat Trough oil-perspective reservoir. – In:BESKOPYLNY V.N.,POROSHIN B.D. (Eds.). Ways of effective search, exploration and reservoir engineering of oil in Belarus. Proceedings of Scientific-Practical Conference (Gomel, October 4-6 2006). Gomel: 85-96 (in Russian).

PLAKSA, D.P., (2007): Devonian (Late Emssian-Frasnian) fish fauna of Belarus and its stratigraphic importance. – Candidate Theses. Minsk: 23 p. (in Russian with Belarussian and English summary).

PUSHKIN V.I. (2007): Late Devonian bryozoans of Belarus and Ukraine. – In: GUTAK YA.M., MEZENTSEVA O.P., UDODOV V.P. (Eds.). Nature and Economy of Kuzbbass. Regional Compendium of Scientific Papers. Memoir 11 (Paleontology, Stratigraphy, Paleogeography, Mineral Resources). Novokuznetsk: 23-34. (in Russian).

SACHENKO T.F., OBUKHOVSKAYA T.G., KRUCHEK S.A., PUSHKIN V.I., NEKRYATA N.S.(2007): Specification of the Stratigraphic Chart of Devonian of the Prypiat Trough as the base for geological characterization during the exploration survey. – In: VYSOTSKI E.A. (Ed.). Geological Innovations as a Way towards the Effective and Integrated Resource Development. Abstracts of International Scientific-Practical Conference (Minsk, December 19-21 2007). Minsk: 19-26. (in Russian).

2008

NARKIEWICZ, K., KRUCHEK, S. (2008): Conodont-based correlation of the Middle Devonian in SE Poland and Belarus. – In: MAKHNACH, A.A. (Ed.). "Topical Problems of Geology of Belarus and adjacent territories": Proceedings of the International Scientific Conference devoted to the 90th anniversary of academician A.S. MAKHNACH (Minsk, 9–10 December 2008). Minsk: 188–194 (in English).

OBUKHOVSKAYA, V. Yu. (2008): Palaeontological description and stratigraphy of Frasnian deposits in the northeastern part of the Orsha Depression. – In: MAKHNACH, A.A. (Ed.). "Topical Problems of Geology of Belarus and adjacent territories": Proceedings of the International ScientificConference devoted to the 90th anniversary of academician A.S. MAKHNACH (Minsk, 9–10 December 2008). Minsk: 206–213 (in Russian).

OBUKHOVSKAYA, V.Yu., OBUKHOVSKAYA, T.G. (2008): Miospores of the genus Kedoesporis gen. nov. from Devonian deposits of Belarus. – Lithosphere, 2(29): 61–65 (in Russian, English summary).

OBUKHOVSKAYA, T.G., SACHENKO, T.F. (2008): Stratigraphy of the subsalt carbonate complex and analogues of the lower saliferous strata of the Frasnian stage in the southwestern part of the Pripyat Trough. – In: MAKHNACH, A.A. (Ed.). "Topical Problems of Geology of Belarus and adjacent territories": Proceedings of the International Scientific Conference devoted to the 90th anniversary of academician A.S. MAKHNACH (Minsk, 9–10 December 2008). Minsk: 213–219 (in Russian).

PLAKSA, D.P., (2008): Introduction of vertebrate zonal scales into the stratigraphic chart of Devonian deposits of Belarus. – Doklady of the National Academy of sciences of Belarus. Vol. 52, N 4. P. 83–88 (in Russian, English summary).

PLAKSA, D.P., (2008): Late-Emssian ichthyofauna of Belarus. – In: BOGDANOVA T.N., KRYMGOLTS N.G. (Eds.). Geobiospheric events and the history of organic peace. Theses of the reports LIV of the session of Palaeontological society (Russian Academy of Science) (St.Petersburg, 7-11 April 2008) St. Petersburg: 136–137 (in Russian).

PLAX, D.P. (2008): Devonian fish fauna of Belarus. – Lithosphere, 2(29): 66–92 (in Russian, English summary).

PLAX, D.P. (2008): Facies restrictions of vertebrate remains within deposits of the Upper-Emssian-Frasnian of Belarus. – The appendix to "Proceedings of the National Academy of Sciences of Belarus". Chemical Series. Part 3. – P. 412–418 (in Russian).

PLAX, D.P., VALIUKEVICIUS, J.J., KRUCHEK, S.A. (2008): Zonal distribution of Devonian deposits (Upper Emsian-Frasnian) in the north of Belarus from fish fauna evidences. – In: MAKHNACH, A.A. (Ed.). "Topical Problems of Geology of Belarus and adjacent territories": Proceedings of the International Scientific Conference devoted to the 90th anniversary of academician A.S. MAKHNACH (Minsk, 9–10 December 2008). Minsk: 226–234 (in Russian).

PUSHKIN, V.I., KRUCHEK, S.A. (2008): Early Famennian ecosystems of the Pripyat Trough (Belarus). – Lithosphere, 2(29): 33–48 (in Russian, English summary).

PUSHKIN, V.I., KRUSHEK, S.A. (2008): Biofacies model of the Petrikov horizon (Lower Famennian) of the western part of the Pripyat Trough. – In: MAKHNACH, A.A. (Ed.). "Topical Problems of Geology of Belarus and adjacent territories": Proceedings of the International Scientific Conference devoted to the 90th anniversary of academician A.S. MAKHNACH (Minsk, 9–10 December 2008). Minsk: 247–252 (in Russian).

SACHENKO, T.F., ANTIPENKO, S.V. (2008): Palaeontological substantiation of the boundary between the Zadonsk ana Yelets horizons in the southwestern part of the Pripyat Trough. – In: MAKHNACH, A.A. (Ed.). "Topical Problems of Geology of Belarus and adjacent territories": Proceedings of the International Scientific Conference devoted to the 90th anniversary of academician A.S. MAKHNACH (Minsk, 9–10 December 2008). Minsk: 258–264 (in Russian).

ZAIKA, Y. (2008): Skeletal microstructure of Frasnian Tabulate corals from the Pripyat Trough and Zhlobin Saddle (Belarus) and its response to the dolomite metasomatism. – In: MAKHNACH, A.A.

(Ed.). “Topical Problems of Geology of Belarus and adjacent territories”: Proceedings of the International Scientific Conference devoted to the 90th anniversary of academician A.S. MAKHNACH (Minsk, 9–10 December 2008). Minsk: 84–88 (in English).
ZAIKA, Yu.V., KRUSHEK, S.A. (2008): Upper Devonian (Frasnian) corals (Anthozoa) of Belarus. Part 1: Systematic composition, stratigraphic distribution, palaeoecology. – Lithosphere, 2(29): 49–60 (in Belarusian, English summary).

2009
ANTIPENKO S.V., KRUCHEK S.A. (2009): On organogenic buildups in of western part of the Prypiat paleorift. – In: VYSOTSKI E.A., GUBIN V.N. (Eds.). Problems of Modern Geology: ? University Proceedings Dedicated to the 60-th Anniversary of the Discovery of Starobin Minefield of Potash Salt (Minsk, 3-4 April 2009): Minsk: 43-44 (in Russian).
NARKIEWICZ, K. and KRUCHEK, S. (2009): Upper Eifelian polygnathid–icriodid assemblages from Belarus and their biostratigraphic and palaeogeographic significance. – In: ICOS 2009 in Calgary, Canada, July 12–17 2009.
OBROVETS, S.M., KRUCHEK, S.A., YASHIN, I.A. (2009): Sedimention model of the Formation of Devonian deposits in the intersalt complex of the central petroleum potential region of the Pripyat Trough. – Prirodnyje Resursy (Natural Resources), №1: 5–14 (in Russian, English summary).
PLAX D.P. (2009): Number of taxa and characteristics of skeletal remains of Devonian Vertebrata of Belarus. – In: BOGDANOVA T.N., KRYMGOLTS N.G. (Eds.). Paleontology and Development of the Stratigraphic Base of Geological Mapping. ? Proceedings of the LV Session of the Russian Paleontological Society (St. Petersburg, 6-10 April 2009). St.Petersburg: 109-111 (in Russian).
PLAX D.P., KRUCHEK S.A. (2009): On the ichthyofauna of the Frasnian deposits from the Latvian Saddle, Sarianka River Basin. – In: BOGDANOVA T.N., KRYMGOLTS N.G. (Eds.). Paleontology and Development of the Stratigraphic Base of Geological Mapping. Proceedings of the LV Session of the Russian Paleontological Society (St. Petersburg, 6- 10 April 2009). St.Petersburg: 111-113 (in Russian).
PLAX, D.P., KRUCHEK, S.A., BARBIKOV, D.V. (2009): Eurypterid (Chelicerata, Eurypterida) findings in Famennian saliniferous deposits of the Devonian of Belarus. – Lithosphere, 1(30): 29–38 (in Russian, English summary).
PUSHKIN, V.I. (2009): Complexes of Upper Devonian brachiopods from the Pripyat Trough. – Lithosphere, 1(30): 39–56 (in Russian, English summary).
ZAIKA, Yu.V., KRUCHEK, S.A. (2009): Upper Devonian (Frasnian) corals (Anthozoa) Belarus. Part 2: Description of taxons. – Lithosphere, 1(30): 57–74 (in Belarusian, English summary).
PUSHKIN V.I. (2009): Brachipods of the Productida order Early Famennian of the Pripyat Trough. – Lithosphere, 2(31): 24–37 (in Russian, English summary).
PLAX D.P. (in press): Early Frasnian Ichthyofauna of the Belarusian North. – Lithosphere (in Russian, English summary).
PLAX D.P., KRUCHEK S.A. (in press): Stratigraphy of the Middle and Upper Devonian deposits of the Latvian Saddle (based on the Ichthyofauna from outcrops on the Sarianka River). – Lithosphere (in Russian, English summary).

Postscriptum
CM Tamara G. OBUKHOVSKAYA has now retired.. It is possible to contact her by e-mail: kruchek@igig.org.by

TM Xueping MA

During the year of 2009, our major work was related with the completion of an oil company project related to The Devonian (as well as the Carboniferous) of western Junggar of Xinjiang, northwestern China. In the latter half of May, Research Professor LIAO Weihua and the Peking University group went to western Junggar again, with collection of the Famennian sequence in the Hoboksar and Hoxtolgay region as a major task, as well as general investigation of other time intervals. I finished an internal report concerning the Devonian and Carboniferous stratigraphy of western Junggar, which is part of a combined project report related to northwestern China. Currently one of my students (ZONG Pu) is working on the Famennian stratigraphy of the western Junggar region. She is preparing a paper on the brachiopod fauna cross the supposed Devonian and Carboniferous boundary. Another Student of mine (LI Hua) successfully completed her PhD thesis in June, with the title “Biostratigraphy and sea-level change across the Middle-Upper Devonian boundary in the platform margin facies, Guilin, Guangxi”.

Publications

Li, Hua; Ma, Xueping; Wei, LM. A Middle-Upper Devonian Boundary Section in the Open Platform, Platform Margin Facies of Guilin, South China. Acta Geologica Sinica-English Edition, 83: 524-534.

Li Hua, Ma Xueping, Wei Longming. 2009. Sedimentary facies and sea-level change across the Middle-Upper Devonian boundary at Caiziyan section, Guangxi: The mid-Givetian regression and its timing in South China. Journal of Palaeogeography, 11(5): 503-512 (in Chinese with English abstract).

Xueping Ma, Weihua Liao, Deming Wang, 2009. The Devonian System of China, with a discussion on sea-level change in South China. In: Königshof, P.(ed.) Devonian Change: Case Studies in Palaeogeography and Palaeoecology. The Geological Society, London, Special Publications, 314, 241-262.

Ma Xue-ping. 2009. Spiriferide brachiopods from the Frasnian (Devonian) of the Dushan area, southern Guizhou, China. Acta Palaeontologica Sinica, 48(4). (in English with Chinese abstract).

CM Elga MARK-KURIK

The paleobiological papers mentioned in the previous SDS Newsletter No 24, p. 89 (first ones in the list, below) are now available in the Supplement 1 of the *Acta Zoologica* (Stockholm) vol. 90, as also many other interesting papers on fossil fishes and early tetrapods.

A paper on the Early Devonian fishes from Chukotka, far North East of Russia, initiated by Alain BLIECK, Lille University, is still in preparation, but all four authors hope to submit it as soon as possible. Another paper (MARK-KURIK, in press) on a representative of the rare placoderm group, rhenanids, from the Early Devonian of Siberia is still waiting for publication.

The Devonian stratigraphical scheme of Estonia, published more than 10 years ago in the fundamental book "*Geology and Mineral Resources of Estonia*" (RAUKAS, A. & TEEDUMÄE, A., eds.), Estonian Academy Publishers, Tallinn, 1997 (436 pp.) needed a modernized version. In 2007 such a scheme became available on the Internet home page of the Estonian Commission on Stratigraphy (ESK). In addition, a published scheme was considered to be useful for persons, working in different fields of Estonian geology. It will contain age of the stage boundaries, five biozones: standard conodont, miospore and three fish zones. The agnathan, placoderm and acanthodian zones appear to be significant on different age intervals. Regional stages and main lithostratigraphical units will be indicated. Of the stage boundaries, that of the Eifelian/Givetian is well established, whereas the Givetian/Frasnian boundary needs conodont evidences.

In September I had a possibility to attend the fantastic 69th Annual Meeting of the Society of Vertebrate Paleontology in Bristol, UK, one of its largest meeting, and the single one held outside the USA. Among 423(!) posters was also my poster, which emphasized some correlation problems of the Middle Devonian of Scotland and Estonia + Latvia (see table). The Eifelian/Givetian boundary does not coincide in these regions, and there is the trouble to establish the position of the Givetian/Frasnian boundary in both of them.

A popular paper (in Estonian) characterizes one of the richest Givetian fossil fish locality Tamme on the eastern shore of the lake Võrtsjärv in South Estonia. It has yielded more than 25 taxa, among others, a small *Cheiracanthus* specimen, the only articulated Devonian fish, found in Estonia. Discovery of plant macroremains, fragments of linguloid brachiopods and numerous trace fossils could be reported for the first time among results of the joint excavations of Tartu University and Tallinn University of Technology in the locality in 1993.

References

Mark-Kurik, E. & Botella, H. 2009. On the tail of Errivaspis and the condition of the caudal fin in heterostracans. Acta Zoologica (Stockholm), 90 (Suppl. 1): 44-51.

Lebedev, O., Mark-Kurik, E., Karatajūtė-Talimaa, V., Lukševičs & E., Ivanov, A. 2009. Bite marks as evidence of predation in early vertebrates. Acta Zoologica (Stockholm), 90 (Suppl. 1): 344-356.

Lukševičs, E., Lebedev, O., Mark-Kurik, E. & Karatajūtė-Talimaa, V. 2009. The earliest evidence of host-parasite interaction in vertebrates. Acta Zoologica (Stockholm), 90 (Suppl. 1): 335-343.

Mark-Kurik, E. 2009. Two small Scottish Middle Devonian placoderms in Estonia. Abstract. Journal of Vertebrate Paleontology 29, Suppl. to No 3: p.143A.

Mark-Kurik, E. 2009. Tamme outcrop, a unique locality of the Middle Devonian fishes [Tamme paljand – Kesk-Devoni kalade unikaalne leiukoht]. Geological Society of Estonia, Bulletin 8: 18-26 (in Estonian).

Mark-Kurik, E. (in press). Dolganosteus, the Early Devonian rhenanid (Placodermi) from the northern Siberia. In Xiaobo Yu, Maisey J. & Desui Miao (eds.) Fossil Fishes and Related Biota: Morphology, Phylogeny and Paleobiogeography - in honor of Meemann Chang. Verlag Dr. F. Pfeil, München, Germany.

Mark-Kurik, E., Blieck, A., Burrow, C. & Turner, S. (in prep.). Early Devonian fishes from the coastal area of the Long Strait, Central Chukotka, Russia. Geodiversitas.

Mark-Kurik, E. & Põldvere, A. (in prep.). Devonian stratigraphical scheme of Estonia. Estonian Journal of Earth Sciences.

<table>
<tr><th colspan="4">SCOTLAND</th><th colspan="3">ESTONIA + LATVIA</th></tr>
<tr><td>Frasnian</td><td rowspan="3"></td><td>Whitemire</td><td>Pl. mironovi?</td><td>Pļaviņas</td><td>Pl. mironovi***</td><td>Frasnian</td></tr>
<tr><td rowspan="2">Frasnian - Givetian?</td><td>Nairn</td><td>Psl. undulata**</td><td>Amata</td><td>Psl. undulata</td><td>?</td></tr>
<tr><td></td><td></td><td>Gauja</td><td>tristrichopterid*</td><td rowspan="4">Givetian</td></tr>
<tr><td rowspan="2">Givetian</td><td></td><td>John o’ Groats, Eday</td><td>Tristichopterus Watsonosteus Microbrachius</td><td>Burtnieki Abava</td><td>tristrichopterid Watsonosteus Microbrachius</td></tr>
<tr><td rowspan="3">Upper Caithness Flagst.</td><td>Mey, Rousay</td><td>Millerosteus</td><td>Koorküla
Härma</td><td></td></tr>
<tr><td rowspan="4">Eifelian</td><td>Latheron/ Ham-Scarfskerry, Upper Stromness Flags</td><td></td><td>Aruküla Tarvastu</td><td>Millerosteus</td></tr>
<tr><td>Kureküla
Viljandi</td><td></td></tr>
<tr><td rowspan="3">Lower Caithness Flagst.</td><td>Achanarras, Sandwick Fishbed</td><td>Coccosteus Rhamphodopsis</td><td>Narva Kernavė</td><td>Coccosteus Rhamphodopsis</td><td rowspan="3">Eifelian</td></tr>
<tr><td>Robbery Head, Lower Stromness Flags</td><td>Coccosteus</td><td>Leivu
Vadja</td><td></td></tr>
<tr><td>Lybster</td><td></td><td>Pärnu</td><td></td></tr>
</table>

*Eusthenopteron kurshi Zupiņš 2008; ** Psammolepis undulata (Agassiz); *** Plourdosteus mironovi* (OBRUCHEV)

Correlation table in poster: E. MARK-KURIK “Two small Scottish Middle Devonian placoderms in Estonia”, presented at the 69th Annual Meeting of the Society of Vertebrate Paleontology, Bristol (UK), Sept. 23-26, 2009.

TM John MARSHALL
Devonian Activities 2009

In May I returned to Bolivia with Ian TROTH. We revisited some previously studied sections in the sub-Andean Zone and then visited new sections on the Altiplano. We were successful in collecting a number of *in situ* goniatites and numerous palynological samples. The aim is to extend our record of palynological events into the Altiplano.

In June I made a brief visit to Orkney to continue our high resolution sampling of the terrestrial Taghanic and make further arrangements for the IPC3 SDS fieldtrip.

This was followed by attendance at the NAPC in Cincinnati including three excellent Devonian centric fieldtrips. This gave me the opportunity to see many mid continent Devonian sections and collect comparative palynological material.

In July I visited the Timan in Russia. In collaboration with Olga TEL'NOVA we drilled a short borehole through a marginal Frasnian-Famennian boundary section at Sosnogorsk. Core recovery was excellent and work is in progress on palynology and isotope stratigraphy.

In August I returned to East Greenland with Henning BLOM and Vincent DUPRE from Uppsala, Sweden together with students Ed Fleming and Rich Painting from Southampton. The main focus was searching for tetrapods in the Frasnian section. However, I took the opportunity to extend our measured F/F boundary section on Heintz Bjerg down into the late Frasnian with further collecting through the Givetian and early Frasnian. I also revisited Stensiö Bjerg and managed to find a new *lepidophyta* assemblage just 10 m above the famous in situ *Acanthostega* locality. This is a significant new age tie point. I also clarified aspects of Strunian climatic stratigraphy. More about these results at IPC3. We also worked on a new D-C boundary section in the southern part of the basin. Importantly this has a better record of earliest Carboniferous climatic events. Invaluable logistic support was supplied by CASP.

In September I attended the CIMP spore and acritarch meeting in Faro, Portugal. The year was completed in December with the Palaeontological Association Annual Meeting in Birmingham, England. I have resolved to travel less in 2010.

CM Marek NARKIEWICZ

My activities in 2009 related to Devonian stratigraphy were the following:

1. Contribution to the paper on the early tetrapod footprints from the Eifelian of the Holy Cross Mts. in central Poland (NIEDŹWIEDZKI et al., 2010). The Zachełmie Quarry, where the discovery was made, was a subject of stratigraphic and sedimentological–facies studies during 2007-2008, the results of which are described in a paper submitted by early 2009 and scheduled for a publication in early 2010 (K.NARKIEWICZ and M.NARKIEWICZ, in press). We were able to find a rather unexpected fossiliferous open-marine level in otherwise almost barren (except for the footprints) marly dolomites with mudcracks. The identification of *Bipennatus bipennatus montensis* WEDDIGE allowed to constrain the age of the footprints as being not later than the Eifelian *costatus* Zone. Pierre Bultynck's advise on the taxonomic determination is much appreciated.

2. Historical work on earliest stages of the Devonian research in Poland. The study was based on the unpublished personal diary of Sir Roderic I. MURCHISON from the times of his trip to Poland in 1843. The copy of the diary was made available owing to a kind courtesy of the Geological Society in London. It is a colourful narration on many topics and people met during the visit. What is important, it contains plenty of interesting geological observations, including first remarks (with field sketches) on the Devonian strata around Kielce in the Holy Cross Mts. Sir Roderic was apparently the first geologist to identify the Devonian system also in Poland, basing on fossil content as well as on comprisons with the Rhenish Devonian. His Polish observations were later partly quoted in

the treatise on geology of Russia (1845). The recent paper describing the Holy Cross part of the MURCHISON's trip was submitted as a chapter in a book scheduled for a publication in Polish and English versions in 2010 (co-authors Piotr KRZYWIEC and John DIEMER).

3. Work on a monographic study of the Devonian basin in the Radom-Lublin area in SE Poland. The monograph will summarize research that has been done on the Devonian stratigraphy, sedimentology, palaeotectonics and palaeogeography during the last 15 years. The other authors and co-authors are Katarzyna NARKIEWICZ (conodont biostratigraphy and palaeoecology) and Elżbieta TURNAU (palynostratigraphy).

References

Niedźwiedzki G., Szrek P., Narkiewicz K., Narkiewicz M., Ahlberg P., 2010 - Tetrapod trackways from the early Middle Devonian period of Poland, *Nature*, 463: 43-48.

Narkiewicz K., Narkiewicz, M. (in press) - Mid Devonian carbonate platform development in the Holy Cross Mts. area (central Poland): new constraints from the conodont *Bipennatus* fauna. – *N. Jb. Geol. Paläont. Abh*.

TM Jeffrey OVER

Several projects are in various stages:

Uppermost Devonian in clastic dominated strata of northwestern Pennsylvania (Appalachian Basin) with Gordon BAIRD and others. Conodonts, fish, echinoderms, and brachiopods were recovered from several horizons. The conodont fauna is dominated by *Bispathodus aculeatus aculeatus* in lower strata, and *Bi aculeatus anteposicornis* was recovered higher in the interval.

Upper Devonian of the Alberta Platform continues with Jed DAY and Mike WHALEN where lithostratigraphy, magnetic susceptibility, and brachiopod-conodont biostratigraphy are being utilized to determine the depositional environment and relationship to global sea-level changes.

Eifelian-Givetian Boundary interval in the northern Appalachian Basin. The general absence of conodonts, or other biostraigraphically significant fossils, in the thick organic-rich clastic facies of the Marcellus Subgroup are making correlation difficult. Magnetic susceptibility changes between conodont-brachiopod-goniatite constrained strata suggest that the E-G boundary is at or just above the top of the Cherry Valley Limestone in New York State.

Eifelian-Givetian strata in Mongolia were collected for conodonts and trilobites. The conodont fauna from the lower Tsagaanhaalga Formation at Tsakhir Well includes Eifelian icriodids that have not been placed at the species level; trilobites are also under investigation. Conodonts, icriodids and polygnathids, phacopid trilobites, and the acrotretid brachiopod *Opsiconidian* were recovered from thin limestone beds in shales of the Govialtai Formation which are tentatively identified as Givetian.

Publications:

Over, D.J. (editor), 2009, Studies in Devonian Stratigraphy: Proceedings of the 2007 International Meeting of the Subcommission on Devonian Stratigraphy and IGCP 499: Palaeontographica Americana, Paleontological Research Institute, Ithaca, NY, v. 63, 240 p.

Gordon, G.W., Rockman, M., Turekian, K.K., and Over, J., 2009, Osmium isotopic evidence against an impact at the Frasnian-Famennian boundary: American Journal of Science, v. 309, p. 420-430.

Over, D.J. (editor), 2009, Conodont Studies Commemorating the 150th Anniversary of the First Conodont Paper (Pander, 1856) and the 40th Anniversary of the Pander Society: Palaeontographica Americana, Paleontological Research Institute, Ithaca, NY, v. 62, 149 p.

Over, D.J., de la Rue, S., Isaacson, P.E., and Ellwood, B. 2009, Upper Devonian conodonts from black shales of the high latitude Tomachi Formation, Madre de Dios Basin, northern Bolivia: Palaeontographica Americana, v. 62, p. 89-99.

Over, D.J., Lazar, R., Baird, G.C., Schieber, J., and Ettensohn, F.R., 2009, Protosalvinia Dawson and associated conodonts of the Upper trachytera Zone, Famennian, Upper Devonian, in the eastern United States: Journal of Paleontology, v. 83, p. 70-79.

Over, D.J., Travis, M., Morgan, P., Baird, G., Rosscoe, S., Bartholomew, A., Schramm, T., 2009, Conodonts, dacryoconarids, magnetic susceptibility, and placement of the Eifelian-Givetian boundary in the Marcellus Shale of the lower Hamilton Group, Appalachian Basin, western New

York State: International Conodont Symposium ICOS 2009 Abstracts, Permophiles Number 53, Supplement 1, p. 38.
Over, D.J., and Ruppel, S., 2009, Conodonts and correlation of the Woodford Shale, Upper Devonian-Lower Carboniferous, in the subsurface of eastern new Mexico and western Texas: International Conodont Symposium ICOS 2009 Abstracts, Permophiles Number 53, Supplement 1, p. 38.
Baird, G.C., Over, D.J., Sullivan, J.S., McKenzie, S.C., Schwab, J.C., and Dvorak, K.A., 2009, Conodonts and the end Devonian event stratigraphic chronology in the classic Pennsylvania "Oil Lands" region: Latest Famennian Riceville Formation – Berea Sandstone succession: International Conodont Symposium ICOS 2009 Abstracts, Permophiles Number 53, Supplement 1, p. 3.
Baird, G.C., Over, D.J., and Brett, C.E., 2009, The upslope limits of transgressive, Late Devonian-basal Mississippian black shales on the Catskill Delta prodelta slope: physical characteristics and controls: Geological Society of America Abstracts with Programs, v. 41(1), p. 38.
Baird, G.C., Over, D.J., Sullivan, J.S., McKenzie, S.C., Schwab, J.C., and Dvorak, K.A., 2009, End-Devonian (Famennian) event-stratigraphy in the classic Pennsylvania "Oil Lands": new discoveries in the Riceville Formation – Berea Sandstone succession: Geological Society of America Abstracts with Programs, v. 41(1), p. 40.
Morgan, P.T., Over, D.J., and Travis, M.E., 2009, Dacryoconarids and the Eifelian-Givetian Boundary (Middle Devonian) in the Marcellus Shale of western New York: Geological Society of America Abstracts with Programs, v. 41(1), p. 38.
Over, D.J., and Ruppel, S., 2009, Age and correlation of the Woodford Shale, Upper Devonian-Lower Carboniferous, in the subsurface of eastern new Mexico and western Texas: Geological Society of America Abstracts with Programs, v. 41(1), p. 39.
Travis, M.E, Over, D.J, and Morgan, P.T., 2009, The Eifelian-Givetian Boundary in the Oatka Creek Formation, Marcellus Shale of western New York, based on magnetic susceptibility: Geological Society of America Abstracts with Programs, v. 41(1), p. 39.

CM Nonna OVNATANOVA

Recently, together with L.I. KONONOVA and Yu.A. GATOVSKY (Moscow State University) and L.S. Kolesnik (Komi Institute of Geology, Research Center of the Urals Branch of the Russian Academy of Science, Syktyvkar), I have been studying the conodonts from the Upper Devonian sections of the northeastern European Russia (the Pre-Polar Urals, Chernyshov Ridge). The sections are especially important for they are characteristic of the areas located at the shelf margin in the Late Devonian basin. They are composed mostly of domanikoid lithofacies sequences containing ammonoid shells and many conodont assemblages. The depression sedimentation in the western slope of the Pre-Polar Urals was dominating up to the Tournaisian Stage, the evidence of which is the domanikoid nature of deposits in the section at the Kozhim River (CHERMNYKH et al., 1988; Zhuravlev, 1990, 2003). Unfortunately, the information of these sections is fragmentary (YUDINA,1993; ZHURAVLEV, 1991). The best studied are the conodonts from the Frasnian to Lower Famennian (SAVAGE. R, YUDINA, 1999) and Devonian-Lower Carboniferous boundary (NEMIROVSKAYA et al., 1992; ZHURAVLEV, 2003) deposits. In addition to the conodonts from the Syviu and Kozhim rivers sections, those from the Sariyuga River section (Chernyshov Ridge) have been studied for the first time. This section is particularly important, for it is located in the slope of the Bolshaya Zemlya Uplift, and the starved depression is shallower here than in South Timan.

The Givetian-Frasnian boundary in Russia is still ambiguously defined (within Timanian or at the base of Sargaevian Horizon). Unfortunately, neither *Mesotaxis falsiovalis* nor *Ancyrodella rotundiloba* have been reported from Timanian in a considerable part of the Russian Platform due to its facial peculiarities. However, the normal-marine environment was formed in the sections of the Northeastern European Russia a little earlier than in those of the Volga-Urals Province and South Timan, and most likely the lowermost Upper Devonian conodont assemblages here are somewhat richer. This is evidenced also by scarce finds of early *Ancyrodella* sp. I believe that having analyzed the available data and revised the entire material received, we will have a definite solution to this problem. When thoroughly studied, these sections could be a subject of international research.

TM Grzegorz RACKI

Abnormal palynoflora from the Devonian-Carboniferous boundary beds
Proliferation of anomalous palynoflora during the endDevonian biotic crisis is announced by FILIPIAK and RACKI in paper published in Geological Quarterly, vol. 53, 2010, no. 1. The dispersed miospore assemblage of the *Retispora lepidophyta-Verrucosisporites nitidus* (LN) Zone from the well-known Kowala section, Holy Cross Mountains (Poland) is marked by enrichment (above 4%) in abnormal spore morphotypes during a terrestrial flora turnover close to the Devonian-Carboniferous (D-C) boundary, recorded just above the Hangenberg black shale level. Incomplete and complete tetrads represent mostly *Vallatisporites* spp., supplemented by *Grandispora, Retusotriletes* and *Apiculiretusispora*. Additional peculiar morphotypes, marked by anomalous overall shape and ornamentation, are interpreted as mutated varieties of Vallatisporites based on intermediate morphological stages, connecting them with this well known genus. This relatively high aberrant palynomorph frequency is accompanied by volcanic ash intercalations, as well as charcoal debris and polycyclic aromatic biomarkers indicative of forest wildfire (see *Marynowski* and *Filipiak*, 2007; Geol. Mag. 144: 569595). Thus, the anomalous spore morphology could reflect the mutagenic effect of regional acidification due to explosive volcanism. However, palynological literature data from NW France and Canada highlight possibility of supra-regional mutated miospore signal near the DC boundary, and an urgent need of high-resolution studies of the LN zone is empha-sized. The end Permian scenario of abnormal flora growth in immensely stressed habitats may therefore apply to other potentially volcanically-induced biotic turnovers.

TM Eberhard SCHINDLER

As my annual report for the year 2008 (which I had turned in) didn't make it to SDS Newsletter No. 24, I combine it now with that of 2009.

In 2008 research activities have continued embedded in the IGCP Project 499 "Devonian land–sea interaction: Evolution of ecosystems and climate" (DEVEC). Besides co-leading this project preparation of the final meeting (of course, together with the long-time project colleagues) was one of the highlights of the year. The meeting was held in conjunction with the IGCP Project 497 on the Rheic Ocean in Frankfurt, Germany in early October 2008.

Among the continuing projects, the investigation of Middle Devonian strata especially in the Eifel Hills area went on together with Senckenberg and American colleagues (e.g., TM Carl BRETT). Detailed work yields rather complex and unique development of facies in settings very close to the palaeoshore. The progress in this work was included in a talk by TM Carl BRETT during the Frankfurt IGCP meeting (BRETT et al. 2008 – see list below). Two talks focussing on the palynological aspects of the work were given by CM Rainer BROCKE (BROCKE et al. 2008) – one during the International Congress on Palaeobotany and Palynology held in Bonn in September 2008 (see list below), the other one presented at the annual meeting of the German SDS on the subject.

Work continued – however somewhat reduced during this year – on Lower Devonian siliciclastic sections, especially from the highest part of the Lower Emsian at Alken (Mosel area of the Rheinisches Schiefergebirge). A paper on two fossil-rich units in that section was submitted.

Another ongoing project is the Turkish–German cooperation (DEVEC-TR). In May, a summarizing workshop was held in Ankara hosted by the Turkish petroleum corporation (TPAO) under the guidance of M.Namık YALÇIN from Istanbul University. A series of talks on various subjects from the Taurides was included in the Frankfurt Meeting (see list below).

Work also continued with CM Brooks ELLWOOD on magnetic susceptibility of Devonian sections. A joint paper on Givetian sequences has been submitted and is accepted.

A paper on sections from the Spanish Pyrenees with our Spanish colleagues (TM Nacho VALENZUELA-RIOS and Teresa LIAO) has been published.

Together with Mena SCHEMM-GREGORY (Senckenberg) and American colleagues a cooperation on Lower and Middle Devonian items continued supported by the German DAAD including field work as well as research on collection material (in Mena's case mainly with TM Jed DAY); my own field work led CM

Chuck VER STRAETEN and myself to sections in Pennsylvania, Virginia and West Virginia. For discussion on dacryoconarids Dick LINDEMANN has been met during that trip.

Work on a reef mound from the Western Sahara has been put forward – a paper has been submitted and accepted.

In 2009 IGCP Project 499 did continue 'on extended term' and research was conducted within that outgoing project. The main activities were embedded in the Turkish–German cooperation (DEVEC-TR) resulting in an overview paper of sections in the Eastern and Central Taurides (WEHRMANN et al. 2009, e-publication). Aspects of global events in some of the sections were presented at a meeting of the Turkish Petroleum Corporation (TPAO), see YALÇIN et al. (2009). Preparation of a follow-up project has started.

The results of a detailed study on the development of two fossil-rich units in the area of the Mosel Syncline (Alken quarry) have been updated and the submitted paper was accepted for publication (to be out early in 2010). These results were presented in talks at the '9th North American Paleontological Convention' (NAPC) in Cincinnati and at the Annual Meeting of the 'Deutsche Gesellschaft für Geowissenschaften' (DGG) in Dresden (SCHINDLER et al. 2009).

Work continued on the cyclic Middle Devonian of the Eifel Hills in collaboration with TM Carl BRETT.

In the course of another cooperation with American colleagues on Lower Devonian cyclic trilobite-rich sequences in the Dra Valley of the Moroccan Anti-Atlas a talk and a poster were presented at the GSA Meeting in Portland and at the NAPC in Cincinnati (BRETT et al. 2009). And another ongoing cooperation is on magnetic susceptibility together with CM Brooks ELLWOOD on different Devonian sections (see also report for 2008 above).

Work on a new subject was started together with CM Rainer BROCKE and colleagues from the Czech Republik. First results were presented in talks at different meetings (BERKYOVÁ et al. 2009, BROCKE et al. 2009).
In connection with the (quite substantial) enlargement of the type locality of the Kellwasser Horizons in the Kellwasser Valley of the German Harz Mountains (several people from different institutions are involved) I (re)started a "trip down memory lane", i.e., to work again on the Kellwasser Crisis/Event. After the very rich PhD study of Manfred GEREKE (formerly Marburg University) published in 2007 it became obvious that even minute details within this critical interval of time can be traced between sections which belong to different facies settings. A talk and a guided trip to the Kellwasser Valley in conjunction with the 3rd Workshop on the Geology of the Harz Mountains held in Halle (Germany) were presented (SCHINDLER & GEREKE 2009, GEREKE et al. 2009). The Kellwasser type locality will now be one of the geosites of one of the so-called 'landmarks' in the European Geoparc 'Harz – Braunschweiger Land – Ostfalen'.

Publications 2008 – 2009 (in chronological order)

Brocke, R., Riegel, W., Hartkopf-Fröder, C., Brett, C.E., Königshof, P., Schindler, E. & Wilde, V (2008).: Palynology and facies of the Eifelian-Givetian transition in its type area (Eifel Hills, Germany). – Terra Nostra, 2008/2: 39; Bonn.

Brett, C.E., DeSantis, M.K., Bartholomew, A.J., Baird, G.C., Schindler, E. & Königshof, P. (2008): Middle Devonian eustasy, paleoclimate, and bioevents: Toward an integrated model. – In: Königshof, P. & Linnemann, U. (Eds.): From Gondwana and Laurussia to Pangaea: Dynamics of oceans and supercontinents. – 20th International Senckenberg Conference and 2nd Geinitz Conference, Final Meeting of IGCP 497 and IGCP 499, Abstracts and Programme: 34-37; Frankfurt am Main, Dresden.

Karslıoğlu, Ö., Yalçın, M.N. & Schindler, E. (2008): Geochemical investigation of the Lower Kellwasser Event in an Upper Devonian sequence of the Feke region (Eastern Taurides, Turkey). – In: Königshof, P. & Linnemann, U. (Eds.): From Gondwana and Laurussia to Pangaea: Dynamics of oceans and supercontinents. – 20th International Senckenberg Conference and 2nd Geinitz Conference, Final Meeting of IGCP 497 and IGCP 499, Abstracts and Programme: 68-69; Frankfurt am Main, Dresden.

Özkan, R., Kalvoda, J., Yalçın, M.N. & Schindler, E. (2008): Devonian calcareous foraminifers from the Taurides, southern Turkey. – In: Königshof, P. & Linnemann, U. (Eds.): From Gondwana and Laurussia to Pangaea: Dynamics of oceans and supercontinents. – 20th International Senckenberg Conference and 2nd Geinitz Conference, Final Meeting of IGCP 497 and IGCP 499, Abstracts and Programme: 114; Frankfurt am Main, Dresden.

Wehrmann, A., Yilmaz, I., Wilde, V., Schindler, E., Kozlu, H. & Yalçın, M.N. (2008): Sedimentology and microfacies of shallow-marine carbonates from the Central and Eastern Taurides (Turkey). – In: Königshof, P. & Linnemann, U. (Eds.): From Gondwana and Laurussia to Pangaea: Dynamics of oceans and supercontinents. – 20th International Senckenberg Conference and 2nd Geinitz Conference, Final Meeting of IGCP 497 and IGCP 499, Abstracts and Programme: 137-139; Frankfurt am Main, Dresden.

Yalçın, M.N., Yilmaz, I., Wilde, V., Wehrmann, A., Schindler, E., Özkan, R., Nazik, A., Nalcioğlu, G., Königshof, P., Jansen, U. & Brocke, R. (2008): Palaeogeographical setting of Devonian successions of Turkey – A Gondwanan vs. Laurasian comparison. – In: Königshof, P. & Linnemann, U. (Eds.): From Gondwana and Laurussia to Pangaea: Dynamics of oceans and supercontinents. – 20th International Senckenberg Conference and 2nd Geinitz Conference, Final Meeting of IGCP 497 and IGCP 499, Abstracts and Programme: 141-142; Frankfurt am Main, Dresden.

Wehrmann, A., Yilmaz, I., Schindler, E., Kozlu, H., Bozdoğan, N., Brocke, R., Ertug, K., Gedik, I., Jansen, U., Karslıoğlu, Ö., Nalcioğlu, G., Nazik, A., Özkan, Ö., Saydam Demiray, D.G., Weddige, K., Wilde, V. & Yalçın, M.N. (2008): Key sections from the Devonian of the Central and Eastern Taurides (Turkey). – In: Königshof, P. & Linnemann, U. (Eds.): From Gondwana and Laurussia to Pangaea: Dynamics of oceans and supercontinents. – 20th International Senckenberg Conference and 2nd Geinitz Conference, Final Meeting of IGCP 497 and IGCP 499, Abstracts and Programme: 239; Frankfurt am Main, Dresden.

Schindler, E., Brocke, R. & Königshof, P. (2008): Cephalopod limestones in the Dill Syncline, abondoned quarry Benner (Bicken). – In: Königshof, P. & Linnemann, U. (Eds.): The Rheno-Hercynian, Mid-German Crystalline and Saxo-Thuringian Zones (Central European Variscides). – 20th International Senckenberg Conference and 2nd Geinitz Conference: "From Gondwana and Laurussia to Pangaea: Dynamics of oceans and supercontinents", Final Meeting of IGCP 497 and IGCP 499, Excursion Guide: 86-88; Frankfurt am Main, Dresden.

Liao, J.-C., Königshof, P., Valenzuela-Ríos, J.I. & Schindler, E. (2008): Depositional environment interpretation and development of the Renanué section (Upper Eifelian – Lower Frasnian; Pyrenees, N. Spain). – Bulletin of Geosciences, 83 (4): 481-490; Praha.

Schindler, E. & Gereke, M. (2009): Die Kellwasser-Krise im Ober-Devon: Ein Zeitabschnitt ökologischer Umwälzungen und eines großen Massenaussterbe-Ereignisses – Bezüge zum Harz. – Exkursionsführer und Veröffentlichungen der Deutschen Gesellschaft für Geowissenschaften, 239: 28-30; Hannover.

Gereke, M., Luppold, F.W., Piecha, M., Schindler, E. & Stoppel, D. (2009): Die Typlokalität der Kellwasserkalke am Weganschnitt im Kellwassertal NE Altenau/Oberharz. – Exkursionsführer und Veröffentlichungen der Deutschen Gesellschaft für Geowissenschaften, 239: 51-53; Hannover.

Yalçın, M.N., Karslıoğlu, Ö, Bozdoğan, N. & Schindler, E. (2009): Contributions to the Devonian stratigraphy in Eastern Taurids – Events and source rock formation. – 17th International Petroleum and Natural Gas Congress and Exhibition of Turkey, May 13-15, 2009, Abstracts & Proceedings Book: 11-13; Ankara.

Schindler, E., Wilde, V., Wehrmann, A. & Brocke, R. (2009): Siliciclastic microfacies and taphonomy of a Lower Devonian marine-terrestrial transitional environment (Nellenköpfchen Formation, Rheinisches Schiefergebirge, Germany): Implications for small-scale fluctuations in a complex setting. – Cincinnati Museum Center Scientific Contributions, 3: 52; Cincinnati.

Brett, C.E., Zambito, J.J., Schindler, E. & Hunda, B. (2009): Taphonomy of rhythmic trilobite beds in the Lower Devonian of Morocco: The paradox of „Cyclic Event Beds". – Cincinnati Museum Center Scientific Contributions, 3: 341-342; Cincinnati.

Berkyová, S., Brocke, R., Fatka, O., Frýda, J., Schindler, E., Filipiak, P., Koptikova, L., Budil, P. & Suttner, T.J. (2009): Prasinophyte bloom and intense micritization as evidences for enhanced nutrient load during Basal Choteč Event – a preliminary report. – Berichte des Institutes für Erdwissenschaften, Karl-Franzens-Universität Graz, 14: 11-12; Graz.

Brocke, R., Fatka, O., Berkyová, S., Budil, P., Fryda, J. & Schindler, E. (2009): Early Middle Devonian (Eifelian) phytoplankton bloom associated with the Basal Choteč Event in the Barrandian area (Czech Republic). – CIMP Faro'09 Abstracts: 79-81; Faro.

Brocke, R., Berkyová, S., Budil, P., Fatka, O., Fryda, J. & Schindler, E. (2009): Phytoplankton bloom in the Early Middle Devonian (Eifelian): The Basal Choteč Event in the Barrandian area (Czech Republic). – Schriftenreihe der Deutschen Gesellschaft für Geowissenschaften, 63: 63; Hannover.

Schindler, E., Wilde, V., Wehrmann, A., Brocke, R. & Schultka, S. (2009): A Lower Devonian marine–terrestrial transition – implications for small-scale fluctuations in a complex environmental setting (Nellenköpfchen Formation, Rheinisches Schiefergebirge, Germany). – Schriftenreihe der Deutschen Gesellschaft für Geowissenschaften, 63: 70; Hannover.

Wehrmann, A., Yilmaz, I., Yalçın, M.N., Wilde, V., Schindler, E., Weddige, K., Saydam Demiray, D.G., Özkan, R., Nazik, A., Nalcioğlu, G., Kozlu, H., Karslioğlu, Ö., Jansen, U., Ertug, K., Brocke, R. & Bozdoğan, N. (2009, e-publ.): Devonian shallow-water sequences from the North Gondwana coastal margin (Central and Eastern Taurides, Turkey): Sedimentology, facies and global events. – Gondwana Research, doi:10.1016/j.gr.2009.09.011.

Brett, C.E., Zambito, J.J., Hunda, B.R., Kolbe, S.E. & Schindler, E. (2009): Taphonomic analysis of Devonian rhythmic trilobite beds: Event sedimentation and cyclic cementation. – Geological Society of America, Abstracts with Programs, 41 (7): 31; Boulder.

CM Ladislav SLAVIK

Last year I was busy with several ongoing or newly launched items:

1) A new 5-year project focused on late Silurian conodont-graptolite stratigraphy in the Prague Synform was started; its aim is also to contribute to the global Silurian/Devonian boundary with respect to faunal turnovers among conodonts, graptolites and benthic faunas.

2) We continue the study of the Silurian-Devonian conodonts from Prague Synform in cooperation with Peter CARLS, Mike MURPHY and Nacho VALENZUELA.

3) The local conodont zonal scale of the Lochkovian in stratotype area (Prague Synform) is close to publication. In the early part of the Lochkovian in the Požár-3 section was reconstructed the apparatus of stratigraphically significant taxon *Lanea carlsi*.

4) The studies of the type locality Zinzilban in Kitab State Area, Uzbekistan continued. The total 15 conodont samples were jointly taken with Nadya Izokh, Nacho VALENZUELA and myself from the boundary interval Zinzilban/Norbonak (Beds No. 39-41). The first results from the joint sampling for conodonts with Nacho and Nadya do not seem to be promising for the precise placement of the new boundary. My part of samples (approximately one third of total weight) is already completely processed. About 2000 of conodont elements were extracted. The faunas are relativelly rich in spathognathodontids and simple cones, where taxa "*miae*" and "*Pandorinellina*? *exigua* ssp." prevail. Polygnathids are not abundant and were obtained just from two samples, including the basal Norbonak bed with *Polygnathus excavatus*. Conodont collections obtained by all of us from this sampling campaign will be discussed with Nadya and Nacho in Prague, probably this spring.

5) We worked with Gil MACHADO (Évora), Jindra HLADIL and Leona KOPTÍKOVÁ on the correlation of the Lower/Middle Devonian from Western Ossa-Morena Zone (Odivelas Limestone), this cooperation resulted in paper submitted to Geologica Belgica.

CM Claudia SPALETTA

My current activity is mainly focused on the study of stratigraphic sections at the Frasnian-Famennian boundary in the Carnic Alps. Together with conodont biostratigraphy, taxonomic and biofacies studies, lithostratigraphy and sedimentology analysis on the the studied sections are also carried out. The studies are made in collaboration with Enzo Farabegoli and M.Cristina Perri, Univ. of Bologna, and Monica Pondrelli, Univ. of Pescara.

I am also still studying Famennian conodont biostratigraphy of many sections of the Carnic Alps (with M. Cristina Perri, Univ. of Bologna). A taxonomic revision of upper Famennian-lowermost Carboniferous protognathoidid faunas is just started, together with Carlo CORRADINI (Univ. Cagliari) and Sandra Kaiser (Bonn).

Recently a project for the formal definition of the of the pre-Variscan lithostratigraphic units of the Carnic Alps, was started, under the coordination of Carlo CORRADINI (Univ. of Cagliari) and Thomas SUTTNER (Univ. of Graz), by the Working Group on "Formal Lithostratigraphic Units in the Pre-Variscan sequence of the Carnic Alps". I am responsible for the Devonian pelagic limestone units, but I am also involved in the study of the transitional carbonatic units.

CM TA Hoa Phuong

Report of the research of Devonian stratigraphy in Vietnam

During the year 2009, research on Devonian stratigraphy in Vietnam was relatively active.

1. Researchers on Devonian stratigraphy in Vietnam (namely TONG Dzuy Thanh, TA Hoa Phuong) made contributions to the completion of **"Geology and mineral resources of Vietnam"** monography, *Natural Sciences and Technology Publishing House, Hanoi, 2009*, which is co-edited by Prof. TRAN Van Tri and Prof. VU Khuc. Latest materials on Vietnamese Devonian stratigraphy have been updated in this monography. This book is now being translated into English for publication.

2. Field trips were organised for senior geologists namely Mr. Bui Phu My (84 years old) and Mr. NGUYEN Kinh Quoc (71 years old) who travelled from the South to the North of Vietnam, doing research on Devonian stratigraphy in Bac Son area, Lang Son province and Do Son peninsula, Hai Phong city (in October 2009).

3. Field trips were organised for Vietnamese and French paleontologues, namely TA Hoa Phuong, NGUYEN Huu Hung, Philippe JANVIER, Gael CLEMENT and Paul GONEZ, who made researches on Devonian stratigraphy and fish and plant fossils in Hai Phong and Quang Ninh province (in November 2009).

4. Several scientific articles on and relating to Devonian stratigraphy were published.

Publications

JANVIER PH, TONG-DZUY THANH, TA HOA PHUONG, CLEMENT G., NGUYEN DUC PHONG, 2009. Occurence of *Sanqiaspis*, Liu, 1975 (Vertebrata, Galeaspida) in the Lower Devonian of Vietnam, with remarks on the anatomy and systematics of the Sanqiaspidae. *ScienceDirect Palevol, 8, pp. 59-65. USA* (in Vietnamese).

TẠ HOA PHUONG, NGUYEN DUC PHONG, NGUYEN VAN VUONG, 2009. Proposal hypostratotype for the Si Phai formation (D sp) in Dong Van – Meo Vac area, Ha Giang. Journal of Geology, N0 310, pp. 20-27. Hanoi (in Vietnamese)

TA HOA PHUONG, NGUYEN HUU CU, TRAN DUC THANH, 2009. Geoheritage values in the Do Son peninsula, Hai Phong. Selected works of Marine Environment and Resources, vol. XIV, pp. 15-34. Hai Phong (in Vietnamese).

TRẦN VAN TRI, VU KHUC (EDITORS), TONG DZUY THANH, TA HOA PHUONG et al. 2009. Geology and Natural Resources of Vietnam. Natural Sciences and Technology Publishing House. Hanoi. 592 pgs. (in Vietnamese).

NGUYEN HUU HUNG, NGUYEN THI THUY, DAO TRONG TOAN 2009. The stratigraphic position and age of the Na Tuong Formation in the Song Hien structuro-facial Zone. *Journal of sciences of the Earth, No 31(2), pp. 131-138* (in Vietnamese).

.

TM José I. VALENZUELA-RIOS

Major contribution has been devoted to push forward three Ph. D. Thesis on Devonian biostratigraphy and, also, in coordinating final actions regarding the last year (OET) of the Spanish Working Group within the IGCP-499. Besides, a "two fold" stay in Novosibirsk has allowed direct study of conodont collections around the Pragian/Emsian boundary and the results of it is the future out-coming of several joint papers with the Novosibirsk team. Also, joint fieldwork in Siberia allowed examination of key sections, and evaluation of their potential for the 2011 field trip.

At the end of the year Maria CORRIGA (Italy) spent two months at my laboratory and we started a collaboration aiming at a better understanding of the S/D boundary, together with Carlo CORRADINI and Teresa LIAO, by comparing sections from the Spanish Central Pyrenees and Sardinia. We hope to be able to present preliminary results at SDS meeting in London. The study of the samples we (Nadya, Ladislav and myself, with the help of Peter CARLS) took at the type section of Zinzilban aiming at the new P/E boundary position has not resulted as successful as we expected. The three of us are somehow disappointed with the results, but we shall not dismay in our endeavour. In parallel to this study a detailed re-study of the stratotype of Polygnathus excavatus (Iberian Chains, Aragón, Spain) has started (Peter CARLS and myself).

In a joint paper on several, relevant Spanish sections with Claudia DOJEN and Peter CARLS,

we present a detailed biostratigraphic Lower Devonian ostracod-based framework that is conodont controlled and that we hope can be of global application.

Cooperation with many friends and colleagues aiming at different aspects and Devonian regions is envisaged for the next years; among them, Peter CARLS, Mike MURPHY, Ladislav SLAVÍK, Karsten WEDDIGE, Nadya IZOKH, Carlo CORRADINI, Peter KÖNIGSHOF, Eberhard SCHINDLER, Chuck VER STRAETEN stand out.

Devonian Works published in 2009

Botella, H., Valenzuela-Ríos, J.I. & Martínez-Pérez, C. (2009): Tooth replacement rates in early chondrichthyans: a qualitative approach. Lethaia, 42: 365–376.

Dojen, C.; Valenzuela-Ríos, J.I. & Carls, P. (2009): Ostracodes of Spain (Pyrenees, Celtiberia) and Early Devonian biostratigraphy. Palaeontographica Americana, 63:145-155.

Abstracts and Proceedings

Liao, J.-C. y Valenzuela Ríos, J.I. (2009): Nuevas datos lito-biostratigráficos de la sección Basibé, Pirineo Aragonés. Comunicaciones de las XXV Jornadas de la Sociedad Española de Paleontología y simposios de los Proyectos PICG 493, 499 y 506; Libro de resúmenes: 282-283.

Liao, J.-C. y Valenzuela Ríos, J.I. (2009): Early Ancyrodella from Basibé, a second extinction! Permophiles, 53 (1): 28

Martínez-Pérez, C. y Valenzuela-Ríos, J.I. (2009): Conodontos del Emsiense (Dévonico Inferior) en las subfacies Baliera (Pirineos Aragoneses).Comunicaciones de las XXV Jornadas de la Sociedad Española de Paleontología y simposios de los Proyectos PICG 493, 499 y 506; Libro de resúmenes: 285-287.

Valenzuela-Ríos, J.I.; Liao, J-C.; Clariana, P. y Gil, I. (2009): El Devónico Medio y Superior del sinclinal Tor-Casamanya (Andorra). Comunicaciones de las XXV Jornadas de la Sociedad Española de Paleontología y simposios de los Proyectos PICG 493, 499 y 506; Libro de resúmenes: 296-297.

Valenzuela-Ríos, J.I.; Liao, J-C.; Clariana, P. y Gil, I. (2009): Devonian Conodonts from the Tor-Casamanya Synclinorium (Andorra); a preliminary report. Permophiles, 53 (1): 50.

CM Chuck VER STRAETEN

2009 was a busy year, and included some diverse work. Budgetary problems related to the economy and a broken foot limited some activities. However, there was plenty to do relatively close to home or (while hobbling along on crutches) at the desk. I hope some of this will be of interest and use to other SDS members.

A new paper of mine on Emsian sequence stratigraphy/T-R Cycle Ib came out in November, in Jeff OVER's proceedings volume of the SDS 2007 Nevada meeting. In the paper, I've proposed splitting Devonian T-R cycle Ib into five cycles. built upon my sequence stratigraphic work in the eastern U.S. The pattern is of three lower cycles within what should approximate the Zlichovian, and two upper cycles within what should be the Dalejan. JOHNSON et al. (1985) saw at least some of these cycles, if not all of them - but did not seem to think much of the Emsian, and lumped them together in one long cycle. These five sequences are each major cycles on their own, on the scale of other, non-Emsian T-R cycles. The new T-R cycles are termed Ib_1, Ib_2, Ib_3, Ib_4, and Ib_5.

In 2009, my interest in Devonian orogenesis in eastern North America led to two new papers on the sedimentary record of the Acadian orogeny. The papers examine multiple types of data from New York and beyond (e.g., changes in sediment type, stratal geometry, distribution of volcanic tephras, and conglomerate/sandstone compositions), and their implications for foreland basin evolution, tectonic versus eustatic effects on sea level changes, explosive volcanism, and unroofing of the orogen, and other issues. The first paper was a field trip article (for the New York State Geological Association); the second will be published in a GSA Memoir titled *From Rodinia to Pangea.*

Although the fieldtrip paper came out, I could not run the trip, as I had broken a bone in my foot, and was hobbling about on crutches from late August to late November. Thanks to Carlton BRETT and Alex BARTHOLOMEW, who jumped in and ran a trip to many of the same outcrops.

While preparing for the field trip, I spent a lot of time exploring the Givetian to Frasnian terrestrial facies in the Catskill Front of eastern New York. This led to a few interesting discoveries, including older Givetian evidence of forests, and additional freshwater carbonates in the terrestrial facies.

For years, I've been working on high resolution correlations and sequence stratigraphy of Emsian and Eifelian strata across the Appalachian basin (eastern U.S.). Using that stratigraphy, Dick LINDEMANN, Eberhard SCHINDLER, Bill KIRCHGASSER and I have been collecting Emsian-Eifelian biostratigraphic samples since 2006, in the central to southern Appalachian basin. Dick and I will be sending out samples for analyses of conodonts and palynology +/- ostracodes and bactritid cephalopods in early 2010. Dick and Eberhard, and Bill will work on the dacryoconarids and goniatites. We hope this greatly improves international correlation of the eastern U.S. strata, especially for the Emsian, for which very little data is presently available.

In 2010, I'll also begin bedrock geologic mapping the Berne 15' quadrangle, in the hills west of Albany, New York, where I live. The Berne quadrangle consists mostly of lower to Middle Devonian (Lochkovian to lower Givetian) strata. Its classic Devonian localities have been studied by geologists from around the world since the early 1800s, including James HALL and Charles LYELL. The Berne quad includes the famous John BOYD Thacher State Park, the type area of the predominantly Lochkovian-age Helderberg Group. The Berne quadrangle, anomalously, is also the site of 23 minor earthquakes (1.4 to 3.1 magnitude, 6-16 km deep) during 2009.

Published papers, 2009

Ver Straeten, C.A., 2009, *Devonian T-R Cycle Ib: The "lumping of Emsian sea level history. In* Over, D.J., ed., Studies in Devonian Stratigraphy: Proceedings of the 2007 International Meeting of the Subcommission on Devonian Stratigraphy and IGCP 499, Palaeontographica Americana, no. 63, p. 33-47.

Ver Straeten, C.A., 2009, *The Classic Devonian of the Catskill Front: A Foreland Basin Record of Acadian Orogenesis. In* Vollmer, F., ed., New York State Geological Association, 81st Annual Meeting Guidebook, p. 7-1 to 7-54

Public Outreach/Popular Geology Articles

Ver Straeten, C.A., 2009, *The 2009 Berne Earthquakes*. For "The Friends of Thacher and Thompsons Lake State Parks" newsletter, Nov. issue.

Papers Awaiting Publication

Ver Straeten, C.A., revised and awaiting publication, *Lessons from the foreland basin: Northern Appalachian basin perspectives on the Acadian orogeny.* Invited paper for a Geological Society of America Special Paper, "From Rodinia to Pangea: The Lithotectonic Record of the Appalachian Region". Volume submitted to GSA, for publication in 2010.

Ver Straeten, C.A., Brett, C.E., and Sageman, B.B., revised and awaiting publication, *Mudrock Sequence Stratigraphy: A Multi-proxy (sedimentologic, paleobiologic, geochemical) Approach, Devonian Appalachian Basin.* Invited submission to special volume of Palaeogeography, Palaeoclimatology, Palaeoecology.

Brett, C.E., Baird, G.C., Bartholomew, A., and Ver Straeten, C.A., revised and awaiting publication, *Sequence stratigraphy and revised sea level curve for the Middle Devonian in eastern North America:* Invited submission to special volume of Palaeogeography, Palaeoclimatology, Palaeoecology.

Ver Straeten, C.A., Brett, C.E., and Davala, S., revised and awaiting publication, *Bedrock geological map of the Tully 7.5 minute Quadrangle, central New York*: New York State Geological Survey.

Published Abstracts, 2009

Ver Straeten, C.A., 2009, Biofacies and Delineation of Multiple Emsian T-R cycles, *Appalachian Basin*: Ninth North American Paleontological Convention/International Subcommission on Devonian Stratigraphy meeting, Cincinnati, OH, June 2009.

Lindemann, R., and Ver Straeten, C.A., 2009, *Eifelian through lower Givetian (lower Middle Devonian) dacryoconarid successions, northern Appalachian Basin:* Ninth North American Paleontological Convention/International Subcommission on Devonian Stratigraphy meeting, Cincinnati, OH, June 2009.

Abstracts submitted for 2010

Ver Straeten, C.A., 2010, Unroofing *the Acadian Orogen: Composition and Provenance of Devonian Clastics, New York State.* Submitted for Geological Society of America Abstracts with Programs/Northeastern-Southeastern Geological Society of America meeting, March, 2010.

Grady, B., Travis, M., Over, D.J., Ver Straeten, C.A., Bartholomew, A., and Schramm, T.J., 2010, *Magnetic Susceptibility Based Placement of the Eifelian-Givetian Boundary in the Marcellus Shale of the lower Hamilton Group in New York State.* Submitted for *Geological Society of America* Abstracts with Programs/Northeastern-Southeastern Geological Society of America meeting, March, 2010.

CM Michael WHALEN

I have been continuing work with my students and Jed Day on Devonian stratigraphy and bioevents in western Canada. Jed and I have a manuscript currently in revision for the Journal of Sedimentary Research that investigates the magnetic susceptibility (MS) signature from stratigraphic sections across the Alberta basin. I was also recently co-author on a paper comparing the MS signature of Frasnian deposits in western Canada and Belgium.

During spring 2009 my student Josh PAYNE, finished his Master's thesis looking at the application of geochemistry and carbon and nitrogen isotopes across the Frasnian-Famennian boundary in western Canada. I also presented this work at the annual GSA meeting in Denver.

In December I attended the first meeting of IGCP 580: Application of Magnetic Susceptibility on Paleozoic Sedimentary Rocks in Liége, Belgium. I helped to organize this project with Anne-Christine DA SILVA and Frederic BOULVAIN (Liége university), Jindrich HLADIL (Institute of Geology and Czech Academy of Sciences), Simo SPASSOV (Section du Magnétisme Environnemental, l'institut Royal Météorologique de Belgique), Daizhao CHEN (Institute of Geology and Geophysics, Chinese Academy of Sciences) and Xavier DEVLEESCHOUWER (Université Libre de Bruxelles). The project will foster international collaboration on MS stratigraphy in the Devonian and future field conferences are planned for China, Morroco, and the United States. A manuscript based on the work of my current PhD student, Maciej ŚLIWIŃSKI, concerning geochemistry and MS of the Frasnian *punctata* zone event in western Canada, was presented and submitted for a special volume resulting from that meeting.

Papers

da Silva, A.C., Mabille, C., Potma, K., Weissenberger, J., Whalen, M.T., & Bouvlain, F., 2009, Magnetic susceptibility evolution and sedimentary environments on carbonate platform sediments and atolls, comparison of the Frasnian from Belgium and from Alberta, Canada, Sedimentary Geology, v. 214, p. 3-18.

Payne, J.H., 2009, Chemostratigraphy of the Late Devonian Frasnian-Famennian transition in Alberta, Canada and its implications, M.S. Thesis, University of Alaska Fairbanks, 120 p.

Śliwiński, M.G., Whalen, M.T., and Day, J.E., submitted, Trace Element Variations in the Middle Frasnian Punctata Zone (Late Devonian) in the Western Canada Sedimentary Basin: Changes in Oceanic Bioproductivity and Paleoredox Spurred by a Pulse of Terrestrial Afforestataion? Special Issue of Geological Belgica for IGCP 580.

Whalen, M.T., Day, J.E., in review, Cross-basin variations in magnetic susceptibility influenced by changing sea level, paleogeography, and paleoclimate; Upper Devonian, Western Canada Sedimentary Basin, Journal Of Sedimentary Research.

Abstracts

Payne, J.H., Whalen, M.T., and Day, J.E., 2009, Differential geochemical response during two Late Devonian mass extinction pulses: Implications for global change, Geological Society of America Abstracts with Programs v. 41, No. 7, p. 513.

For unknown reasons the Newsletter contributions by Alain BLIECK went missing during submission and, therefore, were not part of the originally edited issue. This was discovered after its placing on our SDS website. Both are added here, continuing the pagination.

R. Th. BECKER

TM Alain BLIECK

Alain BLIECK (France) is currently working with Ordovician to Devonian, and sporadically with Early Carboniferous vertebrates. However most results are concerned with Devonian vertebrates, and particularly with Early Devonian assemblages. His CNRS research programme is entitled « *Early and Middle Palaeozoic palaeoichthyology and palaeobiogeography* ». Its three main topics are as follows:

1) at the origins: Cambrian-Ordovician vertebrates; with the settling of a taxonomic and biostratigraphic database of Cambrian and Ordovician vertebrates (in collaboration with S. TURNER, Brisbane, Australia) and the study of an Ordovician locality from Saudi Arabia (material collected by D. VASLET, BRGM, France; in collaboration with O. LEHNERT, Erlangen, Germany).

2) the adaptive radiation of Early Devonian vertebrates in transitional continental-marine environments of the Old Red Sandstone Continent; with studies of new localities from the Ardenne massif in Belgium and the Grand Duchy of Luxembourg, of new Emsian material from the Rhenish slate massif in Germany (in collaboration with E. Schindler, R. BROCKE *et al*., Frankfurt a.M., and A. LÓPEZ-ARBARELLO, München, Germany), of Silurian – Early Devonian material from eastern Poland (in collaboration with M. BORSUK-BIALYNICKA, Warsaw, Poland), of Early and Middle Devonian material from Severnaya Zemlya, Russia (in collaboration with V.N. KARATAJUTE-TALIMAA, Vilnius, Lithuania), of new material from northern Spitsbergen, and eventually of Early and Middle Devonian material from eastern Canada (in collaboration with R. CLOUTIER, Québec, Canada, and H. LELIÈVRE, Paris, France).

3) the terrestrialization of vertebrates in Late Devonian marine to continental environments, after study of material from the Famennian of Condroz, Ardenne massif, in Belgium, and from the Late Devonian of European Russia, in the districts of Novgorod and Luga (this project is coordinated by G. CLÉMENT, Paris, France, and O.A. LEBEDEV, Moscow, Russia).

Alain BLIECK is also involved in a collaborative work with seven other palaeontologists (S. TURNER, C.J. BURROW, H.-P. SCHULTZE, C.B. REXROAD, P. BULTYNCK, G.S. NOWLAN and W.-E. REIF [deceased]), either as vertebrate or conodont experts, in order to give a revised series of arguments against the "conodonts are vertebrates" theory of the British School (R.J. ALDRIDGE, P. DONOGHUE, M. PURNELL, M.M. SMITH et al.). Conodonts (known from the Upper Cambrian to the Triassic) are neither vertebrates nor craniates, and have to be considered as basal chordates at the best, but even this hypothesis is perhaps not pertinent. The latter study is in press in *Geodiversitas* (MNHN, Paris); a shorter, more interpretative version will be proposed to *Episodes* (IUGS).

Papers

Thirion, F. & Blieck, A. (2009).- New pteraspidiform heterostracans (Vertebrata) from the Lower Devonian of La Gileppe and Nonceveux, Belgium.- *Geologica Belgica,* 12 (1-2): 31-43, 7 fig., 2 pl.; Bruxelles [also World Wide Web address: http://popups.ulg.ac.be:80/Geol/document.php?id=2651].

Dupret, V. & Blieck, A. (2009).- The Lochkovian-Pragian boundary in Podolia (Lower Devonian, Ukraine) based upon placoderm vertebrates.- *C. R. Geoscience,* 341 (1): 63-70, 4 fig., 1 appendix; Elsevier, Amsterdam & Acad. Sci. Paris [also World Wide Web address: http://dx.doi.org/10.1016/j.crte.2008.09.007].

Blieck, A. (2009).- Le Nord – Pas-de-Calais depuis 450 millions d'années — Un passé agité.- *In*: Robaszynski, F. & Guyétant, G. (coord.), *Des roches aux paysages dans le Nord – Pas-de-Calais — Richesse de notre patrimoine géologique* (dans le cadre de l'Inventaire National du Patrimoine Géologique et de l'Année Internationale de la Planète Terre); Conserv. Sites Natur. Nord - Pas-de-Calais & Soc. Géol. Nord édit.: 20-29, 9 fig. [In French]

Blieck, A. (2009).- Pernes en Artois – Les roches les plus vieilles du Nord – Pas-de-Calais.- *In*: Robaszynski, F. & Guyétant, G. (coord.), *Des roches aux paysages dans le Nord – Pas-de-Calais — Richesse de notre patrimoine géologique* (dans le cadre de l'Inventaire National du Patrimoine Géologique et de l'Année Internationale de la Planète Terre); Conserv. Sites Natur. Nord - Pas-de-Calais & Soc. Géol. Nord édit.: 86-87, 3 fig. [in French]

Blieck, A. (2009).- Biodiversité, environnements et évolution au Paléozoïque : le cas des vertébrés du Cambrien au Dévonien.- *Ann. Soc. Géol. Nord,* 2e série, 16: 19-33, 11 fig.; Villeneuve d'Ascq. [in French]

Abstracts

Blieck, A. (2009).- Palaeozoic biodiversity, ecosystems and evolution : the case of Ordovician to Devonian vertebrate-dominated assemblages.- *In*: Godefroit (P.) & Lambert (O.) eds, *Tribute to Charles Darwin and Bernissart Iguanodons: New perspectives on vertebrate evolution and Early Cretaceous ecosystems* (E.A.V.P. extraordinary meeting, Brussels, 8-14 Febr. 2009). Programme, Abstracts and Field Trips Guidebook: 20; R.B.I.N.S., Brussels.

Blieck, A., Turner, S., Burrow, C.J., Schultze, H.-P., Reif, W.-E., Rexroad, C.B. & Nowlan, G.S. (2009).- Biologie des organismes, phylogénie et stratégie de publication : pourquoi les conodontes ne sont pas des vertébrés ?- *In*: Thirion, F., Legrain, X. & Vecoli, M. (eds), *Prospectives en paléontologie et palynologie* (congrès APF-APLF, 2-5 juin 2009, Lille). Résumés: 16-17; Villeneuve d'Ascq [reproduit *in* : *Journal de l'APF*, 56 : 14-15]. [In French]

Blieck, A., Turner, S., Burrow, C.J., Schultze, H.-P., Reif, W.-E., Rexroad, C.B. & Nowlan, G.S. (2009).- Organismal biology, phylogeny and strategy of publication: why conodonts are not vertebrates.- *In*: Third International Conference Geologica Belgica (Ghent, Belgium, 14-15 Sept. 2009). Programme and abstracts: 19-20; Ghent University.

Blieck, A., Turner, S., Burrow, C.J., Schultze, H.-P. & Rexroad, C.B. (2009).- Organismal biology, phylogeny and strategy of publication : why conodonts are not vertebrates.- *In*: 69th Annual Meeting Society of Vertebrate Paleontology & 57th Symposium on Vertebrate Palaeontology and Comparative Anatomy (SVPCA) (Univ. Bristol, UK, Sept. 23-26, 2009). Program and Abstracts. *Jl. Vert. Paleont*., 29 (Suppl. to Nr. 3): 65A.

Schultze, H.-P., Turner, S., Blieck, A., Burrow, C.J., Reif, W.-E., Rexroad, C.B., Bultynck, P. & Nowlan, G.S. (2009).- Phylogenetische und systematische Stellung der Conodonten [Phylogenetic and systematic position of conodonts].- *In*: 79. Jahrestagung der Paläontologischen Gesellschaft: Paläontologie – Schlüssel zur Evolution (Bonn, 5-7 Okt. 2009). *Terra Nostra* (Kurzfassungen), 2009 (3): 111-112; Bonn [In German].

Book reviews

Blieck, A. (2009).- Notes de lecture: Laurin, M., 2008: *Systématique, paléontologie et biologie évolutive moderne — L'exemple de la sortie des eaux chez les vertébrés*. Ellipses, collection Parcours LMD – Sciences de la vie et de la Terre, Paris, 176 p., illustré.- *Journal de l'APF*, 55 [déc. 2008]: 32-33; Paris. [In French]

Blieck, A. (2009).- Analyse d'ouvrage: Steyer, S. 2009: *La Terre avant les dinosaures*. Belin – Pour la Science, Bibliothèque scientifique, Paris, 205 p., illustrations et figures par A. Bénéteau, ISSN 0224-5159.- *Journal de l'APF*, 56: 6-7; Villeneuve d'Ascq. [In French]

Other

Blieck, A. (2009).- Associations professionnelles de géoscientifiques: situation en France dans le contexte mondial. Année Internationale de la Planète Terre (AIPT). Liste des associations françaises de géosciences.- *In* : Dossier Géosciences – Formations et métiers de demain. *Durabilis*, 10: 30-31, 35, 39; JVProspectives, Preixan (France). World Wide Web address: http://www.magazine-durabilis.net/ [In French]

Comment on the discovery of supposed lower Eifelian tetrapod tracks from Poland

TM A. BLIECK

NIEDZWIEDZKI *et al.* (2010) have recently announced and illustrated the discovery of early Eifelian tetrapod tracks and trackways from the northern Lysogory region of the Holy Cross Mountains, Poland, in the disused Zachemie Quarry "within the Wojciechowice

Formation, some 20m below the level where a conodont sample showing a characteristic *costatus* Zone assemblage (Eifelian) was taken" (*ibid*., p. 43). This discovery confirms the recent paradigm that the earliest tetrapods have to be found before the Late Devonian, say in the Mid Devonian, and even earlier if one ?Silurian-Early Devonian track from Australia is well dated. This is briefly discussed in BLIECK *et al*. (in press).

This is a typical example of what happens to "scenarios" in palaeontology. Owing to the oldest known fossils of tetrapods, we hypothesize that they originated in the Late Devonian or a bit earlier in the Mid Devonian. Polish colleagues do find a Mid-Devonian supposed tetrapod tracks (supposed because as long as the actual organism is not directly connected to the tracks, it remains an hypothesis), and this is supposed to "confirm" the original hypothesis. If the Australian, Glenisla track is (1) confirmed to be of a tetrapod, and (2) confirmed to be of Silurian-Early Devonian age, we will change the scenario again for a Silurian origin of tetrapods. In the latter case, we will have a "ghost range" of ca. 30 My for the elpistostegids, the sister group of tetrapods, which is known from the Frasnian at the oldest (for the time being). So, what can we do now? First: try to find older elpistostegids; second: try to find more Early Devonian tetrapod tracks, or better bones; third: try to find even older tetrapod remains, etc. etc. etc. This is endless. One possible test is to compare these geological ages of fossils with what molecular phylogenies say. The "only" problem is that, in the case of molecular phylogenies with ages (the so-called molecular clock), these ages are based upon the well dated oldest fossil remains of each clade in the phylogeny. We are typically here in a circular reasoning ... So, what? Let's go on, and find more fossils.

A few years ago (15 years?), we were "convinced" that the oldest tetrapods were Famennian in age (see the "Strunian" tetrapods *Ichthyostega* and *Acanthostega* of East Greenland). Then Frasnian remains were found. Now possible Eifelian remains are reported. Silurian-Early Devonian ones are supposed. Who is "convinced" of the Eifelian or Silurian-Early Devonian age of the oldest tetrapods? Certainly colleagues who, as all the others, need to make a mediatic effect in order to apply to and obtain more funds for their own research. This is probably one of the reasons why so many colleagues have been working with the earliest tetrapods in the last decade. The terrestrialization of vertebrates (as well as the terrestrialization of plants and of invertebrates) is one of the sexiest topics of modern palaeontology (sexiest in the sense of media). So, work on this subject, find the "oldest one", get funding, and publish (or perrish)! Now, try to know what I am partly doing as a scientist (look at my personal contribution to this issue of the *SDS Newsletter*) … I am member of a French-Russian-Latvian team composed of Oleg LEBEDEV (Moscow, co-leader of the project), Sasha Ivanov (St Petersburg), Ivars Zhupinsh (Riga), Galina Zakharenko (Moscow), Yulia SHUVALOVA (Moscow), Gaël CLÉMENT (Paris, co-leader of the project), Sébastien OLIVE (Paris), and others. This team was looking after ... Frasnian tetrapods in European Russia for its first field expedition on last summer (2009). This project will run until 2011.

References

Blieck, A., Clément, G. & Streel, M. (in press).- The biostratigraphical distribution of earliest tetrapods (Late Devonian) – a revised version with comments on biodiversification.- *In* : Vecoli, M., Clément, G. & Meyer-Berthaud, B. (eds), The terrestrialization process : modelling complex interactions at the biosphere-geosphere interface. *Geol. Soc. London, Spec. Publ*. [submitted, accepted].

Niedzwiedzki, G., Szrek, P., Narkiewicz, K., Narkiewicz, M. & Ahlberg, P.E. (2010).- Tetrapod trackways from the early Middle Devonian period of Poland.- *Nature*, 463: 43-48.